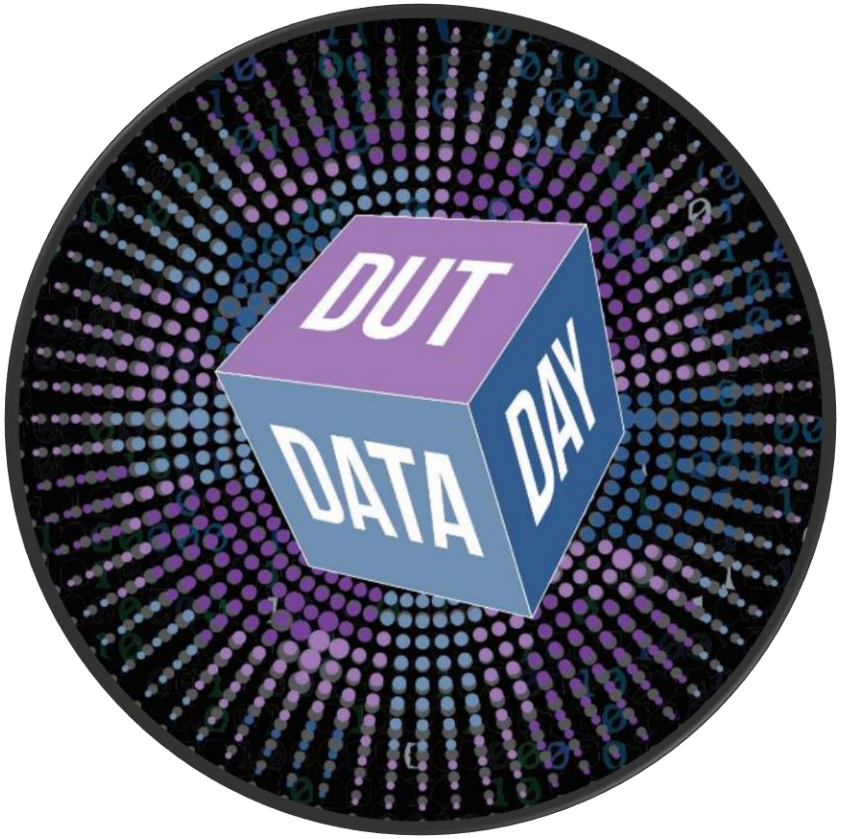

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DURBAN UNIVERSITY OF TECHNOLOGY

INYUVESI YASETHEKWINI YEZOBUCHWEPHESHE

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FINANCE AND INFORMATION MANAGEMENT/ INFORMATION TECHONOLOGY

PT. SIMELANE & O. OGUTU

PROSPECTIVE ANALYSIS: FORECASTING (CHAPTER 6)

KEY CONCEPTS

- Strategy, accounting, and financial performance analyses provide valuable information that help to shape forecast assumptions.

- Forecasts of future performance should be comprehensive, including all condensed financial statements.

- The starting point for forecasts should be the time series behavior of key measures such as revenue growth, earnings, and ROE (and its components).

Forecasting models

- **Forecasting models** are one of the many tools businesses use to predict outcomes regarding sales, supply and demand, consumer behavior and more.
  - These models are especially beneficial in the field of sales and marketing.
  - There are several forecasting methods businesses use that provide varying degrees of information. From the simple to the complex, the appeal of using forecasting models comes from having a visual reference of expected outcomes.

Four common types of forecasting models

- There are four main types of models or methods that companies use to predict actions in the future.
  - Time series model - Uses historical data as the key to reliable forecasting. Visualize patterns of data better when you know how the variables interact in terms of hours, weeks, months or years.
  - Econometric model - Forecast changes in supply and demand, as well as prices.
  - Judgmental forecasting model - Utilize subjective and intuitive information to make predictions. For instance, there are times when there is no data available for reference. Launching a new product or facing unpredictable market conditions also creates situations.
  - The Delphi method - This series of steps is based on the Delphi method, which is about the Oracle of Delphi. It assumes that a group's answers are more useful and unbiased than answers provided by one individual.

