Cambridge Economics

News from the Cambridge Faculty of Economics

Issue 9 September 2016

Representing Business Operating in Britain

Distinguished Alumna – Carolyn Fairbairn

The unexpected outcome of the referendum on Britain's membership of the EU has been despite the best efforts of Carolyn Fairbairn, the first woman to become the Director-General of the Confederation of British Industry. With the CBI's position overwhelmingly to 'remain', she orchestrated a policy whereby its member firms, while not telling their employees how to vote, provided them with fact-based information about the implications for their particular business. She is now working with members to ensure that our new relationship with the EU and the rest of the world continues to be underpinned by the principle of openness – access to the single market, ability to attract global talent, and protecting the trade deals we have while seeking new ones. It is the latest in a series of challenges that she has tackled so far in her career.

Carolyn says her intellectual roots lie in her time at Cambridge at the start of the 1980s. As one of the first two women economics undergraduates at Caius College, she was fortunate to have had Iain Macpherson as her Director of Studies. He was a powerful influence, a warm but challenging economic historian who inspired her to think differently. Along with other teachers, who included Cliff Pratten, Murray Milgate and a youthful Adair Turner, he ensured that her training in economics was full of lively discussion. The emphasis was less on maths and more on developing a persuasive argument. It gave her an

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awareness of the power of communication that has never left her.

After graduating with a double first, Carolyn studied international relations at the University of Pennsylvania and then went to work at the World Bank. After a couple of years she returned to London as a journalist on The Economist. Her remit included financial deregulation at the time when there were real concerns whether the City would survive the arrival of the Americans. The fascination she acquired with the world of business led to her becoming a consultant at McKinsey & Co. They supported her through an MBA at INSEAD at Fontainebleau. This introduced her to subjects such as accounting and marketing. It also put her among students who were committed to the development of the European Union.

Seven years of very varied problem-solving with McKinsey led to No 10 Downing Street, a place where problems could not be tougher. There she worked for two years with Prime Minister John Major, primarily on health and social security policy. She learnt a lot about politics. One lesson was that success in dealing with government lies in proposing feasible solutions rather than moaning about what is wrong. Another lesson relevant to her current role was that it is always more effective for an organisation to build coalitions than to act alone.

From Downing Street, Carolyn moved to the BBC, rising to the Executive Board with responsibility for the delivery of the BBC's digital services to viewers. This was a time of rapid technological innovation, and her tasks included developing the BBC's digital strategy. Her approach was to focus on the economic issues that were arising as technological change altered markets. In successfully creating Freeview, for example, which gives free-to-air access to multiple TV channels, the key objective was to break into a market then dominated by Sky.

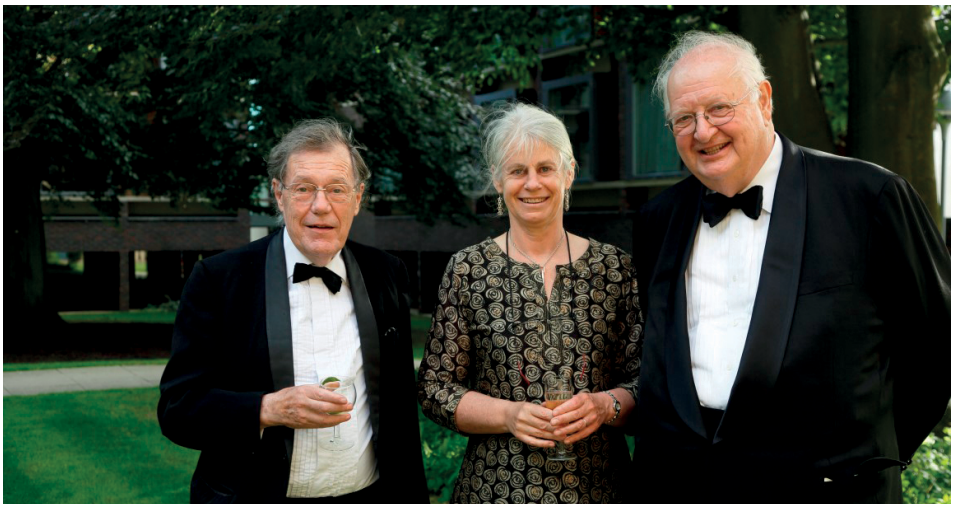
In 2006 she moved to ITV to become their director of corporate development and strategy. The financial crash soon gave her the unenviable task of managing a massive cost-reduction programme to deal with the collapse in advertising revenue. It proved successful in returning the company to growth. More recently she has held non-executive directorships at Lloyds Banking Group, the Competition and Markets Authority, and the Financial Services Authority. For Carolyn the exhilarating thread running through her career has been the initial challenge to understand the implications of changing markets for the economics of her organisation and then, with a good team, mobilising the best response. The historic industrial relations aspect of the CBI's role has been diminished by changing circumstances. Carolyn sees its current remit as representing businesses operating in Britain wherever they are headquartered, and making the British economy as attractive as possible for people in Britain in a very inclusive sense, whether they be employers, workers or investors. CBI members want their organisation to stand for the broader purpose of business and its responsibilities.

One such responsibility that Carolyn has focused on is increasing women's involvement in leadership roles. Although progress has been made in getting women onto the boards of larger companies, smaller firms are still far behind, and very few women are in chief executive positions. It is necessary to engage with girls early in their teens, as some businesses now successfully do, arousing interest and advising on educational choices. She wants to change practices which hold women back within organisations. These include a lazy reliance on self-appraisal, unstructured appointment interviews, and male-biased networking events. She is determined that many more women will follow in her footsteps.

