

Fish Price Forecasting

Damien Dupré

Contents

Prerequisites	5
1 Horse mackerel exports from Norway	7
1.1 Analysis	7
1.2 Glmnet Algorithm Forecast	7
1.3 Prophet Algorithm Forecast	7
1.4 Additional Analyses	7
2 Horse mackerel imports by Norway	9
2.1 Analysis	9
2.2 Glmnet Algorithm Forecast	9
2.3 Prophet Algorithm Forecast	9
2.4 Additional Analyses	9
3 Scomber export by Norway	11
3.1 Analysis	11
3.2 Glmnet Algorithm Forecast	11
3.3 Prophet Algorithm Forecast	11
3.4 Additional Analyses	11
4 Scomber imports by Norway	13
4.1 Analysis	13
4.2 Glmnet Algorithm Forecast	13
4.3 Prophet Algorithm Forecast	13
4.4 Additional Analyses	13

Prerequisites

This report investigate the evolution of fish unit price and implement algorithm to forecast this evolution.

Each chapter is dedicated to a specific fish trade analysis which involves a type of fish, a country and its type of trade (import or export).

Whithin these chapters, a first section is dedicated to the analysis of the trade history using classic methods and visualisations. A second section is dedicated to the implementation of forecast algorithms. Currently, 2 different forecast algorithm models are implemented: Glmnet and Prophet.

- Glmnet is a generalized linear model via penalized maximum likelihood trained for forecast purpose. The regularization path is computed for the lasso or elasticnet penalty at a grid of values for the regularization parameter lambda. The algorithm is extremely fast, and can exploit sparsity in the input matrix x .
- Prophet is a procedure for forecasting time series data based on an additive model where non-linear trends are fit with yearly, weekly, and daily seasonality, plus holiday effects. It works best with time series that have strong seasonal effects and several seasons of historical data. Prophet is robust to missing data and shifts in the trend, and typically handles outliers well.

Finally additional analyses are presented in order to focus on specific points of the analysis such as factors influencing the Unit Price evolution, Seasonality and Trade evolution of specific partners.

Chapter 1

Horse mackerel exports from Norway

Placeholder

1.1 Analysis

1.2 Glmnet Algorithm Forecast

1.2.1 Forecast Validation

1.2.2 Forecast Prediction

1.3 Prophet Algorithm Forecast

1.3.1 Forecast Validation

1.3.2 Forecast Prediction

1.4 Additional Analyses

1.4.1 Factors influencing Unit price

1.4.2 Trend in long lasting trade partners

1.4.3 Unit price seasonality changes

Chapter 2

Horse mackerel imports by Norway

Placeholder

2.1 Analysis

2.2 Glmnet Algorithm Forecast

2.2.1 Forecast Validation

2.2.2 Forecast Prediction

2.3 Prophet Algorithm Forecast

2.3.1 Forecast Validation

2.3.2 Forecast Prediction

2.4 Additional Analyses

2.4.1 Factors influencing Unit price

2.4.2 Trend in long lasting trade partners

2.4.3 Unit price seasonality changes

Chapter 3

Scomber export by Norway

Placeholder

3.1 Analysis

3.2 Glmnet Algorithm Forecast

3.2.1 Forecast Validation

3.2.2 Forecast Prediction

3.3 Prophet Algorithm Forecast

3.3.1 Forecast Validation

3.3.2 Forecast Prediction

3.4 Additional Analyses

3.4.1 Factors influencing Unit price

3.4.2 Trend in long lasting trade partners

3.4.3 Unit price seasonality changes

Chapter 4

Scomber imports by Norway

Placeholder

4.1 Analysis

4.2 Glmnet Algorithm Forecast

4.2.1 Forecast Validation

4.2.2 Forecast Prediction

4.3 Prophet Algorithm Forecast

4.3.1 Forecast Validation

4.3.2 Forecast Prediction

4.4 Additional Analyses

4.4.1 Factors influencing Unit price

4.4.2 Trend in long lasting trade partners

4.4.3 Unit price seasonality changes