- **Artificial intelligence methods**
- Companies in the field of technology use methods of artificial intelligence (AI) to forecast a specific area of growth. This forecasting method provides extremely accurate results using mathematical algorithms. The science behind artificial intelligence predicts numerous user outcomes and helps generate those "you may also like" suggestions that appear on certain sites.

Artificial intelligence methods

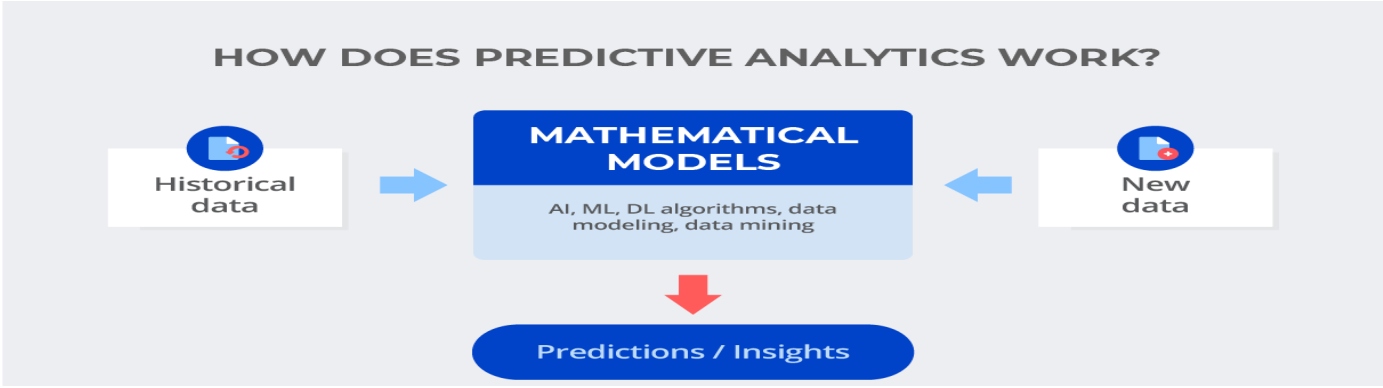


Figure 1: Predictive analytics

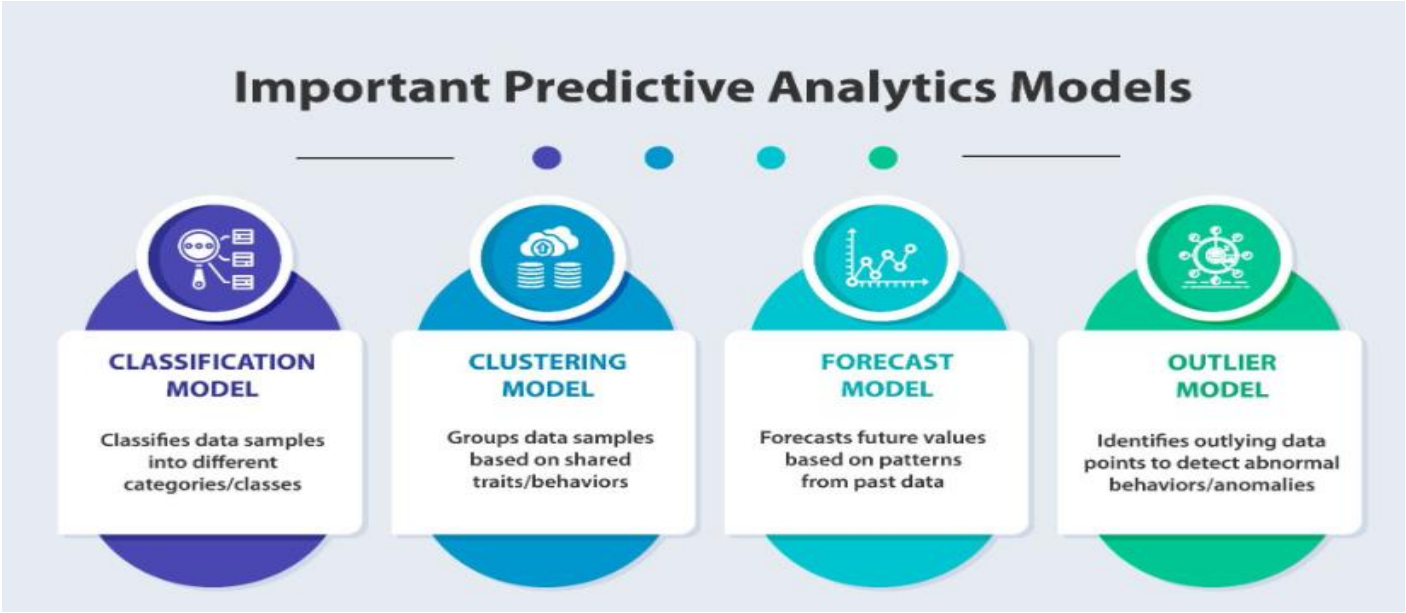


Figure 2: AI Predictive analytics

