



CAMBRIDGE-INET

2012-18 REPORT



CAMBRIDGE-INET 2012-18

12
SEED FUND
GRANTS



101
EVENTS

279
READING
GROUPS AND
SEMINARS



204
VISITORS

136
PUBLISHED
PAPERS



108
WORKING
PAPERS



21
POSTDOCS

16
STUDENTSHIPS &
SCHOLARSHIPS



17
VIDEOS



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1. FROM THE DIRECTORS

It is a pleasure to introduce this report on the activities of the Cambridge-INET Institute. It is an important retrospective report, published in a year that marks a milestone in the life of the Institute. As of 2020, the Institute will begin its transition from a transformational but temporary endeavour of the Faculty of Economics, to a permanent research institution in Cambridge, promoting innovative research on a variety of subjects related, but not narrowly limited, to Economics. We find it appropriate to go back to the origins, and sketch, if only briefly, the vision and the reasons that motivated the Faculty, the University, and the donors to engage in a process that has much affected scientific creativity, academic achievement and the impact of Cambridge research in Economics.

Cambridge-INET would not exist without the Global Financial Crisis and the Great Recession. As was the case in the 30s, or the 70s, the recent crisis shook the consensus views and beliefs in Economics. For many years, these views and beliefs had directed research towards areas and models that downplayed the risk of macroeconomic and financial instability, let alone the possibility of stagnation traps. To be fair, these areas and issues never ceased to be intensively studied: they are core topics in economic research now. At the same time, the crisis gave new impetus for Economics to revisit some of its methodological stances on key issues, such as the degree of rationality that economic agents are endowed with, the role of social networks and the social embeddedness of economic relations.

The increasing availability of micro data, and the development of experimental Economics, are both providing researchers with unique opportunities to rethink economic behavior in the small and in the large, from micro to macro. Integrating micro-evidence and theory, research is flourishing on classical questions in key areas. These include innovation, productivity and sustainable growth, spurring a debate on how technological advances (in communication and information) impinge on market structure, and how to reform policies and regulation vis-à-vis rising concentration; the cause and consequences of widening income inequality and the determinants of wealth distribution and imbalances within and across countries; the sources of fragility in intertwined financial markets, operating at an unprecedented scale and speed.

These developments challenge economic theory to provide convincing models of households' and firms' behavior and heterogeneity that could provide firmer foundations on how policy is designed. Economics may well be headed for a paradigm shift in the near future. What is apparent already is that the field is currently undergoing far-reaching changes, with the widespread adoption of network analysis in theory and empirical work, a reconsideration of decision-making under uncertainty and deviations from unconstrained rationality and the increasing reliance on big data – to merely mention a few examples.

In the global laboratory for nurturing new ideas promoted by the Institute of New Economic Thinking, Cambridge found a unique niche. In setting up our Institute, our main goal was to identify Cambridge strengths in innovative areas of research that could contribute to shaping the changing mainstream in Economics. Initially, we identified four themes: Networks, Crowds and Markets (branching out from Economics to other social sciences); Transmission Mechanisms and Economic Policy (a reconsideration of models for policy assessment and design); Information, Uncertainty and Incentives (reconsidering how individuals make choice) and Empirical Analysis of Financial Markets (offering an empirical bridge between econometrics, information and agency theory). Under these umbrella themes, we also have teams working in trade (boosted by the Brexit referendum and the recent trade war), development and environment, and the Economics of religion. Over the years, Cambridge researchers in these areas have been producing world-class ground-breaking research, some of which is showcased in this report.

Through Cambridge-INET, Economics in Cambridge had the opportunity to invest in young and active researchers: we have created a postdoctoral programme; we have strengthened our teaching and Ph.D. training; we have supported existing and new Faculty and sponsored a variety of programmes, including a visitors' programme which attracts high profile scholars; we have organised many conferences and workshops, often in collaboration with other institutions and with an interdisciplinary approach, aiming to intensify the exchange of ideas and create learning opportunities across fields. We should be extremely grateful to INET, whose managers understood from the very beginning what we were trying to achieve and never failed to support our vision, contributing very actively to the design of our initiatives.