Willy Brown and Tony Cockerill
[Interview on 26 April 2016]

Alumnus Angus Deaton Awarded the Nobel Memorial Prize for Economics

Angus Deaton has this year been awarded the Nobel Memorial Prize in Economic Sciences for his analysis of consumption, poverty, and welfare. He has also been awarded a knighthood. Sir Angus studied for his undergraduate and PhD degrees at Fitzwilliam College and the Economics Faculty. As a fellow of Fitzwilliam he worked with Sir Richard Stone in the Department of Applied Economics, before moving on in 1983 to Bristol and later Princeton.



The picture shows Sir Angus (right) with Geoff Whittington and Nicola Padfield, the Master, on the occasion of the celebration of Fitzwilliam's fiftieth anniversary as a College on 8 June 2016. *[Photo courtesy of Jet Photographics]*

The Benefaction of the El-Erian Institute

Alumnus and co-chair of Cambridge's fundraising campaign Dr Mohamed El-Erian and his wife Jamie Walters El-Erian have donated $25 million to create the El-Erian Institute for Human Behaviour and Economic Policy and Professorship of Economics. The donation will be split between the Faculty of Economics and Dr El-Erian's old college Queens' and is designed to help examine the many factors that drive human decision making and its implications for economic policy. Dr El-Erian explains how Cambridge economics has influenced his life:

It has been almost 40 years since I matriculated at Cambridge as an eager and novice economist, and its impact on me to this day is tremendous and profound. I find myself still heavily influenced by the extraordinary economics education I received there, and for good reason. It went far beyond teaching me 'what' to think and 'why'. It also, and much more importantly, emphasized the 'how' in a highly-effective manner.

Cambridge's stress on the 'how' was evident very early on for me – indeed, even before I embarked on my first year of study at Queens' College in the autumn of 1977. It started at the entrance interview a year earlier. After I had diligently paraphrased the content of a new book that my school teacher had urged me to read carefully and insisted that I bring up in the interview, I was asked a single question that effectively undermined its whole thesis. I was then pointedly reminded that I should not believe things simply because they are printed in a book, no matter how popular. It was an important and unforgettable lesson, and it was one that was reinforced in the years that followed.

Part I of the Tripos exposed me to the thinking of several schools in economics, from neo-classical to Marxists with quite a dose of Keynesian and neo-Ricardian. We were taught to think critically by professors and teaching fellows who were among the very best in the profession. Engaging lectures were accompanied by an extraordinary supervision system which was instrumental in developing our deliberation skills. Sure it was a pain - a real pain sometimes - to prepare at least two essays a week on such a broad range of topics. But the discussions that followed were incredibly enlightening.

During my three life-changing years of studying economics at Cambridge, I never opened a text-book. Instead, we were all instructed to go back to the original works, and to follow this with a wide assessment of the different analytical reactions that they had triggered. We were repeatedly encouraged to look at the same topic from different perspectives, with the resulting diversity playing an important role in strengthening our own foundations and convictions. This rigour and discipline have served me extremely well, and not just in my career but also in other aspects of my life.

Cambridge has provided me with solid frameworks, intellectual curiosity and life-long friendships. Its teaching philosophy facilitated my interactions with a broad range of people and ideas. It has allowed me to internalize and process multiple inputs as I iterate to my own conclusions. And it has instilled in me the importance of thought leadership and diverse perspectives.

The need for multiple perspectives is even greater in today's fluid world. From stubbornly sluggish growth and negative nominal interest rates to the emergence of anti-establishment movements, Brexit and the worsening in the inequality trifecta (that of income, wealth and opportunity), once-improbables, if not unthinkables, have become reality. With that comes the need to revisit some of our traditional economic wisdoms, if only to better reflect advances in behavioural science that shed more light on how human beings actually behave. And Cambridge can - and should - play a major beneficial role in this.

Having benefited so much from what Collegiate Cambridge offered to me as an Economics undergraduate, it is time for me to give back even more to this great institution. It is indeed a great privilege, huge honour and true pleasure to do so. It is my sincere hope that - through my work on the campaign for the University and its colleges, and through direct philanthropy that supports students, teaching and research - a broader range of people will be enabled and empowered, just as the Economics Tripos did for me.

Thank you Cambridge and Queens'. I owe you a great deal.

Image, above: Mohamed A. El-Erian makes his gift with the Faculty Chair Sanjeev Goyal and President Lord John Eatwell of Queens' College and the Vice-Chancellor

Liquidity, Solvency and Bank Runs
The Marshall Lectures 2016

How can we protect ourselves against bank runs? In spite of the global credit crunch and tighter and more comprehensive monitoring and regulation, the fundamental principles of banking remain unchanged. Banks lend long-term to finance illiquid assets while borrowing short-term using, in part, deposits that are repayable on demand. They are necessarily financially fragile institutions, facing continually the threat of liquidity shortages.

Regulatory measures to make them completely safe would cause credit to dry up, to the detriment of economic growth and prosperity. Therefore there will always be some likelihood of bank runs and failure. So the central bank must continue to stand as lender of last resort. Moral hazard cannot be eradicated entirely.

