



CREATES

Annual Report 2007

The Danish National Research Foundation's
Center for Research in Econometric Analysis
of Time Series CREATES

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1. Highlights 2007

Center for Research in Econometric Analysis of Time Series, CREATES, is a research unit at University of Aarhus, hosted by the School of Economics and Management. Research is conducted within the general fields of time series and financial econometrics. The center is funded as a Center of Excellence by Danmarks Grundforskningsfond (Danish National Research Foundation) via a DKK 37 mill. (5 mill. Euro) grant plus own financing. The funding period covers a 5-year period starting 1 April 2007. CREATES' core group of members are affiliated with University of Aarhus, (School of Economics and Management & Aarhus School of Business) and University of Copenhagen. A number of international fellows of Danish origin, mainly from North America, are associated with CREATES.

As of 31 December 2007 CREATES counts 14 domestic research fellows and 10 international research fellows. The junior CREATES faculty counts 5 post doctorates and 14 PhD students. New junior positions at the post doctoral and assistant professor level were posted internationally during the fall of 2007 and interest in these positions has been overwhelming. In 2008 CREATES will have 3 new assistant professors and 3 new post docs. All new positions are filled by international scholars. Also with respect to PhD recruitments CREATES has been successful in attracting promising candidates. 2 out of 5 new PhD candidates have been recruited internationally.

In 2007 more than 30 papers were published in peer reviewed journals, half of them in absolute top econometrics journals such as *Econometrica*, *Journal of Econometrics*, *Review of Economics and Statistics*, *Journal of Business and Economic Statistics*, *Journal of American Statistical Association*, *Econometric Theory*, and *Journal of Financial Econometrics*. A publication has also appeared in *Science*. More than 50 papers have been accepted for publication in peer reviewed journals. 43 working papers have been published in the CREATES Research Paper series since the center opened. The research conducted at CREATES covers a broad range of sub-fields. One of the most active research areas includes econometric analysis of high frequency financial data, especially volatility modeling of financial data. The production in this field is flourishing and CREATES can document one of the strongest research groups worldwide. This area is further expanding via recent recruitments. Other fields with a very dominant position in CREATES include theoretical time series econometrics: the analysis of non-stationary time series, long memory models, optimal inference, and non-linear time series modeling. Also the fields of forecasting and asset return predictability are very active research areas in CREATES.

In 2007 a very active seminar series started up. More than 40 seminars were given at CREATES, mainly by international researchers.

A number of focused international symposia and workshops were organized in 2007. 19-20 August, CREATES held its official opening conference and most members participated. The conference was followed by a "distinguished speaker lecture" by Nobel laureate, Prof. Clive W. J. Granger, University of California San Diego, who also serves on CREATES' advisory board.

The organization of specialized symposia has been a great success. 2-3 specialized symposia are planned in 2008. Also, CREATES has attracted one of the most prestigious time series conferences to Europe: 12-13 September 2008 CREATES will host the 2008 NBER-NSF time series conference. The conference is expected to have 100-150 participants and a large number of world leading scientists in time series analysis will participate. In 2009 CREATES will host the annual EC2-meeting, one of the major annual European conference series in econometrics.

2. Center members and organization

The core group of domestic center members includes time series and financial econometricians from the University of Aarhus (School of Economics and Management and the Aarhus School of Business) and the University of Copenhagen (Department of Economics, Department of Mathematical Statistics).

Over the years, University of Aarhus and University of Copenhagen have produced econometrics candidates who today are among the most cited researchers in the profession and with remarkable academic careers. Also, within the past few years promising PhD candidates in econometrics have been educated who are now affiliated with some of the best universities internationally. These researchers are affiliated with CREATES as international research fellows and typically spend 1-3 months per year at CREATES, which serves as their Danish research base. It is pivotal on CREATES' agenda to put significant efforts into high-level graduate (PhD) training and to support young promising researchers via post doctoral scholarships. In particular, recruitments of post doctorates have been and will be made internationally and efforts will be made to attract international students to PhD scholarships.

As of 31 December 2007 CREATES counts a stock of 14 domestic research fellows, 10 international research fellows, and 5 post doctoral scholars. 10 PhD students are at the host institution, University of Aarhus, 3 PhD students at Aarhus School of Business and 1 at University of Copenhagen. In addition, a number of junior people are associated with CREATES as junior fellows. These associates typically have a PhD degree in econometrics and are now employed in private firms. They are more loosely affiliated with CREATES.

Below is a complete list of CREATES members and associates. See "CREATES Annual Report 2007 – Financial Statement" for a full review of committed research time and financing.

CREATES Staff (as of 31 December 2007)	Financing (2007)¹
Director	
Prof. Niels Haldrup	AU, FSE, CREATES
Research Fellows, Aarhus	
Prof. Ole Barndorff-Nielsen	
Assoc. Prof. Henning Bunzel	AU
Prof. Bent J. Christensen	AU, FSE
Assoc. Prof. Charlotte Christiansen	AU, FSE
Assoc. Prof. Christian Dahl	AU
Prof. Tom Engsted	AU
Prof. Asger Lunde	ASB-AU
Prof. Carsten Tanggaard	ASB-AU
Prof. Timo Teräsvirta	FSE, CREATES
Assoc. Prof. Allan Würtz	AU

¹ Acronyms: AU: University of Aarhus, ASB-AU: Aarhus School of Business, University of Aarhus, KU: University of Copenhagen, FSE: Forskningsrådet for Samfund og Erhverv (Danish Social Sciences Research Council), DG: Danmarks Grundforskningsfond (Danish National Research Foundation).

Research Fellows, Copenhagen

Prof. Søren Johansen	KU, CREATES
Prof. Anders Rahbek	KU
Prof. Michael Sørensen	KU

International Research Fellows

Prof. Torben G. Andersen	Northwestern University, USA, CREATES, 15-24 August 2007
Prof. Tim Bollerslev	Duke University, USA, CREATES, Visiting Professor, August 2007
Prof. Peter Christoffersen	McGill University, Canada, CREATES, Visiting Professor at CBS July-December 2007, regularly at CREATES.
Assist. Prof. Peter Reinhard Hansen	Stanford University, USA, CREATES, Visiting Professor August 2007, shorter visits in May and December
Assoc. Prof. Michael Jansson	UC Berkeley, USA, FSE, Visiting Professor at CREATES July 2007
Assist. Prof. Dennis Kristensen	Columbia University, USA, CREATES, Visiting Professor August 2007
Assoc. Prof. Morten Ø. Nielsen	Cornell University, USA, FSE, CREATES Visiting Professor June-August 2007
Assoc. Prof. Helle Bunzel	Iowa State University, USA, CREATES, Visiting Associate Professor August-December 2007
Assist. Prof. Lars Stentoft	HEC, Montreal, Canada, CREATES Visiting Assistant Professor August 2007. Regular visits at CREATES
Prof. Allan Timmermann	UC San Diego, USA, CREATES 15-24 August 2007

Visiting Professors

Prof. Robert Taylor, University of Nottingham, England	CREATES (20 Oct – 30 November 2007)
See also "International Research Fellows" above	

Post doctoral Scholars

Post doc, Kim Christensen (PhD, ASB-AU), 1 April – 31 July, 2007	CREATES
Post doc, Katarzyna Lasak (PhD, Univ. Carlos III Madrid), 1 Aug-	AU
Post doc, Mark Podolskij (PhD Ruhr Univ. Bochum), 1 Sep 2007-	AU
Post doc, Olaf Posch (PhD, Univ. of Hamburg), 1 Sep 2007 -	AU
Post doc, Almut Veraart (PhD, Oxford University), 1 Oct 2007 -	CREATES
Post doc, Jie Zhu (PhD, AU), 1 Sep 2007 -	AU

PhD students

MSc(econ), Martin Møller Andreasen, 5+3, 1 Sept 2005-31 Aug 2008	AU
MSc(econ), Eske Stig Hansen, 5+3, 1 Feb 2007 – 31 Jan 2010	Copenhagen Economics, MVTU (Industrial PhD)
PhD, Toke L. Hjortshøj, 4+4, 1 Sep 2003 – 31 Aug 2007	AU
BSc(econ), Anders B. Kock, 4+4, 1 Sep 2007 – 31 Aug 2011	CREATES
MSc(econ), Rune Møllgaard, 4+4, 1 Sep 2004 – 31 Aug 2008	AU
MSc(econ), Frank Steen Nielsen, 5+3, 1 Feb 2006 – 31 Jan 2009	FSE
MSc(merc), Thomas Q. Pedersen, 5+3, 1 Sep 2007-31 Aug 2010	CREATES
MSc(econ), Torben Rasmussen, 5+3, 1 Jan 2005 – 31 June 2008	AU
MSc(math econ) David Skovmand, 5+3, 1 Oct 2004 – 30 Sep 2007	AU
PhD, Jie Zhu, 5+3, 1 Sep 2004 - 31 Aug 2007	AU
MSc(merc) Lasse Bork, 5+3, 1 Sep 2005 – 31 Aug 2008, ASB-AU	Jyske Bank, MVTU (Industrial PhD)
MSc(merc) Stig V. Møller, 5+3, 1 Feb 2006 – 31 Jan 2009, ASB-AU	ASB-AU
MSc(fin) Leonidas Tsiras, 1 Okt 2006 – 30 Sep 2009, ASB-AU	ASB-AU
MSc(math econ), Theis Lange, 5+3, 15 May 2005 – 14 May 2008, KU	KU

Support staff

Annette Andersen, Secretary	CREATES
Marie Louise Ates, Secretary	AU
Birgitte Højklint, Secretary	AU
Niels G. Hørstrup, Accountant	AU

Research assistants (part time)

Thomas Q. Pedersen	CREATES
Simon Corvenius Lund	CREATES
Mette Pihl Køster	CREATES
Rasmus Schnejder	CREATES
Jens R. Nordestgaard	CREATES
Christian Bach Kristensen	CREATES

Advisory board

Prof. Tim Bollerslev, Duke University
Prof. Clive W. J. Granger, UC San Diego
Prof. Svend Hylleberg, University of Aarhus
Prof. Robert F. Engle, NYU Stern
Prof. Nick Kiefer, Cornell University
Prof. Neil Shephard, Oxford University

2.1. Recruitments

According to the contract with Danmarks Grundforskningsfond a number of *new* openings should be filled in the contract period. The following recruitments were made in 2007 and/or will be effective during 2008 (categorized according to funding):

New positions funded by host institution, AU:

Prof. Tom Engsted (ASB-AU)	1 Sep 2007-
Assistant Prof., Valeri Voev (University of Konstanz)	1 Sep 2008 – 31 Aug 2011
Assistant Prof., Olaf Posch (University of Hannover)	1 Sep 2008 – 31 Aug 2011
PhD student, Zhenjiang Qin, 4+4 (China)	1 Feb 2008 – 31 Jan 2012
PhD student, Christian Bach Kristensen, 5+3 (AU)	1 Sep 2008 – 31 Aug 2011

New positions funded by CREATES:

Assistant Prof., Christos Ntantamis (McGill University)	1 Aug 2008-31 July 2011
Post doc, Kim Christensen (ASB-AU)	1 Apr 2007-31 July 2007
Post doc, Almut Veraart (University of Oxford)	1 Oct 2007 – 30 Sep 2009
Post doc, Valeri Voev (University of Konstanz)	1 Apr 2008 – 31 Aug 2008
Post doc, Isabel Casas (Univ. Carlos III, Madrid)	1 Sep 2008 – 31 Aug 2010
Post doc, Robinson Kruse (University of Hannover)	1 Aug 2008 – 31 July 2010
Post doc, Michel van der Wel (Free Univ., Amsterdam) (part time)	1 Sep 2008 – 31 July 2010
PhD student, Thomas Quistgaard Pedersen, 5+3 (ASB-AU)	1 Sep 2007 – 31 Aug 2010
PhD student, Anders B. Kock, 4+4 (AU)	1 Sep 2007 – 31 Aug 2011
PhD student, Mateusz Piotr Dziubinski, 4+4 (Univ. of Warsaw, AU)	1 Feb 2008 – 31 Jan 2012

New positions, externally funded:

Post doc, Mark Podolskij (Ruhr Universität Bochum), faculty grant	1 Sep 2007 – 31 Aug 2008
ETH Zurich	1 Sep 2008 – 31 Aug 2009
Post doc, Katarzyna Lasak (University of Barcelona), faculty grant	1 Aug 2007-31 July 2008
FSE	1 Aug 2008 – 31 Aug 2009
Post doc, Jie Zhu (University of Aarhus), faculty grant	1 Oct 2007 – 30 Sep 2009
Post doc, Olaf Posch (University of Hannover), faculty grant	1 Sep 2007 -31 Aug 2008

All positions agreed with Danmarks Grundforskningsfond to be funded by the host institution and CREATES at the post doc, assistant professor and higher levels have now been filled. It should be noted that the host institution has contributed with additionally 1 assistant professorship and 5 post doc years via (competitive) grants offered by the Faculty of Social Sciences. The latter are registered as external funding.

One year after its establishment, CREATES has experienced an overwhelming international interest in junior positions. By 1 September 2008 CREATES will have a stock of 3 assistant professors and 7 post docs, all recruited internationally. It is important that CREATES continues to

offer positions at the post doc level in the future. However, additional external funding will be necessary to achieve this goal and initiatives in this direction are already being made.

3 PhD positions funded via the CREATES grant have now been filled and another 2 positions funded by the host institution have been filled in 2008. 40% of the new PhD scholarships have been offered to international students, and the challenge is to increase this figure even further in the future. In addition to the PhD scholarships already offered, the host institution has committed to finance additionally 5 PhD scholarships in the contract period.

3. Research Plan and publications 2007

3.1 A review of publications

The 2007 Research Plan is specified in the contract between Danmarks Grundforskningsfond and CREATES (January 2007) where milestones until 1 April 2009 are outlined. It is no exaggeration to say that CREATES, in the first year after its establishment, is already a great success in terms of both research activities and actual publications produced. In fact, productivity in terms of number of publications has been almost twice as high as the milestones set, and more importantly, the high qualitative standards put forth in the 2007 Research Plan have been fulfilled.

Details about publications for 2007 are reported in Appendix I.

