

Aktuarielles Controlling I (Teil 3)

Basics of US GAAP for Life Insurers

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Dr. Ruprecht Witzel

ruprecht.witzel@aktuariat-witzel.ch

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1. Introduction

- US GAAP (General Accepted Accounting Principals) financial reporting is characterized by the following two principles:
 - **true and fair**
 - **time wise matching (synchronization) of proceeds (income) and expenditures (outgo)**

1. Introduction

- The US GAAP financial reporting should be „**true and fair**“ because the main addressees are investors and analysts
- **True and fair** implies for example that
 - a reserve can only be set up if there is really a corresponding claim against the insurance company
 - **contingency reserves** (provisions for unlikely or undefined purposes) **are not allowed**
 - **the assets and liabilities should be neither overstated nor understated relative to their real value**

1. Introduction

- **The time wise matching (synchronization) of proceeds and expenditures is realized by accrual accounting and deferring.**
- **Accrual accounting and deferring** means
 - that adjustments in the financial statements are made to allocate revenue and expenses more appropriately to the measurement period
 - **Examples** are the **deferred acquisition costs (DAC)** or the way the bonus reserve is build up

1. Introduction

- US GAAP distinguishes between
 - **H-GAAP**
 - and
 - **P-GAAP**
- **H-GAAP** is the accounting standard for a **historical grown company**
- **P-GAAP** is the accounting standard for a **purchased company**
- In the following, first the H-GAAP methodology is presented and called just US GAAP
- In the last chapter, the characteristics of P-GAAP are presented

1. Introduction

- **US GAAP or more general Anglo-American Accounting Systems**
 - **are based on case law**
 - This is very well verified by a look at the different FASes (Financial Accounting Standards) in US GAAP
 - Example: FAS 97 as an amendment to FAS 60, if premium paying period is shorter than insurance period
 - **are focused on the capital markets**
 - The main purpose is to provide useful and reliable information for the investors and the analysts

1. Introduction

- **Continental-European Accounting Systems** in contrast
 - are based on code law
 - are focused on creditors
 - This allows for example to understate the financial situation
 - I.e. you are allowed to present the company poorer as it really is
 - A typical example are the hidden reserves

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2.1 Overview

- US GAAP accounting rules for insurance companies are formulated in different **Statements of Financial Accounting Standards (SFAS or short FAS)**
 - **FAS 60, FAS 97 and FAS 120** are relevant for insurance product classification
- **FAS 60** (issued in 1982) contains the **general principles of accounting for insurance products**; there you find:
 - definition of premium income, calculation method to determine provisions for future policyholders' benefits (technical reserves) including assumptions setting, definition of investment income, expense classification and expense allocation etc.

2.1 Overview

- But not all types of products are covered by FAS 60
 - **FAS 60 is the basis**
 - **FAS 97 and FAS 120 are amendments for special life products**
- **FAS 97** (issued in 1987) addresses
 - Universal Life Type Contracts (**Unit Linked Products**)
 - **Limited Payment Contracts**
 - **Investment Contracts**
- **FAS 120** (issued in 1995) addresses participating life products with **policyholders' dividends according to the contribution principle**

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2.2 FAS 60

- According to **FAS 60** insurance contracts are classified as **short-duration or long-duration contracts**:
 - **Short-duration contracts** provide insurance protection for a fixed period of short duration
 - Typical **examples** are **non-life insurance contracts** such as motor or household insurance.
 - **The contract enables the insurer**
 - **to cancel the contract** or
 - to adjust the provisions of the contract **at the end of any contract period**, such as **adjusting the amount of premiums** charged for coverage provided

2.2 FAS 60

- **FAS 60 short** (cont.)
 - The **premiums written** (“gezeichnete Prämien”) are the premiums belonging to a written contract
 - If the contract lasts e.g. for five years and is financed by annual premiums, the premiums written equal five annual premiums
 - The **premiums booked** (“gebuchte Prämien”) would be in this example of a five years contract five times the premium for one year
 - The premiums booked are the **premiums received** in the reporting period

2.2 FAS 60

- **FAS 60 short (cont.)**
 - The **premiums earned** (“verdiente Prämien”) are that part of the premiums booked which belongs to the accounting period
 - They are determined using the **unearned premium reserve (UPR)**
 - The **premiums earned are part of the income in the P&L** to finance the losses of that accounting period
 - That is why a change in the UPR is not going through the P&L
 - The UPR is part of a “prologue” to the P&L
 - **Short-duration contracts do not need an actuarial premium reserve**
 - **There is no savings premium**

2.2 FAS 60

- **FAS 60 long-duration contracts** are expected to remain in force for an extended period
 - Typical examples are **life insurance contracts** as non participating endowments, annuities, whole life etc.
 - **The contract generally is not subject to unilateral changes by the insurer**
 - **Typically there is a tariff guarantee**
 - The performance of various functions and services (including insurance protection) is guaranteed for an extended period

2.2 FAS 60

- **FAS 60 long** (cont.)
 - The **premiums due** (“fällige Prämien”) are part of the income in the P&L
 - The part which is not earned, is going into the unearned premium reserve (UPR)
 - Because premiums due are part of the income in the P&L, a change in UPR has an impact to the P&L for long-duration contracts
 - The UPR is part of the provisions of policyholders benefits (Technical Reserves)

2.2 FAS 60

FAS 60 Long Duration Contract Provisions

- **The provisions for future policyholders' benefits (technical reserves) for FAS 60 long-duration products are calculated using the prospective method**
 - I.e. they are determined as the difference of the present value of the expected future insurance benefits and of the present value of the expected future premiums payments **using locked-in best estimate assumptions including lapse rates and PADs** (Provisions of Adverse Deviations)

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2.3 FAS 97

- FAS 97 establishes accounting standards for
 - **Universal life type contracts (Unit Linked Products)**
 - **Investment contracts**
 - **Limited payment FAS 60 long contracts**

2.3 FAS 97

- **FAS 97 Universal Life Type Contract**
 - **The provisions for future policyholders' benefits (technical reserves) equal the account value;** in general (exception SOP 03-1; SOP = Standard of Position), they can only be determined using the **recursive deposit method**
 - According to the **SOP 03-1**, special additional reserves belonging to such products may be calculated in a different way (e.g. minimum guaranteed death benefit)
 - **Amounts that accrue to the benefits of the policyholders' (including interest accrued to policyholders' balances) are not fixed or guaranteed by the terms of the contract**

2.3 FAS 97

- **FAS 97 Universal Life Type Contract**
 - Premiums may be changed by the policyholder within contract limits without consent of the insurer
 - **Savings premiums and interest accrued on investments are not recorded as revenues, but as deposits**
 - **Only fees for risk and expenses, surrender charges and interest charges are recognized as income**
 - **There is no technical interest rate**
 - It is usual to **classify all Unit Linked Products whenever possible as FAS 97 Universal Life Type Contracts**

2.3 FAS 97

- **FAS 97 Investment Contract**
 - **In these contracts there is no or no significant insurance risk**
 - For example there is no or no significant mortality or morbidity risk
 - **Premiums and interest accrued on investments are not recorded as revenues but as deposits**
 - **Two types are to distinguish:**
 - **Unit linked type**
 - **Traditional type**

2.3 FAS 97

- **FAS 97 Investment Contract**
 - **For the unit linked type**
 - **The provisions for future policyholders' benefits (technical reserves) equal the account value**
 - I.e. they can only be determined using the **recursive deposit method**
 - **There is no technical interest rate**
 - The difference to the universal life type is the missing insurance risk

2.3 FAS 97

- **FAS 97 Investment Contract**
 - **For the traditional type**
 - **there is a technical interest rate**
 - premiums cannot be increased by the policyholder without consent of the insurer

2.3 FAS 97

- **FAS 97 Limited Payment FAS 60 Long Contract**
 - These are traditional insurance products where the insurance period is longer than the period of paying premiums, e.g. single premium business
 - **For these products both FAS 60 long and FAS 97 are relevant**
 - Any amounts of gross premiums in excess of net premiums should be deferred and recognized over the period that services are provided
 - The corresponding reserve is called **Deferred Profit Liability (DPL)**

2.3 FAS 97

- **FAS 97 Limited Payment FAS 60 Long Contract (cont.)**
 - The **provisions for future policyholders' benefits (technical reserves)** for these products are calculated using the **prospective method**
 - I.e. they are determined as the difference of the present value of the expected future insurance benefits and of the present value of the expected future premiums payments **using locked-in best estimate assumptions including lapse rates and PADs as typical for FAS 60 long products**

2.3 FAS 97

- **FAS 97 Limited Payment FAS 60 Long Contract (cont.)**
 - These products are often classified as:
 - **“Traditional limited payment insurance FAS 60 long with FAS 97 DPL”**

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2.4 FAS 120

- For certain **participating life insurance contracts** there were some special rules
 - firstly stated in a **Statement Of Position (SOP 95-1)** relevant only for **mutual life insurance enterprises** and then
 - secondly in **FAS 120** also applicable for **stock life insurance enterprises** (in force since 1995)

2.4 FAS 120

- The rules of **FAS 120 (SOP 95-1)** should be applied if the life insurance contract **meets both of the following conditions:**
 - The contract is a **long duration participating contract** that is expected to **pay dividends to policyholders based on actual experience of the insurer**
 - Annual policyholder dividends are paid in a manner that identifies divisible surplus and distributes that surplus in approximately the same proportion as the contracts are considered to have contributed to divisible surplus (**contribution principle**)

2.4 FAS 120

- **Basis for the contribution principle are the three components of the product life insurance:**
 - the savings component
 - the risk component
 - the service component
- So, there is in principle
 - a savings bonus
 - a risk bonus
 - a service bonus

2.4 FAS 120

- **The provisions for future policyholders' benefits (technical reserves) equal in general the local statutory unillmerized technical reserves**
 - So, the technical reserves are determined using the **prospective method** and they are equal to the difference of the present value of the expected future insurance benefits and of the present value of the expected future premiums payments
 - In contrast to FAS 60, **for FAS 120 products the technical reserves are calculated without lapses**

2.4 FAS 120

- **In Germany, there exists an exception:**
 - Note, in Germany the local statutory reserves are zillmerized
 - The technical reserves were strengthened for the existing (deferred and in payment) **annuity portfolio** in the local statutory accounting system, but not in US GAAP, because a Loss Recognition Test (see below) showed that in US GAAP it was not necessary to strengthen the reserves
 - So, the **difference** between these US GAAP reserves and these local statutory reserves is **not only due to the Zillmer reserve**

2.4 FAS 120

- **Total premiums and interest accrued on investments are recognized as income**
- In continental Europe, life insurance companies in general have the **US GAAP accounting policy to classify all participating life products whenever possible as FAS 120**
 - The rationale for this decision is the aim that the US GAAP provisions for future policyholders benefits are equal to the local statutory unzuillmerized technical reserves

2.4 FAS 120

- In general, the local statutory unskillmerized reserves relevant for FAS 120 products contain larger margins than the reserves for FAS 60 products using best estimate assumptions including lapse rates and PADs

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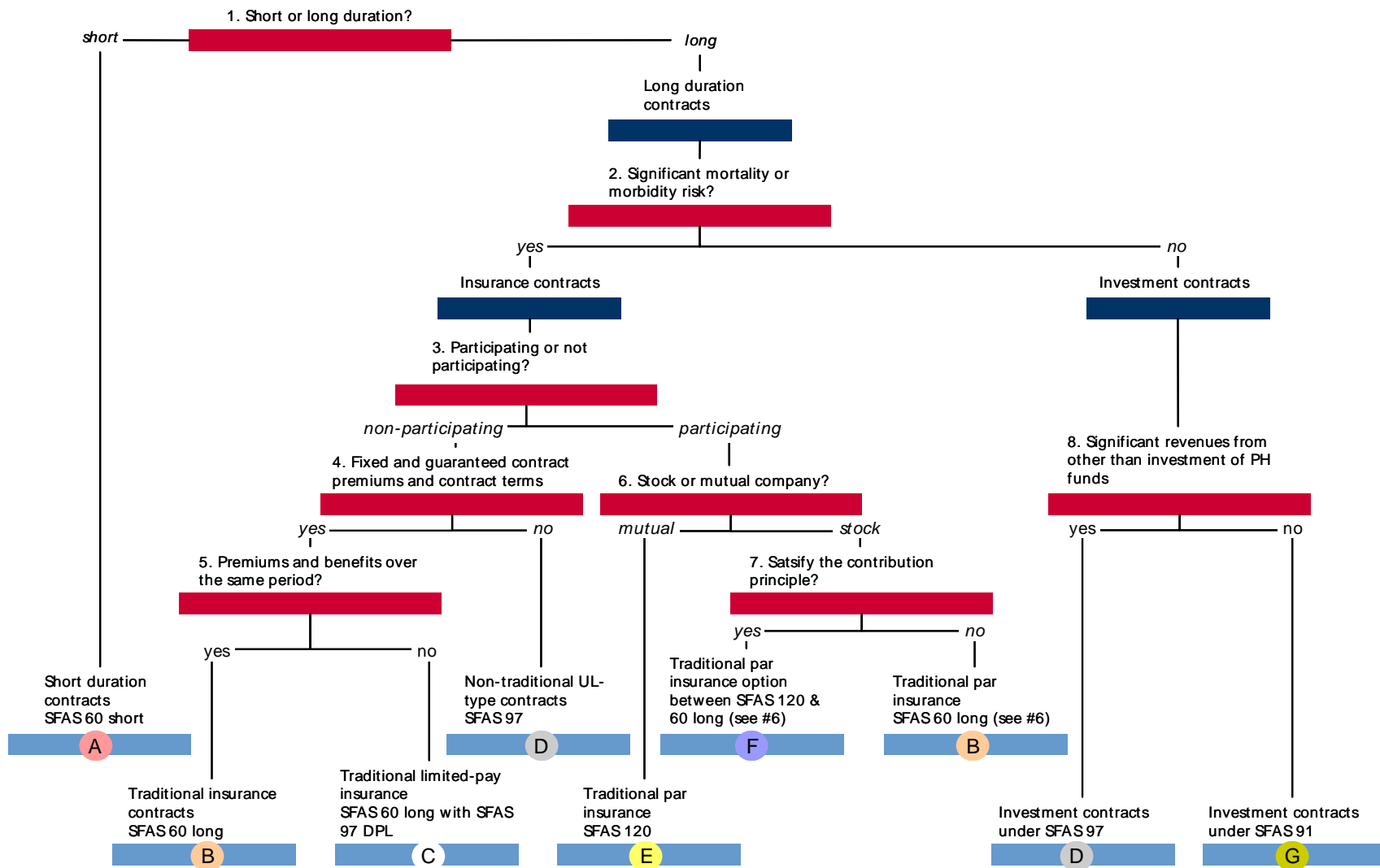
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2.6 Deposit versus Non-Deposit

