

**The Long Run Growth and Development of the World
Economy: Measurement and Theory**

An ESF Exploratory Workshop

28 April – 1 May 2005

Scientific Report

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1. Executive summary

Context

According to the 2001 declaration agreed by EU leaders at Laeken, the EU seeks to become “a power wanting to change the course of world affairs in such a way as to benefit not just the rich countries but also the poorest.” Such an aspiration is easily understood, since underdevelopment remains the central economic problem in most of the world today. Why is it so difficult for so many countries to make the transition from stagnation to modern economic growth? The long run history of our own continent is an obvious laboratory in which to explore this question, since Europe was the first region to successfully make the transition to economic modernity.

But qualitative narratives are not sufficient. For a scientific approach, we require high-quality data spanning several centuries, and high-quality theory with which to interpret the data. In the past five years or so both theorists and quantitative economic historians have made huge strides in thinking about and measuring economic growth and population growth in the very long run (i.e. from the Middle Ages until today). However, interactions between the two groups have been limited, with theorists of very long run growth often basing their modelling on a few stylised facts, without an extensive knowledge of the economic history of the period they are interested in, and economic historians unaware of the theoretical developments which would help them to interpret the new data which they are uncovering.

The aims of the exploratory workshop were to bring together the insights of theorists and historians, and to pave the way for future common research on the causes of economic growth and development in the very long run.

Scientific content

The scientific content of the workshop was organised around a number of key themes, as follows:

- **Knowledge, technology and long run growth:** emphasising the key role played by technology in European development and modelling technological change as an endogenous process
- **Institutions and long run growth:** documenting and drawing on game theoretic analysis to understand the evolution of the institutions of a modern market economy
- **Market integration and Europe’s growth experience:** examining market integration at both the macro and the micro level, drawing on econometric methods
- **The Great Divergence:** offering new perspectives on European development by considering the divergence of productivity and living standards between Europe and Asia, and emphasising open economy issues
- **What caused the European take-off?:** some preliminary attempts at combining the best elements of theory and data analysis to provide a coherent account of the European transition to modern economic growth

In addition, the workshop featured two keynote lectures, one by a distinguished senior economist and the other by a distinguished senior economic historian, plus a roundtable discussion.

Outcomes

The workshop was highly successful in its aim of bringing together economists and economic historians, with some of the leaders in the field in attendance. Barriers were broken down, a common agenda developed, and possibilities of further communication created. The call for papers generated a very impressive set of submissions, so that the Scientific Committee decided to seek additional funding so as to avoid turning away high quality papers.

A number of future directions for the field were identified, drawing on the contributions of both economic theorists and economic historians:

- **Stochastic modelling:** allowing a potential role for accidents of history and path dependence, whilst retaining a role for underlying economic forces, via a stochastic approach to modelling.
- **Relative price effects:** further investigation of the role of relative prices in creating incentives for entrepreneurs.
- **Open economy:** the need for a systematic consideration of open economy issues, such as international trade and factor flows.
- **Endogenous technology:** the central role of technology, and the need to build on work endogenising technological change
- **Institutions:** The need to allow for a two-way relationship between institutions and economic growth.

2. Scientific content of the event

In recent years, economic theorists have made important advances in understanding the transition of economies from pre-industrial stagnation to modern economic growth, while economic historians have developed a detailed empirical account of economic growth over the second millennium. The aim of the exploratory workshop was to bring together the insights of theorists and historians, and pave the way for future common research on the causes of economic growth in the very long run. The workshop was organised around a set of themes where research is active on both sides. These themes are:

Topic 1: Knowledge, technology and long run growth

The first paper, by Daron Acemoglu, Oded Galor and Omer Moav, took as its starting point the recent theoretical work on the unified modelling of the transition from Malthusian stagnation to modern economic growth, with a key role played by human capital accumulation during the demographic transition. By endogenising intellectual property rights, a key bridge was built to the other main theoretical strand emphasising institutions. The second paper, by Robert Allen, offered a more historical treatment of these issues, emphasising the importance of high wages in stimulating the development of new technologies, as well as seeing an important role for trade in producing these favourable factor prices. The paper also discussed the 'invention' of R&D activities during the late 18th century.