34 papers and notes were published in peer reviewed journals in 2007 (Appendix I.1, I.2). Additionally 51 papers and notes are forthcoming in peer reviewed journals, handbooks, etc. (see Appendix I.7).

It is always difficult to rank journals, and making a short list of top journals is difficult when it covers a range of fields: general econometrics, financial econometrics, and statistics/stochastics. In Baltagi (2007, *Worldwide Econometrics Rankings: 1989-2005*, *Econometric Theory* 23, pp. 952-1012) a list of 16 major econometrics journals are included in the ranking. However, the Baltagi list does not include publications in statistics journals and particularly in finance journals and it would be unfair to members of the center not to include such journals. In order to benchmark the research conducted at CREATES the following lists of top journals are suggested (in alphabetic order):

General econometrics:

Econometrica, *Econometric Reviews*, *Econometric Theory*, *Econometrics Journal*, *Journal of Applied Econometrics*, *Journal of the American Statistical Association*, *Journal of Business and Economic Statistics*, *Journal of Econometrics*, *Oxford Bulletin of Economics and Statistics*, *Review of Economics and Statistics*.

Financial econometrics:

Journal of Banking and Finance, *Journal of Empirical Finance*, *Journal of Finance*, *Journal of Financial and Quantitative Analysis*, *Journal of Financial Econometrics*, *Journal of Financial Economics*, *Journal of International Money and Finance*, *Journal of Monetary Economics*, *Journal of Money Credit and Banking*, *Review of Financial Studies*.

Statistics/Stochastics:

Annals of Statistics, *Bernoulli*, *Journal of Royal Statistical Society Series B*, *Stochastic Processes and its Applications*, *Journal of Time Series Analysis*, *Scandinavian Journal of Statistics*, *Finance and Stochastics*, *Mathematical Finance*

Many more journals deserve to be on these lists. Members of CREATES regularly publish their results in less specialized journals that are considered absolute top journals in economics, for instance *American Economic Review*, *Journal of Economic Literature*, *Economic Journal*, *International Economic Review*, *Journal of Economic Dynamics and Control*, and many other journals. Also, in 2007 Søren Johansen published an article in *Science* (see Appendix I.2), which is not a typical journal for econometricians, but everybody would agree that this is a top publication. Several CREATES members have contributions to peer-reviewed handbook series such as *Handbook of Econometrics*, *Handbook of Financial Econometrics*, *Handbook of Financial Time Series* etc., and such publications are considered prestigious by the profession. CREATES members have 4 such contributions forthcoming. Likewise, contributions to *New Palgrave Dictionary of Economics* are considered very prestigious and invitations to contribute to this series are only given to particularly influential researchers who have contributed significantly to the field. CREATES members have 5 such contributions accepted for the next volume of the dictionary.

Using the suggested benchmark lists covering the above journals, 16 out of 34 publications in 2007 appear on the list. In addition, another 9 articles are published in journals considered to be of high ranking. Most of these publications fall into the “General econometrics” category.

With respect to the articles accepted for publication in journals, 19 out of 38 journal articles appear on the lists above, and again, especially on the “General Econometrics” list.

CREATES has its own working paper series: CREATES Research Papers (see Appendix I.6). In 2007, a total of 43 research papers were published in the research paper series; 41 with CREATES members as authors. Yet another 7 papers were published in other working paper series. 33 out of 50 working papers published as working papers had domestic CREATES members as (co-)authors.

Table 1. Review of Publications 2007

	CREATES members, Denmark	International research fellows	Total
Articles in refereed journals	17 (6)	16 (10)	31 (16)
Notes in refereed journals	3 (1)	0	3 (1)
Contributions to refereed books	0	2	2
Refereed books	1	0	1
Editor of refereed journals	0	0	0
Published working papers	33	21	50
Forthcoming articles in refereed journals and books	36 (11)	17 (9)	51 (19)

Note: Number in parentheses indicates the number of publications appearing on the suggested benchmark list. Note that due to co-authorship the total column is not the sum of the other columns.

3.2 Bibliometric benchmarking

Baltagi (2007) (Worldwide Econometrics Rankings: 1989-2005, *Econometric Theory* 23, pp. 952-1012) reports a ranking of both institutions and individuals based on publications in 16 top econometrics journals for the 1989-2005 period (and sub-periods). The rankings are made according to different criteria including: by theoretical econometrics publications, by all econo-

metrics publications, and according to the number of standardized page counts, number of articles, individual journals, and journal clusters. Reporting all rankings is too detailed, but it is worth noting that the following CREATES members appear on rankings including publications by the top 150 econometricians: Søren Johansen², Tim Bollerslev, Timo Teräsvirta, Allan Timmermann, Morten Ø. Nielsen, Michael Jansson, Ole Barndorff-Nielsen, Anders Rahbek and Niels Haldrup. Note, however, that the list does not include publications in finance and statistics journals where several CREATES members will typically publish and this may bias the view. Readers are referred to Baltagi (2007) for details.³

3.3. Research areas, the 2007 Research Plan, and future research directions

According to the 2007 Research Plan, the main research areas of CREATES is categorized as follows:

- A. Theoretical time series econometrics: long memory, persistence, and optimal inference
- B. Asset returns and volatility
- C. Non-linear time series modeling
- D. Forecasting, predictability, and bubbles

These areas are all very active and rapidly expanding research fields where CREATES members contribute with research results at the absolute research frontier. The categories have been chosen to provide an overview of the focused research areas, but in fact the areas overlap considerably and in some cases it can be discussed whether a particular research project belongs to one category or the other: For instance, volatility models are intrinsically non-linear models which often exhibit long memory and persistence and are especially relevant in a forecasting context. Hence aspects of “volatility” are covered in all 4 categories. The fact that the various research areas overlap is also reflected by the participating researchers in the individual projects. Below an attempt is made to categorize the publications according to theme.

From the review below it is clear that research fields A and B dominate in terms of the number of papers produced and published. However, within each of the four categories, CREATES members contribute significantly to the research frontier and in some fields CREATES has some of the strongest research groups worldwide. The mentioned research areas are still very active and will play a major role in the future research at CREATES.

A research field that is likely to be given higher priority in the future is “dynamic panel data models”. This area is gaining increasing research interest as panel data with both large N and large T dimensions become available, e.g. in finance, regional, and macro economics. Non-stationary panel data models are included in this development and draw heavily on advances in time series econometrics. Also the development of estimation and inference methods in quantile models is likely to receive increasing research interest in the future, both for time series

² Søren Johansen has the highest rank (12-14) on listings for “theoretical econometrics”, and “all econometrics” contributions for the 1989-2005 period.

³ According to institution rankings, University of Copenhagen is among the top 30 (46) universities, and University of Aarhus is among the top 75 (79) universities for the 1989-2005 period when rankings are made w.r.t. all theoretical econometrics (all econometrics) publications. However, since CREATES includes members dispersed across different institutions, things may look very different for a more recent period.

and panel data. Methodological advances in this direction have important applications in financial economics and macro economics.

3.3.1. Theoretical time series econometrics: long memory, persistence, and optimal inference

Much of the research under this heading is concerned with the development of econometric theory and models in the analysis of fractionally (co-)integrated time series mainly by use of high-frequency data. This requires a basis for developing an appropriate framework in which fractionally cointegrated series can be estimated and tested and thus further develop theory for cointegrated processes. An important issue is our understanding of the features of long memory (fractionally integrated) processes and how they can be discriminated from a range of non-linear models. Another issue under this general heading concerns basic econometric and statistics research questions regarding how *optimal* inference procedures can be constructed under a range of conditions. In general, this area covers a range of contributions to econometric theory development.

Publications:

I.1 (Articles in refereed journals): 4,11,12,14,15,16,17,18,30,

I.2 (Notes in refereed journals): 1, 2

I.6 (Working papers): 1,2,3,9,10,11,12,13,23,26,27,28,29,30,32,33,35,36,38,40,44,45,46

I.7 (Forthcoming publications): 1,2,3,4,11,13,14,15,16,17,18,19,20,21,22,26,28,30,38, 50, 51

3.3.2. Asset returns and volatility

The volatility or variance of return is a key characteristic of any financial price process, and is a determining factor in asset pricing, hedging, and risk management. It is by now widely accepted that financial market volatility is not constant through time, but on the contrary is governed by a stochastic process, and that this is, to some extent, predictable. The recent availability of high-frequency intraday asset prices and real-time economic announcement data for a host of different financial markets and instruments has spurred a large and rapidly growing literature on the statistical and empirical analysis of this new rich source of data. The use of more frequently sampled data should result in better asset return and volatility measures and more accurate forecasts of these, thus facilitating improved pricing, trading strategies, monitoring and and portfolio management. The research agenda includes a vast number of projects dealing with a range of problems in volatility modeling. An especially active research field in CREATES is analysis of continuous time processes and frequently sampled discrete time processes and the appropriate calculation of volatility measures subject to jumps, market micro structure noise and other regularities of the data.

Publications:

I.1 (Articles in refereed journals): 1,2,3,4,5,6,7,8,9,10,13,15,19,20,21,22,25,26,27,29,31

I.2 (Notes in refereed journals): 3

I.3 (Contributions to refereed books): 1,2

I.6 (Working papers): 1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,31,34, 37,39,41, 42,43,44,45,46,47,48,50

I.7 (Forthcoming publications): 1,4,5,6,7,8,9,10,12,23,24,25,26,27,28,32,35,37,40,41,42,47,48

3.3.3 Non-linear time series modeling

A vast amount of recent empirical research in economics and finance repeatedly establishes the need to apply nonlinear time series models. However, most applications are based on nonlinear econometric and statistical models for which only rudimentary theory for estimation, testing, and general inference exists. Moreover, for many of the existing econometric models the dynamic properties are not well understood. The missing econometric theory means that the interpretation of the empirical analyses may be incorrect, and that it is not possible to validate the modeling of the observed economic data. Furthermore, in addition to the missing econometric theory, extensions of the models are needed to better capture the rich dynamics of observed economic and financial data.

The class of nonlinear time series models is enormous as it by definition includes all time series models except the classical linear ones. Leading classes of nonlinear models are models involving breaks, structural changes, and asymmetries. But also volatility models, including stochastic volatility and ARCH type models are non-linear in nature and belong to this class. Both classes are widely applied in dynamic econometric modeling in finance and economics, and they comply with the points raised above: The econometric theory for estimation and inference is still incomplete, and the model classes need extensions. Projects under the current heading include nonlinear cointegration, models with shifting mean and variance (including regime switching models), and smooth transition models.

Publications:

I.1 (Articles in refereed journals): 5,13,22,25,26,27,28

I.4 (Refereed books): 1

I.6 (Working papers): 1,2,5,9,10,14,15,18,19,22,31,36,38,47,49

I.7 (Forthcoming publications): 6,7,20,31,33,34,36,42,49,

3.3.4 Forecasting, predictability and bubbles

Forecasting is at the center of most questions in finance, dynamic macroeconomics, and other disciplines. For instance, the present value model characterizes the price of an asset in terms of the asset's *predicted* future cash flows discounted at some risk-adjusted rate, and the permanent income hypothesis dictates that current consumption reflects *expected* future income flows. Firms' capital budgeting decisions like when and whether to begin investment projects, whether to raise capital by issuing debt or equity and whether to use fixed or floating rate debt all involve forward-looking decisions that require making conditional forecasts. The projects under the current heading contain as a major theme aspects of forecasting across a range of fields. The basic research advances include developments in forecasting and forecast evaluation subject to non-standard conditions such as structural shifts, asymmetries, and other kinds of non-linearities. Also, the issue of how to make reliable forecasts from high-dimensional models based on shrinkage is scrutinized. Often it is the case that multiple forecasts based on different models are available to a practitioner, and it becomes a central issue to choose the best forecast from a pool of competing forecasts. Also, it is at the core of financial decision making to assess the predictability of asset returns for which existing tools are needed to be extended: How well do these tools work in practice and how can the methods be improved? Bubble phenomena in asset prices for instance result from expectations and forecasts made by economic agents and are a topic of intensified interest given recent events in asset and housing markets worldwide. Methods are developed to analyze bubble phenomena.

Publications:

I.1 (Articles in refereed journals): 9,23,24,25,27

I.6 (Working papers): 14,17

I.7 (Forthcoming publications): 21,42,43,44,45,46,

4. PhD activities

By 31 December 2007 CREATES has a stock of 8 PhD students enrolled at the host institution, 3 PhD students at ASB-AU, and 1 PhD student at the University of Copenhagen. For the remaining funding period additionally 5 CREATES PhD students will be offered scholarships by the host institution. It is likely that additional students will become affiliated, funded by Aarhus School of Business and the University of Copenhagen. See Table 2 for a review.

Table 2. PhD students affiliated with CREATES

Name of student	Funding	2007	2008	2009	2010	2011	2012
<i>PhD students enrolled at host institution:</i>							
Jie Zhu	AU						
Toke L. Hjortshøj	AU						
David Skovmand	AU						
Torben B. Rasmussen	AU						
Rune Mølgaard	AU						
Martin M. Andreassen	AU						
Frank S. Nielsen	FSE						
Eske Stig Hansen	MVTU						
Thomas Q. Pedersen	CREATES						
Anders B. Kock	CREATES						
Mateusz Dziubinski	CREATES						
Zhenjiang Qin	AU						
Christian Bach	AU						
PhD NN	AU						
PhD NN	AU						
PhD NN	AU						
PhD NN	AU						
PhD NN	AU						
<i>PhD students enrolled at other institutions:</i>							
Lasse Bork	ASB-AU						
Stig V. Møller	ASB-AU						
Leonidas Tsiaras	ASB-AU						
Theis Lange	KU						

PhD students' external relations:

It is an integral part of the PhD education that PhD students visit international research environments during their studies. CREATES PhD students visited the following universities in 2007: Duke University, Cornell University, Princeton University, Harvard University, Manchester Business School, University of California Berkeley, and Catholic University Leuven (see Appendix A.2).

PhD students are also active in presenting their works at international conferences, seminars, symposia and workshops (see Appendix B.4.2).

PhD theses

There were no PhD theses completed by CREATES members in 2007. It is expected that 6-7 CREATES PhD theses will be defended in 2008.

CREATES lunch seminar series

CREATES has a weekly lunch seminar series where PhD students and post doctoral fellows have priority in presenting and discussing their works.