- **Deposit Accounting** is used for insurance products which are **similar to bank savings products**; as a consequence the **savings premiums and interest accrued on investments are not recognized as revenue**
 - Typical **examples** are **unit linked products**
 - In general, the **provisions** for expected future policyholders' benefits are **equal to policyholders' accounts**
 - As a consequence, the technical reserves can only be calculated according to the **recursive deposit method**
 - Due to SOP 03-1, exceptions are possible (e.g. the minimum guaranteed death benefit reserves)

2.6 Deposit versus Non-Deposit

- But there are also **traditional products with deposit accounting**
 - E.g. Flexiplus in Spain; here the allocated interest rate is determined every year for one year
- These products are **Investment Contracts Traditional Type**
- In these products there is no or no material insurance risk, but there is a technical interest rate guaranteed

2.6 Deposit versus Non-Deposit

- **Non-Deposit Accounting** is characterized by the **prospective reserve calculation**
 - I.e. the provisions for expected future policyholders' benefits (technical reserves) are equal to the difference of the present value of the expected future insurance benefits and of the present value of the expected future premiums payments
 - **The total premiums and interest on investments are recognized as revenue**
 - Typical **examples are traditional endowments or annuities**

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2.7 Separate Account versus General Account

- The **differentiation** between Separate Account and General Account **depends on the treatment of the assets**
- **Separate Accounting** is characterized by the following facts:
 - **The investment policy is chosen by the policyholder and thus the investment risk is borne by the policyholder**
 - **The assets of a separate account are valued at fair value (market value if possible) in the Balance Sheet and in the P&L (see chapter 5)**

2.7 Separate Account versus General Account

- And since SOP 03-1, **the assets backing the policyholders' liabilities are in a "security funds" ("Sicherungsfonds")**
 - I.e. the assets backing the contract liabilities are legally insulated from the general account assets, **so the contract holder is not subject to insurer default risk**
- If there is no "security funds" for the assets of a unit linked product, these assets are classified as General Account (since SOP 03-1)
- Separate Accounting always implies Deposit Accounting

2.7 Separate Account versus General Account

- **General Accounting** is the residue to Separate Accounting; i.e. General Accounting is characterized by the fact that
 - **either the investment risk is with the insurance enterprise**
 - **or the investment risk is with the policyholder and the assets backing policyholders' liabilities are not in a "security funds" ("Sicherungsfonds")**
- **The assets in General Accounting are valued and accounted for according to their classification (see Chapter 5)**

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- **Non-Deposit Accounting implies:**
 - assets are in General Account
 - products are classified FAS 60 long, FAS 60 long/97 (limited payment) or FAS 120

- As a consequence there is no
 - Non-Deposit Accounting and Separate Account
 - Non-Deposit Accounting and FAS 97 (except FAS 60 long/97 limited payment)

2.8 Summary

- **Deposit Accounting implies:**
 - products are classified FAS 97
- **Deposit Accounting and FAS 97 traditional implies General Account**
(Investment Contract Traditional Type)
- **Deposit Accounting and FAS 97 unit linked implies Separate Account, only if there is a “security funds”**
 (“Sicherungsfonds”)

2.8 Summary

- **Deposit Accounting and FAS 97 unit linked implies General Account, if there is no “security funds” (“Sicherungsfonds”)**
 - If assets can be classified as trading, then no issues arise
 - If assets cannot be classified as trading, then special issues may arise
 - E.g. in UK real estate funds
 - Assets valued according to a model, since they cannot be classified as trading
 - Liabilities valued according to market values

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3. Expense Classification

- **For the expense classification FAS 60 is relevant**
 - The following expense classification is made for the relevant books of business
- **Deferrable Acquisition Expenses**
 - Expenses considered to vary with and to be primarily related to the acquisition of new business are classified as „Deferrable Acquisition Expenses“ (DAE)
 - **Examples:** initial commissions, underwriting and policy issue expenses, medical fees
 - **These expenses are capitalized as Deferred Acquisition Costs (DAC)**

3. Expense Classification

- **Non-Deferrable Acquisition Expenses**
 - All other expenses associated with the new business **that do not vary** with and are not primarily related to new policies are classified as **non-deferrable acquisition expenses**
 - **Examples:** new rate books, advertising used to promote the life company in general, agent recruitment and training
 - **These expenses are not capitalized**
- **Remark:** In FAS 60, 28., for the above defined deferrable acquisition expenses (DAE) the wording “acquisition costs” is used

3. Expense Classification

- **Investment Expenses**

Expenses associated with the investment process are classified as investment expenses

- **Examples:** internal investment department expenses, transaction expenses
- In general, these expenses are charged against investment income in US GAAP
 - So, the earned rate of the company is in US GAAP in general net of investment expenses
 - Attention: This is different to Embedded Value calculations

3. Expense Classification

- **Policy Maintenance Expenses**

Expenses associated with maintaining records relating to insurance contracts are classified as policy maintenance expenses

- **Examples:** premiums collection expenses, renewal commissions, settlement expenses

3. Expense Classification

- **Administration Expenses**
 - The residue to total expenses is classified as administration expenses
 - **Examples:** overhead, advertising, marketing, product development
 - In general, the **administration expenses are the greatest part of the expenses which are not deferrable**

3. Expense Classification

- Concerning expense classification, the fundamental question is:

To defer or not to defer?

- The answer is
 - **to defer:** if you do not sell products, you would not incur these expenses
 - **not to defer:** if independent of the sales volume these expenses incur

3. Expense Classification

- **Example/Exercise**

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4. BS and P&L Structure

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4.2 Structure of the Profit & Loss Account for a Life Insurance Company

4.1 Structure of the Balance Sheet for a Life Insurance Company

Assets	Liabilities	Comments
<p>Assets invested for traditional business</p> <ul style="list-style-type: none"> - Bonds - Shares - Real estate - Loans & mortgages - Cash - Others 	<p>Technical reserves for traditional business</p> <ul style="list-style-type: none"> - Provisions for future policyholders' benefits - Claim reserves - Provision for future policyholders' dividends (bonus funds) - Bonus held on deposit 	<p>Classification of assets</p> <p>Outside capital (Fund Capital)</p>
<p>Assets invested for unit linked business</p>	<p>Technical reserves for unit linked business</p>	<p>Outside capital</p>

4. BS and P&L Structure

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4.1 Structure of the Balance Sheet for a Life Insurance Company

4.2 Structure of the Profit & Loss Account for a Life Insurance Company

4.2 Structure of the Profit & Loss Account for a Life Insurance Company

Cash- Flows	Profit & Loss Account	Issues
	Income	
Cash-Inflow	Premiums <ul style="list-style-type: none"> - Annual premiums - Single premiums - Single premiums from bonus 	Market share; Premium growth; Classification of products
Cash-Inflow; Revaluation	Investment income <ul style="list-style-type: none"> - Current income - Realized gains/losses - Investment expenses (-) 	Classification of assets; Earned rate versus technical rate
Cash-Inflow	Fee income & others	

4.2 Structure of the Profit & Loss Account for a Life Insurance Company

Cash- Flows	Profit & Loss Account	Issues
	Outgo without bonus	
Cash-Outflow	Benefits paid <ul style="list-style-type: none"> - Maturity - Death - Annuity payments - Surrender values 	Structure of the portfolio; Liquidity; Risk process; Surrenders
Change in assets (Aktivtausch)	Increase in technical reserves <ul style="list-style-type: none"> - Traditional business - (Unit linked business) 	Investment policy; Classification of products

4.2 Structure of the Profit & Loss Account for a Life Insurance Company

Cash- Flows	Profit & Loss Account	Issues
	Outgo without bonus	
Cash-Outflow	Expenses <ul style="list-style-type: none"> - Deferrable acquisition expenses (DAE) - Non-deferrable acquisition expenses - Policy maintenance expenses - Administration expenses 	Amount of expenses, Liquidity; Classification of expenses
Capitalization	- Increase of deferred acquisition costs (DAC) (-)	Intangible assets
Cash-Outflow	Reinsurance result & others	Reinsurance policy

4.2 Structure of the Profit & Loss Account for a Life Insurance Company

Cash- Flows	Profit & Loss Account	Issues
	Result before bonus	
Cash-Outflow Change in assets	Bonus to policyholders - Bonus paid - Increase in bonus funds	Bonus (price) policy; Liquidity; Earned rate versus bonus-relevant rate
	Profit before taxes	

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5. Asset Classification

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5.1 Overview

- To value assets (as e.g. bonds and shares), there are three different classes:
 - **Trading**
 - **Available for sale**
 - **Held to maturity**

5.1 Overview

- **Trading** is to be used if the investment strategy is to exploit short term fluctuations of the prices
 - Typical **examples** are shares (**“Day trading” strategy**)
- **Held to maturity** is to be used if the investment strategy is to hold a bond until it reaches maturity (**“buy and hold” strategy**)
 - This classification can only be used for bonds or similar products
 - A maturity date is necessary
 - It is nearly impossible to sell such a bond before maturity

5.1 Overview

- **Available for sale** is to be used if the **investment strategy is long term oriented but the possibility to sell the assets** at any point in time should be given
 - Life insurers and Non-Life insurers prefer this classification
 - This classification is possible for bonds and shares

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5.2 Trading

- If an asset is classified as **trading** this asset is valued **in the Profit and Loss Account and the Balance Sheet at market value**
- Bonds and shares can be classified as trading
- Derivatives are always classified as trading
- For **bonds in the P&L**
 - the **current income** is determined according to the amortized cost method
 - I.e. the current income equals the coupon paid plus the change in the amortized cost value
 - the **realized gains / losses** equal the difference of the changes in the market values and the amortized cost values, even if the bond is not sold

5.2 Trading

- For **shares in the P&L**
 - the **current income** is the dividend paid
 - the **realized gains / losses** equal the change in the market values, even if the share is not sold
- For **assets classified as trading**
 - the **investment income is rather volatile** because the changes of the market values are going through the Profit and Loss Account
 - the **valuation is the same** in the Profit and Loss Account and the Balance Sheet
 - the “P&L book value”, the “BS book value” and the market value are all three equal
- **The “P&L book value” is relevant to determine the current investment income in the P&L**

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5.3 Held to Maturity

- If a bond is classified as **held to maturity** this bond is valued **in the Profit and Loss Account and the Balance Sheet at amortized cost value**
- Only bonds and similar products can be classified as held to maturity because they have a maturity date
- For **bonds in the P&L**
 - the **current income** equals the coupon paid plus the change in the amortized cost value
 - in general, the item **realized gains / losses** is zero
 - But if the bond is really sold, which is only possible under special circumstances, this item equals the difference of the realized market value and the amortized cost value (the book value)

5.3 Held to Maturity

- For **bonds classified as held to maturity**
 - the **investment income is in general very stable** because the change of the amortized cost value is independent of the market evolution
 - the **valuation is the same** in the Profit and Loss Account and the Balance Sheet
 - the “P&L book value” and the “BS book value” are both equal to the amortized cost value and both are in general different to the market value
 - the unrealized gains / losses (difference between market value and BS book value) are not shown in the Balance Sheet
 - the **market value** is here only **relevant at the point in time when the bond is bought or sold** (which is only possible under special circumstances)

