Lecture 5

Forecasting Income Statement and Balance Sheet

Group valuation company, bonus points, signup for case presentations

- Group Valuation Project company is Ekokem

- Use class activity points section at MyCourses to track your activity: mark down your comment there
  - Instructors will add their own judgement when deciding on the final bonus points

- 1 Group = 1 case discussion in any of the four exercise sessions
  - Sign up via MyCourses

Operating leases: recipe for Carrefour case

- Operating Lease is like rental, Financial Lease is like buy with debt
- Big idea of operating lease capitalization:
  - Treat operating lease as if debt would have been issued to purchase the leased asset
  - Move lease payment from operating costs to interest payments and depreciation
  - Add leased asset to both sides of balance sheet

1	Forecast leasing payments
2	Calculate PV of lease
3	Forecast new lease agreements for financial year
4	Calculate depreciation schedule for leased asset
5	Calculate net change in leased assets and resulting balance sheet values for each year
6	Take out lease payment from COGS
7	Calculate interest part of lease payment
8	Rest is amortization
9	Calculate deferred tax asset

Learning objectives for today

- After today's lecture, you should know how to:
  - Set up revised income statement for forecasting
  - Know how to forecast sales and operating profit
  - Understand how the income statement forecasts link to balance sheet
  - In short: be able to start building your group valuation project model

Structure of discussion today

- **H&M example: structuring revenue tree**

- Where do we start from: simplified and revised income statement

- Forecasting income statement and balance sheet: "theory"

- Forecasting income statement and balance sheet: case Finnair

- It all seemed very easy, any more tricks of the trade?

Structuring H&M revenue growth tree

H&M: first possible solution

Market area

- EMEA
- Americas
- Asia & Oceania

Country

- UK
- France
- Germany
- Italy
- Etc.

Business

- Retail
- Wholesale (Weekday brand)
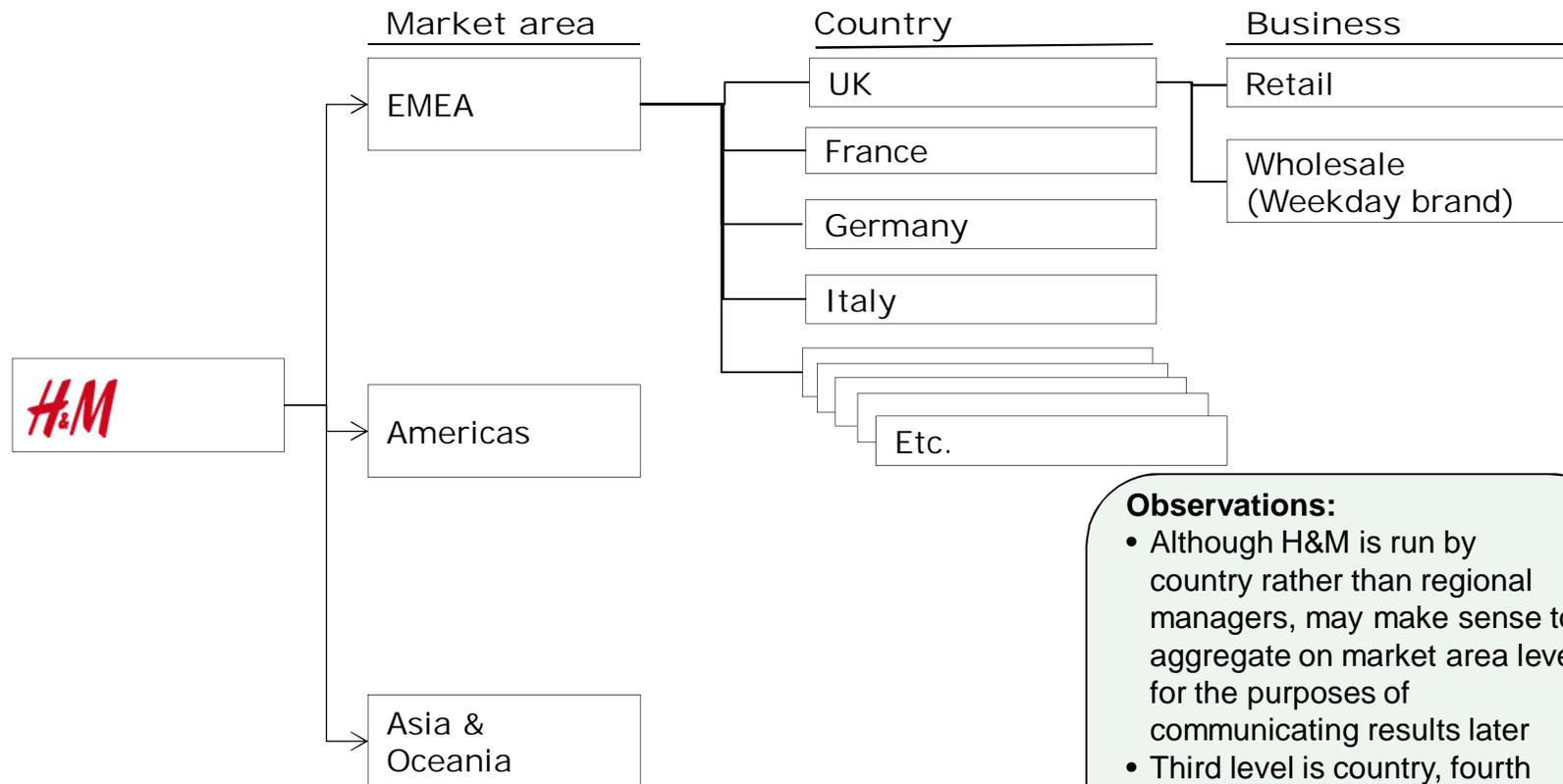
Observations:
- Although H&M is run by country rather than regional managers, may make sense to aggregate on market area level for the purposes of communicating results later
- Third level is country, fourth level business: could also be other way around depending on data availability

