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DIRECTOR'S

ANNUAL REPORT FORM

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CENTRE/GROUP/NETWORK DIRECTOR'S ANNUAL REPORT 2011

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**Name of Centre/Group/Network** : Centre for Microdata Methods and Practice  
Director's name : Andrew Chesher  
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## 1. Introduction

The research of the Centre for Microdata Methods and Practice (CeMMAP) develops and applies tools designed to extract information about individual behaviour, and the influences on it, from 'microdata'. The 'individuals' the Centre studies can be, for example, people, households or enterprises. The Centre aims to spread good practice through training, capacity building and communication with users. The Centre runs a programme of professional training courses and advanced masterclasses, trains doctoral students and aims to boost the research careers of postdoctoral researchers. The Centre for Microdata Methods and Practice is built on the foundations established through seven years' seedcorn funding from the Leverhulme Trust. In that time, CeMMAP has become the leading European centre for training in microdata methods and has become the hub of a network of international research activity.

## 2. Impact and highlights

### Research highlights

Two highlights of our progress towards our research objectives this year are our publication in *Econometrica* on analysis of models with multiple equilibria and our publication in the *American Economic Review* of quasi-power measures for non-parametric restrictions.

#### 1. *Econometric analysis for models with multiple equilibria*

It is not uncommon for economic feedback models to produce more than one solution. In some cases, multiplicity can cause identification problems. In others, it can produce more variation in the data. In recent work, we show formally that the latter is the case in many models of entry-exit of firms and in many peer effect models. This work has already been positively cited in general surveys on estimation of strategic interactions and is due to be published in *Econometrica* (January 2012). [This work contributes to our research strands *Identification* and *Understanding Feedback Effects*.]

#### 2. *Quasi-power measures for non-parametric restrictions*

When data satisfy revealed preference restrictions, it is hard to know whether this is a triumph for economic theory or a warning that the conditions are so undemanding that almost anything goes. This research proposes a method to measure the predictive success of revealed preference conditions, allowing researchers to judge between the two conclusions. Our approach builds on theoretical support in the form of an axiomatic cardinal characterisation of this class of measures. The research was published this year in the *American Economic Review*. [This work contributes to our research strands *Computation* and *Measurement*.]

### Academic impact

The Centre has established itself as a national and international hub for research and dissemination of best practice in relation to microdata. In 2011, CeMMAP output included six refereed journal articles and 42 working papers in the CeMMAP series. Centre staff presented 55 conference and seminar papers and 27 academic seminars. CeMMAP hosted four conferences, five masterclasses and five workshops. Amongst the highlights were the following:

*1. Identification in structural econometrics*

In the past decade, CeMMAP has been one of the key international centres shifting the emphasis of econometrics from estimation and inference towards the problems and challenges of identification. In November 2011, in a masterclass attended by 79 academic researchers and students from the UK and Europe, CeMMAP Director Andrew Chesher described the principles and practice of identification analysis in structural econometrics. The lectures provided the audience of academics and users of research with an overview of the state of the art on issues including the nature of the information about economic processes contained in data, the role of ‘assumptions’ in econometric inference, the extent to which the restrictions of models are falsifiable, the design of surveys and experiments, and the impact of measurement.

*2. Market microstructure and asset pricing*

There is a pressing need to understand the relationships between the structure of securities markets and the role they play in providing liquidity and price discovery. This year, CeMMAP held a masterclass by two of the foremost authorities in the world on these issues: David Easley (Cornell) and Maureen O’Hara (Cornell). This event gave UK-based academics and policymakers the opportunity to get up to date with the research frontier on issues connected with the new high-frequency markets. The functioning of securities markets was reviewed and the speakers then described asymmetric-information microstructure models and the role that market microstructure plays in asset pricing and in determining the cost of capital.

**Economic and societal impact**

The Centre’s research on methods and practice is of direct use to academics and practitioners using microdata. During 2011, CeMMAP provided 11 training courses. Attendees included academic users and 101 public sector attendees, 16 private sector attendees and 51 international attendees. In addition, we staged four conferences and five workshops. Here are two examples of particular interest: the first was an interdisciplinary policy-focused workshop, the second a public lecture.

*1. Measuring living standards and well-being*

The ONS Measuring National Well-Being Programme, launched in November 2010, aims to develop and publish an accepted and trusted set of National Statistics that help in understanding and monitoring national well-being. In 2011, CeMMAP staged this workshop, sponsored by the NCRM, to improve understanding of the issues involved by exploring the measurement of living standards and well-being. Speakers described new findings on the value of traditional economic measures such as income and consumption as well as new approaches. Speakers included Michael Daly (Trinity College Dublin), Gunther Fink (Harvard), Bruce Meyer (Chicago), Cormac O’Dea (IFS), Steve Pudney (Essex) and Arthur van Soest (Tilburg). Contributors included Arthur Lewbel (Boston College) and Vivienne Avery (Office for National Statistics).

