

Sessions 5 & 6:

The Concept of Building blocks in Aviation Charges

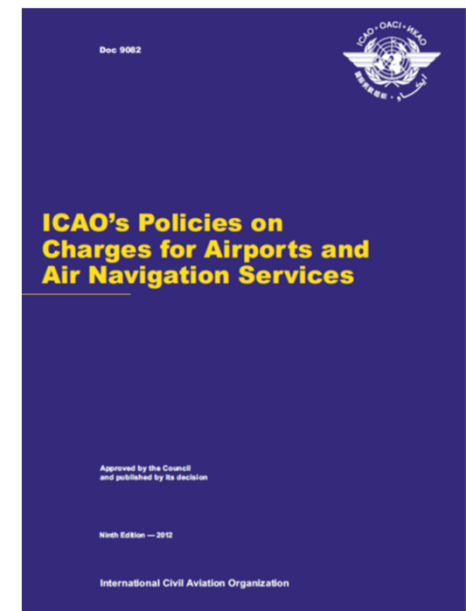


Objective:

An informative half day training session covering the ICAO building block methodology for setting user charges (including the different elements of CAPEX and depreciation, OPEX, Traffic forecasts...etc)

ICAO framework for charges setting: doc 9082

- Airports and ATC companies fall under the scope of the ICAO policies.
- These policies do not only provide guidance but deliver the framework within which they are regulated.
- As ICAO members, full compliance with these policies is expected.
- **National legislation would typically have incorporated ICAO policies.**
- Legislation also describes a process how to settle different views.



ICAO charges policies are framed with 4 key principles

ICAO recommends that the four principles should be incorporated into national legislation, regulation or policies (...) to ensure compliance.



- Non-Discrimination.
- Cost Relatedness.
- Transparency.
- Consultation.



ICAO Council, States are encouraged to incorporate the four key charging principles of non-discrimination, cost-relatedness, transparency and consultation with users into their national legislation, regulation or policies, as well as into their future air services agreements, in order to ensure compliance by airport operators and air navigation services providers (ANSPs).

The wording “encouraged”:

The meaning is not diminished as all ICAO member states have endorsed the policies – setting the standards to be complied with.



The Non-Discrimination and Consultation principles

For different reasons, IATA and airlines often struggle to understand charges proposals.

- While cost-relatedness and transparency are the key subjects of any consultation – the process of the consultation sometimes can be difficult and as a consequence not meaningful
- In some cases there is actually no consultation process existing – although ICAO policies do apply, charges are set without prior consultation.
- Different charges for the **same** services are sometimes implemented – an indication of a discriminatory charging scheme.

Non-discrimination is sometimes NOT the case

- Charging principles should be transparent and applicable without prejudice.
- Non-discrimination means that no difference is made between national airlines and those from other countries and between those of other countries.
- Same service at same cost to the same use of airspace or infrastructure – following the user pays principle: *user pay – user say*.
- There is sometimes a tendency that domestic airlines receive some kind of preferential treatment.

Allocation of costs of air navigation services among aeronautical users

5. The allocation of the costs of air navigation services among aeronautical users should be carried out in an equitable manner. The proportions of cost attributable to international civil aviation and attributable to others (including domestic civil aviation, State or other exempted aircraft, and non-aeronautical users) should be determined in such a way as to ensure that no users are burdened with costs not properly allocable to them according to sound accounting principles. It is also recommended that States ensure that basic utilization data in respect of air navigation services are maintained, when such information is relevant to the allocation and recovery of costs. Such data could include the number of flights by user category, whether domestic or international, as well as distances flown and information on aircraft type or weight¹.

What is transparency?

Transparency can be seen as by how much does the provided information enable to understand the proposal on prices/charges, this means information on

- cost/planning,
- cost development,
- investment planning,
- traffic forecasting,
- revenue forecasting,
- bad debt management,
- etc.

Cost-relatedness links the company's cost to its revenues

In simple terms, the company should be able to recover its reasonable and efficient running cost, be able to pay for its investments and make a regulated profit if allowed.

In this sense, the cost to run the business would have to be recovered with revenues – such as aeronautical charges or commercial activities.