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5.4 Available for Sale

- If an asset is classified as **available for sale** this asset is valued **in the Profit and Loss Account at “P&L book value”** and **in the Balance Sheet at market value**
 - In general, the “P&L book value” differs from the “BS book value” which is here equal to the market value
 - The definition of the “P&L book value” depends of the asset class
 - The “P&L book value” is relevant for the determination of the current investment income
- Bonds and shares can be classified as available for sale
- **The “P&L book value” is**
 - **for bonds the amortized cost value**
 - **for shares the cost value**

5.4 Available for Sale

- **For bonds in the P&L**
 - the **current income** is determined according to the amortized cost method
 - I.e. the current income equals the coupon paid plus the change in the amortized cost value
 - the **realized gains / losses** equal the difference of the realized market value and the amortized cost value (“P&L book value”) only if the bond is really sold which is here possible
 - If the bond is not sold, this item is zero
 - the realized gains / losses may be affected by an **impairment**
 - Impairments for bonds are rather seldom

5.4 Available for Sale

- **For shares in the P&L**
 - the **current income** is the dividend paid
 - the **realized gains / losses** equal the difference of the realized market value and the cost value (“P&L book value”) only if the share is really sold which is here possible
 - If the share is not sold this item is normally zero
 - the realized gains / losses may be affected by an **impairment** (see below)

5.4 Available for Sale

- **For bonds and shares in the Balance Sheet**
 - on the **asset side the market values are used**
 - on the **liability side**
 - the corresponding **“P&L book value”** is used e. g. to back the **technical reserves**
 - the corresponding **unrealized capital gains / losses** are part of the **equity** under the title **“Accumulated Other Comprehensive Income” (AOCI)**
 - So, there are shown in the Balance Sheet
 - the unrealized capital gains / losses are the difference of the market value and the **“P&L book value”**
 - the **“P&L book value”** of bonds is the amortized cost value and of shares it is the cost value

5.4 Available for Sale

- In addition **for the valuation of shares there are special impairment rules:**
 - If the **market value is higher than the cost value** (“P&L book value”) there are **unrealized capital gains** and there is no impairment issue
 - If the **market value is lower than the cost value** (“P&L book value”) there are **unrealized capital losses** and now the special impairment rules become relevant
 - **Unrealized capital losses are accepted as far as they are “temporary”**
 - **But in US GAAP there is no general prescribed definition when they are temporary and when not**
 - **It is management’s judgment (including the external auditor) to define the impairment rules**

5.4 Available for Sale

- A **significant or prolonged decline** of the market value below the cost value is often the reason to do an impairment
 - “**Significant**” is often interpreted as 20% or more
 - “**Prolonged**” is often interpreted as 6 months or more

5.4 Available for Sale

- For example **Credit Suisse** had in 2001/2 the following impairment rule: A share is impaired if its market value
 - is 20% below the cost value (“P&L book value”)**or**
 - is more than 6 months below the cost value
- For example **Swiss Re** had in 2001/2 “nearly the same” impairment rule: A share is impaired if its market value
 - is 20% below the cost value (“P&L book value”)**and**
 - if this is true for more than 6 months
- The main difference of these two impairment rules is “only” the difference between **and** respectively **or**; but the impact of this “small” difference can be substantial

5.4 Available for Sale

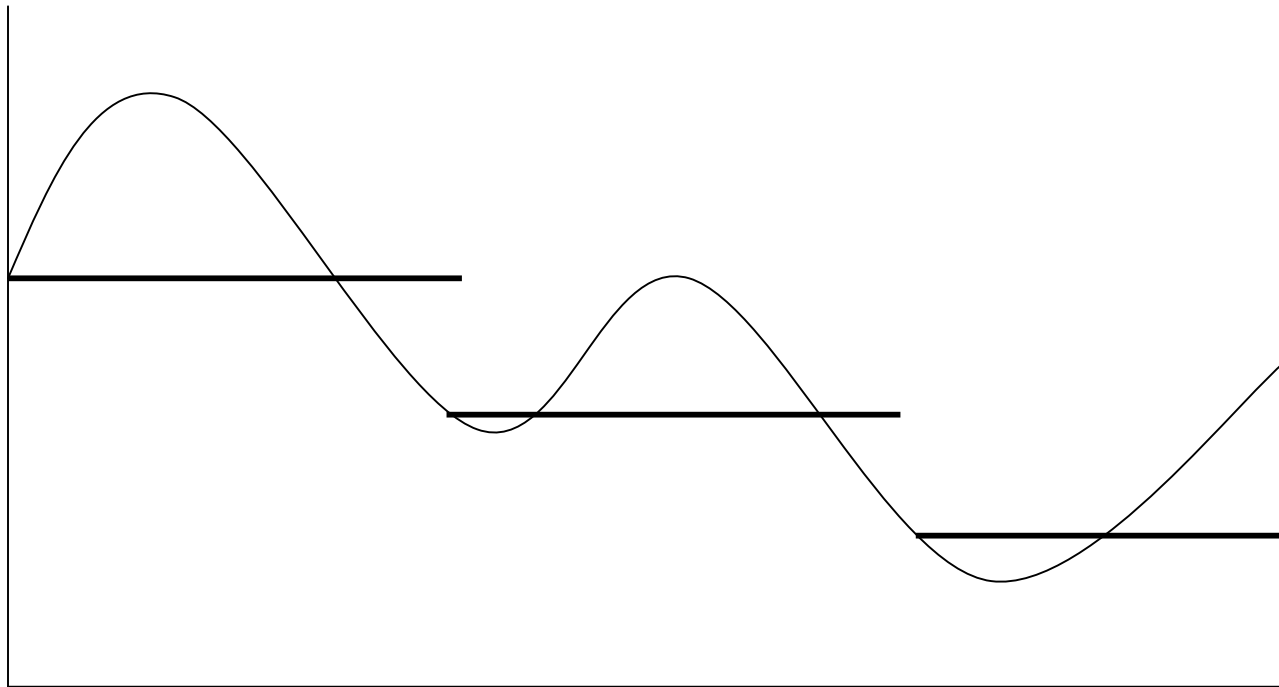
- **If a share has to be impaired**
 - the **impairment losses** are defined as the **difference** between
 - the **current market value** and
 - the **"old" cost value**
 - **these losses are recognized in P&L** as a realized loss
 - so, the investment income is lowered by this amount
 - the **current market value becomes the "new" cost value**
 - **these impairment losses are irreversible for P&L**
- **Additional future declines** of the market value are treated in the **same way**

5.4 Available for Sale

- **The book value of an impaired share remains constant or is impaired once more**
 - So, this valuation method is comparable with the **strong lower of cost or market value method** (“strenges Niederstwertprinzip”)

5.4 Available for Sale

- US GAAP impairment rules for shares classified as AFS:



Market Value: _____

Cost Value: _____

5. Asset Classification

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5.4 Available for Sale

Bonds

Classification	Balance Sheet	Profit & Loss Account
Available for sale	Market values; in AOCI unrealized gains/losses are shown; URGs imply shadow adjustments	Amortized cost values; impairments very seldom
Held to maturity	Amortized cost values; unrealized gains/losses are not shown	Amortized cost values
Trading	Market values; unrealized gains/losses do not exist	Market values

5.4 Available for Sale

Shares

Classification	Balance Sheet	Profit & Loss Account
Available for sale	Market values; in AOCI unrealized gains/losses are shown; URGs imply shadow adjustments	Cost values; impairments (“strong lower of cost or market value”)
Held to maturity	Not applicable	Not applicable
Trading	Market values; unrealized gains/losses do not exist	Market values

5.5 Summary

- **Note, that bonds and shares classified as available for sale are differently valued**
 - in the **Balance Sheet** and
 - in the **Profit and Loss Account**
- This strange situation
 - is the result of a compromise
 - imply **Shadow Adjustments** as a specific consequence

5.5 Summary

- In addition, some remarks concerning the **valuation of real estate in US GAAP** :
 - **Building and land are valued separately**
 - **The building is amortized (linearly) over 20 to 30 years**
 - **The land is depreciated if necessary**
- In contrast to this, in Swiss Statutory Accounting and IFRS 4 building and land are valued together and depreciated if necessary

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6. Technical Reserves

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6.5 Reserves for Bonus

6.1 Overview

- The following **types of technical reserves** are distinguished:
 - Provisions for future policyholders' benefits traditional
 - Provisions for future policyholders' benefits unit linked
 - Claim reserves
 - Special technical reserves
 - Reserves for bonus
 - Unearned premium reserves (UPR), as part of provisions for future policyholders' benefits

6.1 Overview

- **The provisions for future policyholders' benefits traditional are classified as non-deposit or deposit traditional**
 - The corresponding products are classified as **FAS 60 long, FAS 97 (limited payment together with FAS 60 long or investment traditional) or FAS 120**
 - The **assets** backing these liabilities belong to the **General Account**
 - The corresponding products are characterized by an increasing or decreasing **savings process according to an actuarial model** as it is typical for an endowment or an old age annuity in payment
 - The **provisions** can be calculated using the **prospective method**

6.1 Overview

- **The provisions for future policyholders benefits unit linked are classified as deposit unit linked**
 - The corresponding products are classified as **FAS 97 (universal life (unit linked) or investment unit linked type products)**
 - The **assets** backing these liabilities belong
 - either to the **Separate Account**, if there is a "security funds"
 - or to the **General Account**, if there is no "security funds" (SOP 03-1)
 - The corresponding products are characterized by a **savings process according to the performance of the assets** as it is typical for unit linked products

6.1 Overview

- The **provisions** can only be determined using the **recursive method**, because they are in general equal to the account value (exception: SOP 03-1 minimum guaranteed death benefits reserves)
- Special issues may arise, **if the assets are in the general account and cannot be classified as trading** such as real estate (e.g. real estate funds in UK); then it is possible that
 - the liabilities (units) are valued according to the market price of these assets and
 - the corresponding assets at book value, since they are in the general account
 - So, a discrepancy between assets and liabilities can emerge and flow through the P&L

6.1 Overview

- **Claim Reserves** (reserves for death and other benefits) are set up if the **corresponding insured event occurred**.
- These reserves are calculated independent of the product classification according to the different FASes **using current best estimate assumptions without PADs at every valuation date**
- **These assumptions are not locked-in**; therefore they do not have PADs
- Typical **examples** of claim reserves are:
 - Reserves for disability annuities
 - Reserves for claim settlement costs
 - Reserves for pending claims
 - Reserves for special claims
 - Reserves for incurred but not reported claims (IBNR)

6.1 Overview

- In some cases, there exist **Special Technical Reserves** as for instance:
 - The **SOP 03-1 reserves**
 - for **minimum guaranteed death benefits** in Japan for a whole life unit linked product (FAS 97) with such a guarantee
 - These reserves are necessary if the funds performance is not high enough
 - for **old age annuity options** in the employee benefit business in Switzerland (FAS 120)
 - It is necessary for the mandatory part because there the annuity conversion rate is too high, due to bad political decisions

6.1 Overview

- **Special Technical Reserves** (cont.):
 - for **sales inducement** in Hong Kong (FAS 97)
 - It is necessary to finance an extra bonus for loyal policyholders (loyalty bonus)
 - The **additional reserves due to a triggered Loss Recognition Event** (see below)
 - This can be the case if existing reserves are insufficient, e.g. due to an increase of longevity or due to a decrease of investment income
 - This is especially an issue for FAS 60 long products

6.1 Overview

- Concerning the **Reserves for Bonus** the following types are distinguished:
 - Reserves for bonus which will be allocated at the **following policy anniversary (bound bonus reserve)**
 - Reserves for **terminal bonus** (which in US GAAP is part of the provisions for future policyholders benefits)
 - If there is a **legal quote for policyholders' profit participation**
 - The **free bonus reserve** which will be allocated to the policyholder in future years
 - The **Deferred Bonus Reserve (DBR)** which picks up all temporary timing differences of earnings between US GAAP and local statutory GAAP

6.1 Overview

- For example, in **Germany** there is a **legal quote or legal requirement** to determine the policyholders' dividends
 - By law the life insurers are obliged to allocate after tax at least 90% of the surplus to the policyholders (simplified version)
- In **Switzerland** there is a **legal quote** for the employee benefit business (“berufliche Vorsorge”)

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6.5 Reserves for Bonus

6.2 FAS 60

- **For FAS 60 short products (Non-Life insurance) only**
 - a **gross unearned premium reserve (UPR) to cover the future policyholders benefits**
- and
- a **reserve for incurred and still pending losses including IBNR reserves (Incurred But Not Reported) is set up**
- Part of the reserve for incurred losses are the
 - **Allocated Loss Adjustment Expenses (ALAE;** examples: medical reports, police reports)
 - **Unallocated Loss Adjustment Expenses (ULAE;** examples: salaries, IT-costs)
 - The amount of these expenses may sum to 10% of the loss reserves

6.2 FAS 60

- In Non-Life for a part of the expenses, there are sometimes two ways to allocate these expenses with different consequences for the financial figures:
 - If they are declared as “**normal**” **expenses** and are therefore allocated to the administration expenses, then **only the payments are recognized in the P&L**
 - If they are declared as **loss adjustment expenses** and therefore allocated to the losses then **the payments and in addition normally an increase in the reserve for incurred losses are recognized in the P&L**

