

NTNU

Department of Industrial Economics and Technology Management

Spring 2020

TIØ4285 Production and Network Economics Assignment 2

Out: Thursday 23 January

In: Thursday 30 January 6pm

Supervision: Monday 27 January, 4:15pm A31

Note that late answers will not be approved.

Exercise 1

The manager of the local football club is putting together the budget for next season. Attendance accounts for the largest portion of the revenues and the manager believes that attendance is directly related to the number of the team's wins. For the past 8 seasons, the following attendance figures are given:

Wins	Attendance
14	3,630
16	4,010
16	4,120
18	5,300
16	4,400
17	4,560
15	3,900
17	4,750

- a) Given the players on the team, the manager strongly believes that the team will win at least 17 matches next season. Use a linear regression model to forecast next season's level of attendance.
- b) Analyze and discuss the quality of the forecast. Would you trust the forecast? (Do not discuss whether or not the manager is right in expecting at least 17 wins.)

Exercise 2

Good Bread AS is a large, successful bakery, selling bread to supermarkets all over the country. The company is organized in an independent sales division, distribution division and baking division. Over the past months, Good Bread AS has found itself more often in a situation with high inventory costs while at the same time being unable to deliver the ordered products in time. The figure below shows the customer demand for bread and the production orders issued by the baking division.

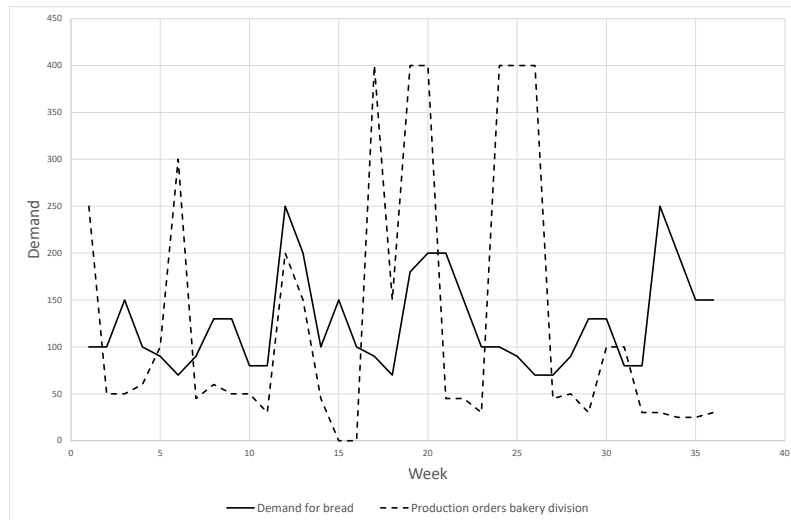


Figure 1: Customer demand and production orders by the baking division

- a) Explain to the CEO of Good Bread AS what might be causing the problems regarding inventory costs and service level.

After explaining the problem to the CEO, she wants to know more about the observed phenomenon and provides you with additional information: The demand for bread is independently and identically distributed in each week. The inventory is controlled by a policy using a safety buffer based on the variance of demand. Orders can be issued in each week.

- b) There exist theoretic models to quantify the ratio between the variance of bread demand and the variance of orders issued by the bakery division. Please use one of these models to determine this ratio. Make sure you name all assumptions. Suggest and discuss measures to reduce this ratio.