As a first step, the total cost base has to be defined and subsequently calculated and planned.

Revenues (charges) are directly linked to traffic development:

More traffic – more revenues↑

Less traffic – less revenues↓





ICAO also sets a framework of how to calculate charges

The relevant reference is Doc 9082, Section II para 2 i.

The concept is the method of building blocks to determine the charges level (but not the charges structure).

ICAO building blocks are defined by as: Charges should reflect the full cost of providing airport or ANSP services

Total cost including an eventual profit shall be equal to

- operational expenses
- + depreciation of assets
- + cost of capital or WACC (if applicable)
- non aeronautical revenue (single till, including any subsidies)
- / traffic forecast

Translation of cost and revenues into charges: Building Blocks

The concept of building blocks is a logical approach to calculate charges and it is used all over the world.

It is important that first all sides understand the logic and the value of the building block methodology.

The next step then is to populate each block with numbers, reflecting the cost to which charges are related to.

It is equally important to understand the general framework: revenue constraints, privatization issues, development of other commercial activities and tourism.

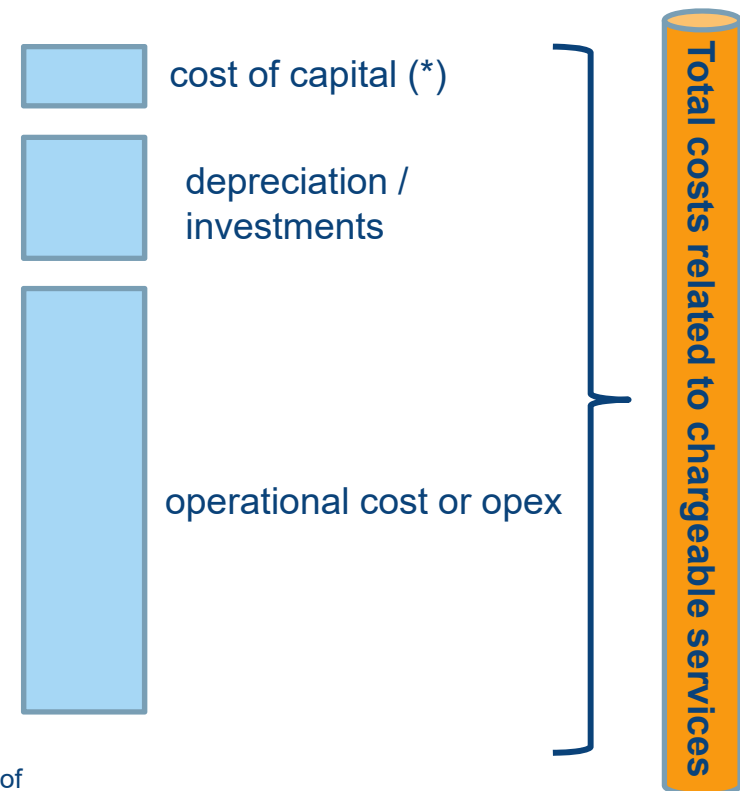
Future investments have to be carefully reviewed and discussed with the users of these investments.

What the building blocks are

- The building blocks are the determining elements of the total charges level in many regulations and as per ICAO recommendation.
- They add up all the different costs to a total cost and may also include a reasonable profit.
- In the calculations the profit is treated as a cost element as it will be recovered the same way as the other costs – via charges calculation.
- When the building blocks have built the total cost base, the result is set in perspective to the forecasted traffic on a per unit base.

Building blocks build the cost base

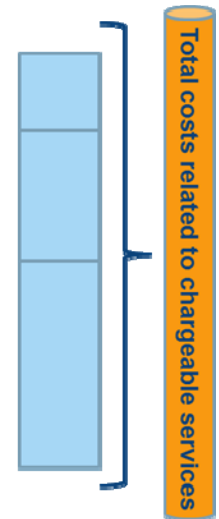
- The building blocks define the total cost of the company related to chargeable services.
- This concept is applied by many regulators when determining the overall charges level.
- The company needs to be able to recover its reasonable cost and generate cash flow for investments.