Topic 2: Institutions and long run growth

The role of institutions in economic growth has been a particularly fruitful line of research in recent years for both theorists and economic historians, and this was well reflected in the papers at the workshop. The second session included a theoretical paper by Morgan Kelly on how institutions and per capita income can co-evolve in both bad and good ways, and a paper by Paul Seabright which combined archaeological evidence and economic theory to reconsider how agriculture came to be adopted widely despite evidence that any productivity gains over hunting and gathering were at best modest, and may have been more than eaten up through increased need for defence expenditure. A further session on institutions on the second day included two papers on Venice, which played a key role in the evolution of institutions which would eventually define a modern market economy. Both papers, by Diego Puga and Dan Trefler and by Yadira Gonzalez de Lara, used game theory and historical evidence to examine the role of the state and private sector institutions in producing Venetian prosperity.

Topic 3: Market integration and Europe's growth experience

Markets are widely seen as playing a crucial role in the development of the West, and yet far too little is known about when, where, and how they became integrated. Papers in the third session by Mette Ejrnaes and Karl Gunnar Persson, and by Graziella Bertocchi and Chiara Strozzi, looked respectively at the important cases of grain market integration and labour market integration, focusing on the nineteenth century, sometimes characterised as the first period of genuine globalization. Two further papers on the second day by Albert Carreras and Xavier Tafunell, and by Camilla Josephson, considered respectively the long run growth experience of the countries that currently make up the European Union, and the growth experience of Sweden since 1950.

Topic 4: The Great Divergence

One of the most active areas of research in recent years has been the Great Divergence of living standards between Europe and Asia, with world historians pointing to the need to bring Asia more fully into the story of European development. This topic was addressed specifically

by two papers on the first day. Stephen Broadberry and Bishnupriya Gupta examined the shift of competitive advantage in cotton textiles between India and Britain, while Joerg Baten and Jan Luiten van Zanden assessed the role of knowledge capital, as indicated by book production.

Topic 5: What caused the European take-off?

Three papers considered the empirical modelling of the European take-off, drawing on the most up-to-date data and methods. James Robinson considered the empirical links between democracy and income, arguing that although there is a positive association between these variables cross-sectionally, the relationship breaks down when a time dimension is added. Democracy is neither caused by growth, nor a cause of growth. A second paper by Gregory Clark highlighted a puzzlingly large fall in the interest rate over the centuries preceding the Industrial Revolution, and offered an explanation based on shifting time preferences. Finally, Nico Voigtländer and Hans-Joachim Voth used a simulation framework to stress the role of income inequality and demand in explaining the primacy of England during the Industrial Revolution.

As well as the papers, the programme included two keynote lectures by a distinguished economist and a distinguished economic historian, plus a round-table discussion to bring out the major themes for future research. At the end of the first day, Ronald Findlay offered the perspective of an economist and showed how the early modern and Industrial Revolution periods could be modelled within an economic framework, stressing in particular open economy aspects. At the end of the second day, Nick Crafts offered the perspective of an economic historian, highlighting a number of themes which he felt needed to be addressed by the new modeling frameworks if they were to be consistent with the known stylised facts of the Industrial Revolution. The round-table, which included two participants who would describe themselves primarily as economists (James Robinson and Omer Moav) and two who would describe themselves primarily as economic historians (Albrecht Ritschl and Jan Luiten van Zanden), agreed that there was a common agenda and that the two sides could learn much from each other. In particular, it was felt that it was essential for theoretical modellers to take proper account of historical experience, and for economic historians to interpret their findings in the light of economic models. Only with this two-way approach is a genuinely scientific analysis of long run growth and development possible, and only then can robust policy conclusions be drawn for solving the problems of underdevelopment in the contemporary world.

