ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ & ΤΕΧΝΟΛΟΓΙΑΣ ΤΗΣ ΠΛΗΡΟΦΟΡΙΑΣ
SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY

ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ
DEPARTMENT OF STATISTICS

ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΣΕΠΤΕΜΒΡΙΟΣ 2017

George Athanasopoulos

Associate Professor and Deputy Head, Department of Econometrics and Business Statistics
Monash University, Victoria, Australia

Forecasting cross-sectional and temporal hierarchies through trace Minimization

ΠΕΜΠΤΗ 7/9/2017
12:30

ΑΙΘΟΥΣΑ 607, 6ος ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

ΠΕΡΙΛΗΨΗ

In many applications, there are multiple time series that are hierarchically organised and can be aggregated at several different levels in groups based on products, geography or some other features. A common constraint is that forecasts of the disaggregated series need to add up to the forecasts of the aggregated series. This is known as "coherence". We develop a new reconciliation forecasting approach that incorporates the information from a full covariance matrix of forecast errors in obtaining a set of coherent forecasts. Our approach, which we refer to as MinT, minimises the mean squared error of coherent forecasts across the entire collection of time series. We evaluate the performance of MinT compared to alternative approaches using a series of simulation designs and an empirical application forecasting Australian domestic tourism. In the second part of this talk we will also discuss the application of MinT for forecasting a single time series by generating what we refer to as temporal hierarchies. A temporal hierarchy can be constructed for any time series by means of non-overlapping temporal aggregation. Our results from an extensive empirical evaluation show that forecasting using temporal hierarchies increases accuracy significantly over conventional forecasting. We will also discuss organisational implications of the temporally reconciled forecasts using a case study of Accident & Emergency departments.

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AUEB STATISTICS SEMINAR SERIES SEPTEMBER 2017

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ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)

ABSTRACT

In many applications, there are multiple time series that are hierarchically organised and can be aggregated at several different levels in groups based on products, geography or some other features. A common constraint is that forecasts of the disaggregated series need to add up to the forecasts of the aggregated series. This is known as "coherence". We develop a new reconciliation forecasting approach that incorporates the information from a full covariance matrix of forecast errors in obtaining a set of coherent forecasts. Our approach, which we refer to as MinT, minimises the mean squared error of coherent forecasts across the entire collection of time series. We evaluate the performance of MinT compared to alternative approaches using a series of simulation designs and an empirical application forecasting Australian domestic tourism. In the second part of this talk we will also discuss the application of MinT for forecasting a single time series by generating what we refer to as temporal hierarchies. A temporal hierarchy can be constructed for any time series by means of non-overlapping temporal aggregation. Our results from an extensive empirical evaluation show that forecasting using temporal hierarchies increases accuracy significantly over conventional forecasting. We will also discuss organisational implications of the temporally reconciled forecasts using a case study of Accident & Emergency departments.