H&M: second possible solution

Market area	Country	Region
EMEA	UK	Region 1
	France	Region 2
	Germany	Region 3
	Italy	
	Etc.	
Americas		
Asia-Pacific		
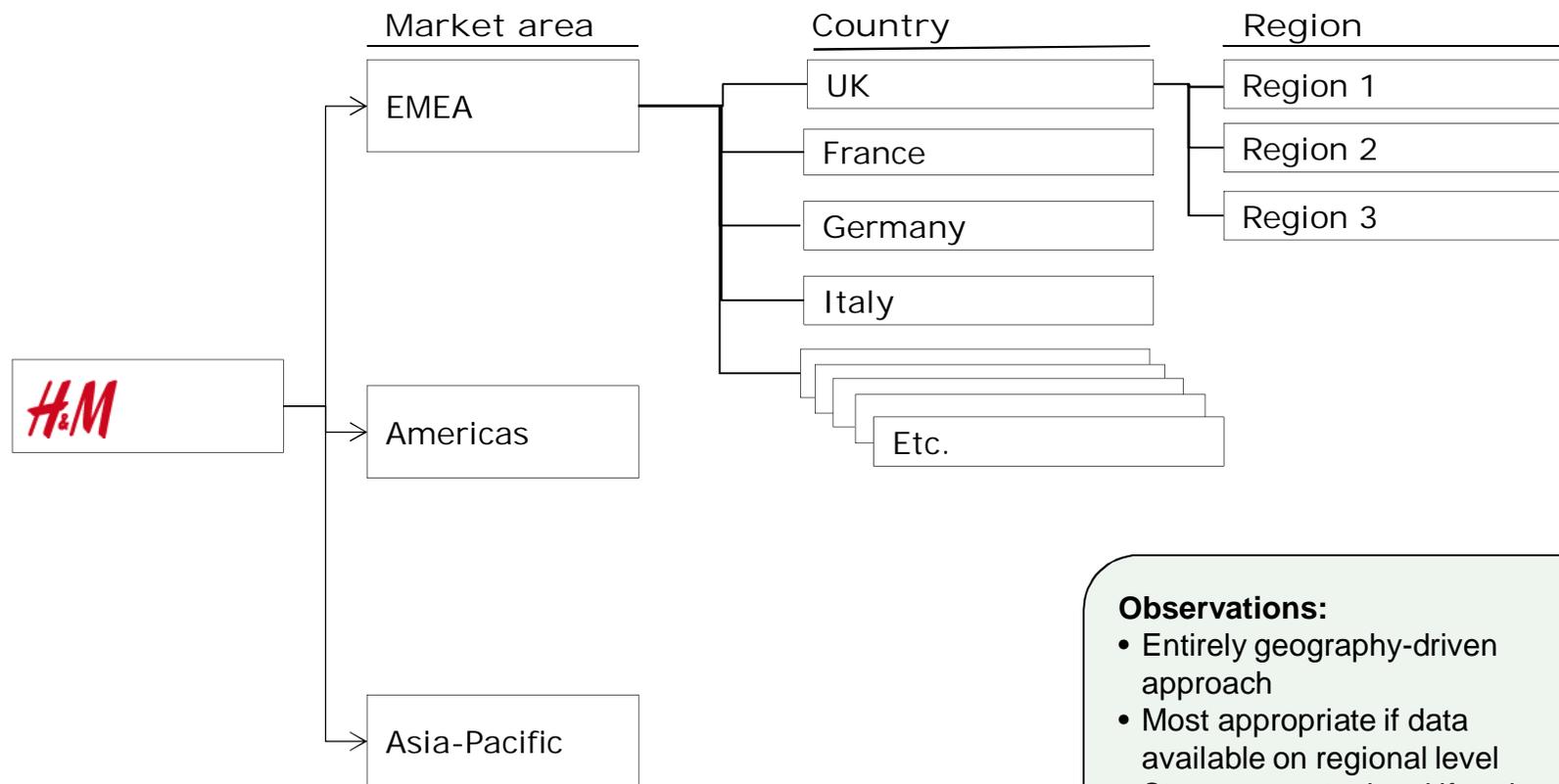
Observations:
- Entirely geography-driven approach
- Most appropriate if data available on regional level
- Stay on country level if regional level data not available

H&M: third possible solution
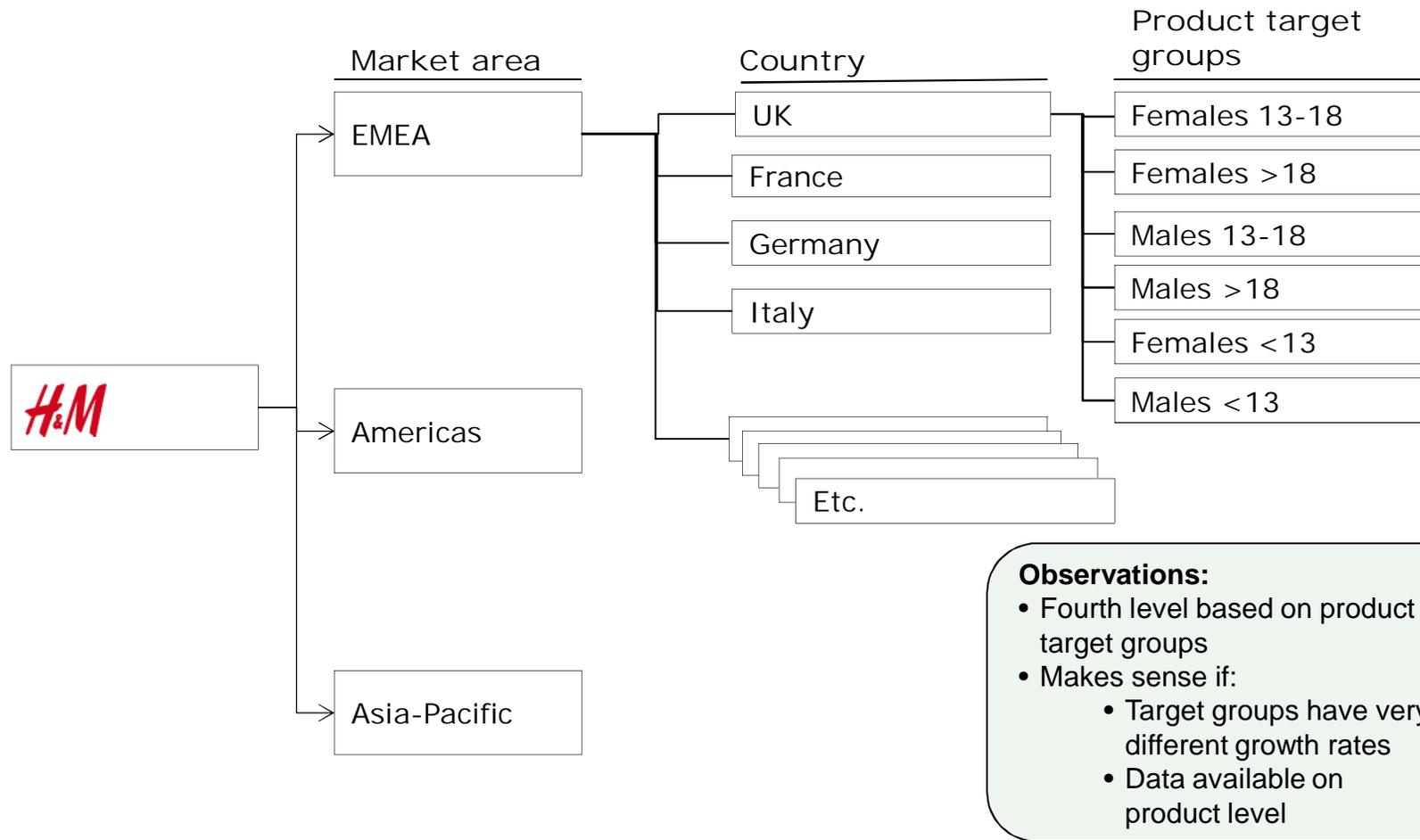
Market area