By the same token, the creation of Cambridge-INET would not have been possible without the enthusiastic support of the University and the School of the Humanities and Social Sciences, especially at the outset. The Institute was able to count on the intelligence and passion of a group of scholars and administrators who shared the sense that, especially after the crisis, Cambridge could no longer delay a strategic investment

in economic research. Building on its exceptional past achievements, throughout the years Cambridge has maintained a research environment which is open to new ideas, fosters a critical reappraisal of models and theories, and takes risky research projects in new directions – striving to keep all disciplined by logically rigorous analysis and methods. Cambridge-INET was designed to empower such an environment with new resources and tools. It is not by chance that topics once at the core of the Cambridge research agenda, from the theory of multipliers to production networks, are now reconsidered in a novel and convincing light by our researchers.

Throughout the years, the Institute has received generous support from many prestigious Centres and Funds in Cambridge. We are extremely grateful to the Cambridge Endowment for Research in Finance, essential for our ongoing work in finance and economics, as well as to the Keynes Fund, which allowed us to back important basic research on economic behavior, financial distortions and stabilisation policy. In the early years, we had the privilege to count on the support of the Isaac Newton Trust for our Post-docs. We are also very grateful to Queens' College and Dr. Mohamed A. El Erian who created a research and teaching position working in coordination with the Faculty and the Institute. Constructive cooperation with all these institutions and centres has multiplied the opportunities and the scope of research and training in Cambridge.

Finally, Cambridge-INET would not exist without the extraordinary dedication and intelligent support of Bill and Weslie Janeway, whose generous gift made it possible for the Institute to operate in perpetuity. The Institute took shape through an intense and fruitful dialogue between the University, the Faculty and the donors, aimed at identifying ambitious but feasible goals that could provide a compass for the Institute's development in the next decades.

This report is meant to offer a representative sample of the fruits of our work so far. To start with, it is useful to let the numbers speak. As shown in the overview on the first page of this report, we heavily invested in our young researchers, hiring 21 postdocs, granting 16 studentships and scholarships to students, and promoting intense dialogue and learning through 279 reading groups which are open to Faculty and students alike. We networked and promoted our activities and researchers by hosting more than 267 visits of high profile academic and policy makers, and by organising 101 events. We listed 108 working papers, many of which are now published in international journals. We also encouraged innovative research by granting 12 seed funding grants, aimed at assisting researchers at a very early stage of the development of their ideas. Many of the initiatives listed in this report were designed and launched in strict collaboration with publicly funded centres and projects in Cambridge, as well as with international policy and research institutions.

In this report, under the heading “How We work” in Section 2, you will find a synthetic description of the four themes that provide the intellectual and organisational backbone of our activity. Section 3 gives some insight into our research. There we list the outcome of a small set of projects, selected to account for the scope and breadth of our initiatives. Sections 4 and 5 are devoted to our researchers, and provide short profiles of the postdocs and Ph.D. students who have worked with us during the years covered by the report, as well as a list of our distinguished visitors. We close the report with a list of seed funded projects, the titles in our working paper series as well as our published papers, and the videos produced in conjunction with visits and conferences. One indicator of the transformative role of the Institute that makes us particularly proud is the increasing international recognition that Cambridge students receive for their achievement as young scholars.

The success of the Institute builds on the work that the theme coordinators, the deputy director, the managers, the administrators, and our researchers have conducted with dedication and professionalism over the years. It is our duty and privilege to express the sincere gratitude of the Institute.

Since its creation, Cambridge-INET has always aimed for academic excellence and sought to generate impact for the Faculty. This report gives evidence of our progress. When we started, we envisioned an inclusive research environment, open to ideas and dialogues across disciplines. We are looking forward to seeing how this vision will continue to shape the future identity and work of the Institute.