3. Assessment of the results, contribution to the future direction of the field, outcome

3.1 Assessment

The organisers, and also the participants who have been contacted subsequently, felt the conference to be very successful. A major goal was to bring together researchers using quite different approaches to analyse the same basic problem. Normally, it is easier for researchers to remain within their own group of like-minded academics, and as a result, there has been very limited communication between groups, particularly those who see themselves primarily as theoretical economists and those who see themselves primarily as economic historians. The conference was very successful in breaking down these barriers, developing a common agenda, and creating possibilities of further communication.

A large number of very high quality papers was submitted to the conference, with contributions from some of the biggest names in the field, on both sides of the Atlantic. As a result, the Scientific Committee decided to seek, and was successful in obtaining, additional funding for American speakers. In addition, a decision was taken to expand the number of papers from 12 to 15 plus 2 keynote lectures, so as to accommodate the large number of high quality submissions. Even so, a number of potentially very interesting papers had to be turned away, and it is to be hoped that these can be accommodated in any follow-up conferences that may be financed from a future application. Each session generated much discussion from the floor and at breaks for meals and coffee.

Despite the limited number of participants and time slots, the Scientific Community gave priority to encouraging young researchers, who gained a valuable opportunity to network with senior members of the academic community.

3.2 Contribution to the future direction of the field

The keynote lectures and the round-table discussion were particularly helpful in identifying future directions for the field, drawing on the contributions of both economic theorists and economics historians:

- The economic historians present argued strongly that future research consider the potential role of accidents of history and path dependence, whilst retaining a role for underlying economic forces. Such concerns might perhaps be formally modelled via some sort of stochastic approach.
- A number of papers stressed the importance of relative prices in creating incentives for entrepreneurs, a neglected area in much of the recent economic history literature. This highlighted the need for more comparative empirical work as well as posing a challenge for theorists.
- A central theme which emerged in many of the sessions was the need for a systematic consideration of open economy issues. Much theoretical modeling continues to be conducted in a closed economy framework, even though European economies were becoming increasingly open in the late 18th century, and even though the impact of various exogenous shocks (e.g. sectoral productivity shocks) will have opposite effects in open and closed economies. Corresponding to this flaw underlying much recent theoretical work in the area, it is only recently that economic historians have begun to take seriously the need to consider the linkages

between Asia and Europe, or between Africa, the Americas and Europe, when explaining the Industrial Revolution.

- Technology was highlighted as a crucial factor in many sessions. Of particular significance was the paper by Acemoglu, Galor and Moav, which integrated technology into a demographic/human capital growth model, thus effecting a reconciliation between the two major theoretical approaches to long run growth that have emerged over the last decade or so.
- Institutions were clearly seen as important, but having a complex relationship with economic growth. The conference pointed to a number of promising directions of research in this area involving growth models, game theory, econometric analysis and detailed historical analysis of particular institutions.

3.3 Outcome

The major outcome of the conference was a bringing together of a heterogeneous group of researchers into a coherent community focused on the scientific explanation of long run growth and development. Of particular importance here was the ability of economic theorists to see the need for engagement with economic historians to keep their modelling exercises grounded in what actually happened, and the ability of economic historians to see the need for engagement with economic theorists so that general conclusions can be drawn from historical experience. A second outcome was the identification of future directions for the field, particularly as a result of the efforts of the two keynote speakers and the round-table participants. The theoretical work suggested future lines for empirical research – for example, better data on human capital formation, relative factor prices or institutions protecting intellectual property rights – while the history suggested possible future modelling strategies for theorists to pursue, notably a more open-economy approach to the issue of very long run growth. A third important outcome was the chance that was afforded to young researchers and doctoral students to interact with some of the big names in the field, and to form relationships which can hopefully be sustained through future meetings.