- EMEA
- Americas
- Asia-Pacific

Country

- UK
- France
- Germany
- Italy
- Etc.

Product target groups

- Females 13-18
- Females >18
- Males 13-18
- Males >18
- Females <13
- Males <13

Observations:
- Fourth level based on product target groups
- Makes sense if:
  - Target groups have very different growth rates
  - Data available on product level

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Refresher: Income Statement

Income Statement

Sales
 Cost of Sales

Gross profit
 SG&A
 Other operating income, net of expense
Operating profit
 Net interest expense (income)
 Investment income
Profit before tax
 Tax expense
Profit after tax
 Minority interest
Net profit

Additional info on items by nature
 Cost of materials
 Personnel expenses
 Depreciation

Before proceeding to actual forecasting, you should have simplified, **standard accounts** at the worksheet:

- Necessary **adjustments** done at least to last year's financials
- **Simplified or detailed** on appropriate detail: start high-level and add detail

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Forecasting: "theory" how to do it

- Aim is to develop an integrated set of financial forecasts that reflect the company's expected performance. We must have an idea on:
    1. ***The appropriate level of detail***:
        a. Typical forecast has at least two periods: explicit forecast and continuing value
        b. Level of detail "as simple as possible, but not simpler". Very detailed predictions of individual accounting items seldom make sense: use your time on getting value drivers and their forecasts right
    2. ***Building a well-structured spreadsheet model***:
        a. Raw inputs, computations, and outputs as separate sheets
        b. Flows from one worksheet to the next and handles multiple scenarios

Level of detail goes down the longer you forecast

Phase 1: Explicit and detailed

- A detailed 3- to 7 (usually 5) year forecast
- Develops high-level, but complete balance sheets and income statements
- Revenues should be forecasted using real value drivers
- Other items either link to real drivers or as % of revenues: use judgment

Phase 2: Explicit

- A simplified forecast for additional 3-7 years
- Focus on a few important variables, such as revenue growth, margins, and capital turnover
- Can be combined with phase 1 if value drivers available beyond phase 1

Phase 3: Steady state

- Value the remaining years by using terminal value formula, multiples, or liquidation value

Detailed next page

Steady state is when your forecast turns into a perpetual motion machine

- Modeling shorthand: very few things can be really forecasted beyond 10 (or even 5) years
- Assumes the following state:
    - Constant growth and reinvestment of operating profits
    - Constant ROIC
- Important to have at least one business cycle (and model it explicitly) in your explicit forecast period
    - Otherwise value understated for companies at the bottom of the cycle
    - Overstated for companies at the peak of the cycle (why do most of the M&A happen in booms?)

Modeling: some best practices

- Valuation models become easily messy, especially for beginners
- Structuring well early saves time later
- Good valuation models have certain characteristics.
  - First, original data and user input are collected in only a few places
  - Denote raw data (my pick: blue) or user input (my pick: green) in a different color than calculations (my pick: black)
  - Never hard-code numbers in a formula: all formulas must refer to cells which have input
  - Delete all information that is non-essential to prevent model bloating

In your model, data should generally flow in one direction

Modeling: example worksheet structure

- Many spreadsheet designs are possible. In the Finnair FCF valuation example to follow, the Excel workbook contains seven worksheets:
  1. Raw historical data from company financials
  2. Adjusted financials based on raw data
     1. Based on how detailed your analysis must be
     2. Match at least revenues, operating profit and profit for the financial year with latest available reported numbers
     3. Start with aggregate numbers, disaggregate until the level of detail is sufficient (in the Finnair example, we have rather aggregate numbers)
  3. Revenue and cost forecasts with drivers matched for latest year and forecasts
  4. Forecasted income statement, FCF, and balance sheet (may be each on separate sheet depending on level of detail)
  5. Calculation of discount rate
  6. Valuation summary

Forecasting: six steps to success

Although the future is unknowable, careful analysis can yield insights into how a company may develop. We break the forecasting process into six steps:

1. ***Prepare and analyze historical financials.*** Before forecasting future financials, build and analyze historical financials. Often reported financials either too simple or too complex. When this occurs, rebuild financial statements with the right balance of detail for your model

2. ***Build the revenue forecast.*** Almost every line item will rely directly or indirectly on revenue. You can estimate future revenue by using either a top-down (market-based) or bottom-up (customer-based) approach. Forecasts should be consistent with growth history and insights on market volume development and company ability to gain market share (faster/slower than market growth) and price development

3. ***Forecast the income statement.*** Use the appropriate economic drivers to forecast all line items, with *appropriate* level of detail

Forecasting: six steps to success

We break the forecasting process into six steps:

4. *Forecast the balance sheet:*

  a. *Forecast the balance sheet: invested capital and non-operating capital*

  b. *Forecast the balance sheet: investor funds.* Complete the balance sheet by computing retained earnings and forecasting other equity accounts. Use cash and/or debt accounts to balance the cash flows and balance sheet.

