
Chair: Reinaldo Castro Souza, PUC-Rio - Brazil

The 4th IIF workshop on “Risk, Volatility and Forecasting in Energy and Financial Markets” took place at PUC-Rio (Catholic University of Rio de Janeiro, Brazil) on the first week of January 2007 (3-5/01/07).

The first day (03/01) was entirely dedicated to an 8 hour short course entitled: “System Identification and Forecasting Neural Networks with Applications in Econometrics” taught by Prof. Hans-Georg Zimmermann from Siemens, Germany. The two remaining days were dedicated to the actual workshop, which followed the traditional format, i.e., 45 minutes for the presentation (without interruption), followed by a 15 minutes paper discussion by selected local discussants and concluded by a 10 minute period of questions opened to the floor audience. A total of 10 papers were presented during the two workshop days.

The speakers and respective discussants were:

- Alexandre Pinto Alves da Silva (COPPE/UFRJ)

On Electric Load Forecasting and Neural Networks

Discussant: Hans Georg Zimmermann (Siemens, Germany)

- Antoni Espasa (Universidad Carlos III)

Eighteen Years Experience in Data Adjustment and Forecasting Daily and Hourly Electricity Consumption

Discussant: Monica Barros (PUC-Rio, Brazil)

- Emil Pelikan (Czech Republic)

Regional Numerical Weather Prediction Models and their Applications in Energy Consumption Forecasting

Discussant: Plutarcho Lourenco (CEPEL, Brazil)

- Eric Nowak (University of Lugano)

Omega Based Portfolio Optimization: A Simulation Study on Private Equity Investments

Discussant: Tara Baydia (PUC-Rio, Brazil)

- Erik Larsen (University of Lugano)

Behavioural Models of Energy Markets

Discussant: Marina Figueira (PUC-Rio, Brazil)

- Hans-Georg Zimmermann (Siemens AG)

Price Forecasting in Energy Markets

Discussant: Alvaro Veiga (PUC-Rio, Brazil)

- Patrick McSharry (University of Oxford)

Wind Power Density Forecasting Using Ensemble Predictions and Time Series Models

Discussant: Lilian M. de Menezes (Cass Business School, England)

- Siem Jan Koopman (Vrije University)

Periodic seasonal Reg-ARFIMA-GARCH models for daily electricity spot prices

Discussant: Cristiano Fernandes (PUC-Rio, Brazil)

- James W. Taylor (University of Oxford)

Short-Term Load Forecasting in European Countries Using Methods Based on Exponential Smoothing and Principal Component Analysis

Discussant: Marcelo Medeiros (PUC-Rio, Brazil)

- Maxwell Stevenson (University of Sydney)

Short-Term Temperature Forecasting and its Implications for Network Load Management

Discussant: Luiz Felipe Amaral (IEPUC, Brazil)

In addition, it was organized in the afternoon of the second day a round table where the speakers (all of them professionals from the electricity market in Brazil) had 15 minutes to present their experience on load forecasting in Brazil), followed by an open discussion among the participants. The speakers of this table were:

- Plutarcho Maravilha Lourenco – CEPEL
- Silvana Radis Reis – AES Eletropaulo
- Mirtis Sá – ONS
- Jose Francisco Pessanha – CEPEL
- Reinaldo Castro Souza – IEPUC.

Concerning the participants, we had 43 registrations for the short course and 77 for the workshop. Important to mention that we had full house on both days of the

workshop the audience was composed mainly by graduate students university lecturers and professors and practitioners from various Brazilian private and public electricity companies.

Important to mention that the workshop program was thoroughly followed as stated, particularly the scheduled time for the talks and discussions which were strictly observed. Also, during the two days of the workshop we have available Portuguese-English simultaneous translation in order to help the participation of the audience.

The total costs of the conference (around R\$ 85,000, or, approximately US\$40.000) was entirely covered by the financial support we received from the following sponsors: IIF, IEPUC, CNPq, ELETROBRÁS, UTE NORTE FLUMINENSE, LIGHT, AMPLA, ONS and CEPEL.

The costs varied from air fares for the speakers (approximately half of the costs), accommodation in a 4 star hotel in Copacabana (www.mirador.com.br) transfers to and from the airport - workshop site - hotel, printed material simultaneous translation, development and maintenance of the workshop website (www.webzip.com.br/workshop), coffee breaks, etc. There are some pictures available on the website of the Workshop.

The organizing committee was composed by the following professionals:

- Reinaldo Castro Souza: IEPUC, PUC-Rio
- Lílian M. de Menezes: Cass Business School, City University
- Luiz Felipe M. Amaral: IEPUC, PUC-Rio
- Cristina Vidigal C. Miranda: IEPUC, PUC-Rio
- Mônica Barros: IEPUC, PUC-Rio
- José Francisco Pessanha, CEPEL

As a final word, the participants evaluated very positively the workshop, particularly the level of the presentations, the depth of the discussions and the general organization of the event. It was also announced by Dr James Taylor and Dr Antoni Espasa that the papers presented at the workshop will be refereed for possible publication on a special issue of the IJF.