4. Final programme

Friday 29 April 2005

9.00-9.15 Introduction and presentation on the European Science Foundation by Stephen Broadberry (University of Warwick and CEPR)

Session A: Knowledge, technology and growth

Chair: Nick Crafts (LSE and CEPR)

9.15-10.00 Paper 1

Daron Acemoglu , Oded Galor and Omer Moav*

“The Emergence of Intellectual Property Rights and the Process of Development”

10.00-10.45 Paper 2

Robert Allen

“Economics, Science and the British Industrial Revolution”

10.45-11.15 Coffee

Session B: Institutions and long run growth (part 1)

11.15-12.00 Paper 3

Morgan Kelly

“Developing Rotten Institutions”

12.00-12.45 Paper 4

Paul Seabright

“Warfare and the Multiple Adoption of Agriculture after the last Ice Age”

12.45-14.00 Lunch

Session C: Market integration and growth

14.00-14.45 Paper 5

Mette Ejrnaes and Karl Gunnar Persson*

“The Nature and Costs of Disequilibrium Trade: The Case of Transatlantic Grain Exports in the 19th Century”

14.45-15.30 Paper 6

Graziella Bertocchi* and Chiara Strozzi

“Citizenship Laws and International Migration in Historical Perspective”

15.30-16.00 Tea

Session D: The Great Divergence

16.00-16.45 Paper 7

Stephen Broadberry* and Bishnupriya Gupta*

“Cotton Textiles and the Great Divergence: Lancashire, India and Shifting Competitive Advantage, 1600-1850”

16.45-17.30 Paper 8

Joerg Baten and Jan Luiten van Zanden*

“The Impact of Knowledge Human Capital on Early Modern Welfare Growth and the Great Divergence”

17.30-18.30 Lecture

Ronald Findlay

“Economic Models of Development and Explaining the Industrial Revolution; An Economist’s View”

Saturday 30 April

Session E: Institutions and long run growth (part 2)

9.15-10.00 Paper 9

Diego Puga* and Dan Treffler

“International Trade and Domestic Institutions: The Medieval Response to Globalization”

10.00-10.45 Paper 10

Yadira Gonzalez de Lara

“The State as an Enforcer in Early Venetian Trade”

10.45-11.15 Coffee

Session F: Europe’s growth experience

11.15-12.00 Paper 11

Albert Carreras* and Xavier Tafunell

“The European Union Growth Experience, 1830-2000”

12.00-12.45 Paper 12

Camilla Josephson

“Understanding Business Cycles and Productivity Growth by Means of Cointegration Analysis”

12.45-14.00 Lunch

Session G: What caused the European take-off (part 1)

14.00-14.45 Paper 13

James Robinson

“Income and Democracy”

14.45-15.30 Paper 14

Gregory Clark

“The Interest Rate in the Very Long Run”

15.30-16.00 Tea

Session H: What caused the European take-off (part 2)

16.00-16.45 Paper 15

Nico Voigtländer and Hans-Joachim Voth*

“Why England? Demand, Growth and Inequality during the Industrial Revolution”

16.45-17.45 Lecture

Nick Crafts

“Models of Economic Development and the Industrial Revolution: An Economic Historian’s View”