6.2 FAS 60

- An allocation to the losses implies a lower cost ratio and a higher loss ratio and a higher combined ratio
 - **Example:** Expenses of 100 are no longer declared as administration expenses but as loss adjustment expenses:
 - the administration expenses are reduced by 100
 - the claim payments are increased by 100
 - the reserve for incurred losses is increased by e.g. 40 for expected future loss adjustment expenses
 - The motivation is a reduction of the cost ratio, if the loss ratio is “too” low
 - Consequences are a higher loss ratio (i.e. a “normal” loss ratio) and a higher combined ratio

6.2 FAS 60

- For **FAS 60 long products** (Life insurance) the provisions for future policyholders' benefits (traditional) are determined using the **prospective method**
 - I.e., these provisions are equal to the present value of future benefits (including related maintenance expenses) less the present value of future net premiums
 - Net premiums are the portion of gross premiums (paid by the insured) required to finance all guaranteed benefits and related maintenance expenses
 - Not included in the net premiums are the loadings for the acquisition expenses and the profit margins (including the administration expenses)

6.2 FAS 60

- The **split of the gross premium** is calculated according to the following equation for the present values (PV):
 - PV(Gross premiums) 100%
 - PV(Future benefits) -x%
 - PV(Maintenance expenses) -y%
 - PV(Deferrable acquisition expenses) -k%
 - PV(Future profits incl. Admin.) =p%
- The percentage of the gross premiums used for accruing the liability amounts to $(x\% + y\%)$

6.2 FAS 60

- The present values are determined using **best estimate locked in assumptions** concerning investment yields, mortality, morbidity, **surrenders**, expenses etc. **applicable at the time the insurance contracts are signed**
- These best estimate assumptions shall include **Provisions for Adverse Deviations (PADs)** which provide margins for volatility, diagnosis and prognosis risks since they are locked in
 - There are rules to determine these margins
 - In general, the best estimate assumptions and the PADs together imply smaller margins than the local statutory tariff assumptions at the beginning of the contract

6.2 FAS 60

- **Examples for the margins according to the PADs** are as follows:
 - **Mortality for capital products:** 5% of the mortality rate; so $1.05q_x$ is used instead of q_x
 - **Mortality for annuities (longevity):** 10% of the mortality rate; so $0.9q_x$ is used instead of q_x
 - **Disability for active insured:** 10% for incidence rates, 5-10% for recovery rates and 5% for the average disability degree
 - **Interest rates:** 10% of the best estimate interest rate, rounded to the nearest 0.25% earned rate (**Example:** if the best estimate earned rate is 6.0%; 10% of this is 0.6%, calculated rate is 5.4%, rounded earned rate is 5.5%)

6.2 FAS 60

- Examples for the **margins according to the PADs** are as follows (cont.):
 - **Disability for disabled insured:** These assumptions are used in claim reserves which should be based on current best estimate assumptions and which are not locked-in, so they should be changed from time to time as knowledge develops; that is why these reserves are calculated without PADs
 - **Lapse rates:** often no PADs are used for lapse rates

6.2 FAS 60

- **Original US GAAP assumptions including PADs** shall continue to be used in subsequent periods to determine changes in the provisions for future policyholders benefits ("**locked-in principle**") unless premium deficiency exits (see LRE test below)
 - These assumptions are determined at inception of the policy or at the point in time when a loss recognition event happened

6.2 FAS 60

- For FAS 60 long products, US GAAP reserves are often lower than the local statutory reserves because in US GAAP
 - best estimate assumptions are used including lapse rates and
 - the margins due to PADs are in general not so large as the margins according to local statutory accounting

6.2 FAS 60

– PADs

- **are only used to determine the US GAAP reserves for FAS 60 long products**
- **are not used to determine the US GAAP reserves for FAS 97 or FAS 120 products**
- **are not used to determine claim reserves**

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6.5 Reserves for Bonus

6.3 FAS 97

- **For FAS 97 limited payment FAS 60 long contracts** the provisions for future policyholders' benefits are determined **in accordance with FAS 60 long**
 - During the period of premium payments the **Deferred Profit Liability (DPL)** is set up to finance the services in the period without premium payments
 - Note, that these products are sometimes also called **FAS 60 long traditional products with a DPL according to FAS 97**

6.3 FAS 97

- **For FAS 97 universal life type or investment unit linked type contracts the provisions for future policyholders' benefits are equal to the account values** (exception SOP 03-1 reserves and investment traditional products)
 - So in general, they can only be determined using the **recursive deposit method**

6.3 FAS 97

- If there is **front end loading**, an **Unearned Revenue Liability (URL)** has to be set up (see URL below)
 - Front end loading describes the fact that, for example, in the first year the annual premium is used to finance the commission for the agent and that there remains no money to invest
 - Front end loading for unit linked products is comparable to zillmerization for traditional products

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6.4 FAS 120

- **For FAS 120 products** the provisions for future policyholders' benefits are determined in general using the **prospective method with the local statutory tariff assumptions without zillmerization**
 - **So in general, these provisions are equal to the local statutory unzillmerized reserves**
 - Important remark: **in general lapse rates are not included in these reserve calculations** (this different compared with FAS 60 long reserves)
 - If in local statutory accounting reserves are zillmerized, as for example in Germany, the US GAAP reserves are still unzillmerized and they are larger than the statutory reserves

6.4 FAS 120

- **Important exception in Germany:**
 - For the existing (deferred and in payment) **annuity portfolio**, the **technical reserves were strengthened in the local statutory accounting system, but not in US GAAP**
 - A Loss Recognition Test (see below) using best estimate assumptions (without PADs) showed that it was not necessary to strengthen the reserves in US GAAP
 - The main cause for this were the differences between the different technical interest rates used in local statutory and the best estimate earned rates according to an interest rate path used in US GAAP

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6.5 Reserves for Bonus

- For **traditional products** the local statutory assumptions to calculate the premiums contain margins as a protection against the volatility, diagnosis and prognosis risks
- In general, this implies a **rather high surplus per year** defined as revenue minus outgo without bonus according to the local statutory accounts, **which is not the profit** of the life insurance company
- This **surplus is shared** with the insured as **bonus or policyholders' dividends or policyholders' participation**
- **The effective policyholders' bonus paid is determined on the basis of the local statutory accounts**

6.5 Reserves for Bonus

- The bonus may be allocated to the policyholders at the following **policy anniversary or at maturity (terminal bonus)**
- That part of the bonus which
 - **will be allocated at the following policy anniversary**
 - and
 - **is earned in the corresponding period**is booked as an **increase of the reserves for policyholders' dividends in the US GAAP accounts (bound bonus reserves)**
- **Example:** Endowment financed by a single premium and policy anniversary at 1. December

6.5 Reserves for Bonus

- **Exception from this accrual principle for the allocation to the bonus funds for Swiss individual business:**
 - The new regulation (new AVO since 1.1.2006) implies for the Swiss individual business that the bonus, which will be allocated to the policyholders in year n , has to be reserved in the bonus funds of year $n-1$.
 - In addition, the new regulation implies that the capital allocated to the bonus funds has to be used for future bonus allocations

6.5 Reserves for Bonus

- Thus, this bonus funds consists of a **bound bonus funds and a free bonus funds**, although there is no legal quote
- As a consequence, in future for the Swiss individual business the bonus funds in US GAAP will be equal to the one in local statutory

6.5 Reserves for Bonus

- That part of the bonus which
 - **will be allocated at maturity**and

- **is earned in the corresponding period**

is booked as an **increase of the reserves for terminal bonus** in the US GAAP accounts which is here part of the provisions of policyholders benefits, and is not part of the bonus funds

- In US GAAP the reserves for terminal bonus are determined by using the EGMs (see below)
 - So in general, the reserves for terminal bonus according to US GAAP differ from the local statutory reserves, but the amounts paid as terminal bonus are equal

6.5 Reserves for Bonus

- If there is a **legal quote or legal requirement** to determine policyholders' dividends or allocation to the bonus funds (as for example in Germany or Swiss employee benefit business) in addition to the bound bonus funds
 - a **free bonus reserve**
 - and
 - a **Deferred Bonus Reserve (DBR)**is to set up:
 - The **free bonus reserve** is used for bonus allocations in future years
 - It is accumulated if the allocation to the bonus funds is higher than the bonus allocation to the policyholders in a given period

6.5 Reserves for Bonus

- **The DBR should catch all temporary timing differences of earnings between the US GAAP and the local statutory accounts**
 - **Example:** If in US GAAP there is a DAC and in local statutory acquisition expenses are not activated the DAC implies an increase of the DBR according to the legal quote

6.5 Reserves for Bonus

- In **local statutory accounts**
 - the increase of the bonus reserve is in some countries not restricted to the planned bonus allocation of the following year
 - building up a **free bonus reserve** may be allowed in some countries, although there is no legal quote for profit sharing with the policyholders

6.5 Reserves for Bonus

- In general, if there is **no legal quote**, a "**free bonus reserve**" in local statutory accounts is treated in **US GAAP as equity**
 - For Swiss individual business this was true up to the year 2005
 - According to the new version of the VAG, since 2006 there is also in US GAAP a free bonus reserve for this portfolio, although there is no legal quote

6.5 Reserves for Bonus

- **The amounts booked as an increase of the bound bonus reserves and of the reserves for the terminal bonus are in general different between US GAAP and local statutory accounting**
- **But the amounts booked as bonus paid are always the same in US GAAP and local statutory accounting**
- **The bonus paid is always determined according to the local statutory accounts**

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7. Deferred Acquisition Costs

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7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.1 General Remarks

- The essential principles of US GAAP – **accrual accounting, matching and deferring** – imply the **capitalization and amortizing of Deferrable Acquisition Expenses (DAE)**
- **Capitalization of DAE** means to set up an asset, the **Deferrable Acquisition Costs (DAC)**, which should be amortized over the life time of the insurance contracts (or premiums payment period for FAS 60 long) of a book of business of an issue year
- The reference value for amortizing the DAC depends on the FAS classification of the product
- In analogy to DAC, liabilities as **Unearned Revenue Liability (URL)** and **Deferred Profit Liability (DPL)** are set up, if earnings are deferred and released over time

7.1 General Remarks

- After the purchase of a business, an asset called **Present Value of Future Profits (PVFP)** is set up and amortized over time
 - This asset is the capitalization of the future profits of the acquired business
- DAC and PVFP are intangible assets
- URL and DPL are intangible liabilities
- **The changes of those intangible assets / liabilities flow through the P&L**
- The focus is on DAC, because it is the most important intangible asset

7. Deferred Acquisition Costs

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7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.2 Reference Values for DAC-Amortization

- The reference values for DAC-amortization depend on the FAS classification of the products
- For **FAS 60 products** generally the entire commissions are capitalized
- For **FAS 60 short products** the DAC is amortized proportional to the earned premiums recognized
- For **FAS 60 long products** the DAC is amortized using a **fixed percentage of gross premiums (k%)**; for the determination of this k-factor see chapter 6.2 or 7.3

7.2 Reference Values for DAC-Amortization

- For **FAS 97 products** the DAC-amortization is according to the so called **Estimated Gross Profits (EGPs)** which are defined as follows:

EGP = Amounts expected to be assessed for mortality
+ Amounts expected to be assessed for expenses
(acquisition, only if there is no URL, and
administration)
+ Amounts expected to be earned from the
investment of policyholders' balances
+ Amounts expected to be assessed against
policyholders' balances upon termination of the
contract (surrender charges)
+ Others (cont.)