5. *Calculate discount rate*

6. *Calculate FCFF / FCFE and discount to get value*

  a. To complete the forecast, calculate free cash flow as the basis for valuation. Future FCF should be calculated the same way as historical FCF.

  b. Calculate ROIC to assure forecasts are consistent with economic principles, industry dynamics, and the company's competitive advantage.

  c. Make cool output graphs from your model to summarize key outcomes, impress everybody and ensure the output behavior makes sense (e.g., no unexplained jumps in key variables, no negative value of equity etc.)

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Prepare historical financials

- Collect raw historical data and build the financial statements in a spreadsheet
- Understand most recent historical data: do not mix operating and financial items (although companies sometimes do), take out non-recurring items and focus on largest items (in practice, forget items <1% of revenues / total balance sheet)
- Often makes sense to consolidate historical financials into more aggregate structure (as in the Finnair model), unless the analyst has true insight on more detailed line items

Income statement	2013	2014
Revenue	2400.3	2284.5
Other income	18.8	18.3
Materials and services (COGS)	-1594.2	-1577.7
Employee benefit expenses	-381.3	-344.5
Depreciation and impairment	-140.7	-134.3
Other operating expenses	-291	-282.8
Operating profit	**11.9**	**-36.5**
Currency changes and non-recurring items	-4.0	-35.9
Financial income	42.6	3.5
Financial expenses	-19.7	-26.9
Minority interest	-4	-3.2
Profit /loss before taxes (EBIT)	26.8	-99
Income taxes	-3.9	16.5
Profit for the financial year (=net income to common s|	22.9	-82.5

Need to resort to segment reporting to build more detailed sales forecast

Operational leases are accounted for operating expense

Reported profit good only as starting point

Firm's financials

Comparables

Operating leases into debt

R&D expenses into asset

Non-recurring items into separate item

"Normalized" revenues and profit
- Business cycle
- Structural changes
- Be skeptical to pro-forma adjustments

Clean up operating items, e.g.:
- Financial expenses
- Capital expenses
- Non-recurring expenses

Revenues and operating profit as basis for forecasting

Update:
- Quarterly/monthly data
- Earnings guidance
- Voiceovers from the management

Accounting is ruled by law, your numbers by logic

Financial expenses not hidden into operating expenses

- Financial expense: a commitment that is tax deductible that you have to meet no matter what
- Example: operating leases can be operating expenses, they are really financial expenses and need to be reclassified as such. This has no effect on Net income or FCFE but does change EBITDA/EBIT/FCFF

No capital expenses in operating expenses and vice versa

- Any expense expected to generate benefits over multiple periods is a capital expense (e.g., drug development personnel costs)
- R&D is typically obscure to an outsider: failed and discontinued R&D is an expense, whereas successful R&D should be capitalized. Often impossible to tell for an outside analyst

Your revenue and operating cost baseline should be ruled by logic to make accurate forecasts. Accounting choices do not always follow the logic you would like