In this year's Marshall Lectures, Raghuram (Raghu) Rajan, then Governor of the Reserve Bank of India, the central bank, gave a detailed and formal examination of the present circumstances of commercial and central banking in developed economies which broadly confirms the traditional textbook analysis.

In his formal model, banks act as intermediaries between households and 'entrepreneurs'. The former provide financial capital in the form of deposits, while the latter take loans for projects. Projects take *time* to mature, so risk and uncertainty are ever present. At some time in the period during which projects are coming to fruition, the prospects for their successful completion, and hence for financial repayment and returns to investors by the banks, will become clear.

At this point, households (depositors) will choose individually, according to their expectations and preferences with respect to current or future consumption, to withdraw all, some, or none of their deposits. If overall they withdraw some of their deposits, some part-completed projects will have to be abandoned and the loans repaid by the entrepreneurs, if they can.

If the financial and economic conditions are such that households collectively withdraw *all* their deposits, there is a bank run. Banks become illiquid and the weaker among them become insolvent; that is, they are unable to continue as financial intermediaries. Raghu's key insight is that there is always some risk of a bank run and hence always a threat to the integrity and stability of the financial system.

In the face of such inevitability he considers and evaluates what preventative or remedial actions central banks could and should take. Policy interventions take the forms of bailouts, loans, and minimum reserve capital requirements. The first two are financed in his analysis by taxes on households that are subsequently repaid out of the financial returns on completion of the projects that otherwise would have been abandoned. Setting reserve capital at the appropriate level assumes that regulators have full insight into the financial risks and solvency levels of all systemically significant banks.

He concludes that none of these pathways can be guaranteed to be wholly effective and that, as a consequence, the central bank must always stand ready as the lender of last resort. Knowing this, the players in this game – the lenders, the borrowers and the banks – will always act in their own self-interest in ways that are likely to distort and destabilise the financial system, to the detriment of economic and social welfare.

So if preventative or responsive interventions on their own cannot prevent banking and financial crises, what can be done? Alongside the inevitability of central bank support, Raghu looks to careful pre-emptive monitoring of banks' illiquid assets ('cleaning up early') and to monetary policy that sends appropriate signals to banks, investors and borrowers alike about interest rates and other financial conditions that will balance aggregate investment and saving at levels that maintain the liquidity and solvency of an efficient banking system.

Raghu's research into the causes and consequences of the unavoidable illiquidity of banks' financial assets has been carried out at the Chicago Booth School of Business, where has held a Chair since 1991. His work, much of it in collaboration with Doug Diamond, has informed his policy initiatives, first at the IMF and for the past three years at the Reserve Bank of India.

As Chief Economist at the IMF between 2003 and 2007 he identified warning signals during the later stages of the Great Moderation, in particular financial asset overvaluation arising from active monetary policy which kept interest rates low so as to sustain and encourage economic growth (the 'Greenspan put'). As Governor of the Indian Central Bank since 2013 Raghu has worked to reduce inflation and assist fiscal consolidation; to open the banking and financial services sector to new entrants, both international and domestic; and – importantly – to expand banking services to the poor. It came as a surprise to many that he stood down from the Bank in September this year to return to research and teaching at Chicago Booth.

Tony Cockerill

The Marshall Lectures were delivered on 10 and 11 May 2016.

Details are at: **www.econ.cam.ac.uk/events/seminars/Marshall_Lecture**

Women Wanted

Victoria Bateman reports on Cambridge's attempts to encourage more women to study economics

Since the global financial crisis, a crisis from which economies are only just starting to recover, economics has faced a serious challenge from the outside. The discipline is, as a result, slowly but surely, undergoing a revolution. However, as history has shown time and time again, not all revolutions bring about the desired effect. If economics is to change for the better and not for the worse, it needs to draw upon new ideas and new voices, embracing experiences that differ from the 'norm' and that can offer something new. That includes the experiences of women.

Just like the natural sciences, economics has a 'woman problem' – and it is one that exists not just at the top but from bottom-up. Whether it is the fact that only one female economist has ever won the Nobel Prize, or that there are three times as many US and UK male students studying economics at degree level as there are women, it is difficult to avoid the conclusion that economics is failing to make the most of female talent. Given that economics offers a path into some of the highest-paid professions, along with access to positions of global leadership and influence, this is clearly not good news for the gender gap. Neither is it good for economics as a discipline.

Lacking female input, economics has built a model of the economy that you could say tells only half the story. Whilst our models are supposedly 'gender-neutral', with those good old 'rational economic agents' being neither male nor female, the types of things economists seek to study, the tools they choose to apply and the things they go out of their way to measure, all reflect a stereotypical male experience. It is an experience of being inside rather than on the edge of markets, and where the cut-throat reality of competition leaves little time to think about emotion. It is a life which leaves care and community to the opposite sex, seeing such 'social' factors as, like the housewife herself, dependent upon – instead of an equal contributor to – economic success.

Blinded by male experience, economics has been slow to recognise the crucial role of society to economic prosperity, preferring to model social outcomes as a consequence not cause of economic outcomes. It for too long sidelined the contribution of caring activities and failed to acknowledge the influence of fertility and women's empowerment on the economy. It was slow to realise that real human characteristics, including the ability to love and to make mistakes, are just as important for understanding the economy as are the more robotic 'rational', cool and calculating types of behaviour most commonly incorporated in our traditional models.