(*) Other expressions: weighted average cost of capital or WACC, reasonable rate of return, allowed return, return on capital.

The concept follows business logic

- The company needs to invest to have the infrastructure in place with which to deliver the services: DEPRECIATION.
 - To run the services the company has operating costs: staff, maintenance, utilities etc.: OPERATING COST OR OPEX.
 - If the company works on a for profit base, this is calculated by the WACC concept: COST OF CAPITAL OR WACC.
- The result is the total allowable revenue or total cost for the provision of aeronautical services for which charges can be levied (minus the inclusion of commercial revenues or subsidies).



The often observed difference in practice

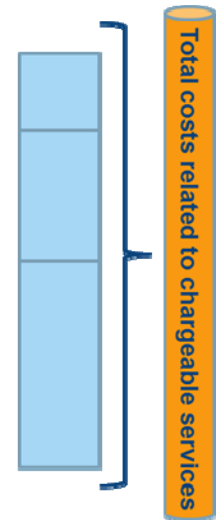
Airlines seek good service at acceptable and transparent cost

Airlines

- Agreed service levels.
- Service delivery at an efficient and reasonable cost base.
- Investments adequate to the demand.
- No discrimination.
- Pro-active engagement.
- Transparent cost and charges structure.

ANSPs / Airports

- Investment plans not discussed and some investments nice-to-have (“gold plating”).
- Traffic risk management.
- Shareholder satisfaction.
- Development of commercial activities.
- Secrecy when discussing costs and charges setting.



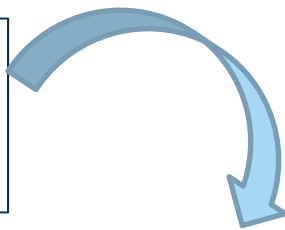
How the building blocks translate into charges

As a principle, the charges should enable the company to fulfil its services and defined quality levels, allowing it to recover costs and investments.

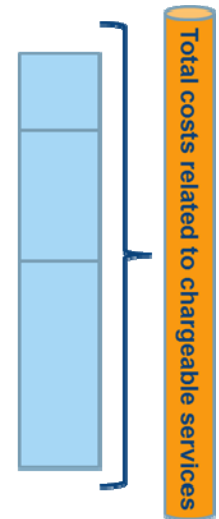
Charges are being paid by users for these services, e.g. for overflight navigation, approach, airport facilities etc.

As charges are linked to using the services, costs are influenced by the usage of these services.

A flat fee for example per user would not follow the user-pays principle, as some users use the services more than others (non-discrimination principle).



The result is
**a charge
per use**,
e.g. a
charge per
overflight or
per PAX.



From costs and traffic to charges

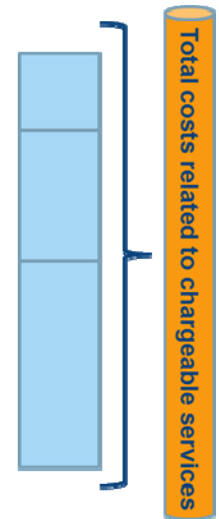
Typically, charges are set for a period's traffic expectation in relation to the estimated justified cost.

The sum of all building blocks defines the total cost which needs to be recovered to be able to finance the services.

Total cost is set in perspective to estimated / forecasted traffic development in that same period.

Total cost divided by total traffic results in a charge per unit.

This is where many "problems" begin.



Contentious debates about costs and traffic

Too often, incentives may exist to discourage a transparent approach.

- The building blocks accumulate the company's cost and divide that by the units of traffic.
- The result is a charge per unit (e.g. cost per overflight or landing charge at airports).
- In simple terms:

Total cost = 10,000,000 USD

Total traffic = 500,000 flights

Charge per unit: 20 USD

This simple as it looks approach gives often rise to contentious debates and a certain level of “mutual distrust” – this is not necessary.

Why do simple building blocks can cause problems?

What often happens :

- The higher the cost and the lower the traffic, the higher the unit charge.
- Both sides can prepare their arguments for an endless discussion.
- The solution lies in a **transparent, open and fair** consultation process – with agreed resolution mechanisms.