Forecasting structure

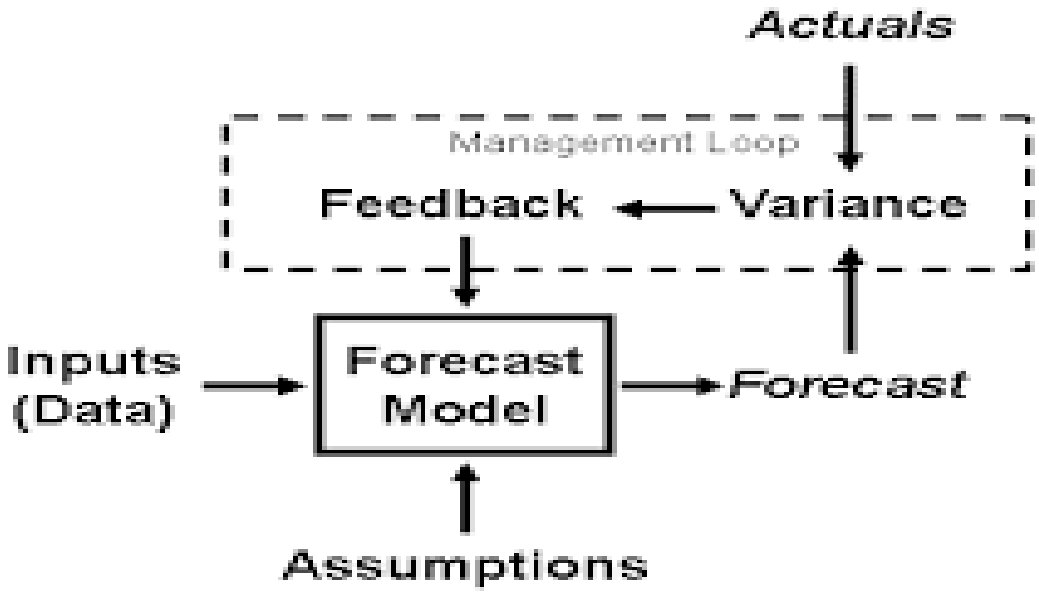


Figure 3: Forecasting structure

OVERALL STRUCTURE OF THE FORECAST

- Typically, a few key strategic drivers are critical to forecasting future firm performance.
  - For example, breakthrough technologies, business alliances, and business line expansions.

- A practical approach begins with deriving condensed financial statements that contain key elements of the income statement, balance sheet, and statement of cash flows.

- Typically, estimating future revenues is the critical first step in arriving at forecasted financial statement information.