Finnair segment reporting structure in Annual Report 2014
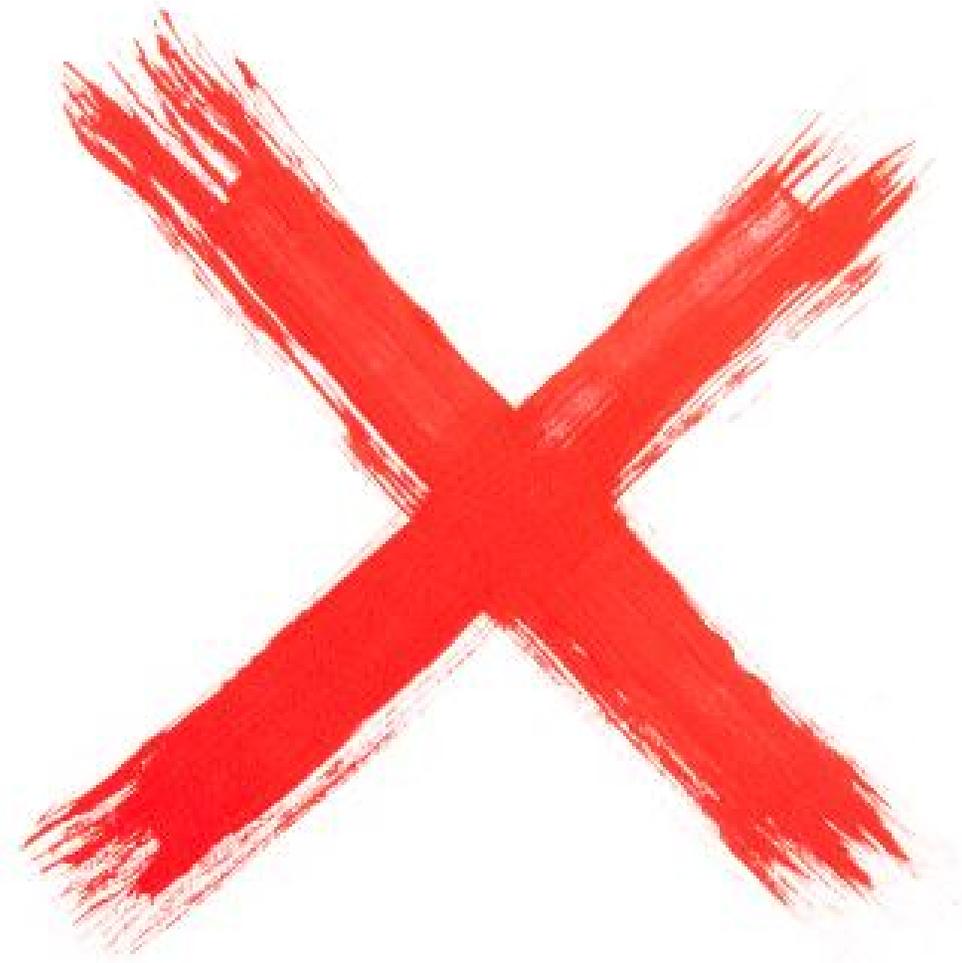
First step in making a revenue forecast is to make a sensible revenue tree
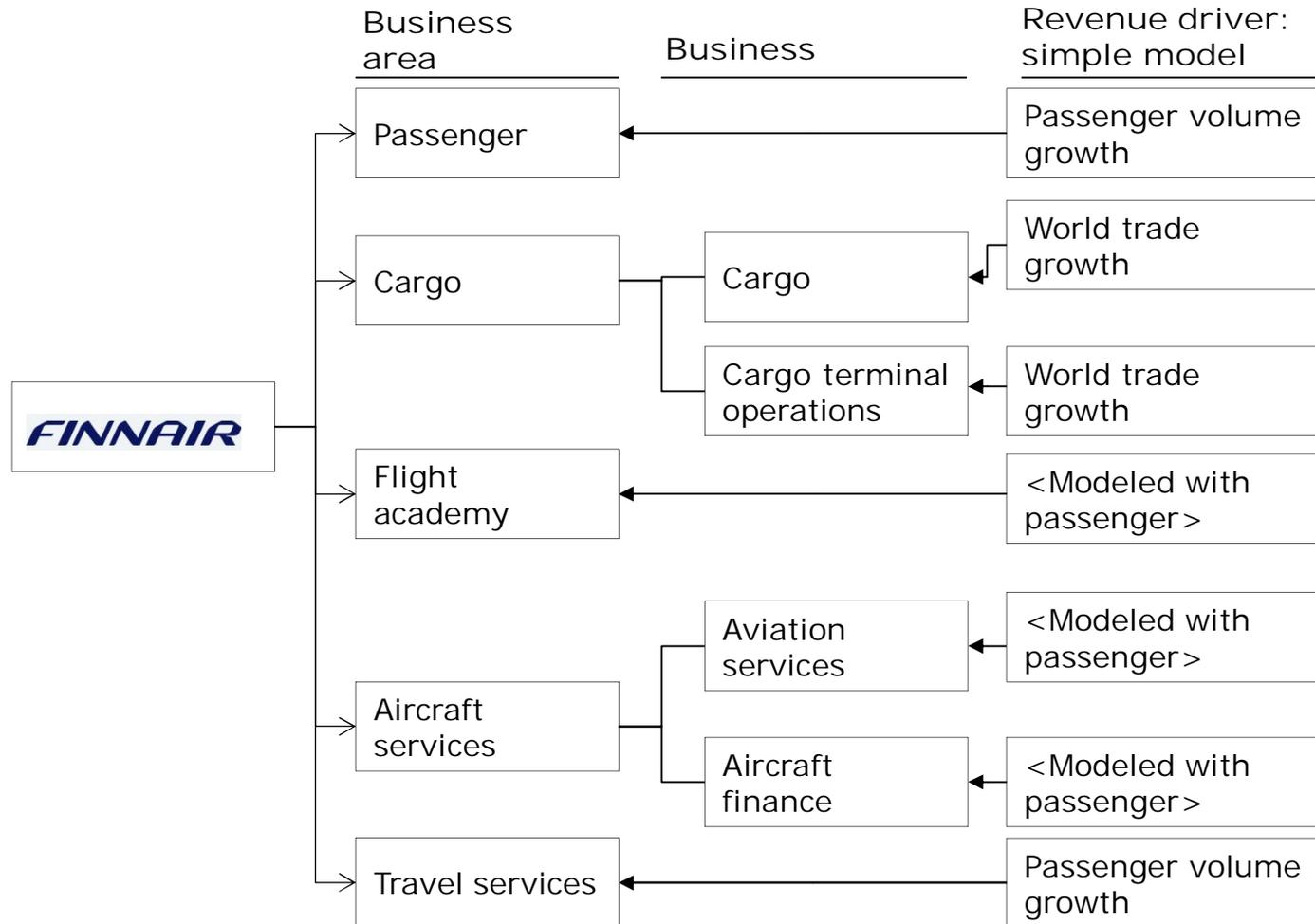
Even more detailed revenue forecast requires time, data, and insight

Business area

Business

Revenue driver: detailed model

FINNAIR

Passenger
- Passenger miles offered
- Load factor
- Price per passenger mile delivered

- -

Cargo — Cargo
- World trade growth (volume) per market area
- Price growth in air cargo per market area

- -

Cargo terminal operations
- Cargo volume growth at Helsinki-Vantaa
- Price per cargo ton charged at Helsinki-Vantaa

Flight academy

- -

Aircraft services — Aviation services
- Passenger and cargo growth

- -

Aircraft finance
- Passenger and cargo volume
- Leasing price per aircraft growth

- -

Travel services
- Passenger volume growth at airports
- Average spend per airline passenger for travel services

Revenue forecasting: principles

- Create a good revenue forecast as it drives most other items in your model

- Dynamic forecast; constantly re-evaluate as new information becomes available (e.g., quarterly earnings releases, CMD presentations, earnings guidance)

- Bottom-up forecast is more appropriate in B2B contexts, but can be used in B2C if bottom up forecast done by product or market area

Top-down revenue forecast

1. Estimate size of total addressable market (per business)

2a. Estimate market share and pricing strength based on competition and competitive advantage