Total cost = 10,000,000 USD

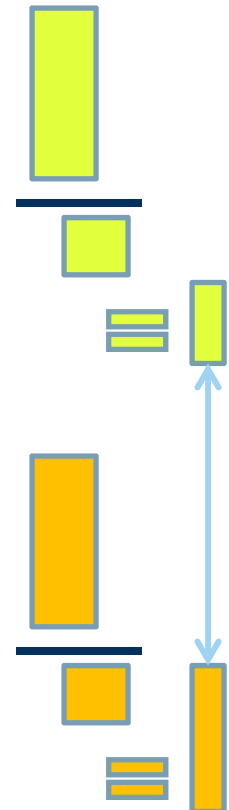
Total traffic = 500,000 flights

Charge per flight: 20 USD

Total cost = 12,000,000 USD

Total traffic = 450,000 flights

Charge per flight: 26.7 USD





The determination of the building block

OPERATIONAL EXPENSES OR OPEX

What exactly is opex?

- Managing the company requires resources: staffing, telecommunications, consulting, maintenance, utility supplies (electricity, water), equipment rentals, marketing etc.
- Smaller items are consolidated into larger groups: Staff cost comprises salaries, social security payments (pension, health) and insurance.
- It is like owning a car: the car itself is the capital investment, the cost to run the car (petrol, maintenance, fines) is the opex
- This is often a reflection of the company's chart of accounts!

The biggest driver for opex is typically staff

- The major element within opex is generally related to staffing – all employee related costs of a company (salaries, insurance, social security contribution etc.).
- Staffing is expressed as the number of Full Time Equivalents or FTEs (= staff).
- The math is simple: The more people, the more cost.
- Staff levels often tend to rise – especially if there is no competition.
- But increases must be reasonable: why does staffing increase for instance if traffic is stagnating or even falling?

Staffing levels are important to look at as they drive other cost

What other costs are linked to staff numbers?

Travel expenses – airfare, accommodation: no staff – no travel.

Training expenses – same logic: no staff – no training.

Admin cost, e.g. computers, workstations, software etc. – same logic.

→ Transparency in a consultation for the charges determination will allow the users (who pay) to understand if any increase or change is reasonable (e.g. compared to their own business).



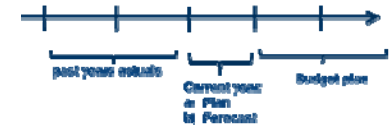
Actuals figures should be reviewed with the original plan

What can happen?

➤ In many cases, actuals are better (lower) than originally planned, i.e. cost had been planned higher and was then managed to be lower.

→ Why is this important and what does it mean?

- 1) The charges were calculated on the higher, planned cost.
- 2) This increases the propensity to over plan costs – not deliberately but as a matter of fact (our experience).
- 3) We also often see that costs had been planned high previously, then actual figures show that costs were managed well but they increase again for the new period under consultation.
- 4) This is why a transparent discussion must happen to find agreement.



Variances should be analyzed and explained

What variances do we mean?

Variance analysis comes in several dimensions:

- Analyzing actuals over plan.
- Analyzing year over year.

To understand and accept cost developments, we should look and discuss variances in those numbers and then ask ourselves:

- What do we see?
- How do we explain what we see?
- What do we need to know to understand variances?



The determination of the building block

DEPRECIATION

The concept behind depreciation: Your infrastructure becomes outdated and loses value

- Depreciation calculates that any investment can be used over a certain period of time.
- The total invested amount is then spread over those years.
- The amount per year reflects the annual depreciation.
- In the accounting world, the depreciation amount is shown on the profit and loss account to reflect a loss.
- Instead of having the full investment being shown in the P&L, only the annual loss in value portion is taken up.
- For the charges determination, this annual amount is taken up as the building block depreciation.
- This is done for each individual investment qualifying as an asset (capital expenditure).

Depreciation in a charges calculation compensates for ageing infrastructure

- For airports or ANSPs, the users are not charged for the investment at once but will pay with depreciation over the determined period. Operators have to finance investments first (loans or cash reserves).
- The amount of depreciation each year is booked as a loss in the .
- The company recuperates its investment in form of the depreciation values it includes in the charges calculations.
- That also means that any overspent on assets (actual spent being higher than planned) is paid by users through the depreciation later – we observe that often users are not informed about changed cost estimates.