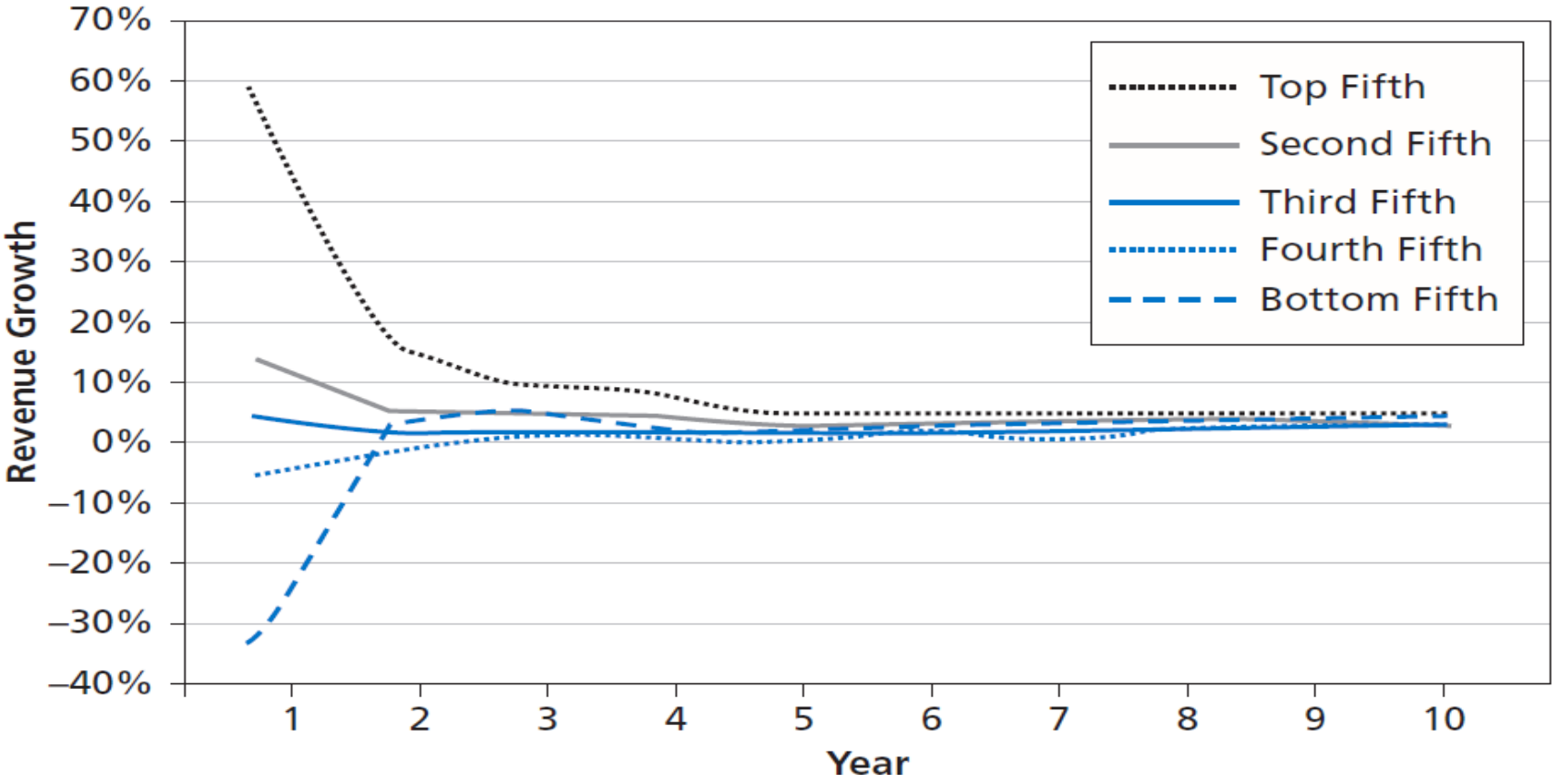
PERFORMANCE BEHAVIOR: A STARTING POINT

- Past performance may be used to understand the behavior of key measures such as revenue or earnings.
  - Studying the time series of measures such as earnings can provide insights into trends for future performance.
  - Measures from prior periods provide benchmarks to compare forecasts against.