Below we present a summary of the papers kindly prepared by Dr Maxwell Stevenson:

“The 4th International Institute of Forecasters Workshop was held at PUC-Rio in Rio de Janeiro, Brazil from January 3 to 5, 2007. The theme of the workshop was “Risk, Volatility and Forecasting in Energy and Financial Markets.

There was a general agreement among all those who attended that the excellent organization, informative presentations and ensuing discussions offered a unique insight to the problems and potential solutions associated with managing the forecasting functions associated with global energy and financial markets.

The organizers of the workshop brought together a comprehensive range of international experts in electricity load and price forecasting, weather forecasting and its impact on forecasting of energy consumption, forecasting wind power and portfolio optimization in the recently private equity investment market. A round table discussion forum that included a range of practitioners from the Brazilian energy markets provided both national and international attendees with an update of innovative forecasting techniques either at present in practice or being developed for future implementation.

The first day of the workshop (January, 3 2007) involved a short course that offered a comprehensive introduction to the topic of neural networks with a theoretical introduction sufficient to enable participants to develop a working knowledge of the application of this technique to practical energy forecasting. The course leader was Dr. Hans Georg Zimmermann from Siemens AG, Germany, an established international expert in the application of neural networks for forecasting electricity load and forward prices.

Day 2 of the workshop saw the commencement of the presentations by national and international speakers. All presentations were supplemented by well constructed criticism from a range of discussants.

After an introduction by the chair of the workshop Organizing Committee, Prof. Reinaldo Castro Souza (PUC-Rio), and a co-organizer, Dr. Lilian M. de Menezes (Cass Business School, England), the first session commenced with a paper on load

forecasting using neural networks by Alexandre Silva (COPPE, UFRJ). This paper forwarded an extension to the work covered in the short course developed on Day 1 of the workshop. Further papers developed in this session were by James Taylor (Oxford University, England) who concerned on the application of double exponential smoothing to forecast electricity load for up to eleven European countries, and by Siem Jan Koopman (Vrije University, Netherlands) who spoke of the use of periodic seasonal Reg-ARFIMA-GARCH models in forecasting daily electricity spot prices.

In the second session of Day 2 papers addressed the modeling and prediction of weather as an input to energy consumption forecasting, the ever increasing issue of the developing forecasting models for wind power, and the electricity network managers problems of forecasting long and short term load. Emil Pelikan (Institute of Computer Science, Czech Republic) presented a paper that reported in the development of a weather prediction model for the Czech Republic designed to provide accurate input for energy consumption forecasting. This most impressive effort by Pelikan and a list of co-authors, provided a weather prediction benchmark that will no doubt be difficult to simulate both in Czech republic and elsewhere. Patrick McSharry (Oxford University, England) presented results for wind power density forecasting using ensemble predictions and times series models. He concluded that the difficulty of further developments of forecasting tools for wind power lies with the relatively small contribution made by wind "farms" to national power grids and the lack of comprehensive historical data from wind power generators. The dual problems faced by network managers namely long and short term load forecasting was addressed by me (University of Sydney, Australia) as well as developing a long term load forecasting model that incorporated intraday load profiles over a forecasting horizon that extended to ten years; I have introduced a short term temperature forecasting tool (the six pack model) that provided short term temperature forecasts that further feed the short term load forecast model over a seven day time horizon.

Day 3 commenced with an interesting paper by Erik Larsen (University of Lugano, Switzerland) on behavioral models in energy markets. With increasing deregulation of global energy markets, the evolution of different workplace cultures

requires important consideration in order to maintain an efficient and cooperative workplace to enable workers to overcome the many serious challenges provided by the new regulatory environment. Erik provided important insights into how cultures can be successfully changed and, critically, examples of inappropriate attempts to change that have had disastrous consequences. Hans Georg Zimmermann spoke on how a higher dimensional neural network model has been developed by Siemens AG (Germany) to provide long-term electricity forward price forecasts. Accurate forward price forecasting, because of its long term nature and its important role in risk management models for the electricity markets, is a difficult task. The Zimmermann model gives impressive results and promise for application by both electricity generators and retailers. Another highlight of this workshop was the input of a theoretical forecaster who has developed a forecasting load model that has been used by practitioners in Spain for eighteen years. Antoni Espasa (Universidad Carlos III, Spain) spoke of the challenges facing the forecasting of daily and hourly electricity consumption in Spain, and the success over eighteen years of a model developed by him for this purpose. In addressing a different forecast problem to that of energy load or price forecasting, Erik Nowak (University of Lugano, Switzerland) reported on his work with Omega based portfolio optimization of private equity investments. The lack of transparency of the results of existing private equity investment projects requires a simulation approach to portfolio optimization. This paper is one of the small number addressing an important and fast growing investments tool that knows no international barriers and the success of which will leave an important impact on the future wealth of international financial markets.

The final session of the workshop was taken up by an informative round table discussion among electricity practitioners from Brazilian generators and retailers. Innovative projects already developed (or under development) were discussed freely and frankly. This was a session that was most useful to both attendees from the Brazilian electricity market as well as Brazilian and international academics.

Commendable component of the workshop was the well organized social program that was associated with each day. Not only did it give attendees the

opportunity to enjoy and appreciate Brazilian hospitality, but it also provided a relaxed forum and atmosphere in which issues of interest for individuals that arose out of the days proceedings could be discussed.