7.2 Reference Values for DAC-Amortization

(EGP definition continued)

- Benefit claims in excess of the related policyholders' balances (Schadenssumme)
 - Costs incurred for the contract maintenance
 - Interest credited to policyholders' balances
 - Others
-
- **Note, that acquisition expenses and administration expenses are not allowed in the EGPs; so, the EGPs reflect “gross profits”**

7.2 Reference Values for DAC-Amortization

- The **EGPs** are **projected until the end of all contracts** of the corresponding book of business **using best estimate assumptions**
 - These **assumptions are adjusted for future years according to actual experience**, if necessary
 - The replacement of assumptions by experience for the projections of **future years** is called "**dynamical unlocking**"
 - The replacement of assumed values by **realized values of the past year** is called "**true up process**"
 - The present values of the **EGPs** are calculated by using the **credited rate as discount rate**

7.2 Reference Values for DAC-Amortization

- For **FAS 120 products** the DAC-amortization is analog to FAS 97 products with the following two differences:
 - The EGPs are replaced by the **Estimated Gross Margins (EGMs)**
 - The **earned rate** is used **as discount rate** instead of the credited rate

7.2 Reference Values for DAC-Amortization

– **The EGMs are defined as follows:**

EGM = Amounts expected to be received from premiums

+ Amounts expected to be earned from the investment of policyholders' balances (net level premium reserve)

+ Others

- Benefit claims expected to be paid including expenses for claim settlement

- Costs expected for the contract maintenance

- Expected change in the net level premium reserve

- Expected policyholders' dividends

- Others

7.2 Reference Values for DAC-Amortization

- The **EGMs** are **projected** in the future **analog** to the **EGPs**
 - but, as **discount rate the earned rate is used**
- As in the **EGPs**, in the **EGMs** the **acquisition expenses and administration expenses are not allowed**
 - so, the **EGMs reflect “gross margins”**

7. Deferred Acquisition Costs

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7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.3 DAC-Amortization for FAS 60 long

- To determine the **DAC amortization for FAS 60 long products, projections in the future are calculated to split the present value of the gross premiums** (paid by the insured) as follows:

PV of gross premiums	100 %
= PV of future policyholders' benefits incl. related expenses	= x %
+ PV of policy maintenance expenses	y %
+ PV of deferrable acquisition expenses	k %
+ PV of future profits incl. administration expenses	p %

- In these projections, **the locked-in best estimate assumptions including lapse rates and PADs are used**

7.3 DAC-Amortization for FAS 60 long

- **The DAC-roll forward is as follows:**

$$DAC_t = (DAC_{t-1} + DAE_t) \cdot (1 + i_t) - k \cdot GP_t \cdot (1 + i_t)$$

- The DAC-amortization of the year t depends on the
 - **k-factor which is determined by the split of the present value of the gross premiums and**
 - **the Gross Premium of the year t (GP_t)**
- **The DAC is recoverable if the sum of the x-, y- and k-factor is lower than 100%; i.e. if $x+y+k < 100\%$**
- **If $x+y+k > 100\%$, a portion of the DAC or the total DAC has to be written off immediately, so that the new $x+y+k$ -factor is equal 100%**

7.3 DAC-Amortization for FAS 60 long

- **Example: 5-Year Term Policy with Sum Assured of CHF 10'000**
- This example is according to “US GAAP for Life Insurers” edited by E. Herget, 2000
- **Input**

Policy Year	Gross Premium CHF pro 1000	Commission Rate	Maintenance Expense CHF pro 1000	Investment Income Rate	Mortality Rate	Lapse Rate
0	4.50	75.0%	0.30			
1	4.50	5.0%	0.31	7.00%	0.200%	15.00%
2	5.50	5.0%	0.31	7.00%	0.230%	12.00%
3	5.50	5.0%	0.32	6.50%	0.248%	12.00%
4	5.50	5.0%	0.32	6.50%	0.268%	10.00%
5				6.50%	0.290%	9.00%

7.3 DAC-Amortization for FAS 60 long

- **Output : Development of the Portfolio**

Policy Year	Dead	Lapses	Portfolio
0			10'000.00
1	20.00	1'500.00	8'480.00
2	19.50	1'017.60	7'442.90
3	18.46	893.15	6'531.29
4	17.50	653.13	5'860.66
5	17.00	527.46	5'316.20

7.3 DAC-Amortization for FAS 60 long

- **Output: Development of Gross Profit and Calculations of Factors**

	(1)	(2)	(3)	(4)	(5)	(6)
Policy Year	Premium	Acquisition Expenses	Maintenance Expenses	Benefits	Gross Profit	Discounting Factor
0	450'000.00	337'500.00	30'000.00			1.000000
1	381'600.00	19'080.00	26'288.00	200'000.00	-111'725.00	0.934579
2	409'359.28	20'467.96	23'072.98	195'040.00	164'728.24	0.873439
3	359'220.96	17'961.05	20'900.13	184'583.82	205'012.71	0.820130
4	322'336.15	16'116.81	18'754.10	175'038.57	166'144.59	0.770075
5				169'959.06	136'191.42	0.723075
PV(0)	1'707'016.86	400'350.84	106'303.96	766'340.27	434'021.79	
Factors	100.00%	23.45%	6.23%	44.89%	25.43%	
	100.00%	k%	y%	x%	p%	

$$(5)_t = ((1)_{t-1} - (2)_{t-1} - (3)_{t-1}) * (1 + i_t) - (4)_t$$

7.3 DAC-Amortization for FAS 60 long

- Output: Development of DAC and Reserves**

(7) (8) (9) (10)

Policy Year	DAC	Change in DAC	Total Reserves	Change in Reserves
0	-			
1	248'197.63	248'197.63	14'047.65	14'047.65
2	190'224.65	-57'972.98	596.04	-13'451.61
3	122'139.08	-68'085.57	14'349.29	13'753.25
4	59'481.48	-62'657.60	13'558.59	-790.70
5	0.00	-59'481.48	-	-13'558.59

$$(7)_t = ((7)_{t-1} + (2)_{t-1}) * (1 + i_t) - k * (1)_{t-1} * (1 + i_t)$$

$$(9)_t = ((9)_{t-1} + (1)_{t-1} * (x + y) - (3)_{t-1}) * (1 + i_t) - (4)_t$$

7.3 DAC-Amortization for FAS 60 long

- Output: Development of Gross P&L Impact**

(11) = (5)

(12) = (8)

(13) = (10)

(14)

Policy Year	Gross Profit	Change in DAC	Change in Reserves	Gross P&L Impact
0				
1	-111'725.00	248'197.63	-14'047.65	122'424.97
2	164'728.24	-57'972.98	13'451.61	120'206.87
3	205'012.71	-68'085.57	-13'753.25	123'173.89
4	166'144.59	-62'657.60	790.70	104'277.70
5	136'191.42	-59'481.48	13'558.59	90'268.53

$$(14)_t = (11)_t + (12)_t + (13)_t$$

7. Deferred Acquisition Costs

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7.5 DAC-Amortization for FAS 120

7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.4 DAC-Amortization for FAS 97

- **For FAS 97 products the DAC-amortization is based on the EGPs**
- At the valuation date t^* , the DAC_t of the year t can be calculated according to the following DAC roll-forward:

$$DAC_t = (DAC_{t-1} + DAE_t) \cdot (1 + i_t) - k(t^*) \cdot EGP_t$$

7.4 DAC-Amortization for FAS 97

- The k-factor of the valuation date t^* is defined as follows

$$k(t^*) = \frac{PV_0(DAE_t(t^*))}{PV_0(EGP_t(t^*))}$$

- The present value is always calculated for the issue year 0 ($PV_0(\)$)
 - the EGPs up to t^* are **past actual values** and
 - the EGPs after t^* are **future projected values**
 - So, the present value of the EGPs is a combination of past actual and future projected EGPs
 - The same holds for the DAEs

7.4 DAC-Amortization for FAS 97

- The k-factor can change from year to year due to
 - the **true-up process** (replacement of expected values by realised values, e.g. EGP of the past year) or
 - the **dynamical unlocking** (replacement of assumptions by experience for the projections of future years)
- At any valuation date t^* , a complete DAC roll-forward is calculated with updated assumptions (k-factor $k(t^*)$, updated $EGP_t(t^*)$, updated interest rates $i_t(t^*)$ etc.)

7.4 DAC-Amortization for FAS 97

- **The DAC is recoverable if the k-factor is less than or equal 100%**
 - If there is an Unearned Revenue Liability (see URL below) it may even be recoverable if the k-factor is higher than 100%
- **If the k-factor is greater than 100%** and there is no URL, a portion of the DAC or the total DAC has to be written off immediately, so that the new k-factor is equal 100%
 - A write off of DAC may be caused by dynamical unlocking or true up

7.4 DAC-Amortization for FAS 97

Example DAC roll-forward

Valuationdate $t^*=1$

Year	1	2	3	4	5	6
EGP	100	200	200	200	150	100
Interest rate	5%	5%	5%	5%	5%	5%
PV EGP	806	746	584	413	234	95
DAE	400	0.00	0.00	0.00	0.00	0.00
k	49.62%					
DAC roll-forward	370.38	289.65	204.89	115.90	47.26	0.00
DAC opening balance	0.00	370.38	289.65	204.89	115.90	47.26
Unlocking effect	0.00	0.00	0.00	0.00	0.00	0.00
DAC after unlocking	0.00	370.38	289.65	204.89	115.90	47.26
DAE	400.00	0.00	0.00	0.00	0.00	0.00
Interest on DAC	20.00	18.52	14.48	10.24	5.79	2.36
Amortization	-49.62	-99.24	-99.24	-99.24	-74.43	-49.62
DAC closing balance	370.38	289.65	204.89	115.90	47.26	0.00
True-up						

7.4 DAC-Amortization for FAS 97

Example DAC roll-forward Valuationdate $t^*=2$

Year	1	2	3	4	5	6
EGP	100	250	150	100	100	50
Interest rate	5%	5%	5%	5%	5%	5%
PV EGP	650	582	361	229	141	48
DAE	400	0.00	0.00	0.00	0.00	0.00
k	61.59%					
DAC roll-forward	358.41	222.37	141.11	86.58	29.33	0.00
DAC opening balance	0.00	370.38	222.37	141.11	86.58	29.33
Unlocking effect	0.00	-11.96	0.00	0.00	0.00	0.00
DAC after unlocking	0.00	358.41	222.37	141.11	86.58	29.33
DAE	400.00	0.00	0.00	0.00	0.00	0.00
Interest on DAC	20.00	17.92	11.12	7.06	4.33	1.47
Amortization	-49.62	-153.96	-92.38	-61.59	-61.59	-30.79
DAC closing balance	370.38	222.37	141.11	86.58	29.33	0.00
True-up		-24.81				

7.4 DAC-Amortization for FAS 97

- The precise calculation according to the DAC roll-forward for the valuation date t^* is as follows:

– for

$$t > t^*$$

$$\text{DAC}_t(t^*) = (\text{DAC}_{t-1}(t^*) + \text{DAE}_t(t^*)) \cdot (1 + i_t(t^*)) \\ - k(t^*) \cdot \text{EGP}_t(t^*)$$

– for

$$t \leq t^*$$

$$\text{DAC}_t(t^*) = (\text{DAC}_{t-1}(t^*) + \text{DAE}_t^r) \cdot (1 + i_t^r) \\ - k(t^*) \cdot \text{EGP}_t^r$$

7.4 DAC-Amortization for FAS 97

- Where
 - $DAC_t(t^*)$ denotes the DAC for point of time t calculated with the information of the valuation date t^* and
 - the superscript r denotes realized values of DAE and EGP
- Without the superscript r the DAE and EGP are expected (projected) values

7.4 DAC-Amortization for FAS 97

- The **dynamical unlocking effect** (new assumptions for future projections) for the valuation date $t^*=2$ (compare the example) is:

$$\begin{aligned} \text{DAC}_{t^*-1}(t^*) - \text{DAC}_{t^*-1}(t^*-1) &= \text{DAC}_1(2) - \text{DAC}_1(1) \\ &= 358.41 - 370.38 = -11.96 \end{aligned}$$

- In the second year, there is an additional DAC amortization for the first year of 11.96 with a hit on the P&L of the second year
- **With the information of the second year the DAC amortization in the first year was too small**
- In $t^* = 2$, the expectations on the future EGPs are not so optimistic as in $t^* = 1$

7.4 DAC-Amortization for FAS 97

- The **true up effect** (replacement of assumed values by realized values for the past year) **as part of the amortization** is (compare the example):

$$k(t^* - 1) \cdot (EGP_{t^*}^r - EGP_{t^*}(t^* - 1))$$
$$= 49.62\% * (250 - 200)$$

$$= 24.81$$

- It is also possible to use the new k-factor 61,59% instead of the old one 49.62%
- In the example, the realized EGP value of the second year (250) is larger than the (in the first year) expected EGP value of the second year (200)

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7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.5 DAC-Amortization for FAS 120

- For **FAS 120** products the **DAC-amortization and roll-forward is analog to FAS 97 products** with the following two differences:
 - The **EGMs** are used **instead of the EGPs**
 - The **earned rate** is used instead of the credited rate **as discount rate**
- At the valuation date t^* , the **DAC roll-forward** is now

$$DAC_t = (DAC_{t-1} + DAE_t) \cdot (1 + i_t) - k(t^*) \cdot EGM_t$$

$$\text{with } k(t^*) = \frac{PV_0(DAE_t(t^*))}{PV_0(EGM_t(t^*))}$$

7.5 DAC-Amortization for FAS 120

- In the example above, you have only to write EGM instead of EGP and i is to be interpreted as earned rate instead of credited rate
- **The DAC is recoverable if the k-factor is less than 100%**
 - For FAS 120 products, there is no URL
- **If the k-factor is greater than 100%**, a portion of the DAC or the total DAC has to be written off immediately, so that the new k-factor is equal 100%
 - A write off of the DAC may be caused by dynamical unlocking or true up

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7.6 Unearned Revenue Liability

- For **FAS 97 products**, it is necessary to set up an **Unearned Revenue Liability (URL)**, if there is **front end loading** for financing the acquisition expenses
- The handling of the URL is analog to the handling of the DAC for FAS 97 product
- At the valuation date t^* , the **URL roll-forward** is as follows:

$$URL_t = (URL_{t-1} + UR_t) \cdot (1 + i_t) - K(t^*) \cdot EGP_t$$

$$\text{with } K(t^*) = \frac{PV_0(UR_t)}{PV_0(EGP_t)}$$

UR_t is the Unearned Revenue in year t , i.e. the front end loading of year t

7.6 Unearned Revenue Liability

- **DAC recoverability and URL**
 - If the k-factor for DAC-amortization is higher than 100% and there is an URL with a K-factor, the DAC is still recoverable as long as the difference k-K of the two factors is smaller than 100%:

$$k - K \leq 100\%$$

- i.e.