KEY ACCOUNTING MEASURES

- Revenue growth rates tend to be mean-reverting. See Figure 6.1.

FIGURE 6.1 Behavior of revenue growth for European firms over time, 1995–2014

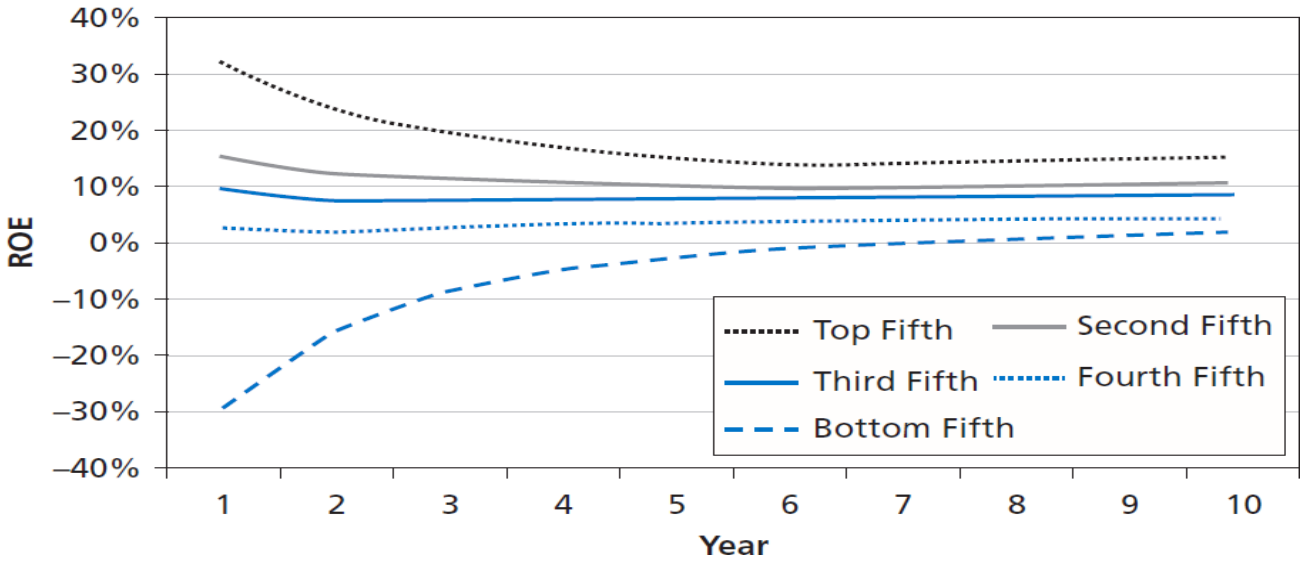


KEY ACCOUNTING MEASURES

- On average, earnings follow a random walk or random walk with drift. Long-term trends tend to be sustained, on average.

- Return on Equity Behavior
  - ROE behavior is dependent on both earnings and the asset base.
  - Patterns tend to be mean-reverting. See Figure 6.2.