If economics is to build a more complete understanding of the economy, it needs to do a better job of attracting young women in the first place. Here in Cambridge, we are doing precisely that. Last September, we held the first 'Women in Economics Day', at Gonville and Caius College, which welcomed over a hundred sixth form young women from across the country to hear from high profile speakers such as Kate Barker and Vicky Pryce along with recent female alumnae, Maria Balgova, Sophia Parkinson, Nadine Sarwat and Jessica Sturgeon. Taking inspiration from the event, a small but enthusiastic group of female graduate students went on to initiate an internal women's economics network, with the idea of supporting women's progression in the discipline here in Cambridge. Plenty of tea and sandwiches were on offer at the first two 'meet and greet' sessions. The Society for Economic Pluralism has taken up the mantle and, along with the Marshall Society, Cambridge students are now running a series of special lectures and events designed to give a voice to female economists, inspiring the next generation.

With our alumnus Carolyn Fairbairn having recently taken on the role of Director-General of the CBI and with Professor Jane Humphries having just returned to Cambridge to deliver the Ellen McArthur Lectures (aptly titled 'Gendering Economic History'), it is clear that Cambridge women are already making their mark in the discipline, helping to close the gender gap both inside and outside the ivory towers. Long may it continue.

See also:
www.capx.co/author/victoriabateman
www.bloombergview.com/contributors/victoria-bateman

Women in Economics Day

Informative Social Interactions

What are the social processes underlying investment behaviour? Recent history has been punctuated by systemically serious investment events. One example was the fast spread of stock market participation in the 1990s that led to the burst of the dot-com bubble. Another was the spread of excessive borrowing against home equity, leading to the 2008 global financial crisis. It is natural to ask what the role of social interactions and peer effects is in the spread of financial behaviour.

The research of Chryssi Giannitsarou, supported by the Keynes Fund, has been providing some answers. She has been working with Luc Arrondel (Paris School of Economics), Hector Calvo Pardo (Southampton University) and Faculty alumnus Michael Haliassos (Goethe University, Frankfurt) on how the social circle of people influences their decisions in the stock market. They distinguished two ways by which social interactions may affect investment decisions. The first is purely through the information that is exchanged with friends and acquaintances. The second way is through the imitation of peers, reflecting social norms in preferences and opinions. Their data were gathered with an innovative survey which provided measures of stock market participation and social connectedness, but which also derived measures of beliefs and perceptions of stock market returns using probabilistic elicitation techniques. It was conducted in two stages in late 2014 and mid 2015, on a sample of individuals who were representative in terms of standard demographics of the population of France.

The analysis suggests that there is an information effect that runs directly from respondents' social interactions to how much they invest in the stock market. Having a social circle that is perceived to be better informed about the stock market is associated with both higher expected returns and a higher share of the respondent's financial wealth being invested in stocks. The same is true for perceived participation in the stock market by the respondent's social circle, indicating that some pure imitation may also be going on. The researchers then identified the subset of the respondent's social circle – their financial circle - with whom they interact on financial matters. It is assumed that they are considered more knowledgeable and that the respondent trusts their views. By asking them to provide information about all these people, it is possible to get measures relating to their financial circle on the one hand, and the outer circle of people with whom they do not discuss financial matters on the other.

Analysis using the financial circles of respondents reinforces the main conclusion that there is a pure information effect present. There is a strong and significant relationship between the share of financial wealth that individuals invest in the stock market and the proportion of their financial circle that is perceived to follow the stock market. The relationship with the outer, non-financial circle is statistically insignificant. In other words, information about the stock market does not pass from the outer circle to the respondents because the respondents apparently do not discuss financial matters with them.

It is useful to distinguish between two types of imitation. One is 'mindless' imitation, when respondents might simply copy what others do, responding to peer pressure or fads. But there is also 'selective' imitation, by which investors might take the actions of the knowledgeable members of their circles as informative signals. It was possible to explore the influence of these different sorts of imitation by regressing the share of financial wealth invested by respondents in the stock market on two proxy measures: the proportions that are perceived to invest in the stock market of, first, the respondents' financial circle for 'selective' imitation and, second, their non-financial circle for 'mindless' imitation. The effect of their financial circle was again sizeable and significant, while the effect of the non-financial circle was statistically insignificant. It appears that investors' decisions are indeed influenced by their social networks, but not blindly so. Investors use their social interactions selectively and they act on the indirect information thus provided.

Alumni/ae Dinner

An alumni/ae dinner and discussion on Economics and Finance after the Crisis was held on 13 January 2016 at The Banking Hall in London.

Photo by Phil Mynott

The Responsiveness of Inventing

Alice Kuegler writes about her Keynes Fund supported historical research

Inventors develop new technology. Although their decisions to invent are important drivers of economic growth and progress, we know little about the incentives and constraints that such highly skilled individuals face. A better understanding of the allocation of their talent and effort should improve innovation policy. To shed light on this I investigated an abrupt change in patent policy that had been made in nineteenth-century Britain. In 1884, patent application fees were cut sharply by 84 per cent from what had been a high initial level. The theoretical impact of this on invention is unclear. Higher payoffs due to a lower fee might encourage efforts to invent. But a lower fee might decrease the quality of patents by making it cheaper to patent ideas. In the debates preceding the reform, while proponents of the high fee argued that it successfully deterred applications for low-quality inventions, their critics claimed that it left the inventors credit constrained.