PhD courses organized by CREATES:

In collaboration with the Danish Graduate Program in Economics, DGPE, CREATES organizes and finances specialized PhD courses, typically 2-3 days up to a week. The courses are taught by top international researchers (including CREATES members) who are specialists in their field. In 2007 CREATES organized the following courses (see Appendix B.2 for details):

1. Timo Teräsvirta, CREATES, "A Short Course in Non-linear Econometrics", 29-30 March
2. Herman J. Bierens, Penn State University, "Semi-non parametric Econometrics", 21-23 May
3. Charles Bos, Vrije Universiteit Amsterdam, "Course on Ox", 24 August – 2 September
4. Søren Johansen, Katarina Juselius, Heino Bohn Nielsen, University of Copenhagen, "Cointegration analysis of non-stationary I(2) variables", 29 October – 2 November
5. Robert Taylor, University of Nottingham, "Topics in time series econometrics", 5-6 November.

5. External relations and collaborations

CREATES participates in numerous collaborations with institutions as well as individuals (see Appendix A for a full list). A few comments:

CREATES members participate in individual research projects with more than 100 individuals from other institutions worldwide. 60% of these collaborators participate in joint works with domestic CREATES members (See Appendix A.3).

In addition to 8 PhD students visiting abroad, 2 fellows, Prof. Bent J. Christensen and Prof. Asger Lunde, were on sabbatical leave at Harvard University and UC San Diego, respectively (Appendix A.2).

In 2007 CREATES had 34 visitors staying for longer or shorter periods (including CREATES international fellows). Most visitors presented papers in CREATES' weekly seminar series (see Appendix A.4).

CREATES also collaborates with a number of international research institutions and centers, including:

- Granger Centre for Time Series Econometrics, University of Nottingham, England
- Oxford-Man Institute of Quantitative Finance, Oxford University, England
- ETH Zurich, Switzerland

The form of this collaboration mainly concerns exchange and co-financing of post doctorates, exchange of PhD students and collaboration on the organization of PhD courses and exchange of visitors.

In 2009 CREATES will organize a conference jointly with the Stevanovic Center for Financial Mathematics, University of Chicago. The theme of the conference is "Financial Econometrics and Statistics: Current Themes and New Directions" and will be held in Skagen, 4-6 June. The Stevanovic Center co-finances the conference with DKK 300,000.

In 2008 a European network in time series econometrics is being established: ETSERN, Econometric Time Series European Research Network. Prof. Anders Rahbek (Copenhagen) and Prof. Niels Haldrup, CREATES, are members of the funding board of ETSERN. It is planned that CREATES will host a network symposium in the fall of 2008 (Non-linear time series econometrics) and in the spring of 2009 (theme to be decided).

CREATES also collaborates with two national research centers: D-CAF, Danish Center for Accounting and Finance, and the Thiele Center for Applied Mathematics in Natural Science. The collaboration is mainly in the form of organizing joint seminars and symposia.

6. D-CAF/CREATES Data Office

CREATES also collaborates with D-CAF regarding access to relevant databases in Economics and Finance. Currently CREATES members at the University of Aarhus and D-CAF members have access to the CRSP, COMPUSTAT, DATASTREAM, and NYSE TAQ data bases in addition to various free data bases. Currently, there are initiatives to increase the number of accessible data bases. Recently, an office has been established to offer support on accessing the relevant data and a data assistant has been employed.

7. Conferences, symposia, and seminar activities

Conference activities, internally and externally, are specified in Appendix B. CREATES members are active in presenting their work internationally at conferences, symposia, etc. In 2007 CREATES members gave 64 invited departmental seminars and more than 110 paper presentations at international conferences of which 37 as invited speakers (Appendix B.4). Also, CREATES members appear in the program committees for leading international conferences (Appendix B.5).

CREATES organizes a weekly seminar series. In 2007 a total of 46 paper presentations were given in the series (Appendix B.3).

An important activity at the center is to organize focused symposia for CREATES members with a limited number of invited specialist speakers. In 2007 4 such symposia were organized:

1. Symposium on “Long Memory”, 28 June – 4 July
2. CREATES summer symposium, August
3. Symposium on “Time Series Econometrics”, 15 November
4. Christmas Symposium, 28 November

19-20 August, CREATES held its opening conference in Aarhus with most CREATES associates participating.

21 August, Nobel laureate, Prof. Clive W. J. Granger gave a “Distinguished Speaker Lecture” at CREATES. Prof. Granger is also a member of CREATES’ advisory board.

Upcoming conference and seminar activities

For 2008-2009 a number of international conference activities are scheduled:

8-9 May 2008, a symposium with the theme “New hope for the C-CAPM” with 6-7 international participants is organized.

On 27 May 2008 Professor Tim Bollerslev, Duke University and CREATES, gives a “Distinguished Speaker Lecture”.

CREATES is pleased to host the 2008 NBER-NSF time series conference 12-13 September 2008 (see <http://nber-nsf08.create.au.dk>). The conference is co-sponsored with NBER (National Bureau of Economic Research, USA) and NSF (National Science Foundation, USA), Danmarks Nationalbank, Danish Social Sciences Research Council, and Faculty of Social Sciences. The NBER-NSF time series conference is one of the most prestigious international conferences in time series econometrics. Normally the conference takes place in North America, and we are therefore very happy that we have been able to attract the conference to Aarhus and CREATES. The conference is expected to have 100-150 participants.

On 11-14 August 2008 a symposium on “Volatility” is held. The symposium will have 10-12 international speakers and will represent the international elite within the theme of the symposium.

On 11 September 2008 Nobel laureate, Prof. Robert F. Engle, NYU Stern, will give a “Distinguished speaker lecture” at CREATES. Prof. Engle is a member of the CREATES’ advisory board.

As mentioned, CREATES organizes an international conference in 2009 jointly with the Stevanovic Center for Financial Mathematics, University of Chicago. The theme of the conference is “Financial Econometrics and Statistics: Current Themes and New Directions”.

Finally, 18-19 December 2009 CREATES will host the 2009 EC2 meeting, one of the major annual European meetings for econometricians. The theme has yet to be decided, but it will cover aspects of time series econometrics. CREATES member Peter R. Hansen, Stanford University, will be the program chair of the conference. The conference is expected to have 100-130 participants.

8. Educational activities

In appendix C the educational activities of “Aarhus-CREATES” faculty at the School of Economics and Management are listed together with short PhD courses organized by CREATES. As seen CREATES faculty contributes significantly to the teaching at the School at the BA, MSc and PhD levels.

As a consequence of the CREATES grant a number of new courses in econometrics at MSc and PhD level are already offered or are planned in the future:

- Time Series Econometrics, 10 ECTS, MSc
- Empirical Finance, 10 ECTS, MSc
- Advanced Programming in Quantitative Economics, 5 ECTS, MSc + PhD
- Computational Methods in Econometrics, 10 ECTS, MSc + PhD
- Topics in Time Series and Financial Econometrics, 5 ECTS, MSc + PhD
- Applied Time Series and Financial Econometrics, 10 ECTS, MSc

9. Academic services

Appendix D lists journals where CREATES members serve on the editorial board as associate editors. As can be seen, members participate in the editorial board of more than 25 peer reviewed journals.

In addition, all senior (and some junior) members regularly referee articles for a broad range of journals. It is estimated that on average senior members review 6-8 articles each year.

10. External funding

A review of external funding is given in Appendix E. A number of grants were allocated prior to the establishment of CREATES in April 2007 (but are directly relevant to CREATES’ activities and the external funding of the center). In addition, CREATES received a number of grants in 2007. In total approximately DKK 10,000,000 external funding relevant to CREATES was provided, and of this amount approximately one third attributes to 2007. Most of the external funding is provided by FSE (Danish Social Sciences Research Council), but the Faculty of Social Sciences has also been generous in providing additional grants to CREATES in the form of post doctoral fellowships.⁴ A limited number of grants were provided via private Danish funds (Nationalbanken to arrange the 2008 NBER-NSF time series conference) as well as international funds (NBER, NSF, and the Stevanovich Center for Mathematical Finance at University of Chicago).

See Appendix E and section 2.1 for further information.

11. Awards and acknowledgments

In 2007, a number of acknowledgments were given to CREATES members. In particular, it should be mentioned that PhD students Theis Lange (Copenhagen) and Rune Mølgaard received the EliteForsk Travelling Awards of DKK 250,000 to study at Duke University and Harvard University, USA. Also, PhD student Martin M. Andreasen received “Tuborgfondens Erhvervsøkonomiske Pris” of DKK 150,000 to study at Duke University.

⁴ Grants from the Faculty of Social Sciences are considered “external” in the sense that they were given in competition with other schools at the faculty and are beyond the budget of the School of Economics and Management.

12. Signature

(Ved underskriften bekræftes det, at beretning og regnskab med tilhørende noter og oversigter indeholder alle relevante oplysninger, som vedrører årets primære aktiviteter i Danmarks Grundforskningsfonds Center for Tidsrækkeøkonometri.)

To my knowledge, this report and accounts including notes and entry files comprise all the information concerning CREATES (The Danish National Research Foundation's Centre for Research in Econometric Analysis of Time Series).

12 March 2008

A handwritten signature in black ink, appearing to read 'Niels Haldrup', with a stylized flourish at the end.

Niels Haldrup
Danmarks Grundforskningsfonds
Center for Research in Econometric Analysis of Time Series, CREATES

Appendix A: External Relations

A.1 Research Institutions:

	Collaborator: Name (person and/or institution) Country	Collaboration subject and/or title. Output/results of collaboration if any
1	Danish Center for Accounting and Finance, D-CAF, Denmark	Seminar and research collaboration, Joint PhD courses, applied seminars, research collaboration. Also D-CAF and CREATES collaborates on data access via the D-CAF - CREATES Data Office
2	Granger Centre for time Series Econometrics, University of Nottingham, England	Exchange of seminar visitors, PhD students etc. 6 weeks visit by Director, Prof. Robert Taylor
3	Oxford-Man Institute of Quantitative Finance, University of Oxford, UK	Exchange of seminar visitors, PhD students, joint postdoc positions. PhD student Silja Kinnebrock, Oxford, regularly visiting CREATES. Director Neil Sheppard in CREATES' Advisory Board
4	The Stevanovich Center for Financial Mathematics, University of Chicago, USA	International Conference organization. Joint Conference scheduled for 2009 in Denmark
5	Thiele Centre for Applied Mathematics in Natural Science, DK	Seminar and research collaboration. Joint seminars and symposia
6	ETSERN - Econometric Time Series European Research Network	Establishment of a European Network organizing Symposia in Time Series Econometrics across Europe. CREATES to organize meetings in 2008 and 2009
7	ETH Zurich	Exchange, postdoctoral students, joint postdoc positions. Mark Podolskij, joint ETH Zurich - CREATES post doc
8	NBER-National Bureau of Economic Research NSF-National Science Foundation	CREATES organizing 2008 NBER-NSF time series conference

A.2 CREATES members' long visits/sabbaticals abroad:

	Venue	CREATES member	Period
1	Harvard University	Bent J. Christensen	01. 09.2006-31.07.2008
2	University of California San Diego	Asger Lunde	01.07.2007-31.07.2008
3	Duke University - visitng PhD student	Theis Lange	07.01.2007-30.06.2007
4	Duke University - visiting PhD student	Martin M. Andreasen	01.09.2007-15.12.2007
5	Cornell University - visiting PhD student	Frank Nielsen	25.08.2007-03.02.2008
6	Princeton University - visiting PhD student	Torben B. Rasmussen	01.09.2006-01.05.2007
7	Harvard University - visiting PhD student	Rune Møllgaard	01.01.2007-30.06.2001
8	Manchester Business School - visiting PhD student	Stig V. Møller	01.01.2007-30.06.2007
9	Univ. of California Berkeley - visiting PhD student	David Skovmand	01.08.2006-31.05.2007
10	Catholic University, Leuven - visiting PhD student	Lasse Bork	1.04.2007-30.06.2007

A.3 Individual research collaboration

	Collaborator: Name (person and/or institution) Country	Type of collaboration	Output/results of collaboration, if any
1	Katsumi Shimotsu, Queens University, Canada	Co-author, Morten Ø. Nielsen	see Appendix I
2	Xiaohong Chen, Yale University, USA	Co-author, Dennis Kristensen	see Appendix I
3	Richard Blundell, University College London, England	Co-author, Dennis Kristensen	see Appendix I
4	Christian Hansen, University of Chicago, USA	Co-author, Michael Jansson	see Appendix I
5	Victor Chernozhukov, MIT, USA	Co-author, Michael Jansson	see Appendix I
6	Yiu Kuen Tse, Singapore Management University, Singapore	Co-author, Peter Christoffersen	see Appendix I
7	Anthony S. Tay, Singapore Management University, Singapore	Co-author, Peter Christoffersen	see Appendix I
8	Roberto Mariano, Singapore Management University, Singapore	Co-author, Peter Christoffersen	see Appendix I
9	Angelo Rinaldo, Swiss National Bank, Switzerland	Co-author, Charlotte Christiansen	see Appendix I
10	Andreu Sanso, University of Balearic Islands, Spain	Co-author, Niels Haldrup	see Appendix I
11	Gabriel Pons, AKF, Denmark	Co-author, Niels Haldrup	see Appendix I
12	Peter Møllgaard, Copenhagen Business School, Denmark	Co-author, Niels Haldrup	see Appendix I
13	Claus Kastberg, Copenhagen Economics, Denmark	Co-author, Niels Haldrup	see Appendix I
14	Francis X Diebold, University of Pennsylvania, USA	Co-author, Tim Bollerslev, Torben G. Andersen, Peter Christoffersen	see Appendix I
15	Clara Vega, University of Rochester, USA	Co-author, Tim Bollerslev, Torben G. Andersen	see Appendix I
16	Dobislav Dobrev, Northwestern University, USA	Co-author, Tim Bollerslev, Torben G. Andersen	see Appendix I
17	R. Steizer, Technical University of Munich, Germany	Co-author, Ole Barndorff-Nielsen	see Appendix I
18	Lin Peng, City University of New York, USA	Co-author, Tim Bollerslev	see Appendix I
19	Wei Xiong, Princeton University, USA	Co-author, Tim Bollerslev	see Appendix I
20	Kristian Stegenborg Larsen, Nykredit, Denmark	Co-author, Michael Sørensen	see Appendix I
21	David C. Porter, University of Wisconsin-Whitewater, USA	Co-author, Carsten Tanggaard	see Appendix I
22	Daniel G. Weaver, Rutgers Business School, USA	Co-author, Carsten Tanggaard	see Appendix I
23	Wei Yu, Rutgers Business School, USA	Co-author, Carsten Tanggaard	see Appendix I
24	Peter Løchte Jørgensen, Aarhus School of Business, Denmark	Co-author, David Skovmand	see Appendix I
25	Bruno Eklund, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
26	Andrew Patton, University of Oxford, England	Co-author, Allan Timmermann	see Appendix I
27	Massimo Guidolin, Federal Reserve Bank of St. Louis, USA	Co-author, Allan Timmermann	see Appendix I
28	Hashem Pesaran, Cambridge University, England	Co-author, Allan Timmermann	see Appendix I