Giancarlo Corsetti
Director, Cambridge-INET Institute
February 2015 – April 2019



Sanjeev Goyal
Director, Cambridge-INET Institute
September 2012 – January 2015

2. HOW WE WORK

**TRANSMISSION MECHANISMS
AND ECONOMIC POLICY**

**INFORMATION, UNCERTAINTY
AND INCENTIVES**

**NETWORKS, CROWDS
AND MARKETS**

**EMPIRICAL ANALYSIS OF
FINANCIAL MARKETS**

TRANSMISSION MECHANISMS AND ECONOMIC POLICY

Theme Coordinators

Professor Giancarlo Corsetti
Professor Vasco Carvalho
Professor Hamish Low
Dr. Meredith Crowley



The Transmission Mechanisms and Economic Policy theme at the Cambridge-INET Institute brings together researchers conducting fundamental research in macroeconomics. We use a variety of approaches – encompassing micro and macro econometrics, macro models and historical and institutional analysis – to develop theoretical and empirical work on a wide range of issues, from firm growth and firm churning to household level savings and inequality, from unemployment dynamics to supply chains, from the analysis of monetary policy to international finance and global imbalances. Our research aims to generate inputs for stabilisation and structural policy.



INFORMATION, UNCERTAINTY AND INCENTIVES

Theme Coordinators

Professor Hamid Sabourian
Professor Christopher Harris



Microeconomics starts from the premise that phenomena should be understood as a result of individual choices. These choices are determined by the incentives that individuals face, and by the psychological make up of these individuals. Furthermore, competition, coordination and learning are vital in aggregating individual choices, and thereby shaping them into the collective behaviour observed in markets and even whole economies.

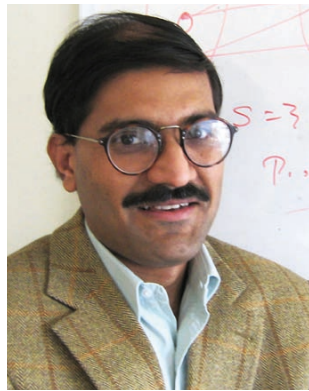
This theme brings together researchers working on individual and group decision making, bargaining, risk sharing, contracts, behavioural approaches to savings decisions, evolutionary economics, experimental economics and competition among firms. The application of these works has been to diverse areas such as financial markets and banking, epidemiology, trust and social norms, and decision-making in human organ transplantation. It is hoped that a better understanding of individual choices will allow policy makers to eliminate some of the more obvious design flaws in their policies, and that a better understanding of how these choices interact to determine collective outcomes will help to identify policies that result in more stable collective outcomes (possibly at the expense of sacrificing some features that appear desirable at the individual level).



NETWORKS, CROWDS AND MARKETS

Theme Coordinators

Professor Sanjeev Goyal
Professor Kaivan Munshi



Social, economic, and infrastructure networks are a defining feature of modern economies. The Networks Theme at the Cambridge-INET Institute is one of the world's strongest cluster of researchers in this dynamic and fast growing field.

There are three broad themes of work. One line of research is concerned with the dynamics of networks. This is motivated by topical problems such as technological innovation, financial contagion, cybersecurity, disease epidemics, supply chain disruptions and international conflict. A second strand of work explores the relationship between markets, states and community networks; how traditional communities shape the behaviour of individuals and groups in a modern economy. This work has important implications for the optimal design of development policy. A third research theme explores bargaining, production and exchange in networks, with implications for industrial policy and the regulation of markets.

The Cambridge-INET Networks Group is unusual in its diversity, both with regard to the methods we use – theory, experiments, and statistical analyses with observational data – and the areas we work in – spanning micro and macro analyses in developing and developed economies and covering the three research themes discussed above.