To evaluate this trade-off I created a new dataset on British patenting for a ten-year period around the fee change. This includes information on the names and addresses of 54,000 British inventors who were granted patents. Renewal information for each of these patents was also collected, which serves as the main measure of patent quality. As shown in Figure 1, the patent fee reduction led to a substantial longer-run increase (of 140 per cent) in overall British patents. The increase in patents that were renewed, and by implication were of high quality, was over 100 per cent. The level of fees had clearly been an important influence on the effort devoted to patenting.

A second question that my work explores is the importance of credit constraints. Using the names and addresses of the inventors, I was able to generate proxy measures for their wealth. One of these measures uses information on whether the inventors employed servants, obtained from the 1881 Census of Population which recorded the number of servants employed per household. It was possible to match this with a subsample of those inventors who were traceable in the census data. Figure 2 shows that inventors who did not employ servants responded more strongly to the lower patent fee. These poorer inventors also responded with more high-quality, renewed patents.

This patenting response to the fee cut is similar to the response of labour supply to a tax cut. It suggests that there are significant efficiency losses when the cost of inventing is high. Such efficiency loss is even larger for inventors who are credit constrained. It suggests that there are large efficiency gains from overcoming constraints that misallocate the talent to invent. In our contemporary world, patent fees are less likely to impede inventive activities. The damaging constraints are more likely to be those on access to higher education and training of potential inventors, and on the funding of their research.

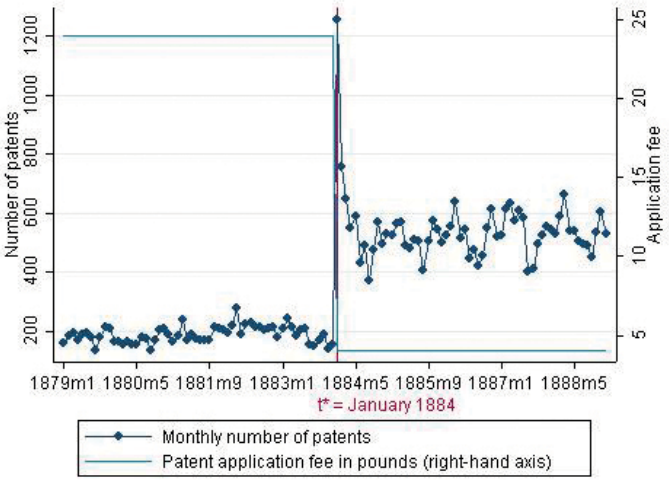


Figure 1: Number of British Patents 1879-1888

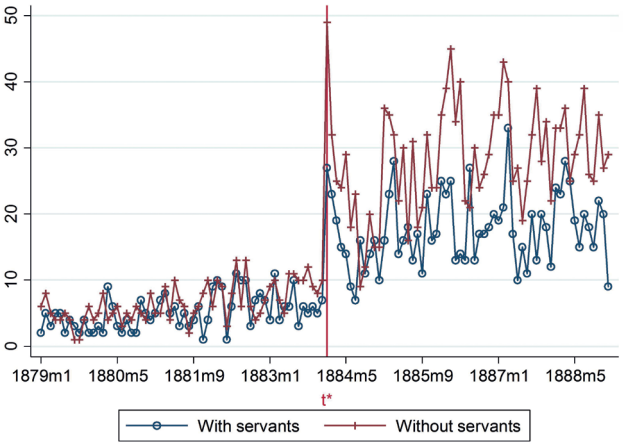


Figure 2: Number of Renewed Patents by Employment of Servants

Sex Selection

Kaivan Munshi, the Frank Ramsey Professor of Economics, writes about his current research

Sex selection, through female feticide, infanticide, or neglect, is an extreme manifestation of gender discrimination. Nobel prize-winning economist Amartya Sen brought sex selection to public attention 20 years ago when he famously claimed that 100 million women were "missing" in Asia. Since that time, countries like India and China have experienced rapid economic growth, and we might expect that sex selection would decrease with such development. This has not been the case in many regions, including South India. The South India Community Health Study (SICHS) which I lead, funded by the Keynes Fund in the Faculty of Economics and the U.S. National Institutes of Health, aims to document and explain sex selection in Tamil Nadu, a state in South India, where sex ratios have been paradoxically worsening as the pace of economic development has increased.

A popular explanation for sex selection in India is that dowry payments at the time of marriage make girls' parents worse off than boys' parents. The dowry hypothesis has received much attention in the press and in public discourse, but has not been subjected to rigorous theoretical and empirical scrutiny. Standard economic theory tells us that if the marriage market functions efficiently, the dowry will correctly reflect the value of the groom, and families on both sides of the market will be equally satisfied with the match. The starting point for our new economic theory is that the marriage market functions *imperfectly* in India, disadvantaging the girl's side. Girls' parents want to use the dowry as a way to share wealth with their daughters, who leave their natal home when they marry. Because the dowry is given to the husband and in-laws, however, girls will receive only a fraction of its value. The loss of part of the dowry – which could constitute a substantial share of the parents' wealth – leaves girls' parents worse off than boys' parents, resulting in sex selection, even when parents have no real preference for sons.

One solution to this marriage market imperfection is to subsidize parents for having a daughter, and many existing government schemes provide financial incentives to parents when they have a girl. An alternative strategy, which we uncovered during formative research, is for parents to circumvent the inefficient dowry transfer mechanism and invest in their daughters' human capital, particularly education, instead. These investments directly benefit daughters, particularly if they can utilize their education to earn an independent income. Furthermore, investment in girls' education cannot be siphoned off by the in-laws, unlike the dowry. The empirical component of this project tests the new theory of sex selection and the hypothesized parental response.