17.45-18.45 Roundtable discussion

* indicates which author is presenting co-authored paper

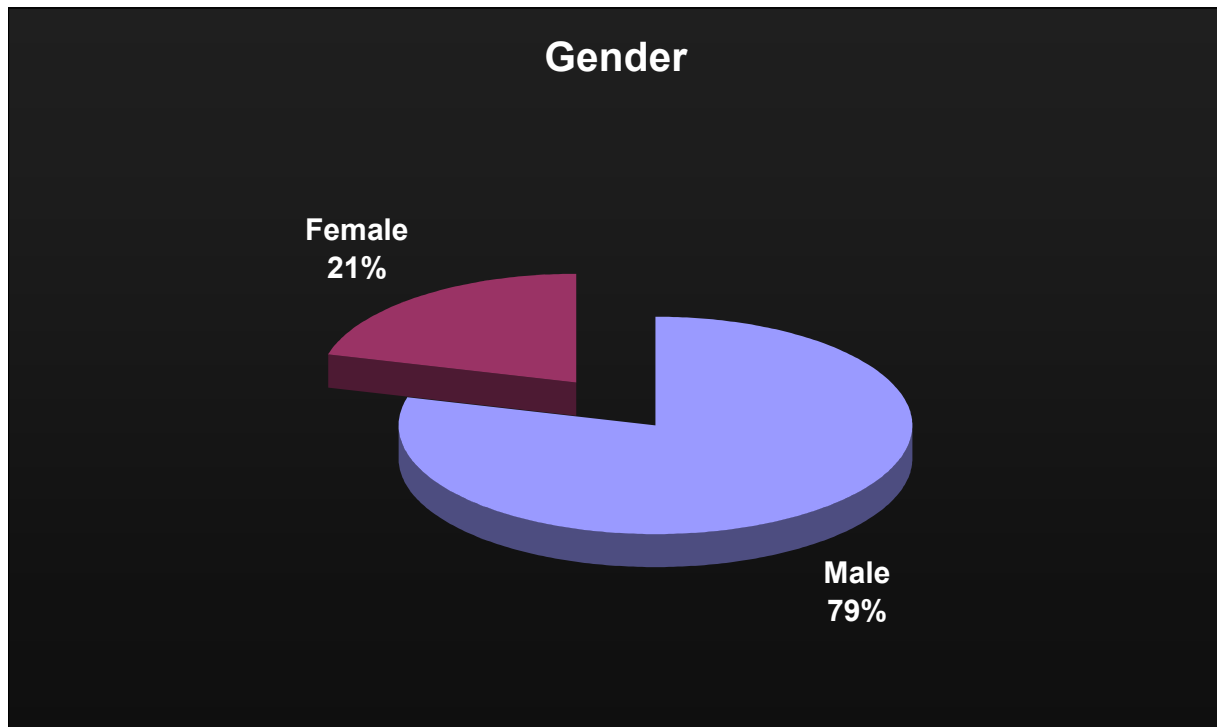
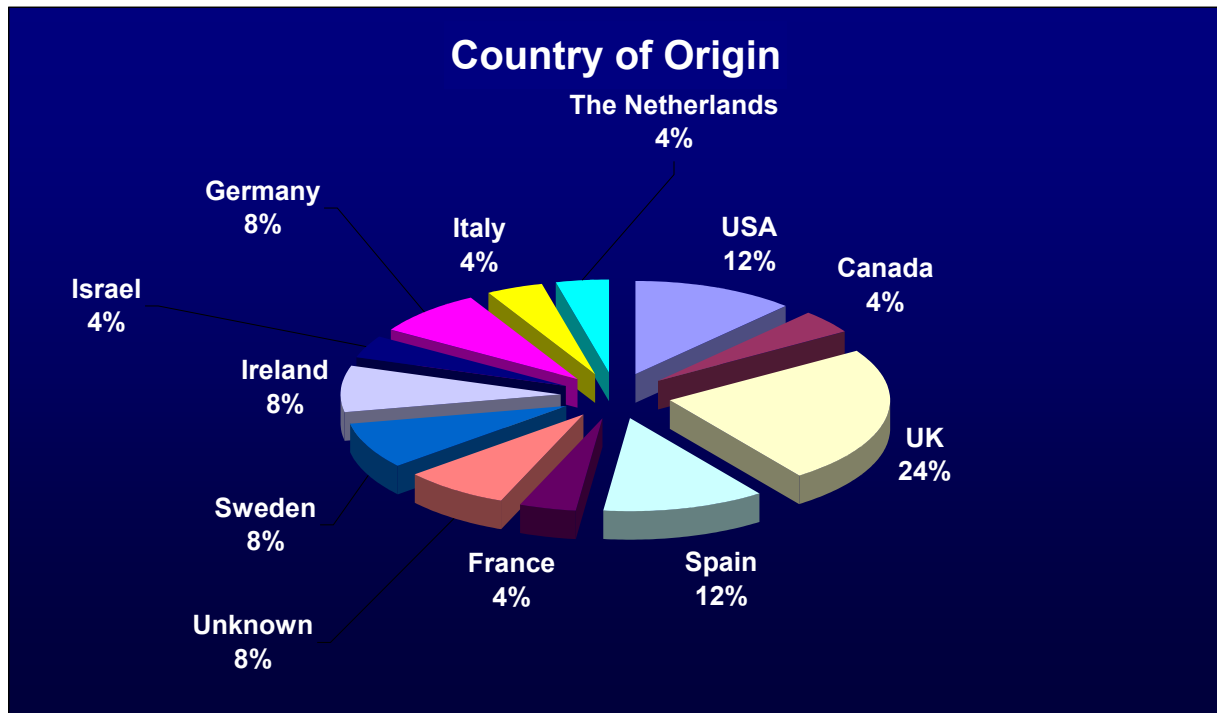
5. Final list of participants