*2. Policy analysis with incredible certitude*

Research findings based on untenable assumptions can lead to policy prescriptions that are useless or even harmful. In a public lecture, co-funded by the Leverhulme Trust, CeMMAP Research Fellow Charles Manski (Northwestern) gave a powerful critique of ‘incredible certitude’ in policy analysis. The lecture drew on his extensive research on how identification problems limit our ability to credibly predict policy outcomes. In his

lecture to an audience of 100 academics and 68 policy analysts, Prof. Manski described specific analytical practices that promote incredible certitude and classified these practices. The lecture was a powerful and authoritative discussion of the issues involved and represented an attempt to move future policy analysis away from incredible certitude and towards honest portrayal of partial knowledge.

### 3. Progress against objectives

#### Research

In Section 2 above, we highlighted two research projects that were published this year. Here we detail progress against our other research objectives.

##### 1. *Endogenous multiple discrete choice models*

We study an instrumental variables model for discrete choice amongst unordered alternatives. The model is shown to be partially identifying and the sharp identified set is obtained. The analysis uses tools of random set theory. The analysis is novel, providing the first identification results for an instrumental variables model admitting high dimensional latent variables. Results are given in CeMMAP Working Paper 39/11. [This work contributes to our research strand *Identification*.]

##### 2. *Coherency and completeness in simultaneous equations models*

Simultaneous equations models of economic processes may deliver multiple, single or no solutions. This is an important econometric issue in non-linear models and has received particular attention in econometric models involving discrete outcomes. In this research, we develop a unifying framework within which identification issues can be studied. We develop sharp identified sets for structural functions and distributions of latent variables under a variety of assumptions. Applications include the simultaneous market entry game studied in empirical industrial organisation. A working paper is in preparation. [This work contributes to our research strand *Identification*.]

##### 3. *Generalised instrumental variable models*

Existing instrumental variable methods require latent variables to be unidimensional. In this research, we relax this restriction and develop a characterisation of the resulting sharp identified set. Applications include demand analysis and occupational choice models. A working paper is in preparation. [This work contributes to our research strand *Identification*.]

##### 4. *Intersection bounds: estimation and inference*

In many models, the identified set is defined by the intersection of many bounds. The tightest bounds available are the lowest upper bound and the highest lower bound. Typical estimators of such bounds are biased. Moreover, standard inferential methods for the measurement of statistical variation do not apply. This paper (joint with Victor Chernozhukov and Sokbae Lee) continues the line of research described in CeMMAP Working Paper CWP34/11 and develops a novel and practical method for estimation of and inference on such bounds. [This work contributes to our research strands *Identification* and *Estimation & Inference*.]

##### 5. *Indirect inference estimation*

Indirect inference is a method used to estimate models when the estimation criterion is difficult or impossible to evaluate directly. Typically, the procedure is computationally intensive. We show how computational advances recently introduced in other areas of

economics can be applied to indirect inference and we assess their performance. As an intermediate output, we produced a software package that can be used for high-dimensional integration (available at <http://www.ucl.ac.uk/~uctpjyy/SparseGrid.html> and <http://cran.r-project.org/web/packages/SparseGrid>). [This work contributes to our research strands *Computation* and *Estimation & Inference*.]

#### *6. Earnings dynamics with labour participation*

Most models of earnings dynamics ignore estimation problems caused by labour force participation choices. This research uses indirect inference to model earnings dynamics with participation to assess how non-random selection into work affects estimation of earnings dynamics. [This work contributes to our research strands *Models of the Life Course* and *Estimation & Inference*.]

#### *7. Endogeneity and heterogeneity*

Work on this topic aims to develop methods to improve our understanding of models that allow for non-linear relationships, unobserved multidimensional heterogeneity and endogenous variables. Applications include the determinants of consumption of various goods, the relationship between education and wages, and the role of institutions in explaining the heterogeneity of current GDP levels across the world. [This work contributes to our research strand *Estimation & Inference*.]

#### *8. Incorporating theoretical restrictions into forecasting by projection methods*

This work seeks to bridge the gap in empirical macroeconomics between approaches based on 'atheoretical' econometric models and those based on 'theoretical' models such as dynamic stochastic general equilibrium (DSGE) models. We propose a method to modify an atheoretical forecast to obtain a new forecast that satisfies theoretical restrictions such as those embedded in a DSGE model. We show that imposing a simple Euler equation can improve the accuracy of the currently best-performing atheoretical models. The resulting paper (joint with Giuseppe Ragusa) is now under revision at the *Journal of Econometrics*. [This work contributes to our research strands *Computation* and *Estimation & Inference*.]