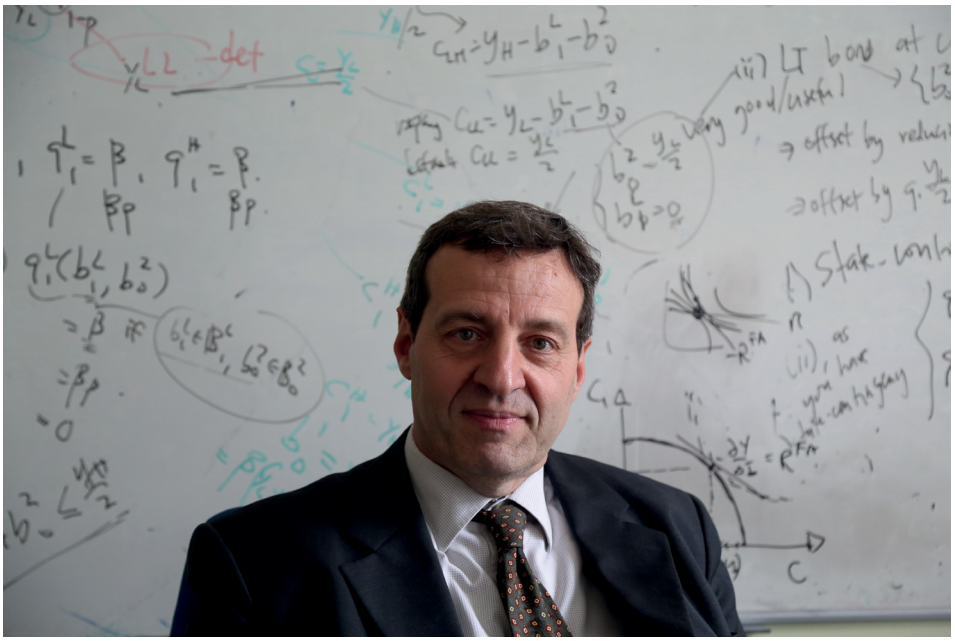
The dowry hypothesis is concerned with the functioning of the marriage market. Over 95 per cent of Indians marry within their caste, and so the caste is the appropriate unit of analysis to test the theory. Existing data sets do not, however, contain caste-level information at the scale and level of detail that are needed for this purpose. We use unique data from the SICHS, which includes a census of all 300,000 households residing in a study area covering half a district to uncover extremely high levels of sex selection within castes. Previous research has emphasized differences in sex selection across castes. Our study is the first to look within castes. We find that the intra-caste variation in sex selection dominates the between-caste variation by an order of magnitude in our study area, providing a new perspective on a well-studied social problem.

Future research will examine whether investments in girls' human capital (education and complementary inputs such as health and nutrition) are being used by parents to reduce the problem we have uncovered. It will quantify the impact of alternative policies, including financial subsidies for girls' parents and employment opportunities for girls. Female labour force participation is quite low in rural South India today. Employment and income generation programs could, therefore, potentially play a significant role in bringing sex ratios back to parity by increasing the returns to investing in daughters' education and making parents less reliant on the inefficient dowry mechanism. Our research would then provide an additional and powerful rationale for investments in female education and affirmative action programs for women, as a way of reducing sex selection.

The Cambridge-INET Institute

The Institute's Director, Giancarlo Corsetti, writes about its work

At the time of its launch, five years ago, it would have been difficult to imagine the profound impact that Cambridge-INET would have in Cambridge, or to anticipate the degree of success of its initiatives. It was established with the goal of giving a strong impulse to innovative fundamental research and to the pursuit of excellence in new economic thinking. Furthering this goal, the Institute provides resources for hiring postdoctoral researchers and organising events. It supports researchers and research projects, promoting interactions and collaborations within the community of researchers in Cambridge and elsewhere.



Since its launch the Institute has hosted over 50 internationally leading scholars as visitors and organised over 100 events, including conferences, workshops, training, public talks and high-level meetings on policy issues. We have promoted an increasing number of collaborations with other projects in Cambridge, such as the Centre for Macroeconomics and the EU's Horizon 2020 programme ADEMU (A Dynamic European Monetary Union). Similarly, we have pursued collaborations with academic and policy institutions (ranging from the Bank of England to the London-based Centre for Economic Policy Research) in a variety of initiatives.

Cambridge-INET currently sponsors twelve postdocs, and indirectly supports a number of postdocs from other programmes. These talented young researchers have injected new energy. Interacting with students and faculty, they have organised meetings and study groups, and assisted with teaching. Most importantly, they have worked on projects at the frontiers of our research themes, often branching into history and other disciplines. This year, two of the postdocs have come to the end of their contracts, getting first-rate jobs in leading academic centres.

The Institute has a rich and increasingly visible series of working papers on diverse topics, including fiscal multipliers, production networks, network analysis, and financial econometrics, many of which have already been published. None of these achievements would have been possible without the intellectual leadership and work of the faculty in Cambridge who coordinate work around the themes of the Institute and drive specific initiatives.