FIGURE 6.2 Behavior of ROE for European firms over time, 1995–2014

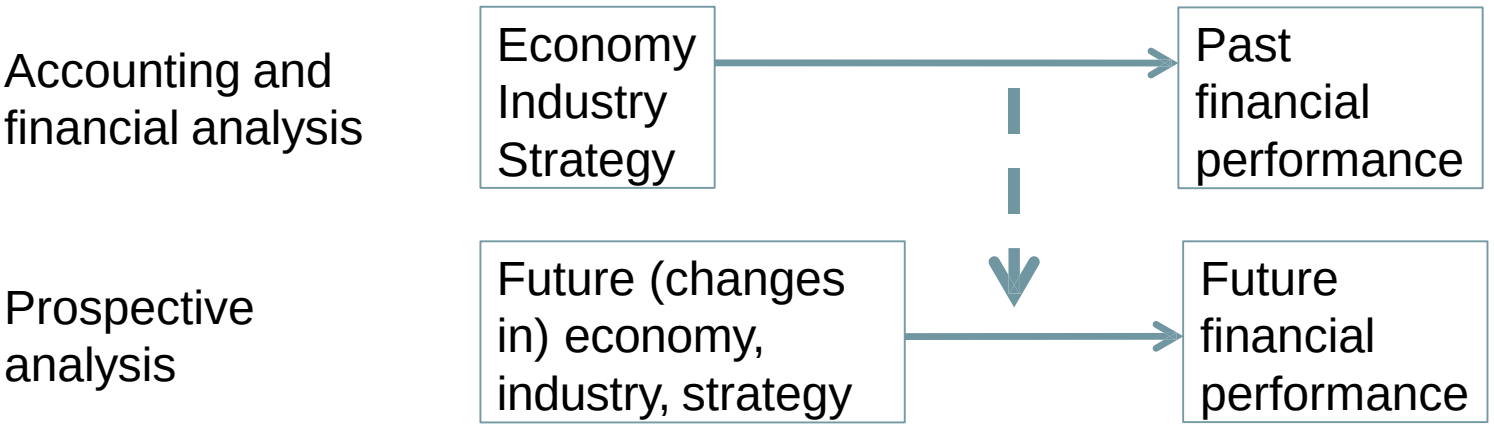


DECOMPOSING ROE FOR FURTHER ANALYSIS

- ROE may be decomposed ultimately to the following components:
  - NOPAT margin × Operating asset turnover
  - Return on investment assets
  - Spread (Return on Business Assets minus Interest rate after tax)
  - Financial leverage
- Analyzing the behavior of the components from 1995 – 2014 provided the following insights:
  - Operating asset turnover and financial leverage tend to be rather stable
  - NOPAT margin is the most variable component of ROE, and drives changes in the spread

HOW FORECASTING RELATES TO OTHER ANALYSES

- Accounting analysis and financial analysis help to understand which factors drove past performance (and how).
  - Forecasting can be seen as performing a reverse financial analysis
  - What are the expected future changes in performance drivers?
  - How do such expected changes translate into future changes in performance?



STEPS OF THE FORECASTING PROCESS

- **Step 1:** Predict changes in environmental and firm-specific factors.

- Using Hennes & Mauritz as an example:
  - **From a macroeconomic analysis.** How will the economic situation in H&M's geographic segments develop?
  - **From industry and business strategy analysis.** Will a recovery of the economy reduce price competition in the industry? How sustainable is H&M's above-peer performance? Is it expected that new retailers will enter the industry? Will H&M's brand recognition help the firm to preserve customer loyalty? How will the average labor costs in production countries develop? How long will H&M maintain its policy of outsourcing all production? Will H&M be able to successfully replicate its strategy in emerging markets?
  - **From accounting analysis.** Are there any aspects of H&M's accounting that suggest past earnings and assets are misstated, or expenses or liabilities are misstated? If so, what are the implications for future accounting statements?

STEPS OF THE FORECASTING PROCESS

- **Step 2:** Assess the relationship between step 1 factors and financial performance.
  - Hennes & Mauritz: What were the sources of H&M's superior performance in 2013? Which economic factors caused the firm's profitability to increase in 2014 (and by how much)? Are these factors and their performance effects permanent or transitory? Is there any discernible longer-term pattern in H&M's past performance? If so, are there any reasons why this trend is likely to continue or change?
- **Step 3:** Forecast condensed financial statements.

REVENUE GROWTH AND MACROECONOMIC FACTORS

- Impact of changing macroeconomic conditions on the apparel retail industry:
  - The apparel retail industry is a cyclical industry
  - Near-term impact of recession
  - Longer-term impact is sufficiently unpredictable to focus on the firm's competitive position and strategy

TABLE 6.1 Realized and expected economic growth rates

	2013 (%)	2014 (%)	2015e (%)	2016e (%)
European Union	–0.1	1.4	2.1	1.9
Weighted average of H&M's European markets	0.4	1.4	2.1	2.0
Weighted average of H&M's World markets	1.2	1.8	2.4	2.3

Source: European Economic Forecast Spring 2015 – Directorate-General for Economic and Financial Affairs and OECD Economic Outlook.