29	Davide Pettenuzzo, Università Bocconi, Milano, Italy	Co-author, Allan Timmermann	see Appendix I
30	Valeri Voev, University of Konstanz, Germany	Co-author, Asger Lunde	see Appendix I
31	Heino Bohn Nielsen, University of Copenhagen, Denmark	Co-author, Anders Rahbek	see Appendix I
32	Torben Schmith, Danmarks Meteorologiske Institut, Denmark	Co-author, Søren Johansen	see Appendix I
33	Peter Thejll, Danmarks Meteorologiske Institut, Denmark	Co-author, Søren Johansen	see Appendix I
34	Michael Verhofen, University of St. Gallen, Switzerland	Co-author, David Skovmand	see Appendix I
35	Oleg Bondarenko, University of Illinois at Chicago, USA	Co-author, Torben G. Andersen	see Appendix I
36	Paul Labys, Charles River Associates, USA	Co-author, Torben G. Andersen, Tim Bollerslev	see Appendix I
37	Clive W. J. Granger, University of California San Diego, USA	Co-author, Timo Teräsvirta	see Appendix I
38	Amber Anand, University of Central Florida, USA	Co-author, Carsten Tanggaard	see Appendix I
39	Jesper Rangvid, Copenhagen Business School, Denmark	Co-author, Charlotte Christiansen	see Appendix I
40	Mathias C. Cattaneo, University of California Berkeley, USA	Co-author, Michael Jansson	see Appendix I
41	Richard K. Crump, University of California Berkeley, USA	Co-author, Michael Jansson	see Appendix I
42	Jens Perch Nielsen, Codan Forsikring, USA	Co-author, Carsten Tanggaard	see Appendix I
43	M. C. Jones, The Open University, England	Co-author, Carsten Tanggaard	see Appendix I
44	Xin Huang, University of Oklahoma, USA	Co-author, Tim Bollerslev and Torben G. Andersen	see Appendix I
45	Viktor Todorov, Northwestern University, USA	Co-author, Tim Bollerslev and Torben G. Andersen	see Appendix I
46	Michael Gibson, Federal Reserve Board, USA	Co-author, Tim Bollerslev	see Appendix I
47	Hao Zhou, Federal Reserve Board, USA	Co-author, Tim Bollerslev	see Appendix I
48	Tzuohann Law, Duke University, USA	Co-author, Tim Bollerslev	see Appendix I
49	George Tauchen, Duke University, USA	Co-author, Tim Bollerslev	see Appendix I
50	Per H. Frederiksen, Nykredit Markets, Denmark	Co-author, Morten Ø. Nielsen, Torben G. Andersen, Tim Bollerslev, Frank Nielsen	see Appendix I
51	Uta Kretschmer, University of Bonn, Germany	Co-author, Tim Bollerslev	see Appendix I
52	Christian Pigorsch, University of Munich, Germany	Co-author, Tim Bollerslev	see Appendix I
53	Luca Benzoni, Federal Reserve Board, Chicago, USA	Co-author, Torben G. Andersen	see Appendix I
54	Daniel Ziggel, Ruhr-University of Bochum, Germany	Co-author, Mark Podolskij	see Appendix I
55	Mattias Vetter, Ruhr-University of Bochum, Germany	Co-author, Mark Podolskij	see Appendix I
56	Julie Lyng Forman, University of Copenhagen, Denmark	Co-author, Michael Sørensen	see Appendix I

57	Thomas Elgaard Jensen, Energi Danmark A/S, Denmark	Co-author, Bent J. Christensen and Rune Mølgaard	see Appendix I
58	Stuart Hyde, Manchester Business School, England	Co-author, Tom Engsted and Stig V. Møller	see Appendix I
59	David F. Hendry, Oxford University, England	Co-author, Søren Johansen	see Appendix I
60	Carlos Santos, Oxford University, England	Co-author, Søren Johansen	see Appendix I
61	Bent Nielsen, Oxford University, England	Co-author, Søren Johansen	see Appendix I
62	Kris Jacobs, McGill University, Canada	Co-author, Peter Christoffersen	see Appendix I
63	Karim Mimouni, McGill University, Canada	Co-author, Peter Christoffersen	see Appendix I
64	Gregory Vainberg, McGill University, Canada	Co-author, Peter Christoffersen	see Appendix I
65	Anders Rygh Swensen, University of Oslo, Norway	Co-author, Søren Johansen	see Appendix I
66	José Manuel Corcuera, University of Barcelona, Spain	Co-author, Ole Barndorff-Nielsen, Mark Podolskij	see Appendix I
67	Jean Jacod, Université Pierre et Marie Curie, France	Co-author, Mark Podolskij	see Appendix I
68	Yingying Li, University of Chicago, USA	Co-author, Mark Podolskij	see Appendix I
69	Per Mykland, University of Chicago, USA	Co-author, Mark Podolskij	see Appendix I
70	Tomoaki Nakatani, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
71	Zhengfang Zhao, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
72	Anne Peguin-Feissolle, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
73	Birgit Strikholm, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
74	Juerg Schmiegl, University of Aarhus	Co-author, Ole Barndorff-Nielsen	see Appendix I
75	Friedrich Hubalek, Vienna University of Technology, Austria	Co-author, Ole Barndorff-Nielsen	see Appendix I
76	Makoto Maejima, Keio University, Japan	Co-author, Ole Barndorff-Nielsen	see Appendix I
77	Abreva Jason, Purdue University, USA	Co-author, Christian M. Dahl	see Appendix I
78	Jeremy Large, Oxford University, England	Co-author, Asger Lunde, Peter R. Hansen	see Appendix I
79	Roman Frydman, New York University, USA	Co-author, Søren Johansen	see Appendix I
80	Katarina Juselius, University of Copenhagen, Denmark	Co-author, Søren Johansen	see Appendix I
81	Michael Goldberg, University of New Hampshire, USA	Co-author, Søren Johansen	see Appendix I
82	Allan Zebedee, San Diego State University, USA	Co-author, Asger Lunde, Peter R. Hansen	see Appendix I
83	Eric Bentzen, Copenhagen School of Business, Denmark	Co-author, Asger Lunde, Peter R. Hansen	see Appendix I
84	Asaf Zussman, Cornell University, USA	Co-author, Morten Ø. Nielsen	see Appendix I
85	Noam Zussman, Cornell University, USA	Co-author, Morten Ø. Nielsen	see Appendix I
86	Silja Kinnebrock, Oxford University, England	Co-author, Mark Podolskij	see Appendix I

87	Bo Martin Bibby, University of Aarhus, Denmark	Co-author, Michael Sørensen	see Appendix I
88	Martin Jacobsen, University of Aarhus, Denmark	Co-author, Michael Sørensen	see Appendix I
89	Andres Gonzales, Banco de la Republica de Colombia, Colombia	Co-author, Timo Teräsvirta	see Appendix I
90	Hans Malmsten, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
91	He Changli, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
92	Annastiina Silvennoinen, Univ. of Technology Sydney, Australia	Co-author, Timo Teräsvirta	see Appendix I
93	Graham Elliott, University of California San Diego, USA	Co-author, Allan Timmermann	see Appendix I
94	Ivana Komunjer, University of California San Diego, USA	Co-author, Allan Timmermann	see Appendix I
95	Bruce Lehman, University of California San Diego, USA	Co-author, Allan Timmermann	see Appendix I
96	John A. Carlson, Purdue University, USA	Co-author, Christian M. Dahl	see Appendix I
97	Carol L. Osler, Brandeis University, USA	Co-author, Christian M. Dahl	see Appendix I
98	Christina Amado, Stockholm School of Economics, Sweden	Co-author, Timo Teräsvirta	see Appendix I
99	Christian Dorion, McGill University, Canada	Co-author, Peter Christoffersen	see Appendix I
100	Yintian Wang, Tsinghua University, China	Co-author, Peter Christoffersen	see Appendix I
101	Chayawat Ornthanalai, McGill University, Canada	Co-author, Peter Christoffersen	see Appendix I

A.4 Visitors to CREATES 2007

	Name	Affiliation	Period
1	Andersen, Torben G.	Northwestern University	15-24 August
2	Andersson, Fredrik	University of Lund	30 Nov - 1 Dec
3	Bauwens, Luc	CORE, Belgium	10-12 April
4	Bjerkholt, Olav	University of Oslo	20 November
5	Bollerslev, Tim	Duke University	3-26 August
6	Boswijk, Peter	University of Amsterdam	7-10 November
7	Bunzel, Helle	Iowa State University	August-December
8	Cavaliere, Giuseppe	University of Bologna	14-20 November
9	Christoffersen, Peter	McGill University	At CBS the academic year 2007/2008. Regular visits to CREATES.
10	Courcuera, José Manuel	University of Barcelona	20-25 October
11	Davidson, James	University of Exeter	28 June - 5 July
12	Gao, Jiti	University of Western Australia	15-18 September
13	Granger, Clive W.J.	Univ. of California, San Diego	18-22 August
14	Hansen, Peter Reinhard	Stanford University	5-9 May August 17-20 December
15	Harvey, Andrew	Cambridge University	11-16 November
16	Hualde, Javier	Universidad de Navarra	28 June - 4 July
17	Hyde, Stuart	MBS, University of Manchester	19-21 September
18	Iglesias, Emma	Michigan State University	22-25 November
19	Jansson, Michael	University of California, Berkeley	July
20	Kinnebrock, Silja	Oxford University	14-19 October
21	Kristensen, Dennis	Columbia University	August
22	Lange, Theis	University of Copenhagen	28-29 November
23	Linton, Oliver	London School of Economics	21-24 August
24	Lütkepohl, Helmut	Europ. Univ. Institute, Florence	31 Oct - 2 Nov
25	Nielsen, Morten Ørregaard	Cornell University	June-August
26	Nyberg, Peter	Hanken, Swedish School of Economics and Business Administration	15-17 May
27	Ooms, Marius	Free University of Amsterdam	28 June - 4 July
28	Paap, Richard	Erasmus University Rotterdam	4-5 October
29	Palandri, Alessandro	University of Copenhagen	13-21 August 28 November
30	Patton, Andrew	London School of Economics	15-18 August
31	Silvennoinen, Annastiina	Stockholm School of Economics	11-18 June
32	Stentoft, Lars	HEC, Montreal	August 3-21 December
33	Robert Taylor	University of Nottingham	25 Oct - 30 Nov
34	Timmermann, Allan	Univ. of California, San Diego	16-20 August
35	Tjöstheim, Dag	University of Bergen	18-21 August
36	Voev, Valeri	University of Konstanz	5-7 December

Appendix B: Conferences

B.1 Organization of international conferences, symposia, seminars etc.

	Title and date of event	Number of participants:	
		International	Danish
1	Symposium on "Long Memory", 28 June - 4 July Invited Speakers: James Davidson, University of Exeter Javier Hualde, Universidad de Navarra Marius Ooms, Free University Amsterdam	3	12
2	CREATES Summer symposium, August 2007 Invited Speakers: Andrew Patton, Oxford University Oliver Linton, LSE Dag Tjøstheim, University of Bergen	3	41
3	CREATES Opening Conference, 19-20 August	41	2
4	Distinguished Speaker Lecture: Nobel Laureate, Prof. Clive W. J. Granger, University of California at San Diego, 21 August		
5	Mini symposium on "Time Series Econometrics", 15 November Invited Speakers: Andrew Harvey, Cambridge University Guiseppe Cavaliere, University of Bologna Robert Taylor, University of Nottingham	3	17
6	Christmas Workshop, 28 November Invited Speakers: Robert Taylor, University of Nottingham	20	1

B.2 PhD courses:

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|---|--|
| 1 | Timo Teräsvirta, CREATES, "A Short Course in Non-Linear Econometrics", 29-30 March |
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| 2 | Herman J. Bierens, Penn State University, "Semi-non Parametric Econometrics", 21-23 May |
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| 3 | Charles Bos, Vrije Universiteit Amsterdam, "Course on OX", 24-27 September |
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| 4 | Søren Johansen, Katarina Juselius, Heino Bohn, University of Copenhagen, "Cointegration Analysis of Non-stationary I(2) Variables", 29 October - 2. November |
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|---|---|
| 5 | Robert Taylor, University of Nottingham, "Topics in Time Series Econometrics", 5-6 November |
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B.3 Weekly Seminars:

	Date	Speaker	Title
1	11 April	Luc Bauwens, CORE, Belgium	A Component GARCH Model with Time Varying Weights
2	18 April	Björn Hansson, University of Lund	Predictable dynamics in market, size, and beta values
3	2 May	Christian M. Dahl, CREATES	Asymptotic normality of the QMLE of stationary and nonstationary GARCH with serially dependent innovations
4	9 May	Toke L. Hjortshøj, CREATES	Risk shifting, Debt Governance and Managerial Incentives
5	16 May	Peter Nyberg, Hanken, Swedish School of Economics and Business Administration	Volatility Risk Premium, Risk Aversion, and the Cross-section of Stock Returns
6	23 May	Hermann J. Bierens, Penn State University	Semi-Nonparametric Estimation of Independently and Identically Repeated First-Price Auctions via Simulated Method of Moments
7	30 May	Helle Bunzel, Iowa State University and CREATES	Testing for Breaks using Alternating Observations (with E.M. Iglesias)
8	13 June	Mark Podolskij, Ruhr Universität, Bochum, and CREATES	Estimation of Volatility Functionals in the Simultaneous Presence of Microstructure noise and jumps
9	29 June	Søren Johansen, Univ.of Copenhagen and CREATES	Likelihood Inference for a Nonstationary Fractional Autoregressive Model
10	29 June	Katarzyna Lasak, Universidad Carlos III de Madrid and CREATES	Maximum Likelihood Estimation of Fractionally Integrated Systems
11	30 June	Marius Ooms, Vrije Universiteit, Amsterdam	Long Memory Modelling of Inflation with Stochastic Volatility and Structural Breaks
12	2 July	Morten Ø. Nielsen, Cornell University and CREATES	Nonparametric Cointegration Analysis of Fractional Systems with Unknown Integration Orders
13	2 July	James Davidson, University of Exeter	Convergence to Stochastic Integrals with Fractionally Integrated Integrator Processes
14	3 July	Javier Hualde, Universidad de Navarra	Unbalanced Cointegration
15	3 July	Frank S. Nielsen, CREATES	Regime Switching and Long Memory in Electricity Prices
16	4 July	Michael Jansson, UC Berkeley and CREATES	Optimal Inference for Instrumental Variables Regression with non-Gaussian Errors
17	4 July	Timo Teräsvirta, CREATES	Modelling Conditional and Unconditional Heteroscedasticity with Smoothly Time-Varying Structure
18	16 August	Andrew Patton, London School of Economics	Data-based ranking of realized volatility estimators
19	22 August	Oliver Linton, London School of Economics	Efficient Semiparametric Estimation of the Fama-french Model and Extensions
20	13 Sep	Olaf Posch, CREATES	Jump-Diffusion Estimation in Macroeconomics

21	17 Sep	Jiti Gao, University of Western Australia	Econometric Estimation in Long-Range Dependent Volatility Models: Theory and Practice
22	20 Sep	Stuart Hyde, MBS, University of Manchester	Regime Changes in the Relationship between Stock Returns and the Macroeconomy
23	24 Sep	Christopher Skeels, University of Melbourne	Some Contributions to the Theory of Weakly Identified Linear Simultaneous Equations Models
24	27 Sep	Charles Bos, Vrije Universiteit Amsterdam	Dynamic Correlations and Optimal Hedge Ratios
25	4 Oct	Richard Paap, Erasmus University Rotterdam	Do Leading Indicators Lead Peaks More Than Troughs?
26	11 Oct	Katarzyna Lasak, CREATES	Fractional Cointegration Rank Estimation
27	18 Oct	Silja Kinnebrock, Oxford University	A Note On the Central Limit Theorem for Bipower Variation of General Functions and Applications (joint with The Thiele Centre)
28	23 Oct	José Manuel Corcuera, Universitat de Barcelona	Power Variation and Gaussian Processes with Stationary Increments
29	26 Oct	Robert Taylor, University of Nottingham	Testing for a Unit Root in the Presence of a Possible Break Trend
30	1 Nov	Helmut Lutkepohl, European University Institute, Florence	Identifying Monetary Policy Shocks via Changes in Volatility
31	8 Nov	Peter Boswijk, University of Amsterdam	Testing for Cointegration with Nonstationary Volatility
	15 Nov	Mini Symposium:	
32		Andrew Harvey, Cambridge University	When Is a Copula Constant? A Test for Changing Relationships
33		Giuseppe Cavaliere, University of Bologna	Robust Inference in Autoregressions with Multiple Outliers
34		Robert Taylor, University of Nottingham	Unit Root Testing in Practice: Dealing with Uncertainty over the Trend and Initial Condition
36	20 Nov	Olav Bjerkholt, University of Oslo	Trygve Haavelmo's visit in Aarhus 1938-39
37	23 Nov	Emma Iglesias, Michigan State University	Estimation of Tail Thickness Parameters from GARCH Models

28 Nov		CREATES Christmas Workshop	
38		Theis Lange, University of Copenhagen	Stability Results for First and Second Order Non-Linear Cointegration Models
39		Robert Taylor, University of Nottingham	Testing for Co-Integration in Vector Autoregressions with Non-Stationary Volatility
40		Alessandro Palandri, University of Copenhagen and CREATES	Sequential Conditional Correlations: Inference and Evaluation
41		Peter Christoffersen, McGill University and CREATES	Models for S&P500 Dynamics: Evidence from Realized Volatility, Daily Returns, and Option Prices
42	30 Nov	Fredrik Andersson, University of Lund	Wavelet Analysis of Economic Time Series
43	6 Dec	Valeri Voev, University of Konstanz	Estimating High-Frequency Based
44	13 Dec	Jörn Sass, RICAM, Austrian Academy of Sciences	Trading Regions for Portfolio Optimization Under Transaction Costs
45	19 Dec	Peter Reinhard Hansen, Stanford University and CREATES	In-Sample Out-of-Sample Fit: Their Joint Distribution and Its Implications for Model Selection

B.4 Participation in international conferences, symposia, seminars etc.

B.4.1. Invited departmental seminars

	Venue	Name(s) of participants	Contribution	Invited talk
1	University of Alicante	Søren Johansen	Paper presentation	X
2	Banca D'Italia, Roma	Timo Teräsvirta	Paper presentation	X
3	Bikent University, Ankara	Katarzyna Łasak	Paper presentation	X
4	Brown University	Michael Jansson	Paper presentation	X
5	Boston University	Bent J. Christensen	Paper presentation	X
6	CAM, Copenhagen	Søren Johansen	Paper presentation	X
7	Carlos III, Madrid, November	Anders Rahbek	Paper presentation	X
8	Carnegie-Mellon University	Torben G. Andersen	Paper presentation	X
9	CBS Economics	Peter Christoffersen	Paper presentation	X
10	CBS Finance	Peter Christoffersen	Paper presentation	X
11	CEBR, Copenhagen Business School	Christian Dahl	Paper presentation	X
12	Columbia University	Michael Jansson	Paper presentation	X
13	Cornell University	Torben G. Andersen	Paper presentation	X
14	Cornell University, Economics Dept.	Morten Ø. Nielsen	Paper presentation	X
15	Cornell University, Statistics Dept.	Morten Ø. Nielsen	Paper presentation	X
16	Dansk Selskab for Teoretisk Statistik	Søren Johansen	Paper presentation	X
17	Duke University, Department of Economics	Torben G. Andersen	Paper presentation	X
18	Ente Einaudi, Roma	Timo Teräsvirta	Paper presentation	X
19	Erasmus University, Rotterdam	Torben G. Andersen	Paper presentation	X
20	European University Institute, Florence	Timo Teräsvirta	Paper presentation	X
21	Georgetown University, Washington DC	Tim Bollerslev	Paper presentation	X
22	Goldman Sachs Asset Management	Allan Timmermann	Paper presentation	X
23	Harvard University	Bent J. Christensen	Paper presentation	X
24	Harvard Business School	Bent J. Christensen	Paper presentation	X
25	HEC, Montreal	Peter R. Hansen	Paper presentation	X
26	HEC, Montreal	Allan Timmermann	Paper presentation	X
27	Humboldt University of Berlin	Michael Sørensen	Paper presentation	X
28	London School of Economics	Dennis Kristensen	Paper presentation	X
29	Louisiana State University	Peter R. Hansen	Paper presentation	X
30	Michigan State University	Morten Ø. Nielsen	Paper presentation	X
31	Mittag-Leffler Institute, Stockholm	Michael Sørensen	Paper presentation	X
32	New York University	Michael Jansson	Paper presentation	X
33	Nuffield College, Oxford	Søren Johansen	Paper presentation	X
34	Oxford-Man Institute	Peter R. Hansen	Paper presentation	X
35	Penn State	Dennis Kristensen	Paper presentation	X
36	Purdue University	Morten Ø. Nielsen	Paper presentation	X
37	Queen's University	Morten Ø. Nielsen	Paper presentation	X
38	Rothman School, University of Toronto	Allan Timmermann	Paper presentation	X
39	Rotterdam, Holland	Søren Johansen	Paper presentation	X
40	Rutger's University	Morten Ø. Nielsen	Paper presentation	X
41	Simon Fraser University, Vancouver	Tim Bollerslev	Paper presentation	X
42	Stanford University	Michael Jansson	Paper presentation	X
43	Statistisk Sentralbyrå, Oslo	Niels Haldrup	Paper presentation	X
44	Swiss Finance Institute	Tim Bollerslev	Paper presentation	X

45	Texas A&M	Peter R. Hansen	Paper presentation	X
46	Texas A&M	Morten Ø. Nielsen	Paper presentation	X
47	UC Berkeley	Michael Jansson	Paper presentation	X
48	UC Davis	Peter R. Hansen	Paper presentation	X
49	UC Riverside	Morten Ø. Nielsen	Paper presentation	X
50	UCLA	Morten Ø. Nielsen	Paper presentation	X
51	Universidad Carlos III de Madrid,	Katarzyna Łasak	Paper presentation	X
52	University of Chicago	Asger Lunde	Paper presentation	X
53	University of Chicago, Graduate School of	Peter Christoffersen	Paper presentation	X
54	University of Copenhagen, Economics	Peter Christoffersen	Paper presentation	X
55	University of Copenhagen	Martin M. Andreasen	Paper presentation	X
56	University of Exeter, Finance	Peter Christoffersen	Paper presentation	X
57	University of Oslo	Niels Haldrup	Paper presentation	X
58	University of Pennsylvania	Peter R. Hansen	Paper presentation	X
59	University of Pennsylvania	Tim Bollerslev	Paper presentation	X
60	University of Rochester	Michael Jansson	Paper presentation	X
61	University of Uppsala	Michael Sørensen	Paper presentation	X
62	University of Wisconsin	Michael Jansson	Paper presentation	X
63	University of Zurich	Tim Bollerslev	Paper presentation	X
64	Yale University	Michael Jansson	Paper presentation	X

B.4.2. Participation in conferences etc.

Title of event	Venue	Name(s) of participants	Contribution	Invited talk
American Economic Association Annual Meeting	Chicago, Illinois	Katarzyna Łasak	Paper presentation	
American Finance Association Meeting	Chicago, Illinois	Torben G. Andersen	Paper presentation	
Board of Governors	Washington, DC	Tim Bollerslev	Paper presentation	
CAF members' meeting	Sandbjerg, Denmark	Henning Bunzel	Paper presentation	
Canadian Econometrics Study Group	Montreal, Canada	Morten Ø. Nielsen	Paper presentation	
CEA/ESRC Conference on Financial Econometrics	Cass School of Business, London	Torben G. Andersen	Paper presentation	X
		Tim Bollerslev	Paper presentation	X
CIRANO/CIREQ Financial Econometrics	University of Montreal	Peter Christoffersen	Paper presentation	X
		Dennis Kristensen	Paper presentation	X
Conference in Honour of Paul Newbold	Nottingham, UK	Morten Ø. Nielsen	Paper presentation	
Conference on Financial Econometrics	Imperial College, London, UK	Almut Veraart	Paper presentation	
Conference on Financial Time Series II	TU Graz, Austria	Timo Teräsvirta	Paper presentation	X
Conference on Likelihood Methods in Finance	Princeton University	Michael Sørensen	Paper presentation	X
CREATES Opening Conference	University of Aarhus	Torben G. Andersen	Paper presentation	X
		Asger Lunde	Paper presentation	X
		Mark Podolskij	Paper presentation	X
		Allan Timmermann	Paper presentation	X
		Tom Engsted	Paper presentation	X
		Søren Johansen	Paper presentation	X
		Helle Bunzel	Paper presentation	X
		Dennis Kristensen	Paper presentation	X
		Peter R. Hansen	Paper presentation	X
		Christian M. Dahl	Paper presentation	X
		Bent Jesper Christensen	Paper presentation	X
		Peter Christoffersen	Paper presentation	X
		Lars Stentoft	Paper presentation	X
		Charlotte Christiansen	Paper presentation	X

		Anders Rahbek	Paper presentation	X
		Ole Barndorff-Nielsen, Tim Bollerslev, Lasse Bork, Thomas Busch, Niels Haldrup, Eske Stig Hansen, Anders Kock, Katarzyna Łasak, Rune Mølgaard, Stig V. Møller, Frank Nielsen, Thomas Quistgaard Pedersen, Alessandro Palandri, Torben Rasmussen, David Skovmand, Carsten Tanggaard, Leonidas Tsiaras, Almut Veraart, Jie Zhu		
CREATES Long Memory Symposium, June-July 2007	University of Aarhus	Michael Jansson	Paper presentation	X
		Søren Johansen	Paper presentation	X
		Katarzyna Łasak	Paper presentation	X
		Morten Ø. Nielsen	Paper presentation	X
		Frank S. Nielsen	Paper presentation	X
		Timo Teräsvirta	Paper presentation	X
CREATES Mini Symposium on "Time Series Econometrics", November 2007	University of Aarhus	Lasse Bork		
		Helle Bunzel		
		Henning Bunzel		
		Bent J. Christensen		
		Charlotte Christiansen		
		Peter Christoffersen		
		Christian M. Dahl		
		Tom Engsted		
		Katarzyna Łasak		
		Niels Haldrup		
		Eske Stig Hansen		
		Thomas Quistgaard		
		Timo Teräsvirta		
		Leonidas Tsiaras		
		Almut Veraart		
		Jie Zhu		
CREATES Christmas Workshop, December 2007	University of Aarhus	Peter Christoffersen	Paper presentation	X
		Theis Lange	Paper presentation	X
		Alessandro Palandri	Paper presentation	X
		Helle Bunzel		
		Bent J. Christensen		
		Tom Engsted		
		Niels Haldrup		
		Eske Stig Hansen		
		Søren Johansen		
		Katarzyna Łasak		
		Olaf Posch		
		Thomas Quistgaard		
		Carsten Tanggaard		
		Timo Teräsvirta		
		Almut Veraart		
		Jie Zhu		
D-CAF members' meeting	Sandbjerg, Denmark	Henning Bunzel		