$$\frac{PV_0(DAE_t) - PV_0(UR_t)}{PV_0(EGP_t)} \leq 100\%$$

7.6 Unearned Revenue Liability

- **DAC recoverability and URL**
 - If the difference of the two k-factors ($k - K$) is greater than 100%, a portion of the DAC or the total DAC has to be written off immediately, so that the new difference is equal 100%
 - A write off of the DAC may be caused by dynamical unlocking or true up

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7.6 Unearned Revenue Liability

7.7 Different Ways to treat Acquisition Expenses

7.7 Different Ways to treat Acquisition Expenses

- Using very much simplified **examples**, we demonstrate different ways to treat acquisition expenses
- We analyze **traditional products** according to **FAS 120** and **unit linked products** according to **FAS 97**
- In addition, we compare on the one hand **different local statutory accounting systems** and on the other hand **US GAAP**

7.7 Different Ways to treat Acquisition Expenses

A) Traditional Business (FAS 120)

1) Reserves not zillmerized Acquisition Expenses not activated

Premiums	100
Increase of reserves	-90
Acquisiton expenses	-95
Increase of DAC	0
Total	-85

Switzerland statutory Individual before 2000

2) Reserves not zillmerized Acquisition Expenses activated

Premiums	100
Increase of reserves	-90
Acquisiton expenses	-95
Increase of DAC	95
Total	10

Switzerland statutory Individual after 2000
Switzerland US GAAP Individual

7.7 Different Ways to treat Acquisition Expenses

A) Traditional Business (FAS 120)

3) Reserves zillmerized Acquisition Expenses not activated

Premiums	100
Increase of reserves	0
Acquisiton expenses	-95
Increase of DAC	0
Total	5

Germany statutory

4) Reserves zillmerized Acquisition Expenses activated

Premiums	100
Increase of reserves	0
Acquisiton expenses	-95
Increase of DAC	95
Total	100

Meaningless

7.7 Different Ways to treat Acquisition Expenses

B) Unit Linked Business (FAS97)

1) No Front End Loading Acquisition Expenses not activated

Premiums	100
Increase of reserves	-90
Acquisition expenses	-95
Increase of DAC	0
Total	-85

Switzerland statutory Individual before 2000

2) No Front End Loading Acquisition Expenses activated

Premiums	100
Increase of reserves	-90
Acquisition expenses	-95
Increase of DAC	95
Total	10

Switzerland statutory Individual after 2000
Switzerland US GAAP Individual

7.7 Different Ways to treat Acquisition Expenses

B) Unit Linked Business (FAS97)

3) Front End Loading

Acquisition Expenses not activated
No URL

Premiums	100
Increase of reserves	0
Acquisition expenses	-95
Increase of DAC	0
Increase of URL	0
Total	5

Hong Kong statutory

4) Front End Loading

Acquisition Expenses activated
URL

Premiums	100
Increase of reserves	0
Acquisition expenses	-95
Increase of DAC	95
Increase of URL	-97
Total	3

Hong Kong US GAAP

7.7 Different Ways to treat Acquisition Expenses

B) Unit Linked Business (FAS97)

5) Front End Loading

Acquisition Expenses not activated
URL

Premiums	100
Increase of reserves	0
Acquisition expenses	-95
Increase of DAC	0
Increase of URL	-97
Total	-92

Maningless

6) Front End Loading

Acquisition Expenses activated
No URL

Premiums	100
Increase of reserves	0
Acquisition expenses	-95
Increase of DAC	95
Increase of URL	0
Total	100

Meaningless

7.7 Different Ways to treat Acquisition Expenses

- Summary of the meaningful results in the first year for **Traditional Business (FAS120)**:
 1. Reserves **not zillmerized**
Acquisition Expenses **not activated** -85 (huge loss)
 2. Reserves **not zillmerized**
Acquisition Expenses **activated** +10 (small profit)
 3. Reserves **zillmerized**
Acquisition Expenses **not activated** +5 (small profit)

7.7 Different Ways to treat Acquisition Expenses

- Summary of the meaningful results in the first year for **Unit Linked Business (FAS 97)**:
 1. **No Front End Loading**
Acquisition Expenses **not activated** -85 (huge loss)
 2. **No Front End Loading**
Acquisition Expenses **activated** +10 (small profit)
 3. **Front End Loading without URL**
Acquisition Expenses **not activated** +5 (small profit)
 4. **Front End Loading with URL**
Acquisition Expenses **activated** +3 (small profit)

7.7 Different Ways to treat Acquisition Expenses

- Consequences:
 - **Front end loading for unit linked products is comparable with zillmerization for traditional products**
 - **If there is no zillmerization or no front end loading, activating acquisition expenses improves the result of the first year**
 - **If there is front end loading, activating acquisition expenses makes only sense if at the same time an URL is set up**
 - **If there is zillmerization, only activating the total acquisition expenses is meaningless**
 - But for traditional products there is no URL, here the unzillmerized reserves are used (Germany)

7.7 Different Ways to treat Acquisition Expenses

- Note, that in the above examples concerning Swiss individual business A 2) and B2)
 - i.e., traditional business with unamortized reserves and acquisition expenses activated
 - respectively unit linked business without front end loading and acquisition expenses activated

the **methodologies to activate and to amortize the acquisition expenses is totally different for**

 - **Swiss statutory since 2000**

and

 - **US GAAP**

7.7 Different Ways to treat Acquisition Expenses

- In **Swiss statutory**, acquisition expenses are in principle **activated and amortized according to** the acquisition loadings in the **tariff**
- In **US GAAP**, the **amounts to be activated** are in general **higher** than the corresponding loadings in the tariff; in addition, the **amortization** is according to the **EGMs resp. EGPs** which results in different amortization patterns compared with the local statutory ones

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8. Recoverability Test and Loss Recognition Test

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8.1 General Definitions

- The recoverability and loss recognition test guidance provided in FAS 60 applies to FAS 97 and FAS 120 products as well

8.1 General Definitions

- **The Recoverability Test applies to a block of new business issued during the accounting period**
 - The test is performed on an aggregated level and not for every single new policy for its own
 - **Internal subsidizing in the separate blocks of new business is allowed, but there is no subsidizing from existing business to new business**
 - The test is also referred to as **profit testing**
 - The **definition of the different blocks of new business is crucial for the result** of the test
 - The smaller the groups are defined the higher is the probability that the test is not passed

8.1 General Definitions

- **The Loss Recognition Test applies to an entire block of business written in general during several years**
 - The test is performed on an aggregated level and not for every single new policy for its own
 - **Internal subsidizing in the different blocks of business is allowed, which in general were written during several years**
 - So, in general **policies out of different generations with different margins** are tested together as one block
 - The **definition of the different blocks** of business is **crucial for the result** of the test
 - The smaller the groups are defined the higher is the probability that the test is not passed

8.1 General Definitions

- **The recoverability test as well as the loss recognition test compare the gross premium reserves with the net GAAP liabilities**
 - **The difference between the two tests emanates only from the analyzed portfolios**
 - **In the recoverability test blocks of new business are tested**
 - **In the loss recognition test blocks of existing business, in general written in several years, are tested**
 - **The tests are required to be performed regularly**

8.1 General Definitions

- The **Gross Premium Reserve or Gross Premium Valuation (GPV)** is defined as
 - the present value of future benefits and of related settlement and maintenance costs
 - minus
 - the present value of future gross premiums
- **The acquisition expenses and the administration expenses are not included in the test**
- The gross premium reserves are calculated using the prospective method
- The calculation is based on **current (updated) best estimate assumptions without PADs**

8.1 General Definitions

- The **Net GAAP Liability (NGL)** is defined as
 - all existing US GAAP reserves including URL, DPL (intangible liabilities) and SOP 03-1 reserves minus
 - DAC and PVFP (intangible assets)
- For FAS 60 long products, the PADs are part of the US GAAP reserves
- If there is a **Legal Quote**, there are still some issues **how to treat the DBR**
- Because in both tests the gross premium reserves are compared with the net GAAP liabilities these tests are also referred to as **Premium Deficiency Test**

8.1 General Definitions

- **A Premium Deficiency exists if the net GAAP liability is less than the gross premium reserve; i.e. if**

$$\text{Net GAAP Liability} < \text{GPV}$$

- This means:
 - all existing US GAAP reserves including URL, DPL and SOP 03-1 reserves**
 - minus all intangible assets as DAC or PVFP****<**
 - present value of future benefits and of related settlement and policy maintenance costs**
 - minus present value of future gross premium**

8.1 General Definitions

- So, a premium deficiency exists,
 - if all existing US GAAP reserves together with the present value of future gross premiums will not be sufficient
 - (a) to cover the present value of future benefits
 - (b) to cover the present value of settlement and policy maintenance costs
 - (c) to amortize DAC and PVFP

8.1 General Definitions

- **Loss recognition testing** is especially an issue for **FAS 60 long products**
 - But the principles apply also to FAS 97 and FAS 120 products
- **Typical examples** for products where loss recognition events have been observed are older annuity blocks historically priced during higher interest rate environments
 - In addition, it may happen that old mortality tables were used which are nowadays insufficient (increase in longevity)

8.1 General Definitions

- In **Germany**, the technical reserves were strengthened for the existing (deferred and in payment) **annuity portfolio** in the local statutory accounting system, but not in US GAAP, because a Loss Recognition Test showed that it was not necessary in US GAAP to strengthen the reserves
 - This result was especially due to the different assumptions concerning the interest rates
 - In local statutory, the different technical interest rates were used
 - In US GAAP, the best estimate interest rate path was used

8. Recoverability Test and Loss Recognition Test

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8.3 Consequences of a Premium Deficiency

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8.2 Definition of the Blocks of Business

- **The result of a premium deficiency test crucially depends on the definition of the tested blocks of business, since internal subsidizing is allowed**
- The concept of consistency implies that the grouping of the business should not be changed to often
- Premium deficiency tests are generally applied to the base policies and corresponding riders combined

8.2 Definition of the Blocks of Business

- The concept to define the blocks of business to be tested reads as follows:
 - **Contracts should be grouped in a manner consistent with the way in which the business is managed;**
 - i.e. consistent with the enterprise's manner of acquiring, servicing, and measuring the profitability of its insurance contracts

8.2 Definition of the Blocks of Business

- **Examples:**
 - **Grouping according to manner of acquiring:**
 - Separate direct marketing business from agency produced business
 - Separate a purchased block of business from the business sold after the purchase
 - **Grouping according to manner of servicing:**
 - For example, if direct marketing business is administered with agency business, or purchased business with other business, some practitioners view that these blocks can be combined for loss recognition or recoverability purposes

8.2 Definition of the Blocks of Business

- **Grouping according to manner of measurement of profitability:**
 - Separate FAS 60 business from FAS 97 business
 - “However, some practitioners argue that if universal life can be administered with traditional life, the two could be combined for recoverability or loss recognition testing”
- This last example shows that there is **really some freedom in defining the tested blocks of business**
- The **concrete definition of the blocks of business** to be tested is in the **responsibility of the management**

8. Recoverability Test and Loss Recognition Test

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8.1 General Definitions

8.2 Definition of the Blocks of Business

8.3 Consequences of a Premium Deficiency

8.4 High Level Testing

8.3 Consequences of a Premium Deficiency

- **If the recoverability test results in a premium deficiency**, the order of adjustment is in general as follows:
 - (1) the deferrable acquisition expenses (DAE) should be reclassified to non-deferrable so that the remaining deferrable are recoverable
 - (2) should the DAE totally be reclassified as non-deferrable but a premium deficiency yet remain, a premium deficiency reserve is established such that the final net GAAP liability equals the gross premium reserve

8.3 Consequences of a Premium Deficiency

- **If the loss recognition test results in a premium deficiency**, the order of adjustment is in general as follows:
 - (1) the existing DAC or PVFP assets are reduced to the point necessary to eliminate the premium deficiency
 - (2) should the DAC and PVFP assets be entirely written down but a premium deficiency yet remain, a premium deficiency reserve is established such that the final net GAAP liability equals the gross premium reserve

8.3 Consequences of a Premium Deficiency

- **A premium deficiency always implies a charge to income**, be it via
 - a reclassification of deferrable acquisition expenses to non-deferrable
 - a write down of DAC or PVFP
 - establishing a premium deficiency reserve
- The charge to income is always determined such that the break even point is just reached, i.e. that **the new net GAAP liability is just equal to the gross premium reserve**
 - Doing so, an overcorrection is avoided which would imply future profits
 - For the same reason, the gross premium reserve is calculated without PADs

8.3 Consequences of a Premium Deficiency

- The change of the net GAAP liability is determined in such a way that no loss currently reported should create future profits
- If in the past, a premium deficiency implied a write down of the intangible assets **DAC or PVFP they should not be restored at future valuation dates** even if the updated best estimate assumptions have been changed favorable