REVENUE GROWTH AND MACROECONOMIC FACTORS, CONTINUED

- The primary drivers of H&M's revenue growth are:
  - Investment plans (growth in the number of stores).
  - Growth in revenue per store.

REVENUE GROWTH AND MACROECONOMIC FACTORS,CONTINUED

- The primary drivers of H&M's revenue per store are currency exchange rate changes, changes in the store portfolio composition, and changes in consumer demand and inventory markdowns

TABLE 6.5 Expected revenue growth for H&M

	2014	2015e	2016e	2017e
(Expected) effect on revenue per store of:				
• currency exchange rate changes (%)	4.16	12.56	12.56	12.56
• changes in H&M's store portfolio (%)	–0.22	–0.22	–0.22	–0.22
• changes in consumer demand and inventory markdowns (%)	0.78	1.78	2.78	3.78
(a) Total (expected) effect on revenue per store (%)	4.75	14.32	15.44	16.56
(b) Revenue per store in 2013 (in SEK millions)	43.5	43.5	43.5	43.5
+ (Expected) change in revenue per store (a × b)	2.1	6.2	6.7	7.2
= (Expected) revenue per store	45.6	49.8	50.2	50.7
× (Expected) average number of stores (from Table 6.3)	3,321.5	3,711.0	4,126.0	4,580.0
= (Expected) revenue	151,419	184,632	207,296	232,345
Implied revenue growth rate (%)		21.9	12.3	12.1

NOPAT MARGINS

- Economic factors that contribute to changes in H&M's NOPAT margin are: Input prices; foreign currency exchange rates; inventory markdowns; SG&A cost stickiness, ETR changes, and the net effect of new investments, product offerings and online activities.

TABLE 6.7 Expected NOPAT margins for H&M

	2014 (%)	2015e (%)	2016e (%)	2017e (%)
NOPAT margin in 2013	13.7	13.7	13.7	13.7
(Expected) effect on NOPAT margin of:				
• input prices	+0.16	+0.86	+0.86	+0.86
• foreign currency exchange rate changes	–0.02	–1.60	–1.30	–1.00
• inventory markdowns	+0.10	+0.20	+0.30	+0.40
• SG&A cost stickiness	+0.18	+0.53	+0.85	+0.85
• Effective tax rate	+0.18	+0.18	+0.18	+0.18
• Other factors	–0.63	–0.83	–0.53	–0.23
= (Expected) NOPAT margin	13.7	13.1	14.1	14.8

OTHER MEASURES FOR H&M

- Working capital to revenue – likely to revert to lower levels because of a continued improvement in inventory turnover.

- Non-current assets to revenue – likely to improve in 2015 because of the depreciation of the Swedish Krona early 2015.

- Capital structure – has been stable in the past; will likely remain stable in the future.

MAKING FORECASTS, H&M

- Though H&M exhibits superior performance in the short run, mean- reverting behavior is expected in the long run.

TABLE 6.10 Forecasting assumptions for Hennes & Mauritz

Forecast year	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)
Revenue growth rate	21.9	12.3	12.1	12.0	10.0	8.0	6.0	4.0	3.0	3.0
NOPAT margin	13.1	14.1	14.8	14.0	13.0	12.0	11.0	9.5	8.0	8.0
Operating working capital/ revenue	9.9	9.6	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Net non-current operating assets/revenue	58.3	57.7	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
Investment assets/revenue	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
After tax return on investment assets	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
After tax cost of debt	1.8	2.0	2.2	2.5	2.8	3.0	3.0	3.0	3.0	3.0
Debt to capital	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7

In addition to these assumptions, we also assume that revenue will continue to grow at 3.0 percent in 2025 and all the balance sheet ratios remain constant, to compute the beginning balance sheet for 2025 and cash flows for 2024.