EMPIRICAL ANALYSIS OF FINANCIAL MARKETS

Theme Coordinators

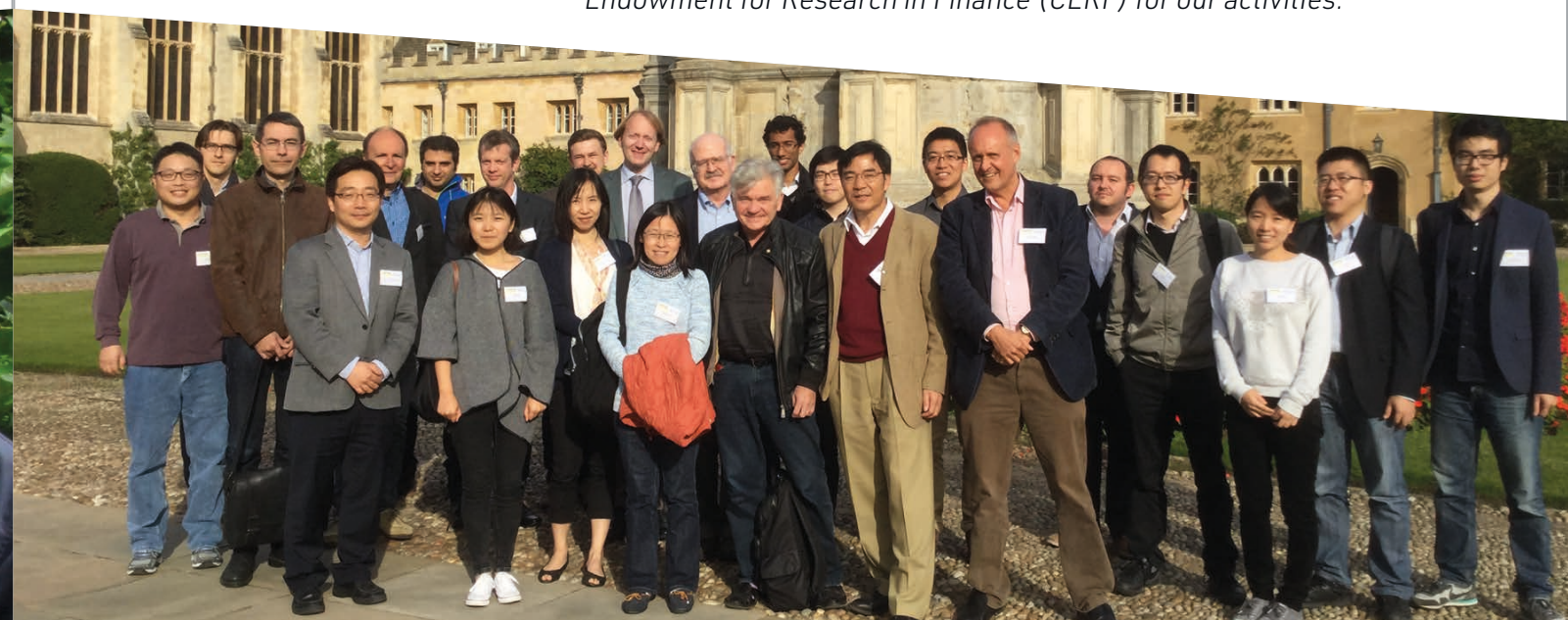
Professor Oliver Linton
Professor Alexei Onatski



Financial markets serve the important function of transferring risk across individuals and over time, and they provide information on the performance of firms and economies. As such their effective performance is of great interest to policymakers, pension holders, and consumers, yet recent events have created profound mistrust about their operation.

The theme brings together researchers working on fundamental methodological issues that can help provide evidence on the functioning of financial markets. We have several projects concerned with market microstructure, about how the trading environment impacts the outcomes for long term investors and policy makers. Does the presence and use of advanced technology improve or degrade outcomes for pension funds and retail investors? What is the best way of measuring volatility with a view to comparisons across markets and across time? Does the presence of market stabilisation mechanisms such as circuit breakers reduce the potential for nonlinear feedback loops and volatility spillovers across securities and markets? Speed is one aspect of current financial markets, but big data is another. The vast databases and the improved hardware and software environments mean that the research cutting edge is constantly being redefined to take account of the better possibilities for evidentiary analysis. We have several projects and researchers who are at the forefront of this work.