Depreciation is a major element in the charges calculations and directly related to infrastructure

- The larger the capital base (= assets), the more is being depreciated.
- Future investments will be recovered via depreciation, the more will be invested, the higher depreciation will be in future, but ...
 - previous investments will reach the end of life and will cease to be depreciated, which reduces the total amount.
- When discussing charges, the investment plan requires a high level of attention as the cost of it lays the base for future charges development.

ICAO's guidance on airport asset depreciation

Examples of range of depreciation periods

Buildings (freehold)	20–40 years
Buildings (leasehold) ³	Over the period of the lease
Runways and taxiways	15–30 years
Aircraft parking areas	15–30 years
Furniture and fittings	10–15 years
Motor vehicles	4–10 years
Electronic equipment (including Telecommunication equipment)	7–15 years
General equipment	7–10 years
Computer equipment	5–10 years
Computer software	3–8 years

Calculating depreciation is simple

- All assets of a company (= investments from previous years or those to come) are generally listed in an asset register.
- An asset register is a simple list of all assets such as buildings, installations, cars etc. (also software).
- The register lists the date of purchase, the price, the lifetime in years and it shows the current value.
- If a new investment will become an asset, the cost impact towards charges can be calculated by dividing the purchase price by the number of years it can be used (charger start at of the month of the beginning of its use).
- The lifetime is normally based on accounting rules but should always be properly reviewed.

Depreciation returns invested money over time

Investments do not come for free – the money comes from savings / cash reserves or from shareholders.



Spending on infrastructure is an investment: it shall generate future returns just as any other form of investment.



In the charges model, money spent on infrastructure is returned over time – via depreciation. The amount of depreciation for each asset is seen as a cost and is paid for with charges.



If it were paid with charges at once, one year's charge would be enormously high only to fall the next year – it would also not reflect international accounting standards.



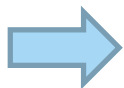
Over the lifetime of the asset, invested money is returned.

All invested money plus “interest” is returned to investors

The depreciation guarantees that the entire spent amount is returned over the lifetime of the asset.

In addition, any interest rate payments in case investments have been financed by loans are taken up as opex in the charges calculation.

If the company is allowed to make a profit, this is determined as the capital cost (WACC) and is based on the total invested capital.



In conclusion: All invested money is returned with interest and an eventual profit over the lifetime of the investment.

Example: How to finance investments?

Aviation infrastructure is expensive and requires large amounts of capital investment.

The financing for infrastructure can be received from different sources.

Bank loans have to be re-paid (amortized) and interest has to be added to these payments.

Private investors will also want to receive a return on their invested capital – this is why they invest.



Example

Investment cost for a new asset: 10,000,000 USD

Lifetime of the asset: 10 years, i.e. the asset loses 1,000,000 USD in value each year: → This is the depreciation.

Financing:

100% via bank loan at 5% interest rate, amortization to the bank is 1,000,000 USD per annum.

Calculation of charges:

1,000,000 USD depreciation as a building block for this asset each year.

Full recovery after 10 years – when the asset value is zero (or 1).

Full loan amortization after 10 years.

5% interest rate each year until full amortization = 500,000 USD.

→ This is part of the operational cost in each year.

Conclusion: Depreciation as a building block is linked to assets

- Every year, investments age and get older until the full period of depreciation is complete.
- As of then, no more depreciation must appear in the calculation as the invested money has then been fully returned.
- The asset can still be used (at no depreciation cost) as the length of depreciation is based on accounting standards and not on actual replacement needs.
- Investments and the depreciation rates should always be subject to the annual auditing process.
- Old assets over time disappear from the depreciation list while new ones are being added.

Regulated assets

- A company may separate its assets for aeronautical usage for which charges are levied to recover the invested money from its assets for purely aeronautical usage.
- The charges related assets are called the **regulated asset base (or RAB)** – they are part for the consultation process on charges. If a company follows such a split, a clear separation has to be done.
- The split of assets is often cumbersome as it also requires an opex split by defined allocation keys.
- The concept of single and dual till represents an artificial split and is not proof of the competitiveness of an industry.