2b. OR alternatively, use latest revenue as basis and use revenue growth rates

3. Extend short-term revenue forecasts to long-term

2. Estimate new customer wins and turnover / growth per area / growth per product

1. Project demand from existing customers/products/ market area

Bottom-up revenue forecast

Revenue forecasting: link your forecast to drivers

Revenue	2014	2015	2016	2017	2018	2019	2020
			Forecasted revenues				
Revenue growth from passenger		4 %	5 %				
Revenue growth from cargo		1 %	1.3 %	1.			
Revenue growth from travel services		4.0%	5.0%	5.0%			
			Forecasted revenues				
Revenue passenger	1832.3	1,905.5	2,000.8	2,100.9			
Revenue cargo	238.4	240.6	243.7	248.1	253.1	258.1	263.3
Revenue travel services	213.7	222.2	233.4	245.0	257.3	270.1	280.9
Total revenues	2284.4	2,368.4	2,477.9	2,594.0	2,716.3	2,844.5	2,953.1
Operating profit margin			Forecasted operating profit margin				
Passenger	-7.6%	0 %	1 %	2 %			
Cargo	-0.1%	0 %	1 %				
Travel services	1.9%	0 %	1 %				
Group operating profit margin	-1.6%	0 %	1 %	2 %			

Revenue drivers:
- Passenger traffic growth from Boeing,
- GDP (trade) growth from OECD forecasts

Margin drivers:
- Subjective forecasts
- Based on Finnair's track record in achieving cost savings

Income statement: fix drivers and predict

- With revenue forecast, next forecast income statement:
    1. **Decide what economic force drives the line item.** For most items, revenue is appropriate
    2. **Adjust financials and match latest financial statement** to the drivers
    3. **Estimate the forecast ratio.** Since cost of goods sold is tied to revenue, estimate COGS as a percentage of revenue.
    4. **Multiply the forecast ratio by an estimate of its driver.** For instance, since most line items are driven by revenue, most forecast ratios, such as COGS to revenue, should be applied to estimates of future revenue.

Simplified income statement

	2014	2015	2016	2017	2018	2019	2020
Total group revenues	2384.4	2368.4	2477.9	2594.0	2716.3	2844.5	2953.1
Total group operating costs	2420.9	2368.4	2453.1	2542.1	2661.9	2787.6	2894.0
Operating profit	-36.5	0.0	24.8	51.9	54.3	56.9	59.1
Financial income	3.5	13.1	13.1	13.7	14.3	15.0	15.7
Financial expenses	-26.9	-22.9	-14.4	-15.7	-16.2	-16.4	-16.5
Minority interest	-3.2						-3.2
Profit /loss before taxes (EBIT)	-63.1	-13.0					55.0
Income taxes	16.5	0.0					11.0
Profit for the financial year	-46.6	-13.0					66.0
Dividend payout ratio		35 %					35 %
Dividend		0	8.5	19.6	20.7	21.9	23.1

Financial income and expenses driven by latest yield for short-term financial assets and liabilities

Income statement: some forecast ratios

- Choice for a forecast driver depends on the company and the industry
- Some guidance on typical forecast drivers and forecast ratios for the most common financial statement line items

Income Statement Forecast Ratios

	Line item	Recommended forecast driver	Recommended forecast ratio	
Operating	• Cost of goods sold (COGS) • Selling, Gen, Admin (SG&A) • Depreciation	• Revenue • Revenue • Prior year net property, plant, and equipment (PP&E)	• COGS / revenue • SG&A / revenue • Depreciation / net PP&E	Simplification: forecast operating profit margin
Non operating	• Non-operating income • Interest expense • Interest income	• Appropriate non-operating asset, if any • Prior year total debt • Prior year excess cash	• Non-operating income / non-operating asset • 0 if extraordinary item • Interest expense$_t$ / total debt$_{t-1}$ • Interest expense$_{t-1}$ / excess cash$_{t-1}$	

Income statement: depreciation

Forecasting depreciation

- Either forecast depreciation as a percentage of revenue or as a percentage of property, plant, and equipment

- In Finnair example, depreciation is not explicitly modeled

- Rather, it is (implicitly) assumed that depreciation + change in operating assets = investment in fixed capital

- Depreciation is included in calculating operating profit

Example: Forecasting depreciation

$$\text{Forecast Ratio} = \frac{\text{Depreciation}_{2013}}{\text{Revenues}_{2013}} = \frac{19}{240} = 7.9\%$$

$$\text{Depreciation}_{2014E} = \text{Forecast Ratio} \times \text{Revenues}_{2014E}$$

Forecasting balance sheet assets

- With balance sheet, start with noncurrent assets (=tangible assets and intangible assets)
- When forecasting balance sheet items, using the stock method (balance sheet item/revenue) vs. flow method (change in balance sheet item / revenue)
- For many items, go through the notes to understand what will drive the level of the balance sheet asset. For many non-operating assets (e.g., land owned for development purposes) having zero growth is reasonable with lack of better information
- Excess cash: it the company holds too much cash, it should be a current asset and added to company value (think that excess cash could be paid out now as dividend)

Assets	2014	2015	2016	2017	2018	2019	2020
Non-current assets							
Intangible and tangible assets	925.4	919.2	961.7	1006.7	1054.2	1	
Minority interest	4.9	4.9	4.9	4.9	4.9		
Deferred tax receivables	33.8	0.8	0.8	0.8	0.8		
	964.1	924.9	967.4	1012.4	1059.9		
Current assets							
Working capital assets	331.1	207.3	216.9	227.0	237.7	249.0	258.9
Other financial assets	496.5	493.2	516.0	540.1	565.6	592.3	614.9
Cash and cash equivalents	93.4	92.8	97.1	101.6	106.4	111.4	115.7
	921	793.2	829.9	868.8	909.7	952.7	989.1
Total assets	1885.1	1718.1	1797.3	1881.2	1969.6	2062.3	2140.9