We gratefully acknowledge the co-sponsorship of the Cambridge Endowment for Research in Finance (CERF) for our activities.





3. RESEARCH HIGHLIGHTS

3a. TRANSMISSION MECHANISMS AND ECONOMIC POLICY

THE ECONOMY AS A COMPLEX PRODUCTION NETWORK

Research by Vasco M. Carvalho

The production of goods and services in any modern economy is organised around complex, interlocking supply chains – or production networks – as firms rely on a variety of different inputs for production. Due to the key role of intermediate goods in the production process, disruptions to the orderly flow of goods and services have been increasingly recognised by policymakers as a source of aggregate risk.

In a series of papers, Vasco M. Carvalho has argued that the structure of these production networks is key in determining whether and how microeconomic shocks – affecting only a particular firm or technology along the chain – propagate throughout the economy and shape aggregate outcomes. Therefore, understanding the structure of the production network can better inform both academics on the origins of aggregate fluctuations and policymakers on how to prepare for and recover from adverse shocks that disrupt these production chains.

Indeed, overlapping policy initiatives at the international, regional, and national levels rely on the premise that firm-level or regional shocks – such as natural disasters, terrorism, or cyber-attacks – can propagate through input-output linkages to a wide array of firms and industries, with potentially adverse macroeconomic impacts. For example, the U.S. National Strategy for Global Supply Chain Security issued in January 2012 is based on the premise that supply chain linkages “serve to propagate risk that arises from a local or regional disruption across a wide geographic area,” which in turn “can adversely impact global economic growth and productivity”. In parallel, a growing academic literature has explored whether the presence of supply chain linkages can translate microeconomic shocks into aggregate, business cycle fluctuations (see Acemoglu et al, 2012 and, for an overview, Carvalho, 2014). Despite the interest of academics and policymakers alike, evidence on the role of input-output linkages as a channel for the propagation of shocks and a source of macroeconomic risk has been scant.

The recent research of Vasco M. Carvalho, together with researchers at Columbia University, the University of Tokyo and the Japanese Research Institute of Economy, Trade and Industry, provides a systematic quantification of the role of input-output linkages as a mechanism for propagation and amplification of shocks (Carvalho et al 2017). They exploit a large, but localised, natural disaster –the Great East Japan Earthquake of 2011. Relying on information on firms’ locations, the researchers exploit the exposure of Japanese firms to the earthquake to obtain measures of firm-level disturbances. They then combine this information with extensive micro-data on firm-to-firm input transactions to trace the extent of shock propagation along supply chains. To study the earthquake’s effects, the authors mapped out concentric networks of firms located upstream and downstream from disaster-hit companies on the supply chain. Customers that relied on earthquake-impacted firms directly, predictably felt the greatest impact; compared to a control group of firms with no direct or indirect exposure to the disaster, their growth rate was on average 2 percentage points smaller in the year after the disaster. The upstream supplier firms felt a smaller jolt, but it was still significant, with sales growth that was 1.2 percentage points smaller than that of the control group in the following year.



Figure 1: A map of the geographic distribution of headquarters locations of firms located in the disaster-stricken prefectures of Aomori, Fukushima, Iwate, and Miyagi, and the headquarters of firms one (bright red), two (orange), three (green), and four (blue) links away on the supply chain, either upstream or downstream. The blue curve represents the boundary of the four disaster-stricken prefectures.

But firms did not need to have direct business partners in disaster areas to be affected, the researchers found. In fact, much of the economic damage was indirect. Tight business relationships among firms meant that supply chains transmitted the shocks further and further away, to firms’ customers’ customers and suppliers’ suppliers. Downstream firms up to four business relationships removed from disaster-hit companies still experienced a noticeable drop in sales growth, of 1.1 percentage points. That effect was 0.1 percentage point for similarly removed upstream firms.