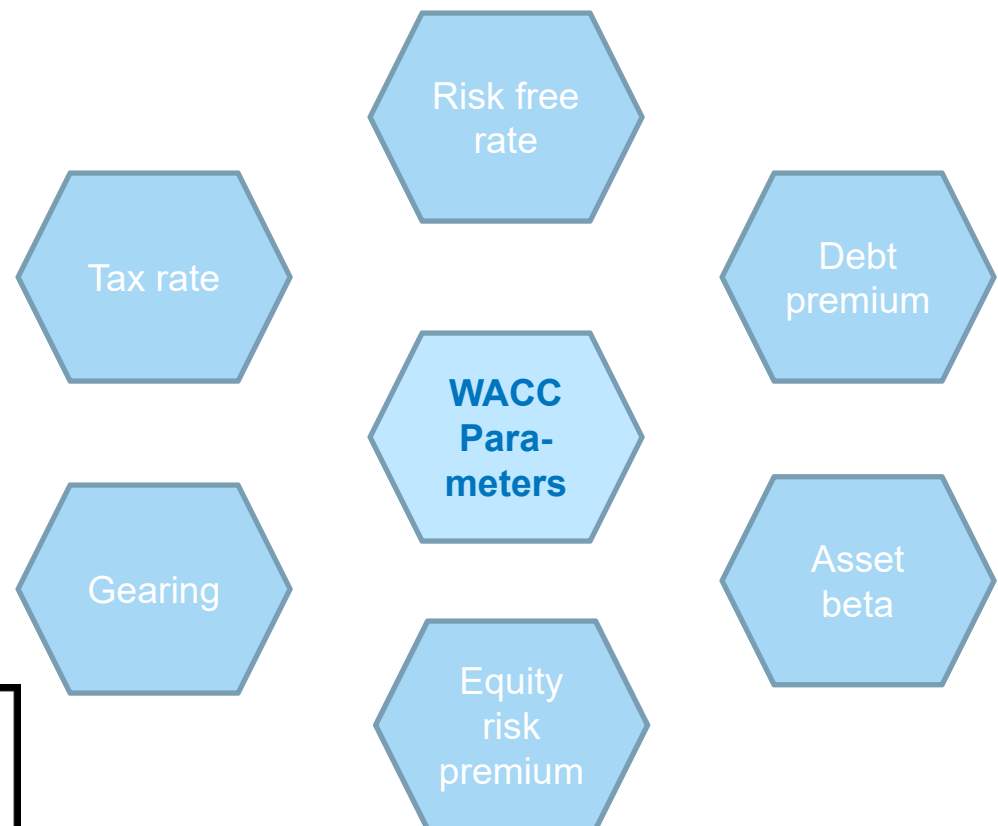
The calculation of profit: the determination of the building block

WEIGHTED AVERAGE COST OF CAPITAL (WACC)

Overview: the WACC components

Different parameters need evaluation: The concept of weighted averages.

$$WACC = \frac{E}{D + E} \cdot K_e + \frac{D}{D + E} \cdot K_{d, after tax}$$



The WACC components: debt



- The different financing methods define the company's capital structure.
- Loans from banks is debt the company has to pay back plus a given interest rate. The company can have many loans from different banks and/or bonds.
- The interest paid on all the outstanding debt is a calculated average expressed as the **cost of debt**.

If the amount of the total debt of a company represents 60% of the company's assets, then 60% of its infrastructure is financed by debt (long term and non-current assets).

The WACC components: equity



- The assets can be financed with debt **or** with money from investors, buying a stake in the company = buying shares (e.g. the company becomes listed) or buying a concession.
- If 60% of the company's assets are financed by debt, the other 40% are financed by equity.

The calculation of equity can be tricky when the company is listed on the stock market: to determine the equity portion out of the stock market valuation of its outstanding shares generally results in an artificially and highly volatile equity ratio.

That is why we take the book value.

The cost of debt and equity



Cost of debt

The total cost of debt is the average percentage the company pays as interest on its outstanding debt.