The academic year 2015-16 has been very active. Among our new ventures, we have introduced a more flexible format for meetings in the form of mini-conferences lasting one afternoon, concentrating on discussion of methodologies and topics at the frontier of macroeconomic research. The first mini-conferences included ones on *Macroeconomics of Financial Frictions*, on *Growth*, *Heterogeneous Agents and Macroeconomic Modelling* and on *Networks in Trade and Macroeconomics*. They bring together young and senior researchers, who are also invited to spend a few days in Cambridge to interact more intensively with our researchers.

The end of the academic year was particularly busy, including a cutting-edge international conference on the *Microstructure of Foreign Exchange Markets* in May, and in June the *Economic Theory Workshop,* and a workshop on *Behavioural Economics and Networks*. June also saw the *International Conference on Smart Infrastructure and Construction* bringing together leading scholars on various disciplines to reflect on 'smart cities' and urbanisation. Our postdocs and faculty members presented their results at the *Keynes Fund & Cambridge-INET Research Days*, as a forum for discussing ideas and projects, open to researchers from different disciplines in Cambridge.

There are exceptional events scheduled for next year. Among these, we will have international conferences on *Sovereign Debt Sustainability and Official Lending* and on *Experiments and Networks*. We will host the *Stochastic Dominance Theory and Applications Workshop & Masterclass* (14-16 Sept). I should also mention the *International Economic Association Roundtable on the Economics of Religion*, which is already scheduled for 10-11 July 2017.

We have recently received two transformational gifts which are a tangible sign of our success and the recognition of our achievements and role in Cambridge. First, the INET New York has renewed and extended its initial grant until 2020. Second, and most importantly, a generous donation from Bill and Weslie Janeway to the Faculty of Economics has created an endowment that will secure Cambridge-INET in perpetuity from 2020 onwards. We are extremely grateful to our donors, and especially to Bill, for supporting so effectively our developments and shared goals.

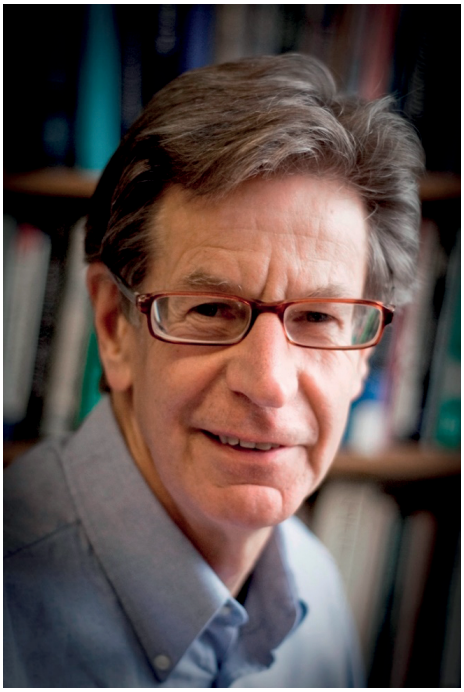
These new developments are a great opportunity for Cambridge-INET to rethink its strategy, structure and identity. They are also quite challenging, as this new phase will require a substantial adjustment in the scale, quality and outreach of our activities. I am sure that the coming year will see the Institute breaking new ground in the pursuit of its goals of fostering Cambridge as a leading international centre of research bringing a new perspective on classic economic questions.

Cambridge-INET Institute website: **www.inet.econ.cam.ac.uk**

Summing Up: Looking Back over 40 Years of Econometrics

Remember struggling with regression equations, matrix algebra – and worse? Andrew Harvey and Richard Smith, who retire this year from their respective Chairs in Econometrics, have been there, done that, and have emerged with a vivid and fascinating perspective of the development of their subject.

Linear regression models and matrix algebra mark the starting point of modern econometrics, driven by access to wider and more detailed ranges of empirical data, and the development of statistical methods such as maximum likelihood, which allows the statistical characteristics of a total population to be estimated from a sample. More complex non-linear models and analysis followed which, using iterative routines, can take account of cycles, shocks and random events. Other robust methods, such as generalized method of moments, have also been introduced. Typically over this period, economic theory and econometric concepts ran ahead of computational techniques and capacity.



Andrew Harvey, Richard Smith

Andrew and Richard say firmly that to be relevant empirical econometrics requires the formulation of structural models within which hypotheses and propositions can be tested. Rigour is necessary if analyses are to possess any statistical credibility.

They are critical of rational expectations models that rely primarily on Bayesian probability methods to set the parameters. Estimates from such models depend heavily on the initial assumptions, or 'priors', that are made. There is so much flexibility in their choice that spurious correlations can arise with the consequence that almost any answer can be derived. Much work in this area is purely economic theoretic in content and has only a weak claim to be classed as econometrics. The outputs in reality tend only to be 'guestimates'.

Richard's recent research has been mainly concerned with micro-econometric analysis, a field in which, thanks to the development of theory-coherent models with carefully formulated assumptions, it is possible to achieve a high degree of rigour and precision in estimation. Robustness and improved inference are central to his work on (generalized) empirical likelihood; see, for example, Newey and Smith (2004) and Smith (2011). Much recent research in micro-econometrics has been concerned with the refinement of particular techniques to guard against unobservable heterogeneity, arising from, for example, omitted variables, an issue commonly present in micro-econometric applications.