NAME	ADDRESS	TEL, FAX, EMAIL
Prof. Robert Allen	Robert Allen Nuffield College Oxford University New Road Oxford OX1 1NF UK	Email: bob.allen@nuffield.oxford.ac.uk Tel: 00 44 1865 278 500 Fax: 00 44 1865 278 621
Prof. Graziella Bertocchi	Dipartimento di Economia Politica Universita di Modena Viale Berengario 51 I - 41100 Modena ITALY	Email: bertocchi@unimo.it Tel: 00 39 059 205 6873 Fax: 00 39 059 205 6947
Prof. Stephen Broadberry	Department of Economics University of Warwick Coventry CV4 7AL UK	Email: S.N.Broadberry@warwick.ac.uk Tel: 00 44 24 7652 3446 Fax: 00 44 24 7652 3032
Dr. Albert Carreras	Department of Economics and Business Universitat Pompeu Fabra Ramon Trias Fargas, 25-27 08005 Barcelona SPAIN	Email: albert.carreras@upf.edu Tel: 00 34 93 542 1761 Fax: 00 34 93 542 1746
Prof. Gregory Clark	Department of Economics University of California Davis, CA 95616 USA	Email: gclark@ucdavis.edu Tel: 00 1 530 752 9242 Fax: 001 530 752 0741
Prof. Nicholas Crafts	Department of Economic History London School of Economics Houghton Street London WC2A 2AE UK	Email: n.crafts@lse.ac.uk Tel: 00 44 20 7955 6399 Fax: 00 44 20 7955 7730
Mr. Guillaume Daudin	Economist OFCE/ Sciences Po 69, Quai d'Orsay 75340 Paris cedex 07 FRANCE	Email: guillaume.daudin@sciences-po.fr Tel: 00 33 1 44 18 54 72
Prof. Ronald Findlay	Department of Economics,	Email:

	Columbia University, New York, NY 10027, USA	FindlayRJ@aol.com Tel: 00 1 212 854 3674 Fax: 00 1 21 854 8059
Prof. Yadira Gonzalez de Lara	Department of Economics, University of Alicante, Campus San Vicente del Raspeig, 03080 Alicante, SPAIN	Email: yadira@merlin.fae.ua.es Tel: 00 39 06 4792 4829 Fax: 00 39 06 4792 4872
Dr. Bishnupriya Gupta	Department of Economics, University of Warwick, Coventry CV4 7AL UK	Email: B.Gupta@Warwick.ac.uk Tel: 00 44 24 7652 3034 Fax: 00 44 24 7652 3032
Ms. Camilla Josephson	PhD student, Lunds Universitet, Box 7083, 220 07 Lund, SWEDEN	Email: camilla.josephson@ekh.lu.se Tel: 00 46 222 0839 Fax: 00 46 13 15 85
Prof. Morgan Kelly	University College of Dublin, Belfield, Dublin 4, REPUBLIC OF IRELAND	Email: Morgan.Kelly@ucd.ie Tel: 00 353 1 706 8611 Fax: 00 353 1 283 0068
Dr. Omer Moav	Department of Economics, Hebrew University of Jerusalem, Mt. Scopus, Jerusalem 91905, ISRAEL	Email: msmoav@mscc.huji.ac.il Tel: 00 972 2 588 3121 Fax: 00 972 2 581 6017
Prof. Kevin O'Rourke	Professor of Economics, Department of Economics and IIS, Trinity College Dublin, Dublin 2, IRELAND	Email: kevin.orourke@tcd.ie Tel: 00 353 1 608 3594 Fax: 00 353 1 677 2503
Prof. Karl Gunnar Persson	Institute of Economics, University of Copenhagen, Studiestraede 6, 3. Sal, DK-1455 Copenhagen, DENMARK	Email: KarlGunnar.Persson@econ.ku.dk Tel: 00 45 35 32 30 42 Fax: 00 45 35 32 30 00
Dr. Diego Puga	CREI, Universitat Pompeu Fabra, Ramon Trias Fargas, 25- 27, Barcelona, 08005, SPAIN	Email: d.puga@utoronto.ca Tel: 00 34 93 542 28 71 Fax: 00 34 93 542 18 60
Mr. Ahmad Rahman	Department of Economics, University of California, 1 Shields	Email: asrahman@ucdavis.edu

	Avenue, Davis, CA 95616, USA	Tel: 00 1 530 752 8074 Fax: 00 1 530 752 0741
Prof. Albrecht Ritschl	Humboldt Universität zu Berlin Department of Economics & Business Spandauer Strasse 1 10178 Berlin GERMANY	Email: ritschl@wiwi.hu-berlin.de Tel: 00 49 30 2093 5715 Fax: 00 49 30 2093 5659
Prof. James Robinson	Department of Government, Harvard University, WCFIA, 1033 Massachusetts Avenue, Cambridge MA 02138, USA	Email: jrobinson@gov.harvard.edu Tel: 00 1 617 496 2839 Fax: 00 1 617 495 8292
Dr. Paul Seabright	Institut d'Economie Industrielle, Universite de Toulouse-1, Manufacture de Tabacs, 21 Allée de Brienne, 31000 Toulouse, FRANCE	Email: seabright@cict.fr Tel: 00 33 5 61 12 86 17 Fax: 00 33 5 61 12 86 37
Prof. Alan M Taylor	Department of Economics, University of California Davis, One Shields Avenue, Davis CA 95616-8578, USA	Email: amtaylor@ucdavis.edu Tel: 00 1 530 752 1572 Fax: 00 1 530 752 9382
Prof. Gianni Toniolo	Dipartimento di Economia e Istituzioni, Università di Roma 'Tor Vergata', Via di Tor Vergata, 00133 Roma, ITALY	Email: toniolo@uniroma2.it Tel: 00 39 06 7259 5734 Fax: 00 39 06 202 0500
Dr. Jan Luiten van Zanden	International Institute Social History, Cruquiusweg 31, 1019AT Amsterdam, THE NETHERLANDS	Email: jvz@iisg.nl Tel: 0031 20 6685866 Fax: 0031 20 6654181
Prof. Hans-Joachim Voth	Economics Department, Massachusetts Institute of Technology, 50 Memorial Drive, Cambridge MA 02142, USA	Email: joachim.voth@econ.upf.es Tel: 00 1 617 452 4273 Fax: 00 1 617 253 1330

6. Statistical information on participants



Age Structure