But:

The general approach for investments looks at future financing requirements to see how much the company has to pay for new debt.

Cost of equity

The return for investors on their invested equity is a defined determination. It is also higher than for debt.

The WACC concept combines both methods to determine the return and thus the profit.

The cost of debt and equity



Cost of equity

Cost of debt

The company finances its infrastructure with debt and equity – each has a cost and each cost can be seen as expressing a certain risk for which compensation is being sought when determining a reasonable profit.

The determination of the cost of debt



➤ The cost of debt in the WACC approach uses two parameters:

The risk free rate of return.

The debt premium.

Both combined define the borrowing cost of the company.

The separation is done in order to anchor the cost of debt determination in the real market.

The risk free rate or RFR is defined as the rate where the borrower basically has no risk that the company goes bankrupt.

The RFR used for the WACC typically is the rate on medium to long term government bonds (5 – 10 years).

Risk Free Rate and debt premium



- The RFR linked to government bonds makes sense: in theory, governments can not go bankrupt (they can always tax their citizens).
 - Government bonds set the floor for interest rates – any other bond issuer than the government (e.g. a company) pays higher rates.
 - The assessment that a company is creditworthy and able to pay back its debt is expressed by credit rating agencies (ratings like AAA, CCC etc.).
 - The better the rating, the less the company has to pay above the government bond rate on its debt.
-
- What has to be paid above the government rate is called the **debt premium**.
 - If the company is owned by the government, there should be no such premium.

The determination of the cost of equity



- The cost of equity calculation looks slightly more complex.
 - It considers different elements, one of which is also the risk free rate.
 - Investors demand a return in addition to the risk free rate that compensates for the greater risk when investing in a company.
 - This additional return is linked to two things:
 - The market (country) in which the company operates.
 - The specific risk of the company's business segment.
-
- The market related factor is expressed as the **market risk premium** or MRP.
 - The company specific risk is expressed as the **equity beta**.

The market risk premium



- The MRP is an element that defines the risk premium that is linked to the market in which the company operates.
- The MRP is understandably be higher in Afghanistan than it is in Switzerland.
- The MRP is followed on a country by country basis by academics and these sources are generally used (DMS/Damodaran, Fernandez etc.)

The MRP can easily be obtained from these sources as they are accurate, reliable and often up to date.

The concept of the beta value



- In finance, a beta indicates the fluctuation of one element against another: the fluctuation of a specific company's share price against the general stock market of that country.
- The beta expresses how risky the company's business is compared to the general market:

Beta = 1: The company's shares move exactly as the general market.

Beta < 1: The company's shares move less than the general market.

Beta > 1: The company's shares move greater than the general market.

What does this mean for the cost of equity?

Cost of equity parameters



- The cost of equity as used in the WACC model considers several elements in combination: the risk free rate, the market risk premium and the equity beta.
- All together aim for the determination of an adequate return (or cost, i.e. what does equity cost) on equity, which is linked to the market/country, the business segment and the general interest rate level.
- The market risk premium is adjusted for the beta factor to consider that within a given market the business segments can be different.

- The cost of equity is expressed in the following way:

$$K_e = R_f + (MRP \times \beta_{levered})$$

WACC: an established procedure



- The cost of equity describes the percentage of what return an investor should get investing in a specific market and business segment.
- The cost of debt describes the interest rate percentage to be paid by the company in its specific environment.
- The procedure is well established among regulators and in regulated environments: it takes an unbiased approach to consider the relevant drivers to determine what profit a monopoly company should be allowed.

The cost of debt and the cost of equity are taken together and weighted with their respective share in the total capital of the company.

The WACC formula



$$WACC = \frac{E}{D + E} \cdot K_e + \frac{D}{D + E} \cdot K_{d, after\ tax}$$

- By multiplying the determined cost of equity and the cost of debt with their respective share of the total capital, the result is a weighted average – the weighted average cost of capital.
- The WACC is expressed as a percentage.
- This percentage expresses the allowed return or profit.
- It is applied (i.e. multiplied) on the amount of invested capital.
- That means: more invested capital – more profit – which makes sense in capital intensive industries.