Over the course of Richard's career, the availability and quality of datasets has improved a great deal. As examples he cites the UK Integrated Household Survey, the successor to the General Lifestyle (formerly Household) Survey, and the National Child Development Survey. Individual household behaviour can be modelled, as can likely outcomes arising from differences in background, for example, the type and duration of schooling. A notable development in recent applications has been the analysis of price formation in auction markets. But there remains a risk of invalid inferences caused by errors in definitions and of measurement in datasets, in particular, as economic systems and relationships change through time.

Andrew has concentrated on macro-econometric modelling using time-series. His early work was on the theory and application of unobserved component models. Such models can be handled by using the state space form and the associated Kalman filter, techniques that were originally developed in the engineering literature to track rockets going to the moon. Andrew was one of the first to realise the potential of these techniques in econometrics and the work he carried out at the LSE in the 1980s culminated in the publication of his 1989 book (Harvey 1989). Since then a considerable amount of work has been done on extending the methods to nonlinear state space models and such models are now widely used in macroeconomics. But Andrew's enthusiasm is somewhat tempered by the uncritical use of Bayesian methods to carry out what he says can be calibration in disguise.

Andrew's recent work is making an important contribution to financial econometrics. Computational techniques now make it possible to access and interrogate vast quantities of data, often in real time, in the quest to model how financial markets operate and to understand the implications for efficiency and risk, and for economic and social welfare. He has focused on the development of a new class of dynamic models to explore the volatility of stock prices and exchange rates (Harvey 2013). An important part of this work is to identify 'tail risk' – that is, the likelihood of extreme outcomes within the probability distribution – and to consider whether, for forecasting and policy purposes, these risks should be weighted to take account of their empirical significance.

Andrew is not a big fan of Vector Autoregressive models. VAR, he says, stands for 'Very Awful Regressions'. His point is that, although VARs can provide a decent reference point for judging

short-term forecasts, they are arbitrary, unreliable and can lack robustness. He is particularly sceptical of how 'impulse response functions' are commonly used to draw conclusions about how the economy might be affected by shocks.

Both Andrew and Richard bridle at the popular criticism that econometric models failed to anticipate the global financial crisis of 2008. Their defence rests on the argument that models could not have been expected to incorporate knowledge that a large number of financial assets, typically associated with the housing sector, were incorrectly valued and actually worthless. Nevertheless macroeconomists and the regulatory agencies should have been more alert to what was happening in the financial sector.

Looking ahead, they see important issues and opportunities for empirical econometrics in developing better tools for estimation and inference, and in capturing the changing characteristics of the economic world.

Tony Cockerill and Willy Brown

The discussion took place on Thursday 29 March 2016.

Harvey, A.C. (1989). *Forecasting. Structural Time Series Models and the Kalman Filter*, Cambridge University Press.

Harvey, A.C. (2013). *Dynamic Models for Volatility and Heavy Tails*, Econometric Society Monograph, Cambridge University Press.

Newey, W.K., and R.J. Smith (2004). 'Higher Order Properties of GMM and Generalized Empirical Likelihood Estimators', *Econometrica*, 72, 219-255.

Smith R.J. (2011). 'GEL Criteria for Moment Condition Models', *Econometric Theory*, 27, 1192-1235.

European Union Grants

Sanjeev Goyal has been awarded a Horizon 2020 grant for large scale experiments to study human behaviour in complex environments. The other institutions of the consortium are the University of Carlos III in Madrid, University of Amsterdam, Universidad de Zaragoza, Universitat de València, Aalto University and University of Oxford. The value of the grant is €2.6 million.

Giancarlo Corsetti has also been awarded a Horizon 2020 grant for work on the dynamics of economic and monetary union. The collaborating institutions are the European University Institute, University of Bonn, Toulouse School of Economics, University College London, Catholic University of Portugal, Barcelona Graduate School of Economics, and Charles University in Prague. The value of the grant is €2.5 million.

Debopam Bhattacharya has been awarded a 5-year European Research Council 'Consolidator' grant for work to advance empirical welfare analysis by developing nonparametric approaches that provide more realistic treatment of consumer preferences. The grants, worth up to €2 million each, are awarded to mid-career scientists to enable them to consolidate their research teams and to develop innovative ideas.

Departures

Pramila Krishnan is leaving, after 13 years in the Faculty, to take up an Associate Professorship in Development Economics at the Department of International Development and a Fellowship at Pembroke College at Oxford University.

Sanjay Jain is leaving, after 8 years in the Faculty, to take up a Departmental Lectureship at Oxford University.

Arrival

Gabriella Santangelo has been appointed to a University Lectureship. Educated at Bocconi and Yale Universities, Gabriella is a development economist.

Promotions

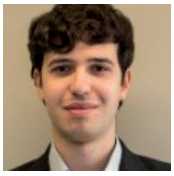
Alexey Onatskiy has been promoted to a Professorship in Econometrics.

Toke Aidt has been promoted to a Readership in Economics.

Debopam Bhattacharya has been promoted to a Readership in Econometrics.

Prizes

Jonathan Smith has won the International Finance and Banking Society's award for the best PhD paper. It was entitled 'The leverage ratio, Risk taking and bank stability'.



Anil Ari has been awarded the 2015 Klaus Liebscher Award by the Central Bank of Austria for outstanding papers concerned with EMU and European integration issues. It was for his paper on 'Sovereign risk and bank risk taking'.

Emeritus Professor **Sir Partha Dasgupta** has been awarded the 2016 Tyler Prize for Environmental Achievement.

Emeritus Professor **Willy Brown** has been elected Honorary Doctor of Science in Economics by the University of Sydney.

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