Summing up all those effects offers a more complete picture of the national economic hangover the earthquake created. The authors found that supply chain disruptions caused by the quake may have knocked as much as 1.2 percentage points off Japan’s aggregate gross output in the following year, an effect far greater than the economic output of the disaster-hit region by itself would suggest. The research establishes that supply-chain linkages can greatly amplify the economic damage of events like natural disasters. To the same extent that an interconnected economy can propel growth, it can also hamper it.

To learn more read:

“The Network Origins of Aggregate Fluctuations”, by Daron Acemoglu, Vasco M. Carvalho, Asuman Ozdaglar and Alireza Tahbaz Salehi, in *Econometrica* (2012)

“From Micro to Macro via Production Networks”, by Vasco M. Carvalho, in *Journal of Economic Perspectives* (2014)

“Supply Chain Disruptions: Evidence from the Great East Japan Earthquake”, by Vasco M. Carvalho, Makoto Nirei, Yukiko Saito and Alireza Tahbaz-Salehi, under revision for the *Quarterly Journal of Economics*.

EXCHANGE RATE FLEXIBILITY AND THE ZERO LOWER BOUND

Research by Giancarlo Corsetti

The classical case for flexible exchange rates rests on the argument that without the constraint of a currency target, policymakers are free to adjust the domestic monetary stance efficiently in response to business cycle disturbances, and choose their own inflation target. In a world of high capital mobility, a country foregoes these options if it, instead, commits to an exchange-rate peg or joins a monetary union.

The presumption that, under flexible exchange rates, monetary policy is able to freely adjust the domestic monetary stance and control inflation has been put into sharp relief by the Great Recession, during which numerous central banks have found themselves constrained by the zero lower bound (ZLB) on interest rates. This has led the literature to

start re-considering the case for flexible exchange rates (e.g. Galí and Monacelli 2016, Cook and Devereux 2016, Schmitt-Grohé and Uribe 2016). Cook and Devereux (2016) in particular, put forward the argument that, with a currency target, domestic inflation cannot deviate too much from foreign inflation.

Even in response to large adverse shocks (that would cause interest rates to fall to the ZLB under a floating exchange rate), inflation expectations then remain anchored, preventing damaging deflationary dynamics. The ‘straightjacket’ of fixed- exchange rate regimes may not be detrimental after all, given that our (advanced) economies seem to be vulnerable to the ZLB problem.