Danish Econometric Society meeting	Sandbjerg, Denmark	Henning Bunzel Niels Haldrup	Organizer Paper presentation	X
EEA-ESEM 2007	Budapest, Hungary	Timo Teräsvirta		X
EC2 Meeting 2007	Faro, Portugal	Helle Bunzel Theis Lange Frank S. Nielsen Morten Ø. Nielsen Niels Haldrup Anders Rahbek	Paper presentation Paper presentation Paper presentation Paper presentation Organizer	
Econometric Society Summer Meeting, North America	Duke University	Torben G. Andersen Peter R. Hansen Theis Lange Morten Ø. Nielsen	Paper presentation Paper presentation Paper presentation Paper presentation	X
Econometric Society Summer Meeting, Europe	Budapest, Hungary	Peter R. Hansen Tim Bollerslev	Paper presentation Paper presentation	X
Econometric Society Winter Meeting	Chicago, Illinois	Torben G. Andersen Michael Jansson	Paper presentation Paper presentation	
Econometric Study Group meeting	Nottingham, UK	Helle Bunzel	Paper presentation	X
Econometric Theory and Practice, A Conference in Honor of Phoebeus J. Dhrymes	Paphos, Cyprus	Søren Johansen	Paper presentation	X
EFMA Annual Congress	Vienna, Austria	Tom Engsted	Paper presentation	X
ESF Workshop on Econometric time-series analysis applied to climate research	Frascati, Italy	Søren Johansen	Paper presentation	X
ESRC Study Group Meeting	Bristol, England	Niels Haldrup	Paper presentation	X
European Finance Association	Ljubljana, Slovenia	Peter Christoffersen	Paper presentation	
Far Eastern Meeting of the Econometric Society	Hong Kong University of Science and Technology	Theis Lange	Paper presentation	
5th ECB Workshop on Forecasting Techniques	ECB, Frankfurt, Germany	Peter R. Hansen Timo Teräsvirta	Paper presentation Paper presentation	X X
5th INFINITI Conference	IIIS, Trinity College, Dublin, Ireland	Charlotte Christiansen	Paper presentation	
5th International Conference on Lévy Processes: Theory and Application	Copenhagen, Denmark	Almut Veraart		
Financial Econometrics	Imperial College, London	Peter Christoffersen Tim Bollerslev	Paper presentation Paper presentation	X

FindEcon 2007 Conference	Lodz	Tom Engsted	Paper presentation	X
First Workshop on Nonlinear Models	Keele University, UK	Timo Teräsvirta	Paper presentation	X
4th Nordic Econometric Meeting	Tartu, Estonia	Henning Bunzel		
Fractional Cointegration Workshop, March 2007	Varese	Søren Johansen	Paper presentation	
Fractional Processes, July 2007	South African Econometric Society	Søren Johansen	Paper presentation	
Greater NY Metropolitan Area Econometrics Colloquium	University of Pennsylvania	Dennis Kristensen	Paper presentation	
Institute of International Forecasters Conference	New York	Allan Timmermann	Paper presentation	X
Interest Rate Term Structure Modeling Conference	Erasmus University, Rotterdam	Torben G. Andersen	Paper presentation	X
ISI 56th Session	Lisbon, Portugal	Søren Johansen Michael Sørensen	Paper presentation Paper presentation	 X
Italian Statistical Society	Venice, Italy	Anders Rahbek	Paper presentation	X
Italian Statistical Society	Rome, Italy	Anders Rahbek	Paper presentation	X
LACEA-LAMES (Latin American Econometric Society Meeting)	Bogotá, Columbia	Timo Teräsvirta	Paper presentation	X
Levy Processes and Related Topics in Modelling	Oberwolfach, Germany	Mark Podolskij	Paper presentation	X
Levy Processes: Theory and Application	Copenhagen, Denmark	Mark Podolskij	Paper presentation	X
Montreal Actuarial and Financial Mathematics Day	Montreal, Canada	Lars Stentoft		
Multivariate Volatility Models Conference	University of Algarve	Peter R. Hansen Alessandro Palandri Timo Teräsvirta	Paper presentation Paper presentation Paper presentation	
NBER Summer Institute	Boston, Massachusetts	Tim Bollerslev	Paper presentation	

NBER-NSF time Series Conference	University of Iowa	Niels Haldrup Bent J. Christensen	Paper presentation Paper presentation	
Nordic Econometrics Meeting	Tallinn, Estonia	Dennis Kristensen	Paper presentation	
Northern Finance Association Annual Meeting	Toronto, Canada	Lars Stentoft	Paper presentation	
Optimization Days 2007	Montreal, Canada	Lars Stentoft	Paper presentation	
Quantitative Methods in Finance	Sydney, Australia	Michael Sørensen	Paper presentation	X
Real Time Data Conference	Philadelphia Federal Reserve	Allan Timmermann	Paper presentation	
S.Co. 2007 Fifth Conference: Complex Models and Computational Intensive Methods for Estimation and Prediction	Venice, Italy	Alessandro Palandri	Paper presentation	X
Satellite Summer School on Lévi Processes: Theory and Application	Sandbjerg, Denmark	Almut Veraart		
Second Forecasting Conference	Duke University	Peter R. Hansen	Paper presentation	X
2nd PhD Presentation Meeting	London School of Economics, UK	Katarzyna Łasak	Paper presentation	
2nd Tinbergen Institute Conference "20 years of cointegration"	Rotterdam, Holland	Katarzyna Łasak	Paper presentation	
Séminaire Européen de Statistique	La Manga del Mar Menor, Spain	Michael Sørensen	Paper presentation	X
Semiparametric and Nonparametric Methods in Econometrics	Oberwolfach, Germany	Dennis Kristensen	Paper presentation	X
		Mark Podolskij	Paper presentation	X
SETA	HKUST, Hong Kong	Christian M. Dahl Peter R. Hansen	Paper presentation Paper presentation	
SITE Conference	Stanford University, California	Tim Bollerslev	Paper presentation	X

SNDE	CREST-ENSAE, France	Christian M. Dahl Anders Rahbek	Paper presentation Paper presentation	
Society of Labour Economists	Chicago, Illinois	Henning Bunzel		
Stephen A. Ross Conference	MIT-Endicott House, Dedham, MA	Torben G. Andersen	Paper presentation	X
Stochastic Analysis and Statistical Inference I	Tokyo, Japan	Mark Podolskij	Paper presentation	X
Stochastic Analysis and Statistical Inference II	Tokyo, Japan	Mark Podolskij	Paper presentation	X
The 20th Australasian Finance & Banking Conference 2007	Sydney, Australia	Stig V. Møller		
Third DYNARE Conference	Paris School of Economics, France	Martin Møller Andreasen	Paper presentation	
XII Workshop on Dynamic Macroeconomics	Vigo, Spain	Martin Møller Andreasen	Paper presentation	
Volatility and High Frequency Data	Chicago, Illinois	Torben G. Andersen	Paper presentation	X
		Tim Bollerslev	Paper presentation	X
		Michael Sørensen	Paper presentation	X
World Computational Finance March 2007 MSRI, Berkeley	London, UK	David Skovmand		
Workshop on Methods and Applications for DSGE Models	Cleveland Fed	Dennis Kristensen	Paper presentation	X
Workshop on Statistics for Stochastic Processes	University of Amsterdam, Holland	Michael Sørensen	Paper presentation	X

B.5 Member of program committees for international conferences

Title of event	Name(s) of participants	Contribution
2007 Econometric Society European Meeting, ESEM, Budapest, Hungary	Niels Haldrup	Program committee member
	Timo Teräsvirta	Program committee member
	Bent J. Christensen	Program committee member
	Peter R. Hansen	Program committee member
	Søren Johansen	Program committee member
	Asger Lunde	Program committee member
	Anders Rahbek	Program committee member
2007 Northamerican Summer Meeting of the Econometric Society, Duke University, Durham	Tim Bollerslev	Program committee member
2007 EC2-meeting, Recent Advances in Time Series Econometrics, Faro Portugal	Anders Rahbek	Program chair
	Christian Dahl	Program committee member
	Søren Johansen	Program committee member
	Dennis Kristensen	Program committee member
	Theis Lange	Program committee member
	Morten Ø. Nielsen	Program committee member
2007 European Financial Association's 34th Annual Meeting, Ljubljana, Slovenia	Charlotte Christiansen	Program committee member
International conference on "Return predictability in the short and long run: Predictive variables, econometric issues, and relations to asset pricing, asset allocation, and the macro economy. Copenhagen 25-26 January, 2007	Tom Engsted	Program committee member and organizer

Note: The list above is not complete

Appendix C: Educational activities

	Title and date of activity:	Level	ECTS	Number of participants
1	Microeconomics, Statistics, Mathematics	BA	20	140
2	Regression Analysis	BA	5	140
3	Finance and Investments	BA	10	150
4	Topics in Applied Economics and Finance	BA/MSc	5	2
5	Econometrics	BA	10	57
6	Applied Time Series Econometrics	MSc	10	7
7	Econometrics 2	MSc	10	27
8	Investments	MSc	10	60
9	PhD Econometrics	PhD	10	7
10	Short Course in Non-linear Econometrics	PhD		12
11	Semi-non Parametric Econometrics	PhD		6
12	Course on Ox	PhD		18
13	Cointegration Analysis of Non-stationary I(2) Variables	PhD		25
14	Topics in Time Series Econometrics	Phd		14

Note: Courses taught by "Aarhus-CREATES" faculty at the School of Economics and Management, University of Aarhus, and PhD courses organized by CREATES. Courses taught at other institutions are not included in list.

Appendix D: Academic services

D.1 Scholarly communication

	Title of journal	Person	Editorial work
1	ALEA - Latin American Journal of Probability and Mathematical Statistics	Michael Sørensen	Associate Editor
2	Brazilian Journal of Probability and Statistics	Michael Sørensen	Associate Editor
3	Annals of Finance	Christian Dahl	Associate Editor
4		Allan Timmermann	Associate Editor
5	Applied Financial Economics	Timo Teräsvirta	Advisory Editor
6	Econometric Theory	Michael Jansson	Associate Editor
7	Econometrics Journal	Michael Jansson	Associate Editor
8		Dennis Kristensen	Associate Editor
9		Anders Rahbek	Associate Editor
10		Allan Timmermann	Associate Editor
11	Economic Policy Review	Allan Timmermann	Associate Editor
12	European Finance Review	Tim Bollerslev	Associate Editor
13	Finans/Invest	Charlotte Christiansen	Editorial Board
14		Tom Engsted	Editorial Board
15	Foundations and Trends in Econometrics	Tim Bollerslev	Associate Editor
16	Internat. Financial Markets, Institutions & Money	Tim Bollerslev	Associate Editor
17	Journal of Applied Econometrics	Tim Bollerslev	Co-editor
18		Niels Haldrup	Associate Editor
19		Peter Christoffersen	Associate Editor
20		Peter Reinhard Hansen	Associate Editor
21		Allan Timmermann	Associate Editor
22	Journal of Asset Management	Allan Timmermann	Associate Editor
23	Journal of Business and Economic Statistics	Allan Timmermann	Associate Editor
24	Journal of Economic Dynamics and Control	Allan Timmermann	Associate Editor
25	Journal of Financial Econometrics	Torben Andersen	Associate Editor
26		Peter Christoffersen	Associate Editor
27		Allan Timmermann	Associate Editor
28	Journal of Financial Forecasting (Risk Journals)	Allan Timmermann	Associate Editor
29	Journal of Futures Markets	Charlotte Christiansen	Associate Editor
30	Journal of Risk	Peter Christoffersen	Associate Editor
31	Journal of the European Mathematical Society	Ole Barndorff-Nielsen	Editorial Board
32	Mathematical Finance	Bent Jesper Christensen	Associate Editor
33	Monetary Studies	Timo Teräsvirta	Associate Editor
34	Oxford Bulletin of Economics and Statistics	Anders Rahbek	Associate Editor
35	Quantitative Finance	Peter Reinhard Hansen	Associate Editor
36	Research in International Business and Finance	Tom Engsted	Associate Editor
37	Scandinavian Journal of Economics	Niels Haldrup	Associate Editor
38	Statistical Inference for Stochastic Processes	Michael Sørensen	Associate Editor
39	Stochastic Processes and Their Applications	Michael Sørensen	Associate Editor

NOTE: The list includes editorial positions where the CREATES members serve in the editorial board as editor or associate editor. In addition, CREATES members regularly review journal articles as referees for peer reviewed journals. On average, senior CREATES members handle 6-8 papers annually.

Appendix E: External funding

E.1 Public Danish Funds

	Funding Body	Title/Purpose	Grant holder	Activity Period	Granted Amount, DKK	Amount for reported year, DKK
1	Danish Social Sciences Research Council	Dynamic Modelling of Long Memory and Persistence in Economic Time Series	Niels Haldrup	2006-2008	3,225,000	990,000
2	Danish Social Sciences Research Council	Analysis of Fractionally Integrated and Co-integrated Time Series with applications to Nordic Electricity Market Volatility	Morten Ø. Nielsen	2006-2008	560,000	187,000
3	Danish Social Sciences Research Council	Guest Professorship, Timo Teräsvirta	Niels Haldrup	2006-2007	912,000	608,000
4	Danish Social Sciences Research Council	Post doc Scholarship	Katarzyna Lasak	2008-2010	1,300,000	0
5	Danish Social Sciences Research Council	Quantile Regression on panel data in the presence of unobserved heterogeneity	Christian M. Dahl	2007-2008	563,000	281,000
6	Danish Social Sciences Research Council	Towards Integration of International Financial Markets	Charlotte Christiansen	2006-2008	611,000	203,000
7	Faculty of Social Sciences, University of Aarhus	1-year post doc Faculty Grant	Mark Podolskij	2007-2008	430,000	143,000
8	Faculty of Social Sciences, University of Aarhus	1-year post doc Faculty Grant	Olaf Posch	2007-2008	430,000	143,000
9	Faculty of Social Sciences, University of Aarhus	1-year post doc Faculty Grant	Katarzyna Lasak	2007-2008	430,000	179,000
10	Faculty of Social Sciences, University of Aarhus	2-year post doc Faculty Grant (Globalization)	Jie Zhu	2007-2008	860,000	72,000
11	Danish Center for Scientific Computing	Computing time at DCSC	Bent Jesper Christensen	2007-2008	400,000	200,000
12	Danish Social Sciences Research Council	2008 NBER-NSF time series conference, CREATES	Niels Haldrup	2008	96,000	96,000
Total					9,817,000	3,102,000

E.2 Private Danish Funds

	Funding Body	Title/Purpose	Grant holder	Activity Period	Granted Amount	Amount for reported year
1	Danmarks Nationalbank	2008 NBER-NSF time series conference, CREATES	Niels Haldrup	2008	75,800 kr.	0 kr