8.3 Consequences of a Premium Deficiency

- If in the past, a premium deficiency reserve had to be set up future changes in the liabilities are based on the revised assumptions
 - **These new assumptions are locked-in until an additional premium deficiency exists in future**
 - At least for internal reporting, the corresponding premium deficiency reserves should be shown separately
 - At future valuation dates, the **premium deficiency reserves are not lowered** even if the updated best estimate assumptions have been changed favorable

8. Recoverability Test and Loss Recognition Test

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8.1 General Definitions

8.2 Definition of the Blocks of Business

8.3 Consequences of a Premium Deficiency

8.4 High Level Testing

8.4 High Level Testing

- **High level recoverability / loss recognition tests can be performed using the k-factors**
- **FAS 60 long contracts:**
 - If the sum of the DAC or PVFP amortization ratio (k-factor), the ratio to support the future benefits (x-factor) and the ratio to support the policy maintenance expenses (y-factor) is higher than 100% (**i.e. if $x+y+k > 100\%$**), **the DAC or PVFP is not recoverable** and these intangibles assets have to be written down until the sum of the above mentioned ratios adds up to 100% exactly

8.4 High Level Testing

- **FAS 60 long contracts** (continued):
 - If DAC or PVFP are totally written off and the sum of the ratios of the gross premiums used for benefits and policy maintenance expenses still exceeds 100% (**i.e. if $x+y > 100\%$**), a premium deficiency furthermore exists and **a corresponding reserve has to be set up** so that the break even point is just met

8.4 High Level Testing

- **FAS 97 and FAS 120 contracts:**
 - If there is **no front end loading** (combined with an URL) and the **k-factor is higher than 100% the DAC or PVFP is not recoverable** and these intangible assets have to be written down until the k-factor is equal to 100%
- **FAS 97 contracts only:**
 - If there is **front end loading combined with an URL** with a corresponding K-factor, the difference of the to factors is relevant; i.e. **k-K must be smaller than 100%**
 - If this is not the case, the DAC has to be written down until the (k-K)-factor is 100%

8.4 High Level Testing

- **FAS 120 contracts only:**
 - For FAS 120 contracts with **terminal bonus**, the EGMs are used both
 - to amortize DAC or PVFP and
 - to accrue a liability for terminal bonus
 - Hence both elements have to be considered whether DAC or PVFP is recoverable
 - So, the **sum of the k-factor to amortize DAC or PVFP and of the factor to accrue the liability for the terminal bonus has to be lower than 100%**

8.4 High Level Testing

- **FAS 120 contracts only:**
 - Sometimes it is not necessary to perform a loss recognition test by real calculations:
 - A **comparison of the tariff-assumptions** with the current **best estimate assumptions** may show that there are **enough margins** in the existing US GAAP reserves
 - Note, that for FAS 120 products the US GAAP reserves are based on the unzmilmerized local statutory reserves

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9. Shadow Adjustments

- **Shadow Adjustments exists only for bonds and shares in the General Account classified as available for sale**
 - Because only for bonds and shares classified as **available for sale**, there are differences possible between the valuation for the Balance Sheet and the Profit & Loss Account (see chapter 5)
 - The **BS book value** for **bonds and shares** is here the **market value**
 - The **P&L book value** for
 - **bonds** is here the **amortized cost value** and for
 - **shares** it is here the **cost value**

9. Shadow Adjustments

- As a consequence, there may be **unrealized capital gains or losses in the Accumulated Other Comprehensive Income (AOCI) as part of shareholders' equity**
 - Up to now, these unrealized capital gains or losses have not been recognized in the P&L

9. Shadow Adjustments

- **Example:** Share not sold during the year
Cost value Begin of year 100 End of year 100
Market value Begin of year 110 End of year 120
- In the **BS on the asset side**, the share has the values 110 resp. 120
- In the **BS on the liability side**, the **AOCI** shows 10 resp. 20 **unrealized capital gains as part of the shareholders' equity**
- In the **P&L**, only the dividends paid are recognized as current income; **the increase in the market value is not recognized in the P&L as part of investment income**

9. Shadow Adjustments

- **If no adjustments would be made, shareholders' equity would be overstated**
 - If for example, the unrealized capital gains would be realized, not the total amount would belong to the shareholders; at least, for example, taxes have to be paid
- **By means of the Shadow Adjustments, one try to determine that part of the unrealized capital gains or losses which “really” belongs to the shareholders**

9. Shadow Adjustments

- The **Shadow Adjustments** are determined by capturing all consequences of an **assumed realization** of the unrealized capital gains or losses
 - It is a **virtual calculation using the assumption: "what would happen, if all unrealized capital gains or losses were realized?"**
- The effects are only shown as **Shadow Adjustments** in the **Balance Sheet**
- The **Profit & Loss Account** is not affected

9. Shadow Adjustments

- The **different shadow adjustments** are:
 - The **taxes** on unrealized capital gains or losses are normally not classified as shadow adjustments, although it is the same issue
 - The unrealized gains or losses are often disclosed net of taxes which implies a corresponding tax position
 - If **unrealized capital gains would be realized**, a **special amortization of DAC or PVFP** would be the consequence for FAS 97 and FAS 120 products, but not for FAS 60 products
 - This is captured by the **shadow DAC or shadow PVFP**
 - In analogy the URL and DPL has to be treated, so there is also a **shadow URL and shadow DPL**

9. Shadow Adjustments

- If there is a **legal quote (legal requirement)** for profit sharing (e.g. 90/10 in Germany) the realization of unrealized gains would imply an increase in the reserves for policyholders dividends
 - This is captured by an increase in the **shadow policyholder liability (shadow DBR)**
- In addition to these main shadow adjustments, it may be that there are also **shadow claim reserves** or a **shadow loss recognition event**
- **On all shadow adjustments, the corresponding taxes are to be recognized**

9. Shadow Adjustments

- **Example:** Share (classified available for sale) with cost value 100 and market value 120; tax rate at 25%; no legal quote for profit sharing; compare for example individual business in Switzerland
 - **Unrealized gains: 20** ($= 120 - 100$)
 - **Deferred tax on unrealized gains: 5** ($= 25\%$ of 20)
 - **Unrealized gains net of tax: 15** ($= 20 - 5$)
 - **Additional amortization of DAC** be by assumption **4**; so on **shadow DAC** there is an impact of -4
 - **Deferred tax on shadow adjustments: 1** ($= 25\%$ of -4)

9. Shadow Adjustments

- **Unrealized gains net of tax and net of shadow adjustments:** $12 (= 20 - 5 - 4 + 1)$; they are part of the equity as “Accumulated Other Comprehensive Income” (**AOCI**)
- **As a consequence of the shadow adjustments, the unrealized capital gains of 20 in the share (classified available for sale) increase equity only by 12**
 - 5 of the difference of 8 ($= 20 - 12$) are due to deferred tax on the unrealized capital gains of 20
 - 3 of the difference of 8 are due to the additional amortization of shadow DAC (-4) and the corresponding deferred tax release of 1

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10. Legal Quote

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10.1 Legal Quote and Bonus Reserves

- If there is a **legal quote or legal requirement** to determine the policyholders' dividends we have to distinguish three types of bonus reserves:
 - the **bound bonus reserve**
 - the **free bonus reserve** and
 - the **Deferred Bonus Reserve (DBR)**
- **Example:** In Germany, after tax at least 90% of the surplus have to be allocated to the policyholders (simplified version)

10.1 Legal Quote and Bonus Reserves

- **The bound (tied) bonus reserve is used for the bonus allocation in the following year; it is a reserve**
- **The free bonus reserve is used for bonus allocations in future years**
 - The free bonus reserve is increased (decreased) if the allocation to the bonus funds is higher (lower) than the effective bonus allocation to the policyholders in a given year
 - **The free bonus reserve is used to smooth the bonus allocation** to the policyholders in future years
 - **Without a legal quote or legal requirement, the free bonus reserve is part the equity in US GAAP**
 - In this case, the free bonus reserve is not accepted as a reserve in US GAAP

10.1 Legal Quote and Bonus Reserves

- But **with a Legal Quote** (e.g. employee benefit business CH) or **another relevant Legal Requirement** (e.g. Individual business CH due to the new version of the VAG), a **free bonus reserve is accepted as a reserve in US GAAP**

10.1 Legal Quote and Bonus Reserves

- **The Deferred Bonus Reserve (DBR) should catch all temporary timing differences of earnings between the US GAAP and the local statutory accounts**
 - The **DBR** is calculated using the **US GAAP valuation for the P&L**
 - The **URG** according to US GAAP are relevant for the **shadow DBR**
 - The basis for the calculation of the DBR should be the US GAAP and local statutory **balance sheets ("block method")** and not the corresponding profit and loss accounts ("slice method")
 - **Example 1: In Germany (without tax effects) a DAC of EUR 100 will imply a DBR of EUR 90**
 - This represents a DBR-liability of EUR 90

10.1 Legal Quote and Bonus Reserves

- **Example 2:** In **Germany** for FAS 120 products (without tax effects) a **Zillmer reserve of EUR 100 will imply a DBR of EUR -90**
 - This creates a DBR-asset (as a negative liability) of EUR -90
 - Note, that in Germany in local statutory accounts zillmerized reserves are used whereas in US GAAP the reserves are unzillmerized which implies that the US GAAP reserves are higher than the local statutory ones and that the difference is just the Zillmer reserve
 - So, 90% of the additional reserves of EUR 100 in US GAAP are backed by the DBR-asset of EUR -90

10.1 Legal Quote and Bonus Reserves

- **Example 3:** In general, in **Switzerland Employoy Benefit Business** the acquisition expenses are financed totally by the money allocated to the policyholders according to the Swiss legal quote.
 - As a consequence, a **DAC of CHF 100 will imply a DBR of CHF 100**
 - So the intangible DAC-asset is offset by an intangible DBR-liability of the same size
 - A consequence may be that there is no longer a DAC-asset for this line of business

10.1 Legal Quote and Bonus Reserves

- **Example 4: DBR and impaired share; Swiss Employee Benefit Business with Legal Quote 90/10**

Point in time	Action	Value		US GAAP		
				BS Value Market Value	Valuation for P&L	URG
1	Share bought at	100		100	100	0
2	Market value up to	120		120	100	20
3	Market value down to	90		90	100	-10
4	Market value down to	60		60	100	-40
5	Impairment in US GAAP to	60		60	60	0
6	Market value up to	90		90	60	30
7	Market value up to	110		110	60	50

10.1 Legal Quote and Bonus Reserves

- **Example 4: DBR and impaired share; Swiss Employee Benefit Business with Legal Quote 90/10 (Cont.)**

Point in time	Swiss Accounting		Swiss Group Business	
	Statutory Book Value	URG	DBR	Shadow DBR
1	100	0	0	0
2	100	20	0	18
3	90	0	9	-9
4	60	0	36	-36
5	60	0	0	0
6	90	0	-27	27
7	100	10	-36	45

10.1 Legal Quote and Bonus Reserves

- So, all temporary P&L-valuation differences will induce a corresponding impact on the DBR
 - If an **US GAAP asset is higher** than the corresponding local statutory item, this implies a corresponding **DBR-liability** (i.e. the corresponding **DBR item is positive**)
 - If an **US GAAP liability is higher** than the corresponding local statutory item, this implies a corresponding **DBR-asset** (i.e. the corresponding **DBR item is negative**)

10.1 Legal Quote and Bonus Reserves

- The total DBR is an intangible liability, if it is positive, and an intangible asset, if it is negative
- **The total DBR may become negative only up to a boundary, so that this DBR-asset is still recoverable**
- Up to now the treatment of the DBR follows the rules concerning **minority interest**; this topic is now a days under discussion; it may be that the treatment of a negative DBR will be changed in future

10.1 Legal Quote and Bonus Reserves

- Lines of business with a legal quote are for example:
 - in Germany the total business
 - in UK the with profit business
 - in Switzerland the employee benefit business since 2004
- Please note, all these three legal quote systems work differently

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10.2 Legal Quote and Shadowing

- If there are **assets classified as available for sale**
 - then there are **shadow adjustments**
- If there are **assets classified as available for sale** and if in addition there is a **legal quote**
 - then the **shadow adjustments include a shadow DBR**

10.2 Legal Quote and Shadowing

- **Example:** Share (classified available for sale) with cost value 100 and market value 120; FAS 120 product; tax rate at 40%; legal quote for profit sharing: 90/10 of the surplus after tax or 85/15 before tax; compare for example Germany (simplified old version)
 - **Unrealized gains: 20** ($= 120 - 100$)
 - **Deferred tax on unrealized gains: 8** ($= 40\%$ of 20)
 - **Unrealized gains net of tax: 12** ($= 20 - 8$)
 - **Increase of shadow DBR** as part of the account
Shadow Policyholder Liability: **17** ($= 85\%$ of 20)
 - **Additional amortization of DAC** be by assumption **1**;
so on **shadow DAC** there is an impact of -1
 - **Deferred tax on shadow adjustments: 7.2** ($= 40\%$ of $17 + 1$)