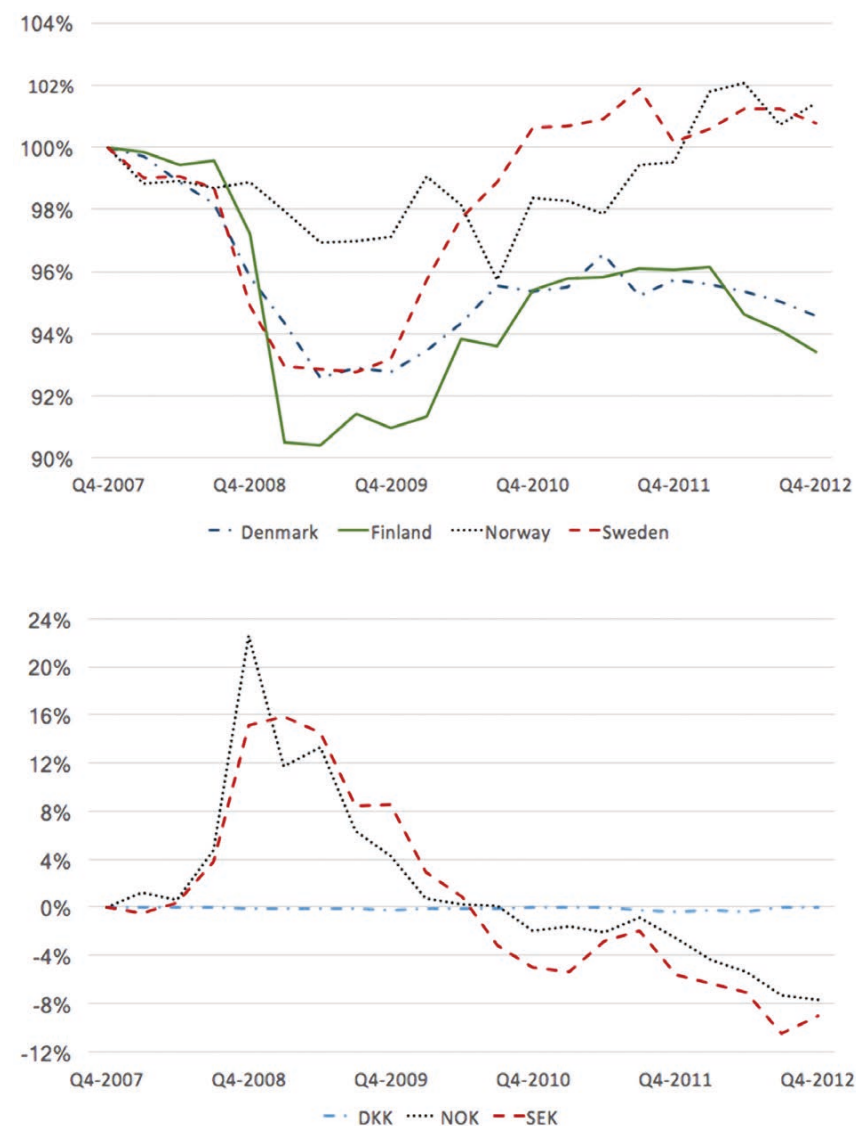


Figure 1. Real GDP (top panel) and change of exchange rate (bottom panel) in four Scandinavian countries

Output Exchange rate. Sources: OECD Economic Outlook and Bundesbank. Sample period = 2007Q4–2012Q4. GDP is normalised to 100% in 2007Q4, the exchange rate is expressed in percentage terms relative to 2007Q4.

The debate is far from theoretical, and this view is far from uncontroversial. To illustrate the issues at the heart of the debate, Figure 1 shows the evolution of output and exchange rates in four Scandinavian countries during the Great Recession.

While there may be relevant country-specific factors that weigh on the divergent response to the global shock, these are countries with comparable income and cultural and institutional commonalities. They do, however, differ in their exchange rate arrangements. Two of these countries have given up exchange rate flexibility: Finland is a member of the Eurozone; Denmark operates an independent currency, but maintains a narrow peg to the Euro. The other two, Sweden and Norway, pursue inflation targeting, but only in Sweden did policy rates fall to the ZLB in 2009–10. The left panel of the figure shows a sizeable output contraction for Finland and Denmark, but not for Norway. The contraction in Sweden, in turn, is larger than in Norway and, in fact, as strong as in Denmark and Finland on impact. Yet Sweden recovers quickly afterwards. Most important for our purposes, the right panel shows that not only did the Norwegian Krone depreciate sharply during the first year of the crisis – something you may expect in a country that does not face a constraint on its monetary policy and enjoys room of manoeuvring policy rates. But also, the Swedish Krona depreciated, although initially by less than the Norwegian currency. This evidence suggests that there may remain a case for flexible exchange rates.

In a recent paper, we reconsider this question, showing that theoretical results and policy lessons are more nuanced than the literature has so far suggested (Corsetti et al. 2017). Flexible exchange rates still retain important welfare properties, even in economies at risk of entering the ZLB.

To be as clear as possible, we encompass existing results in the literature, and present some new ones. We use a New-Open-Macroeconomics model as a unifying framework – working out tractable analytical expressions for a small open economy. We consider three monetary regimes: an unconstrained float, where monetary policy can always pursue a conventional Taylor-type rule targeting the natural rate of interest; a float where monetary policy pursues a Taylor rule but is unable to adjust interest rates for an extended period; and a credible and permanent exchange-rate peg. Thus we contrast an unconstrained monetary regime to two constrained regimes; one because of a currency peg, the other because interest rates are stuck at their ZLB.