E.3 International Funds

	Funding Body	Title/Purpose	Grant holder	Activity Period	Granted Amount	Amount for reported year
1	NBER-National Bureau of Economic Research and NSF-National Science Foundation	2008 NBER-NSF time series conference, CREATES, 12-13 September 2008	Niels Haldrup	2008	USD 12,000	USD 12,000
2	Stevanovich Center for Mathematical Finance, University of Chicago	Stevanovich Center - CREATES joint conference in 2009: Financial Econometrics and Statistics, Current Themes and New Directions	Niels Haldrup	2009	300,000 kr	0 kr

Note: The list only includes grants for CREATES members at the Host Institution, University of Aarhus

Appendix F: Awards and acknowledgments

Award/acknowledgment	Recipient	Granted amount, if relevant
Certificate of Appreciation; American Statistical Association; for serving as Editor of Journal of Business & Economic Statistics, 2004-2006.	Torben G. Andersen	
Desautels Faculty Scholar Award	Peter Christoffersen	75,000 CAD
The Golden Pointer	Christian M. Dahl	10,000 DKK
Summer Research Grant	Dennis Kristensen	4,000 USD
EliteForsk Rejsestipendium 2007	Theis Lange	250,000 DKK
EliteForsk Rejsestipendium 2007	Rune Møllgaard	250,000 DKK
Tuborgfondens Erhvervsøkonomiske Pris	Martin M. Andreasen	150,000 DKK
Marie Curie Fellowship	Stig Vinther Møller	
Atkinson/Epstein Chair of Management Leadership	Allan Timmermann	
Excellence in Teaching, FlexMBA Class of 2007, Rady School, UCSD	Allan Timmermann	
International Journal of Forecasting, Best paper award 2004-2005	Allan Timmermann	
International Journal of Forecasting, Outstanding paper award 2004-2005	Allan Timmermann	

Appendix G: Public outreach

Appendix H: Patents and applications

Appendix I: Publications

I.1 Articles in refereed journals

- 1 2007, Torben G. Andersen, Tim Bollerslev, Francis X. Diebold and Clara Vega, Real-Time Price Discovery in Stock, Bond and Foreign Exchange Markets, Journal of International Economics, 73, 251-277 (PR) (CO)
- 2 2007, Torben G. Andersen, Tim Bollerslev and Francis X. Diebold, No-Arbitrage Semi-Martingale Restrictions for Continuous-Time Volatility Models Subject to Leverage Effects, Jumps and i.i.d. Noise: Theory and Testable Distributional Implications, Journal of Econometrics, 137, 125-180 (PR) (CO)
- 3 2007, Torben G. Andersen, Tim Bollerslev and Dobrislav Dobrev, Roughing it Up: Disentangling Continuous and Jump Components in Measuring, Modeling and Forecasting Asset Return Volatility, Review of Economics and Statistics, 89, 701-720 (PR) (CO)
- 4 2007, Ole Barndorff-Nielsen and R. Steizer, Positive-definite matrix processes of finite variation, Probability and Mathematical Statistics, 27, 3-43 (PR) (CO)
- 5 2007, Tim Bollerslev, Lin Peng and Wei Xiong, Investor Attention and Time-Varying Comovements, European Financial Management, 13, 394-422 (PR) (CO)
- 6 2007, Charlotte Christiansen, Juanna Joensen and Helena Skyt Nielsen, The Risk-Return Trade-Off in Human Capital Investment, Labour Economics, 14, 971-986 (PR) (CO)
- 7 2007, Charlotte Christiansen, Volatility-Spillover Effects in European Bond Markets, European Financial Management, 13, 923-948 (PR)
- 8 2007, Charlotte Christiansen and Angelo Ranaldo, Realized Bond-Stock Correlation: Macroeconomic Announcement Effects, Journal of Futures Markets, 27, 439-469 (PR) (CO)
- 9 2007, Peter Christoffersen, Francis Diebold, Roberto Mariano, Anthony Tay and Tse Yiu, Direction-of-Change Forecasts Based on Conditional Variance, Skewness and Kurtosis Dynamics: International Evidence, Journal of Financial Forecasting, 1, 1-22 (PR) (CO)
- 10 2007, Tom Engsted and Carsten Tanggaard, The Comovement of US and German Bond Markets, International Review of Financial Analysis, 16, 172-182 (PR) (CO)
- 11 2007, Michael Jansson, Victor Chernozhukov and Christian Hansen, Inference Approaches for Instrumental Variable Quantile Regression, Economics Letters, 95, 272-277 (PR) (CO)
- 12 2007, Richard Blundell, Xiaohong Chen and Dennis Kristensen, Semi-Nonparametric IV Estimation of Shape-invariant Engel Curves, Econometrica, 75, 1613-1669 (PR) (CO)
- 13 2007, Celso Brunetti and Peter Lildholdt, Time Series Modelling of Daily Log-Price Ranges for CHF/USD and USD/GBP, Journal of Derivatives, 15, 39-59 (PR) (CO)
- 14 2007, Morten Ø. Nielsen and Katsumi Shimotsu, Determining the cointegration rank in nonstationary fractional systems by the exact local Whittle approach, Journal of Econometrics, 141, 574-596 (PR) (CO)
- 15 2007, Bent Jesper Christensen and Morten Ø. Nielsen, The effect of long memory in volatility on stock market fluctuations, Review of Economics and Statistics, 89, 684-700 (PR) (CO)
- 16 2007, Morten Ø. Nielsen, Local Whittle analysis of stationary fractional cointegration and the implied-realized volatility relation, Journal of Business & Economic Statistics, 25, 427-446 (PR)
- 17 2007, Niels Haldrup, Svend Hylleberg, Gabriel Pons, Andreu Sanso, Common Periodic Correlation Features and the Interaction of Stocks and Flows in Daily Airport Data, Journal of Business and Economic Statistics, 25, 21-32. (PR) (CO)
- 18 2007, Niels Haldrup and Morten Ø. Nielsen, Estimation of fractional integration in the presence of data noise, Computational Statistics and Data Analysis, 51, 3100-3114 (PR) (CO)
- 19 2007, Kristian Stegenborg Larsen and Michael Sørensen, Diffusion models for exchange rates in a target zone, Mathematical Finance, 17, 285-306 (PR) (CO)
- 20 2007, David C. Porter, Carsten Tanggaard, Daniel G. Weaver and Wei Yu, Dispersed Trading and the Prevention of Market Failure: The Case of the Copenhagen Stock Exchange, European Financial Management, 14 (PR) (CO)

- 21 2007, Peter Løchte Jørgensen and David Skovmand, The Valuation of Callable Bonds with Floored CMS-spread Coupons, Wilmott Magazine, 32 (PR) (CO)
- 22 2007, Bruno Eklund and Timo Teräsvirta, Testing constancy of the error covariance matrix in vector models, Journal of Econometrics, 140, 753-780 (PR) (CO)
- 23 2007, Andrew Patton and Allan Timmermann, Testing Forecast Optimally Under Unknown Loss, Journal of American Statistical Association, 102, 1172-1184 (PR) (CO)
- 24 2007, Andrew Patton and Allan Timmermann, Properties of Optimal Forecasts under Asymmetric Loss and Nonlinearity, Journal of Econometrics, 140, 884-918 (PR) (CO)
- 25 2007, Massimo Giudolin and Allan Timmermann, Properties of Equilibrium Asset Prices under Alternative Learning Schemes, Journal of Economic Dynamics & Control, 31, 161-217 (PR) (CO)
- 26 2007, Massimo Giudolin and Allan Timmermann, Asset Allocation under Multivariate Regime Switching, Journal of Economic Dynamics and Control, 33, 3503-3544 (PR) (CO)
- 27 2007, Hashem Pesaran, Davide Pettenuzzo and Allan Timmermann, Learning, Structural Instability and Present Value Calculations, Econometric Reviews, 26, 253-288 (PR) (CO)
- 28 2007, Hashem Pesaran and Allan Timmermann, Selection of Estimation Window in the Presence of Breaks, Journal of Econometrics, 137, 134-161 (PR) (CO)
- 29 2007, Asger Lunde and Valeri Voev, Integrated covariance estimation using high-frequency data in the presence of noise, Journal of Financial Econometrics, 5, 68-104 (PR) (CO)
- 30 2007, Heino Bohn Nielsen and Anders Rahbek, Likelihood Ratio Testing for Cointegration Ranks in I(2) Models, Econometric Theory, 23, 615-637
- 31 2007, Kim Christensen and Mark Podolskij, Realised range-based estimation of integrated variance, Journal of Econometrics, 141, 323-349 (PR) (CO)

I.2 Notes in refereed journals

- 1 2007, Søren Johansen, Torben Schmith and Peter Thejll, A Semi-Empirical Approach to Projecting Future Sea-Level Rise, Science, 317 (PR) (CO)
- 2 2007, Søren Tolver Jensen and Anders Rahbek, A Note on the Law of Large Numbers for Functions of Geometrically Ergodic Time Series, Econometric Theory, 23, 761-767 (PR) (CO)
- 3 2007, David Skovmand and Michael Verhofen, Review of: D. Brigo & F. Mercurio: Interest Rate Models - Theory and Practice, Journal of Financial Markets and Portfolio Management, 21 (PR) (CO)

I.3 Contributions to refereed books

- 1 2007, Torben G. Andersen with Oleg Bondarenko, Construction and Interpretation of Model-Free Implied Volatility, in Israel Nelken (ed.), *Volatility as an Asset Class*, Risk Books, London, pp. 141-181 (PR) (CO)
- 2 2007, Torben G. Andersen, Tim Bollerslev, Francis X. Diebold and Paul Labys, Great Realizations, in Jon Danielsson (ed.), The Value-at-Risk References, Risk Publications, London, pp. 119-130 (reprinted from *Risk*, 13, 105-108, 2000).

I.4 Refereed books

- 1 2007, Clive W.J. Granger and Timo Teräsvirta, Modelling nonlinear economic relationships (Chinese edition), Shanghai University of Finance & Economics Press (PR) (CO)

I.5 Editor of refereed books

I.6 Working papers published in working paper series, conference contributions and non-refereed books, notes and articles

I.6.1 CREATES Research Papers 2007

- 1 2007, Dennis Kristensen, Nonparametric Estimation and Misspecification Testing of Diffusion Models (CREATES RP 2007-1)
- 2 2007, Dennis Kristensen, Nonparametric Filtering of the Realised Spot Volatility: A Kernel-based Approach (CREATES RP 2007-2)
- 3 2007, Bent Jesper Christensen and Morten Ø. Nielsen, The effect of long memory in volatility on stock market fluctuations (CREATES RP 2007-3)
- 4 2007, Amber Anand, Carsten Tanggaard and Daniel G. Weaver, Paying for Market Quality (CO) (CREATES RP 2007-4)
- 5 2007, Charlotte Christiansen, Level-ARCH Short Rate Models with Regime Switching: Bivariate Modeling of US and European Short Rates (CREATES RP 2007-5)
- 6 2007, Charlotte Christiansen, Decomposing European Bond and Equity Volatility (CREATES RP 2007-6)
- 7 2007, Stig V. Møller, Habit Persistence: Explaining Cross Sectional Variation in Returns and Time-Varying Expected Returns (CREATES RP 2007-7)
- 8 2007, Charlotte Christiansen, Juanna S. Schröter and Jesper Rangvid, Are Economists More Likely to Hold Stocks? (CREATES RP 2007-8)
- 9 2007, Thomas Busch, Bent Jesper Christensen and Morten Ø. Nielsen, The Role of Implied Volatility in Forecasting Future Realized Volatility and Jumps in Foreign Exchange, Stock and Bond Markets (CREATES RP 2007-9)
- 10 2007, Bent Jesper Christensen, Morten Ø. Nielsen and Jie Zhu, Long memory in stock market volatility and the volatility-in-mean effect: the FIEGARCH-M model (CREATES RP 2007-10)
- 11 2007, Mathias C. Cattaneo, Richard K. Crump and Michael Jansson, Optimal Inference for Instrumental Variable Regression with non-Gaussian Errors (CO) (CREATES RP 2007-11)
- 12 2007, Michael Jansson, Semiparametric Power Envelopes for Tests of the Unit Root Hypothesis (CREATES RP 2007-12)
- 13 2007, Jens Perch Nielsen, Carsten Tanggaard and M.C. Jones, Local Linear Density Estimation for Filtered Survival Data with Bias Correction (CO) (CREATES RP 2007-13)
- 14 2007, Torben G. Andersen, Tim Bollerslev and Xin Huang, A Reduced Form Framework for Modeling and Forecasting Jumps and Volatility in Speculative Prices; Under Second Round Review Journal of Econometrics (CO) (CREATES RP 2007-14)
- 15 2007, Viktor Todorov and Tim Bollerslev, Jumps and Beats: A New Framework for Disentangling and Estimating Systematic Risks (CO) (CREATES RP 2007-15)
- 16 2007, Tim Bollerslev, Michael Gibson and Hao Zhou, Dynamic Estimation of Volatility Risk Premia and Investor Risk Aversion from Option-Implied and Realized Volatilities (CO) (CREATES RP 2007-16)
- 17 2007, Tim Bollerslev and Hao Zhou, Expected Stock Returns and Variance Risk Premia (CO) (CREATES RP 2007-17)
- 18 2007, Torben G. Andersen, Tim Bollerslev and Francis X. Diebold, Roughing It Up: Including Jump Components in the Measurement, Modeling and Forecasting of Return Volatility (CO) (CREATES RP 2007-18)
- 19 2007, Tim Bollerslev, Tzuo Hann Law and George Tauchen, Risks, Jumps, and Diversification (CREATES RP 2007-19)
- 20 2007, Torben G. Andersen, Tim Bollerslev, Francis X. Diebold and Clara Vega, Real-Time Price Discovery in Global Stock, Bond and Foreign Exchange Markets (CO) (CREATES RP 2007-20)