#### *9. Forecasting in macroeconomics*

This work offers a review of forecasting methodologies and empirical applications that are useful for macroeconomists. It provides an overview of econometric methods available for forecast evaluation. It then analyses their usefulness, their assumptions and their implementation, to provide practical guidance to macroeconomists. The second part of this work addresses special issues of interest to forecasters, including forecasting output growth and inflation as well as the use of real-time data and structural models for forecasting. This work is joint with Barbara Rossi. [This work contributes to our research strands *Computation* and *Estimation & Inference*.]

#### *10. Demand estimation and firm pricing*

We have been pursuing several projects that analyse consumer behaviour in supermarkets. One project studies consumer demand for butter, margarine and saturated fat and evaluates how this demand responds to tax and price changes. A CeMMAP working paper was published in December 2010 and revised in February 2011. Three related papers are studying demand for alcohol and its response to price changes, demand for fruit and vegetables and the impact of the government's 'five-a-day' campaign, and consumers' choice of store. These papers are in progress. Similar methods were applied to the analysis of 'A disaggregate demand for local bus services in Great Britain', which used the UK National Transport Survey. This study was submitted

as evidence in the UK Competition Commission's investigation of the market for local bus services. Finally, we pursued work on an analysis of online automobile auctions. [These papers contribute to the themes of *Heterogeneity & Inequality*, *Models of Feedback Effects* and *Computation*.]

#### 11. Random coefficients models

In two papers, 'Semiparametric estimation of random coefficients in structural economic models' and 'Heterogeneous Euler equations: a structural random coefficients approach', we develop and apply methods that use economic theory to define a structural model but allow for a very flexible degree of unobserved heterogeneity. The first paper, presented in the CeMMAP seminar on 31 May 2011, as well as at the MIT Demand Estimation Conference on 27 May 2011, develops methods to attack this problem. The second paper, presented at the July 2011 NBER Summer Institute on Consumption, applies these methods to study the importance of unobserved heterogeneity in understanding consumer saving behaviour. Both papers require sophisticated computational methods. [These papers contribute to our research strands *Models of the Life Course*, *Estimation & Inference*, *Computation* and *Heterogeneity and Inequality*.]

#### 12. College enrolment and parental transfers

A key consideration when studying government policies towards higher education is how the decisions of teenagers, the decisions of parents, the general economic environment and government policies interact to determine college enrolment decisions. We are building and estimating a model to study these interactions using data from the US National Longitudinal Survey 1997, which contains detailed data on transfers from parents to children as well as enrolments, loans and other key variables. An important problem to overcome in the analysis is modelling the dynamics and the uncertainty facing individuals. Work is continuing on this project. [This project contributes to the research strands *Models of the Life Course*, *Computation* and *Models of Feedback Effects*.]

### **Knowledge transfer and capacity building**

CeMMAP hosted four conferences, five workshops, 11 training courses and five masterclasses in 2011. Details can be found on the CeMMAP website (<http://www.cemmap.ac.uk>). Summaries of attendance are provided in Section 4a.

#### **4a. Summary of performance against key performance indicators**

The Centre's progress towards its key performance indicators was strong in terms of both research outputs and capacity building.

The Centre published six refereed journal articles, most of which were in the top general and field journals such as the *American Economic Review*, the *Review of Economic Studies*, the *Journal of Public Economics* and the *Journal of Econometrics*. The Centre also produced 42 working papers in the CeMMAP series (by staff and international associates), including 13 working papers by one or more Centre researchers. Staff gave three invited addresses at international conferences and five other conference papers, 41 seminar presentations outside the UK and 10 further seminar papers to academic audiences.

In terms of capacity building, we hosted 27 academic seminars, four conferences and five masterclasses and organised and ran five academic workshops. We welcomed 558

mainly academic attendees including 122 international attendees at these various events. We also ran 11 training courses for policy/business users for which, along with UK-based academics, we numbered 101 public sector attendees, 16 private sector attendees and 51 international attendees.

Centre researchers give expert advice where requested: for example, Lars Nesheim is an academic panellist advising the Competition Commission; Andrew Chesher sits on DEFRA's Family Food Committee, advised UK Power Networks on the measurement of efficiency in electricity distribution and the implementation of a total cost benchmarking scheme proposed by Ofgem and advised PricewaterhouseCoopers during a Competition Commission investigation of competition in the audit industry; and Ian Crawford is a member of the ONS's Consumer Prices Advisory Committee – a body of external experts charged with advising the ONS and the National Statistician on the measurement of inflation in the UK.