Conclusion



- Full reasonable cost recovery does not apply the concept of a regulated return.
- It is important to understand that the WACC is a generally fair approach – but the value determination of each parameter is critical and often contentious.
- State owned companies normally do not apply the same WACC concept: some parameters do not apply in the same sense, e.g. debt premiums.
- The WACC requires some profound financial expertise.
- Even or maybe because of such expertise, the devil lies in the detail when determining the value for each parameter.



The final building block

TRAFFIC FORECAST



Most revenue is driven by traffic

The company's revenue typically comes from different sources:

- 1) Revenue from tariffs (charges) for aviation services.
- 2) Revenue from commercial activities (trainings, duty free, hotels, car parking etc.).
- 3) State subsidies or other forms of non-repayable financial support.

The main source of revenue relates to the services provided: aeronautical revenue generated from charges.

All sources of revenue drive the financial position and health of the company.

Traffic forecast is an important building block

- As demonstrated, the traffic forecast defines the price per unit in the charges calculation. That means:
- The higher the traffic, the lower the unit cost.
- The higher the total cost of all three building blocks, the higher the unit cost.
- High traffic can compensate for high cost.
- High traffic can hide an unreasonable cost development.



Starting point: a review of traffic data

- The company's traffic forecast often tends to be very conservative.
- But if the traffic turns out to be higher than planned, charges then have been set too high.



How this can be approached?

- 1) Validating the traffic forecast with airline data.
- 2) Checking the surrounding area for traffic patterns.
- 3) Interpreting current traffic trends.
- 4) Checking potential economic development: economic growth always correlates with increased traffic even if airlines only overfly.

Review of traffic data

- 5) Identifying “neutral” sources of information such as from the regulator or ministry.
- 6) Raise awareness to airlines on the importance that they too have to provide traffic data to the company.
- 7) Check historical data versus existing forecasts: how accurate has been the past forecasting? If traffic forecasts were often different from actual developments, we may want to apply a trend analysis.



Key messages for the traffic forecast

- Traffic development is important for charges and infrastructure development: it needs the right level of attention!
- Bringing in experts from previous meetings to collect as many information as possible.
- Trying to find the best acceptable traffic forecast solution for an agreement.
- Be aware that any charges agreement for a multi-year period means that forecast accuracy tends to be less accurate towards the end of the period.
- In a five year period for the setting of charges, the first years for any figure (cost as well as revenue forecast) are more accurate than for the later years towards the end of the period.
- The traffic forecast translates directly into revenue.

Approach towards a solution

- ✓ Risk can be managed.
- ✓ Risk management is a collaborative approach.
- ✓ Financial instruments can be used to contain risks.
- ✓ Traffic risk sharing is an established model in many countries.
- ✓ The EU uses traffic risk sharing for ATC charges.





Traffic risk sharing demands a good and trusting partnership plus a contractual framework

An agreed traffic forecast is determined as the basis for revenue calculations.
Thresholds are defined.

Risk sharing percentages are then defined.
Review triggers and/or caps are defined.

For example:

2% dead band
70% up to 10%
100% as of 10% - triggers full review.



Traffic risk sharing model - EXAMPLE:

Traffic forecast in units (e.g. number of overflights): 100,000 units.

Dead band: 2% - 102,000 units / 98,000 units – no changes or adjustments.

Risk sharing: After dead band up to 10%. E.g. traffic is 95,000 or 105,000.

Sharing model 70%: $3,000 * 0.7 = 2,100$ units adjustments.

→ $98,000 - 95,000 = 3,000 * 0.7 = 2,100$ * unit charge = positive input for the new charges calculation (increase in the calculation, seen like a reduction in revenues, thus increase in charges).

→ $105,000 - 102,000 = 3,000 * 0.7 = 2,100$ * unit charge = negative input for the new charges calculation (reduction in the calculation, seen as additional profit, thus decrease in charges).

Sharing of information is essential

A best practice approach allows fully open books with historical figures and new traffic estimates being discussed.

As traffic is so important for the revenues, accurate forecasting is essential.

Open books and the right attitude from all participants sets the right stage for a mutual understanding and a good partnership.





THANK YOU