Cash ~4% of balance sheet in line with industry averages

Balance sheet: some forecast ratios

	Typical forecast driver	**Typical forecast ratio**
Operating line items		
Accounts receivable	Revenue	Accounts receivable / revenue
Inventories	Cost of goods sold	Inventories / COGS
Accounts payable	Cost of goods sold	Accounts payable / COGS
Accrued expenses	Revenue	Accrued expenses / revenue
Net PP&E	Revenue	Net PP&E / revenue
Goodwill	Acquired company revenues	Goodwill / acquired company revenue
Non-operating line items		
Non-operating assets	None	Growth in non-operating assets / zero
Pension assets or liabilities	None	Trend towards zero
Deferred taxes	Adjusted taxes	Change in deferred taxes / adjusted taxes

For non-operating assets, one possibility to value separately similar cash (e.g., shares in publicly listed stocks) with zero growth

Forecasting balance sheet liabilities

- **Change in retained earnings (equity)** from clean surplus accounting: $RE_{t+1} = RE_t + Net\ Income - Dividends$ (DO NOT FORECAST BASED ON SALES!)
- **Deferred tax-liability:** read the notes. In case of Finnair, these come from selling assets to Flybe in 2011. Assume that eventually Finnair will pay taxes and this liability is realized
- **Long-term liabilities:** the plug. Total Assets – Total Liabilities ex. Long-term debt
- **Short-term borrowings:** forecast based on sales
- **Trade payables and other liabilities:** forecast based on sales

> For dividend payout ratio, use guidance from annual report

Equity and liabilities							
Total equity	514.3	492.0	526.1	582.3	641.9	705.6	773.2
Long-term liabilities							
Deferred tax liability	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long-term liabilities	437.34	311.6	323.0	315.4	297.8	278.2	247.9
	437.34						
Short-term liabilities							
Borrowings	89.9	89.3	93.4	97.8	102.4	107.2	111.3
Trade payables and other liabilities	843.54	825.2	854.8	885.8	927.5	971.3	1008.4
	933.44						
Total equity and liabilities	**1885.1**	1718.1	1797.3	1881.2	1969.6	2062.3	2140.9

Forecasting balance sheet liabilities: plug

- The plug can be also something else than long-term debt:
  - Simple models use **long-term debt** as the plug (use "newly issued debt" as a separate line item if needed for clarity)
  - Advanced models **use excess cash** or newly **issued debt**, to prevent debt from becoming negative
  - Even more advanced model would have target leverage ratio and switch between excess cash and long-term debt based on leverage ratio

Balance Sheet

The Plug	Excess cash	Newly issued debt	The plug
(use IF/THEN statement for advanced models)	Remaining assets	Existing debt Shareholder's equity	(for simple models)
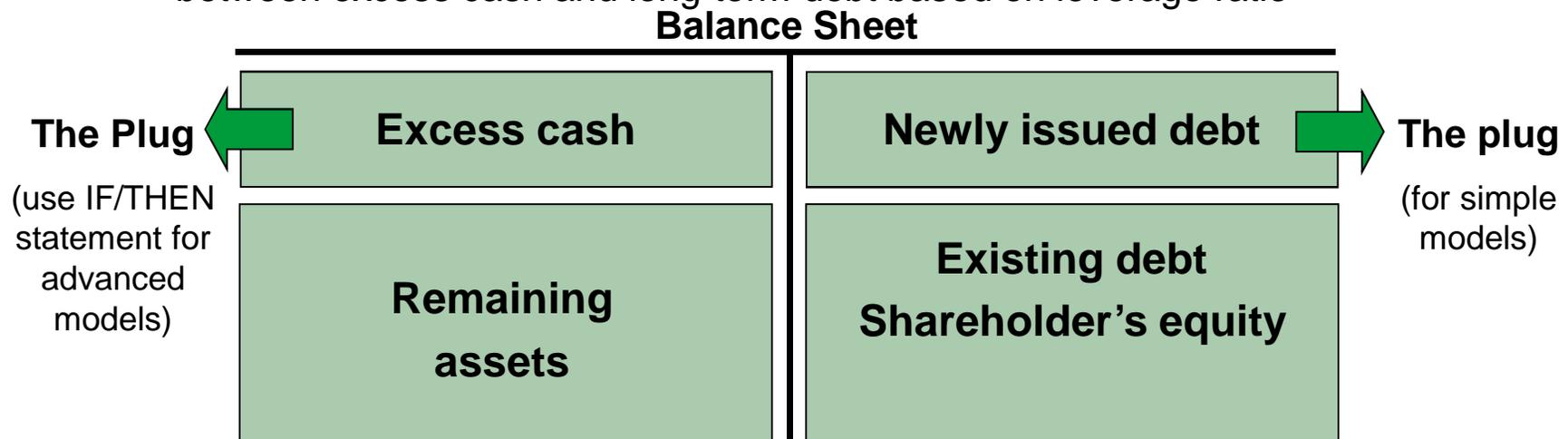
Discount rate: proudly apply everything you have learned so far

Discounting cash flows to **equity**

- CAPM:
  - 12 month EURIBOR most common choice for r_f
  - Beta: use weekly/monthly data
  - Empirical issues discussed in detail on "empirical issues" - lecture
- Multifactor models:
  - Fama-French $r_E = r_f + r_B + r_{SMB} + r_{HML}$
  - Pastor-Stambaugh factor for liquidity
  - Carhart momentum: should it be added or not?
- Doctor Stetson

Discounting cash flows to **firm**

- WACC
  - Do not discount cash flows to equity, such as dividends, with WACC. Ever.
  - Apply tax-shield either at WACC or at FCF calculation (more on this next lecture), not both
  - More useful to discount cash flows to firm when predictions on dividend policies are inappropriate (e.g., high growth companies)

Surface scratch today, lecture 10 will deal with these topics in detail

Finally, we get a value for the firm

- With completed income statement and balance sheet forecasts, calculate FCF for each forecast year.