10.2 Legal Quote and Shadowing

- **Unrealized gains net of tax and net of shadow adjustments: 1.2** ($= 20 - 8 - 17 - 1 + 7.2$); they are part of the equity as “Accumulated Other Comprehensive Income” (**AOCI**)
- **As a consequence of the shadow adjustments, the unrealized capital gains of 20 in the share (classified available for sale) increase equity only by 1.2**
 - 8 of the difference of 18.8 ($= 20 - 1.2$) are due to deferred tax on the unrealized capital gains of 20
 - 10.8 of the difference of 18.8 are due to the increase of the shadow DBR (-17) and the additional amortization of shadow DAC (-1) and the corresponding deferred tax release (7.2)

10.2 Legal Quote and Shadowing

Comparison of shadowing without resp. with legal quote in Switzerland

- Share (classified available for sale) with cost value 100 and market value 120
- URG = 20
- FAS 120 product
- Tax rate at 25%
- Unrealized capital gains (URG) net of tax: 15 (= (120 – 100) * 75%)

10.2 Legal Quote and Shadowing

- **No legal quote** for profit sharing in individual business in Switzerland:
 - Assumption: 4 shadow DAC amortization
 - **URG net of tax = 15**
 - **Shadow DAC net of tax: -3** ($= -4 * 75\%$)
 - **URG net of tax and net of shadowing = 15 – 3 = 12**
- **Legal Quote 90/10** on capital income in employee benefit business in Switzerland:
 - Assumption: 1 shadow DAC amortization
 - **URG net of tax = 15**
 - **Shadow DAC net of tax: -0.75** ($= -1 * 75\%$)
 - **Shadow DBR net of tax: -13.5** ($= 20 * 90\% * 75\%$)
 - **URG net of tax and net of shadowing: 15 – 0.75 - 13.5 = 0.75**

10.2 Legal Quote and Shadowing

The URG net of tax amount to 15

- **Without a legal quote (Swiss individual business) 12 are allocated to equity as AOCI**
- **With a legal quote of 90/10 (Swiss employee benefit business) only 0.75 are allocated to equity as AOCI**

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10.3 Legal Quote and Balance Sheet

- In the following, we show possible impacts of a legal quote on the Balance Sheet using **four examples**
 - We combine the assumption whether there is a **legal quote or not** with the assumption whether the **reserves are zillmerized or not**
- For all four examples, we compare the **local statutory Balance Sheet** with the **US GAAP Balance Sheet**, especially the corresponding **equity**
- The examples are restricted to **FAS120 products**
- Note that the US GAAP equity minus the intangible assets as DAC is often referred to as “**hard equity**”

10.3 Legal Quote and Balance Sheet

1) Without Legal Quote and without Zillmerization (e.g.: Switzerland Individual before 2000)

Statutory		Liabilities	
Assets			
Bonds	145	110	TR(not Z)
		25	Bonus Fund
		10	Equity(stat)
	<u>145</u>	<u>145</u>	

US GAAP		Liabilities	
Assets			
Bonds	145	110	TR(not Z)
DAC	20	25	Bonus Fund
		30	Equity(US)
	<u>165</u>	<u>165</u>	

Equity(US) - DAC = Equity(stat): $30 - 20 = 10$
 TR(not Z) = Technical Reserves not zillmerized

10.3 Legal Quote and Balance Sheet

2) Without Legal Quote and with Zillmerization (e.g.: some products in Japan up to 2007)

Statutory			
Assets		Liabilities	
Bonds	145	100	TR(Z)
		25	Special Fund
		20	Equity(stat)
	<u>145</u>	<u>145</u>	

US GAAP			
Assets		Liabilities	
Bonds	145	100	TR(Z)
DAC	20	10	ZR
		25	Special Fund
		30	Equity(US)
	<u>165</u>	<u>165</u>	

Equity(US) - DAC: $30 - 20 = 10$

Equity(US) - DAC + ZR = Equity(stat): $30 - 20 + 10 = 20$

ZR = Zillmer Reserves

10.3 Legal Quote and Balance Sheet

3) With Legal Quote and without Zillmerization (e.g.: Switzerland Group with DBR(DAC) = DAC)

Statutory			
Assets		Liabilities	
Bonds	145	110	TR(not Z)
		25	Bonus Fund
		10	Equity(stat)
	<u>145</u>	<u>145</u>	

US GAAP			
Assets		Liabilities	
Bonds	145	110	TR(not Z)
DAC	20	25	Bonus Fund
		20	DBR(DAC)
		10	Equity(US)
	<u>165</u>	<u>165</u>	

Equity(US) - DAC: $10 - 20 = -10 < 0$

Equity(US) - (DAC - DBR(DAC)) = Equity(stat): $10 - (20 - 20) = 10$

DBR(DAC) = DBR due to DAC

10.3 Legal Quote and Balance Sheet

4) With Legal Quote and with Zillmerization (e.g.: Germany with $DBR(X) = 0.9 \cdot X$)

Statutory		Liabilities	
Assets			
Bonds	145	100	TR(Z)
		25	Bonus Fund
		20	Equity(stat)
	<u>145</u>	<u>145</u>	

US GAAP		Liabilities	
Assets			
Bonds	145	100	TR(Z)
DAC	20	10	ZR
DBR(ZR)	9	25	Bonus Fund
		18	DBR(DAC)
		21	Equity(US)
	<u>174</u>	<u>174</u>	

Equity(US) - DAC: $21 - 20 = 1$

Equity(US) - (DAC - DBR(DAC)) + (ZR - DBR(ZR)) = Equity(stat): $21 - (20 - 18) + (10 - 9) = 20$

In US GAAP Balance Sheet: DBR = DBR(DAC) - DBR(ZR): $9 = 18 - 9$

DBR(ZR) = DBR due to Zillmer Reserves

10.3 Legal Quote and Balance Sheet

- The examples show that the definition of “**hard US GAAP equity**” has to be modified by
 - the **corresponding DBR** induced by the intangible assets or liabilities, if there is a **Legal Quote**
 - the **Zillmer reserves**, if for FAS 120 products the **local statutory reserves are zillmerized**

10.3 Legal Quote and Balance Sheet

- **Concerning the BS**, a general consequence of a legal quote is that the **US GAAP equity should be close to the local statutory equity**
 - Note, that here the US GAAP equity is not only influenced by the intangible assets DAC and PVFP but also by the corresponding intangible DBR-liabilities
 - **So, only the net position (for example DAC minus DBR(DAC)) has an impact on the US GAAP equity**
 - **Without a legal quote the impact on the US GAAP equity would be given by the total DAC**

10.3 Legal Quote and Balance Sheet

- **Concerning the P&L**, a general consequence of a legal quote is that the **US GAAP profits should be close to the local statutory profits**
 - The arguments are the same as for the impact on the US GAAP equity

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10.4 Legal Quote and Reserves

- If for **FAS 120 products** the **local statutory reserves are zillmerized**, the impacts of a **transition to US GAAP** accounting heavily depends on the fact whether there is a legal quote as in Germany or not as in Japan
 - **With a legal quote as in Germany** (without tax effects) 90% of the Zillmer reserve are backed by the corresponding intangible DBR-asset
 - **Without a legal quote as in Japan** there is no corresponding intangible DBR-asset to back the additional Zillmer reserves

10.4 Legal Quote and Reserves

- In general, in **Swiss Employee Benefit Business** a **strengthening of the reserves only in US GAAP but not in local statutory accounting is totally financed by a DBR-asset**, as long as the DBR does not hit the boundary, if the DBR is negative
 - The rationale for this is the fact that according to the Swiss legal quote rules a higher US GAAP reserve implies in general a negative DBR of the same amount

10.4 Legal Quote and Reserves

Comparison of statutory reserves and US GAAP reserves:

- **US GAAP reserves < statutory reserves:**
 - In **Germany annuity portfolio (FAS 120)**; statutory reserves are strengthened; in US GAAP no LRE because best estimate interest rate is higher than technical interest rates
 - In **Netherlands FAS 60 products** using best estimate assumptions
- The higher statutory reserves are backed by statutory assets

10.4 Legal Quote and Reserves

Comparison of statutory reserves and US GAAP reserves:

- **US GAAP reserves > statutory reserves:**
 - In **Japan products with very high statutory technical interest rates** are classified as **FAS 60**; the US GAAP best estimate interest rates are lower; the higher US GAAP reserves are backed by DAC or PVFP
 - In **Swiss employee benefit business**, for **annuities** a lower reserving interest rate is used in US GAAP as in statutory; the higher US GAAP reserves are backed by a negative DBR-asset
 - In **Germany nearly 90% of the Zillmer reserves** in the US GAAP accounts is backed by a negative DBR-asset

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10.5 Legal Quote and P&L

Acquisition Expenses Revisited for P&L Impacts:

Germany statutory:

Reserves zillmerized
Acquisition Expenses not activated
Legal Quote 90:10

Premiums	100
Increase of reserves	0
Acquisition expenses	-95
Increase of DAC	0
Total	5

Germany US GAAP:

Reserves not zillmerized
Acquisition Expenses activated
Legal Quote 90:10

Premiums	100
Increase of reserves	-90
Acquisition expenses	-95
Increase of DAC	95
Increase of DBR(ZR)	81
Increase of DBR(DAC)	-86
Total	5

10.5 Legal Quote and P&L

- In addition to the above, the existence of a **legal quote** for profit participation has impacts on the
 - **calculation of the EGMs** with consequences for the
 - **PVFP determination**
 - **DAC and PVFP amortization**
 - **recoverability and loss recognition event testing**
(still unsolved issues how to treat the DBR)

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11. Purchase GAAP

- **Purchase GAAP (P-GAAP) is the relevant accounting methodology after a purchase of a life insurance company**
- At the purchase date **all assets and liabilities** of the purchased company **are revalued** as follows:
 - All **intangible assets and liabilities** (as for example DAC and URL) are totally **written off**
 - All **other assets** (as for example bonds and shares) are valued **at market (fair) values**
 - Thus all unrealized capital gains or losses vanish

11. Purchase GAAP

- It is possible to set up a liability called **Market Value Adjustment (MVA)** to catch unrealized capital gains for supporting future policyholders' bonus payments
 - Because of the revaluation of the assets, in future years the investment income will be lower
 - The profits were realized at the purchase date, if no MVA would have been set up
 - By releasing the MVA in future years, the insurance company will be enabled to pay the original planned bonus (without purchase and revaluation)

11. Purchase GAAP

- On the **liability side**, the technical reserves are determined using **updated best estimate assumptions**
 - This is relevant for
 - **claim reserves** and the
 - **reserves of FAS 60 long products**

- **The difference of the newly determined assets and liabilities are called "net assets"**

11. Purchase GAAP

- That part of the purchase price which is above the value of the net assets is split into the two intangible assets
 - **Present Value of Future Profits (PVFP)**
 - **Goodwill**

- So, we have the following split of the purchase price:

$$\text{Purchase Price} = \text{Net Assets} + \text{PVFP} + \text{Goodwill}$$

11. Purchase GAAP

- **The calculation of the PVFP** is, in general, based on the profit margin (p%) for FAS 60 long products, on the EGPs for FAS 97 products and on the EGMs for FAS 120 products
- To determine the **starting value of the $PVFP_0$** a **risk discount rate** is used which is equal to the **credited or earned rate plus a risk margin**
 - There is some freedom in determining this risk margin
 - This implies, that there is **some freedom in the split between $PVFP_0$ and Goodwill at the purchase date**

11. Purchase GAAP

- The **PVFP roll-forward** is analog to the DAC roll-forward, with the exception that there is no corresponding item to the DAE; e.g. for FAS 120 products we have at the valuation date t^* :

$$PVFP_t = PVFP_{t-1} \cdot (1 + i_t) - k(t^*) \cdot EGM_t$$

$$k(t^*) = \frac{PVFP_0}{PV_0(EGM_t(t^*))}$$

11. Purchase GAAP

- Until 2002, the **goodwill** was linearly written off over 20-30 years
- Since 2002, **goodwill impairment testing** is performed at least annually
 - In these tests the amount of the intangible asset goodwill is compared with best estimates of the value of new business written in future years
 - For this purpose the Value of New Business at Point of Sale after Cost of Capital of the Embedded Value calculations is often used
 - If necessary, the goodwill is written off which implies a hit to the Profit & Loss Account

11. Purchase GAAP

- Concerning the PVFP, many companies apply the "**Push Down Method**";
 - This implies that the PVFP is an **intangible asset in the Balance Sheet of the acquired company**
 - As a consequence, the PVFP roll-forward, which is normally an amortization, flows through the Profit & Loss Account of the acquired company
 - So in the P&L of the acquired company **nearly all profits of the "purchased portfolio" vanish**, because they are used to amortize the PVFP
 - **The question arises: How to interpret such P-GAAP profits?**

11. Purchase GAAP

- Concerning the push down method we think that:
 - **P-GAAP results**, calculated according to the push down method, **are adequate to assess the purchase, i.e. the purchase decision of the acquiring management**
 - **P-GAAP results**, calculated according to the push down method, **are not adequate to assess the management of the purchased company**
 - **H-GAAP results** are adequate to assess the management of the purchased company