H&M'S FINANCIAL STATEMENTS

TABLE 6.11 Forecasted financial statements for Hennes & Mauritz

Fiscal year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Beginning balance sheet (SEK millions)										
Beginning operating working capital	17,669.5	18,278.6	19,900.5	21,840.4	24,461.3	26,907.4	29,060.0	30,803.6	32,035.7	32,996.8
+ Beginning net non-current operating assets	101,744.8	107,640.5	119,610.0	132,901.2	148,849.4	163,734.3	176,833.1	187,443.1	194,940.8	200,789.0
+ Beginning investment assets	5,288.5	7,939.2	8,913.7	9,990.8	11,189.7	12,308.7	13,293.4	14,091.0	14,654.6	15,094.3
= Business assets	**124,702.8**	**133,858.3**	**148,424.2**	**164,732.5**	**184,500.4**	**202,950.4**	**219,186.5**	**232,337.6**	**241,631.2**	**248,880.1**
Debt	73,146.8	77,236.2	85,640.8	95,050.6	106,456.7	117,102.4	126,470.6	134,058.8	139,421.2	143,603.8
+ Group equity	51,556.0	56,622.1	62,783.4	69,681.8	78,043.7	85,848.0	92,715.9	98,278.8	102,210.0	105,276.3
= Capital	**124,702.8**	**133,858.3**	**148,424.2**	**164,732.5**	**184,500.4**	**202,950.4**	**219,186.5**	**232,337.6**	**241,631.2**	**248,880.1**
Income statement (SEK millions)										
Revenue	184,632.1	207,296.4	232,344.8	260,226.2	286,248.8	309,148.7	327,697.7	340,805.6	351,029.7	361,560.6
Net operating profit after tax	24,186.8	29,228.8	34,387.0	36,431.7	37,212.3	37,097.8	36,046.7	32,376.5	28,082.4	28,924.9
+ Net investment profit after tax	317.6	356.5	399.6	447.6	492.3	531.7	563.6	586.2	603.8	621.9
= Net business profit after tax	**24,504.4**	**29,585.3**	**34,786.7**	**36,879.3**	**37,704.7**	**37,629.6**	**36,610.4**	**32,962.7**	**28,686.2**	**29,546.7**
– Net interest expense after tax	–1,390.3	–1,712.8	–2,091.1	–2,661.4	–3,278.9	–3,794.1	–4,021.8	–4,182.6	–4,308.1	–4,437.4
= Profit or loss	**23,114.1**	**27,872.5**	**32,695.6**	**34,217.8**	**34,425.8**	**33,835.5**	**32,588.6**	**28,780.1**	**24,378.0**	**25,109.4**
Return (%)	19.2	19.9	21.1	20.0	18.6	17.2	15.8	13.6	11.5	11.5
ROE (%)	40.8	44.4	46.9	43.8	40.1	36.5	33.2	28.2	23.2	23.2
BV of equity growth rate (%)	9.8	10.9	11.0	12.0	10.0	8.0	6.0	4.0%	3.0	3.0

SENSITIVITY ANALYSIS

- Forecasts should be done with more than one possible set of assumptions in mind.

- In H&M's case, there are at least two likely alternative situations to those used for the forecasted financial statements:

  – Upside case: projected effects of competition turn out to be too pessimistic, resulting in a smaller decline in NOPAT margins.
  – Downside case: projected increase in H&M's store productivity turns out to be too optimistic, flattening the company's revenue growth.

CONCLUDING COMMENTS

- Forecasting is the first step in prospective analysis of firm performance.
- Preliminary business strategy, accounting, and financial analysis should form the basis for many assumptions used in forecasting.
- Forecasts should be comprehensive and include key elements of the financial statements.
- When forecasting, the time series behavior of various statistics should be kept in mind.

THANK YOU