- Since a full set of forecasted financials are available, copy the two calculations across from historical financials to projected financials

- **Discount cash flows:** you learned how to do this in your first finance course, but it took a while to get here…

Valuation summary

	2015	2016	2017	2018	2019	2020
FCFE	5.8	18.4	30.2	32.1	34.3	36.4
Terminal value						649.3
Discounted FCFE	5.8	17.0	25.9	25.5	25.3	467.9
Cumulative discounted FCFE	5.8	22.8	48.7	74.3	99.6	567.5
Total number of common shares (average of fiscal year)	128,136,115					
Intrinsic value per share	4.43					

Structure of discussion today

- H&M example: structuring revenue tree

- Where do we start from: simplified and revised income statement

- Forecasting income statement and balance sheet: "theory"

- Forecasting income statement and balance sheet: case Finnair

- **It all seemed very easy, any more tricks of the trade?**

Other issues in forecasting

1. **Operating drivers,** like volume and productivity are next step of detail after predicting aggregate volume growth:
   - In airline industry labor and fuel have increased as a percentage of revenue. Fuel is a greater percentage because oil prices have been rising. Labor also up as percentage of revenue per seat mile has been dropping
   - In B2B applications with relatively few end customers, it makes sense to forecast revenues per account (customer) rather than with growth rates: think companies like Metso or Areva
2. **Fixed and variable costs.** The distinction between fixed and variable costs at the company level is usually unimportant because most costs are variable in the long-term. For individual production facilities, most costs are fixed: the smaller the unit of observation and shorter the time horizon, the more likely a cost is fixed
3. **Inflation.** If cost of capital is often in nominal terms, forecast in nominal terms. High inflation will distort historical analyses

Forecasting: what did we learn?

- Valuation is easy, although time-consuming. First **understand**, then **structure**, **forecast**, build **financials** and **discount**

- First step in modeling is to get a **simple model** (like the Finnair model) roughly right. Then start adding level of detail. Beware getting tangled up with details at the beginning

- **Cross-check your results** against industry forecasts, expert opinions, and common sense. If your company will grow faster than industry, be ready to explain why. If the margin is going to grow, have a story where the margin improvement is coming from

- Break down forecasts and add line items only if you have **insight**. Do not break down revenue into 20 product groups or geographic areas, if you are using same growth rate everywhere

Postscript: Finnair Annual Report 2015

Key revenue sources and split

EUR 2,324 million (2015)

Airline Business — 91.1%*
- Passenger transportation — 82.6%
- Ancillary** — 4.9%
- Cargo — 8.7%
- Other*** — 3.7%

Travel Services — 8.9%*
- Tour operators
- Travel agencies
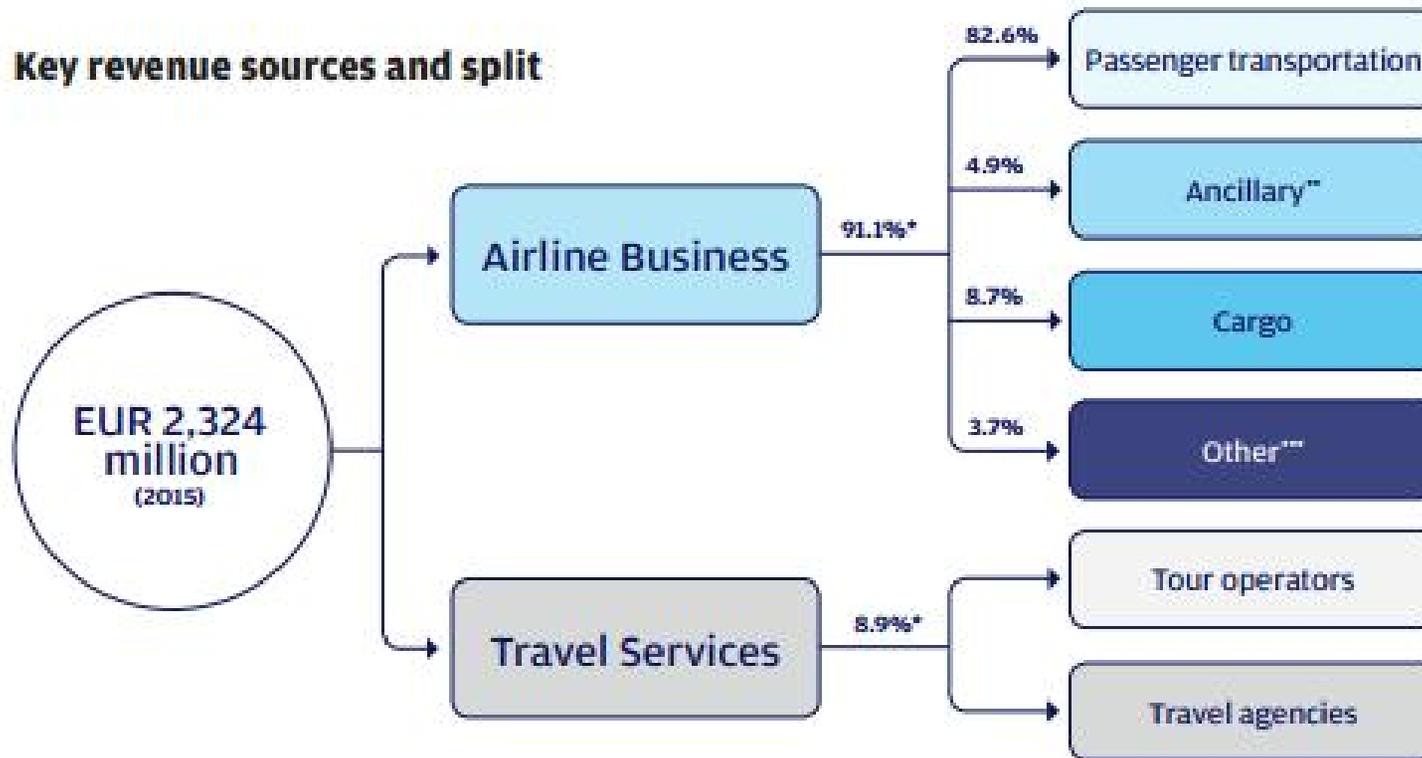
* Based on total revenue excluding Group eliminations.

** Includes: extra baggage fees, advance seat selection, upgrade options, Economy comfort product in long-haul, Sky Bistro in short-haul economy.

*** In 2014 included: Travel Retail Store operations, Finncatering business; in 2015, other revenues consisted primarily of aircraft leases.