In 2011, we had four PhD students under supervision and one postdoctoral researcher in place. One PhD student completed his dissertation and moved to the National Opinion Research Center at the University of Chicago as a postdoctoral researcher. Our website traffic exceeded expectations, with approximately 12,900 unique visitors to the website per month.

A full listing of these indicators is provided in Annex 1 alongside the targets.

**4b. ESRC general indicators for reporting to government**

<b>Name of investment: Centre for Microdata Methods and Practice</b>	
Indicator	Number
Indicator A: Number of activities and events involving the general public	0
Indicator B: Number of projects attracting co-funding	5
Indicator C: Number of public policy/business orientated seminars and workshops	11
Indicator D:  (i) How many non-academic users have worked within the investment on a formal basis to complete a specific programme of work?  (ii) How many researchers have the investment placed in user organisations on a formal basis to complete a specific programme of work?  NB – placements funded through ESRC placement schemes should not be included.	(i) Number of non-academic users hosted: 0  (ii) Number of researchers placed in user organisations: 0
Indicator E: Number of non-academic users on the investment's Advisory Committee	(i) Total number of Advisory Committee members: 11  (ii) Total number of non-academic user members: 2  Including: Number of private sector members: 0 Number of public sector members: 1 Number of third sector members: 1



**Indicator A: Activities and events involving the general public**

For each activity/event please complete the table below:

<b>Title:</b>	<b>Date:</b>	<b>Format: [type of event (e.g. lecture/broadcast ...)]</b>	<b>Number of participants:</b>
N/A	N/A	N/A	N/A

**Indicator B: Number of projects attracting co-funding**

For each project please complete the table below:

<b>Name of project:</b>	<b>Amount of external funding:</b>	<b>Name of co-funding body/bodies:</b>
Programme Evaluation for Policy Analysis (PEPA) node	£63,253	ESRC
Developing Robust Methods for Evaluating Policies in the Markets for Food and Nutrition	£84,108	ESRC
Microeconomic Analysis of Prices, Food and Nutrition (MAPFAN)	£162,124	European Research Council
Research on Microeconometrics: Econometric Theory and Applications (ROMETA)	£52,043	European Research Council
Support for the visit of Prof C Manski	£5,476	The Leverhulme Foundation

**Indicator C: Public policy/business orientated seminars and workshops**

For each event please complete the table below:

<b>Title:</b>	<b>Date:</b>	<b>Target audience: [private sector/public sector/practitioners/third sector]</b>	<b>Number of participants:</b>
Microsimulation	13-14 Jan	Public and private sectors	20
Discrete Choice Modelling	19-21 Jan	Public and private sectors	20
Econometric Estimation of Frontier Functions and Economic Efficiency	24-25 Feb	Public and private sectors	20
Dynamic Econometric Models	17-18 Mar	Public and private sectors	20
Panel/Longitudinal Data Analysis	31 Mar-1 Apr	Public and private sectors	20
Panel Time Series	6-8 Apr	Public and private sectors	20
Policy Evaluation Methods	3-6 May	Public and private sectors	20
Policy Evaluation Methods	31 May-3 Jun	Public and private sectors	20
Introductory Microeconometrics	12-14 Oct	Public and private sectors	20
Panel/Longitudinal Data Analysis	3-4 Nov	Public and private sectors	20
Policy Evaluation Methods	29 Nov-2 Dec	Public and private sectors	20

**Indicator D: Number of (i) non-academic users hosted and (ii) number of researchers placed in user organisations**

For each placement please complete the table below:

<b>Name:</b>	<b>Hosted: [Where from?]</b>	<b>Placed: [Where to?]</b>	<b>Dates/duration:</b>	<b>Purpose:</b>
N/A	N/A	N/A	N/A	N/A

**5. Collaborative activities with other ESRC investments**

In 2011, we collaborated with the NCRM, jointly advertising events. In addition, with researchers from the ESRC Centre for the Microeconomic Analysis of Public Policy, we applied for and obtained funding to establish a research node of the NCRM, Programme Evaluation for Policy Analysis (PEPA). This node was established in 2011, a website was set up, and plans were laid to conduct research and organise courses, masterclasses and conferences. In addition, we continued work on an ESRC-ANC research project on Nutrition and Consumer Demand.

In May 2011, we staged a masterclass and conference jointly with the ESRC Research Centre ELSE.

Finally, Prof. Chesher acted as a member of the Advisory Boards for Understanding Society and PEPA.