- 21 2007, Torben G. Andersen, Tim Bollerslev, Per H. Frederiksen and Morten Ø. Nielsen, Continuous-Time Models, Realized Volatilities and Testable Distributional Implications for Daily Stock Returns; Working Paper, Department of Finance, Kellogg School, Northwestern University; Second Round Review, Journal of Applied Econometrics (CO) (CREATES RP 2007-21)
- 22 2007, Tim Bollerslev, Uta Kretschmer, Christian Pigorsch and George Tauchen, A Discrete-Time Model for Daily S&P Returns and Realized Variations: Jumps and Leverage Effects (CREATES RP 2007-22)
- 23 2007, Olaf Posch, Structural Estimation of Jump-Diffusion Processes in Macroeconomics (CREATES RP 2007-
- 24 2007, Torben G. Andersen and Oleg Bondarenko, Construction and Interpretation of Model-Free Implied Volatility (CO) (CREATES RP 2007-24)
- 25 2007, Torben G. Andersen and Luca Benzoni, Do Bonds Span Volatility Risk in the U.S. Treasury Market? A Specification Test for Affine Term Structure Models; under revision for Journal of Finance (CO) (CREATES RP 2007-25)
- 26 2007, Mark Podolskij and Daniel Ziggel, A Range-Based Test for the Parametric Form of the Volatility in Diffusion Models (CO) (CREATES RP 2007-26)
- 27 2007, Mark Podolskij and Mathias Vetter, Estimation of Volatility Functionals in the Simultaneous Presence of Microstructure Noise and Jump (CO) (CREATES RP 2007-27)
- 28 2007, Julie Lyng Forman and Michael Sørensen, The Pearson Diffusions: A Class of Statistically Tractable Diffusion Processes (CO) (CREATES RP 2007-28)
- 29 2007, Niels Haldrup, Frank S. Nielsen and Morten Ø. Nielsen, A Vector Autoregressive Model for Electricity Prices Subject to Long Memory and Regime Switching (CREATES RP 2007-29)
- 30 2007, Bent Jesper Christensen, Thomas Elgaard Jensen and Rune Mølgaard, Market Power in Power Markets: Evidence from Forward Prices Electricity (CO) (CREATES RP 2007-30)
- 31 2007, Tom Engsted, Stuart Hyde and Stig Vinter Møller, Habit Formation, Surplus Consumption and Return Predictability: International Evidence (CO) (CREATES RP 2007-31)
- 32 2007, Søren Johansen, Some identification problems in the cointegrated vector autoregressive model (CREATES RP 2007-32)
- 33 2007, Søren Johansen and Morten Ø. Nielsen Likelihood inference for a nonstationary fractional autoregressive model (CREATES RP 2007-33)
- 34 2007, Charlotte Christiansen and Angelo Rinaldo, Extreme Coexceedances in New EU Member States' Stock Markets (CREATES RP 2007-34)
- 35 2007, Søren Johansen, Correlation, Regression, and Cointegration of Nonstationary Economic Time Series (CREATES RP 2007-35)
- 36 2007, David F. Henry, Søren Johansen and Carlos Santos, Selecting a Regression Saturated by Indicators (CO) (CREATES RP 2007-36)
- 37 2007, Peter Christoffersen, Kris Jacobs and Karim Mimouni, Models for S&P 500 Dynamics: Evidence from Realized Volatility, Daily Returns, and Option Prices (CREATES RP 2007-37)
- 38 2007, Dennis Kristensen and Anders Rahbek, Likelihood-Based Inference in Nonlinear Error-Correction Models (CREATES RP 2007-38)
- 39 2007, Peter Christoffersen, Kris Jacobs and Gregory Vainberg, Forward-Looking Betas (CREATES RP 2007-39)
- 40 2007, Søren Johansen and Anders Rygh Swensen, Exact Rational Expectations, Cointegration, and Reduced Rank Regression (CREATES RP 2007-41)
- 41 2007, Ole Barndorff-Nielsen, José Manuel Corcuera and Mark Podolskij, Power Variation for Gaussian Processes with Stationary Increments (CO) (CREATES RP 2007-42)
- 42 2007, Jean Jacod, Yingying Li, Per A. Mykland, Mark Podolskij and Mathias Vetter, Microstructure Noise in the Continuous Case: The Pre-Averaging Approach - JLMPV-9 (CO) (CREATES RP 2007-43)
- 43 2007, Michael Sørensen, Efficient Estimation for Ergodic Diffusions Sampled at High Frequency (CREATES RP 2007-46)

I.6.2 Other working paper publications

- 44 2007, Mark Podolskij, Non-parametric estimation of the volatility path in the presence of noise (Oberwolfach reports, 7/2007)
- 45 2007, Mark Podolskij, Inference for diffusion processes in the simultaneous presence of noise and jumps (Oberwolfach reports, 7/2007)
- 46 2007, Mark Podolskij and Daniel Ziggel, Bootstrapping bipower variation (Technical report)
- 47 2007, Tomoaki Nakatani and Timo Teräsvirta, Testing for Volatility Interactions in the Constant Conditional Correlation GARCH Model(SSE/EFI Working Paper Series in Economics and Finance #649)
- 48 2007, Timo Teräsvirta and Zhenfang Zhao, Stylized Facts of Return Series, Robust Estimates, and Three Popular Models of Volatility (SSE/EFI Working Paper Series in Economics and Finance #662)
- 49 2007, Anne Péguin-Feissolle, Birgit Strikholm and Timo Teräsvirta, Testing the Granger noncausality hypothesis in stationary nonlinear models of unknown functional form (CO) (SSE/EFI Working Paper Series in Economics and Finance #672)
- 50 2007, Tomoaki Nakatani and Timo Teräsvirta, Positivity Constraints on the Conditional Variances in the Family of Conditional Correlation GARCH Models (CO) (SSE/EFI Working Paper Series in Economics and Finance #675)

I.7 Forthcoming articles in refereed journals and books

- 1 Ole Barndorff-Nielsen and J. Schmiegel, A stochastic differential equation framework for the timewise dynamics of turbulent velocities, Theory of Probability and Its Applications
- 2 Ole Barndorff-Nielsen and F. Hubalek, Probability measures, Lévy measures, and analyticity in time, Bernoulli
- 3 Ole Barndorff-Nielsen and M. Maejima, Semigroups of Upsilon transformations, Stochastic Processes and Their Applications
- 4 Ole Barndorff-Nielsen, Time change, volatility and turbulence, Proceedings of the Workshop on Mathematical Control Theory and Finance, Lisbon 2007
- 5 Torben G. Andersen, T. Bollerslev, P. Christoffersen, and Francis X. Diebold: Practical Methods for Financial Applications, Princeton University Press
- 6 Tim Bollerslev, Tzu-Hann Law and George Tauchen, Risk, Jumps and Diversification, Journal of Econometrics
- 7 Tim Bollerslev, Uta Kretschmer, Christian Pigorsch and George Tauchen, A Discrete-Time Model for Daily S&P500 Returns and Realized Variations: Jumps and Leverage Effects, Journal of Econometrics
- 8 Charlotte Christiansen, Level-ARCH Short Rate Models with Regime Switching: Bivariate Modeling of US and European Short Rates, International Review of Financial Analysis
- 9 Charlotte Christiansen, Juanna Joensen and Jesper Rangvid, Are Economists More Likely to Hold Stocks?, Review of Finance
- 10 Peter Christoffersen, Option Valuation with Long-run and Short-run Volatility Components, Journal of Financial Economics
- 11 Abrevaya Jason, Christian M. Dahl, The effects of birth inputs on birthweight: evidence from quantile estimation on panel data, Journal of Business & Economic Statistics
- 12 Peter Reinhard Hansen, Jeremy Large and Asger Lunde, Moving Average Based Estimators of Integrated Variance, Econometric Reviews
- 13 Michael Jansson, Optimal Invariant Inference when the Number of Instruments is Large, Econometric Theory
- 14 Michael Jansson, Semiparametric Power Envelopes for Tests of the Unit Root Hypothesis, Econometrica
- 15 Søren Johansen, Correlation, regression, and cointegration of nonstationary economic time series, Bulletin of the International Statistical Institute 2007, ISI
- 16 Søren Johansen, A Representation Theory for a Class of Vector Autoregressive Models for Fractional Processes, Econometric Theory
- 17 Søren Johansen, Cointegration. Overview and Development. Handbook of Financial Time Series, Springer Verlag
- 18 Søren Johansen, Reduced Rank Regression. New Palgrave Dictionary of Economics, Palgrave Macmillan
- 19 Søren Johansen, Representation of Cointegrated Autoregressive Processes with Application to Fractional Processes, Econometric Review. Forthcoming 2009
- 20 D.F. Hendry, S. Johansen and C. Santos, Automatic selection of indicators in a fully saturated regression, Computational Statistics
- 21 Søren Johansen and A.R. Swensen, Exact Rational Expectations, Cointegration, and reduced rank regression, Journal of Statistical Planning and Inference
- 22 Roman Frydman, Michael Goldberg, Søren Johansen and Katarina Juselius, Testing hypotheses in an I(2) model with applications to the persistent long swings in the Dmk/\$ rate, Journal of Econometrics

- 23 Eric Bentzen, Peter R. Hansen, Asger Lunde and Allan Zebedee, The Greenspan Years: An Analysis of the Magnitude and Speed of the Equity Market to FOMC Announcements, Financial Markets and Portfolio Management, Springer Verlag
- 24 Per Frederiksen and Morten Ø. Nielsen, Finite sample accuracy and choice of sampling frequency in integrated volatility estimation, Journal of Empirical Finance
- 25 Morten Ø. Nielsen, Asaf Zussman and Noam Zussman, Asset market perspectives on the Israeli-Palestinian conflict, Economica
- 26 Silja Kinnebrock and Mark Podolskij, A Note on the Central Limit Theorem for Bipower Variation of General Functions, Stochastic Processes and Their Applications
- 27 Kim Christensen, Mark Podolskij and Mathias Vetter, Bias-correcting the Realised Variance in the Presence of Market Microstructure Noise, Finance and Stochastics
- 28 Julie Lyng Forman and Michael Sørensen, The Pearson diffusions: A class of statistically tractable diffusion processes, Scandinavian Journal of Statistics
- 29 Bo Martin Bibby, Martin Jacobsen and Michael Sørensen, Estimating functions for discretely sampled diffusion-type models, Handbook of Financial Econometrics, North-Holland
- 30 M.C. Jones, Jens Perch Nielsen and Carsten Tanggaard, Local linear density estimation for filtered survival data, with bias correction, Statistics
- 31 Andrés Gonzáles and Timo Teräsvirta, Modelling autoregressive processes with a shifting mean, Studies in Nonlinear Dynamics and Econometrics
- 32 He Changli, Hans Malmsten and Timo Teräsvirta, Higher-order dependence in the general Power ARCH process and the role of the power parameter, Handbook of Financial Time Series, Springer
- 33 He Changli, Annastiina Silvennoinen and Timo Teräsvirta, Parameterizing unconditional skewness in models for financial time series, Journal of Financial Econometrics
- 34 He Changli, Andrés Gonzáles and Timo Teräsvirta, Testing parameter constancy in stationary vector autoregressive models against continuous change, Econometric Reviews
- 35 Annastiina Silvennoinen and Timo Teräsvirta, Multivariate GARCH models, Springer
- 36 Timo Teräsvirta, Clive W.J. Granger, New Palgrave Dictionary of Economics, 2nd edition, Palgrave Macmillan
- 37 Timo Teräsvirta, Threshold models, New Palgrave Dictionary of Economics, 2nd edition, Palgrave Macmillan
- 38 Tim Bollerslev, Robert F. Engle, Glossary to ARCH (GARCH). New Palgrave Dictionary of Economics, 2nd edition, Palgrave Macmillan
- 39 Svend Hylleberg, Seasonal Adjustment. New Palgrave Dictionary of Economics, 2nd edition, Palgrave Macmillan
- 40 Timo Teräsvirta, Introduction to univariate GARCH models, Handbook of Financial Time Series, Springer Verlag.
- 41 Timo Teräsvirta, Autoregressive conditional heteroskedasticity, Encyclopedia of Quantitative Finance, Wiley
- 42 Massimo Guidolin and Allan Timmermann, International Asset Allocation under Skew and Kurtosis Preferences, Review of Financial Studies
- 43 Graham Elliott and Allan Timmermann, Economic Forecasting, Journal of Economic Literature
- 44 Massimo Guidolin and Allan Timmermann, Forecasts of US Short-term Interest Rates: A Flexible Forecast Combination Approach, Journal of Econometrics
- 45 Graham Elliott, Ivana Komunjer and Allan Timmermann, Biases in Macroeconomic Forecasts: Irrationality or Asymmetric Loss?, Journal of European Economic Association
- 46 Allan Timmermann, Elusive Return Predictability, International Journal of Forecasting
- 47 Bruce Lehmann, Andrew J. Patton and Allan Timmermann, Performance Measurement and Evaluation, Corporate Finance, Financial Intermediation and Banking

- 48 Jie Zhu, Testing for Expected Return and Market Price of Risk in Chinese A-B Share Market, Mathematics and Computers in Simulation
- 49 Theis Lange and Anders Rahbek, Regime Switching Models: A Survey, Handbook of Financial Time Series, Springer Verlag
- 50 Niels Haldrup, and Andreu Sanso, A Note on the Vogelsang Test for Additive Outliers, Statistics and Probability Letters
- 51 Niels Haldrup, Peter Møllgaard, and Claus Kastberg Nielsen, Sequential versus Simultaneous Market Delineation: The Relevant Antitrust Market for Salmon, Journal of Competition Law and Economics

I.8 List of journals considered to be the most prestigious within CREATES' research field
(Ordered alphabetically)

General Econometrics:

Econometrica
Econometric Reviews
Econometric Theory
Econometrics Journal
Journal of Applied Econometrics
Journal of American Statistical Association
Journal of Business and Economic Statistics
Journal of Econometrics
Oxford Bulletin of Economics and Statistics
Review of Economics and Statistics

Financial Econometrics:

Journal of Banking and Finance
Journal of Empirical Finance
Journal of Finance
Journal of Financial and Quantitative Analysis
Journal of Financial Econometrics
Journal of Financial Economics
Journal of International Money and Finance
Journal of Monetary Economics
Journal of Money Credit and Banking
Review of Financial Studies

Statistics/Stochastics:

Annals of Statistics
Bernoulli
Journal of Royal Statistical Society Series B
Stochastic Processes and its Applications
Journal of Time Series Analysis
Scandinavian Journal of Statistics
Finance and Stochastics
Mathematical Finance