We then ask which exchange rate regimes can ensure better macroeconomic and welfare performance when faced with a Great Recession. If the economy is at the ZLB, under what conditions would flexible exchange rates still provide ‘insulation’? Under which regime would fiscal policy be a better substitute for monetary policy?

Our point of departure is the observation that the ZLB can be a country-specific or a global issue (i.e. a large recessionary demand shock can originate either only at home or abroad). It turns out that the idiosyncratic versus international (systemic) nature of the ensuing recession makes a large difference.

We find that if the source of the shock is abroad and foreign interest rates become constrained at their ZLB, so that foreign monetary policy cannot cushion the adverse demand shock, flexible exchange rates do provide a great deal of insulation to the domestic economy. This is the case not only if domestic monetary stimulus can be deployed with the right intensity without running in turn into the ZLB, but also (albeit to a lesser extent) when domestic monetary policy also becomes constrained by the ZLB. The reason is – and this is the most novel result of our analysis – that the home currency depreciates upfront even in the absence of efficient monetary stimulus (recall the Swedish case in Figure 1). Upfront depreciation stabilises demand, both external and domestic, for domestically produced goods, and decouples domestic prices somewhat from any deflationary crawl that haunts the rest of the world in our scenario.

Vis-à-vis such a worldwide recession, a currency peg would instead perform quite poorly. Here, a country gives up the benefits of stabilising current demand in such a regime so that the domestic economy is fully exposed to the drop in international demand. But also, more importantly, a credible peg anchors home prices to the foreign price level – if the rest of the world suffers a deflationary drift (as a consequence of being in a liquidity-trap Great Recession), the domestic economy is bound to import it. Worse, it does so to such an extent that the exchange rate actually appreciates in real terms. This means that rising real interest rates depress home consumption demand, compounding the negative effects of a falling external demand and the loss in competitiveness. Indeed, these effects linger – a country that pegs its currency gives up the benefits of stabilising future demand as well.

The importance of these results cannot be overemphasised. A decade after the outburst of the Global Crisis, the world economy remains vulnerable to the risk that large global shocks once again cause a Great Recession. This is a challenge to policymaking in small open economies, which by their very openness are particularly vulnerable to external developments. In light of our findings, in such a world, the case for flexible exchange rates remains alive and well: intrinsically, the risk of temporary liquidity traps, ruling out efficient monetary stabilisation, is not a good enough reason to overturn the received wisdom.

As stressed by the literature, results are very different when the recessionary demand shock does not affect the rest of the world. The main difference is the response of world

prices. If the shock is not global, but originates in the small open economy, inflation-averse foreign monetary authorities can keep world prices stable. The peg now provides a commitment to reflate the domestic economy toward a stable world price level. And, a credible and stable nominal anchor is beneficial in a small open economy. If, instead, absent the currency constraint, domestic interest rates would be at the ZLB, economic activity would decline and domestic prices would start to fall.

However, precisely in situations in which the ZLB problem would emerge amid flexible exchange rates (say, because of large domestic demand shocks), there is also a ‘benign coincidence’ – fiscal policy can be expected to become a much more effective tool of stabilisation. A strong inflationary impact of fiscal policy magnifies the size of the multiplier at the ZLB (e.g. Woodford 2011, Fahri and Werning 2017). Importantly, this is true independent of the (domestic or external) origin of the shock. Conversely, as established in earlier work of ours (Corsetti et al. 2013), fiscal policy is rather ineffective under a peg because, by anchoring long-run expectations of the price level to constant world prices, an exchange rate target limits the inflationary impact of public spending. This result can be seen as one more reason to hold that the ZLB problem does not necessarily weaken the case for flexible exchange rates in small open economies.

Of course, the recourse to fiscal policy may be limited by economic or institutional constraints. In this sense, our conclusions could be framed according to the logic of the classic work of Poole (1970) – the choice between a float or a peg vis-à-vis the risk of a ZLB problem is ultimately informed by the type of shocks an economy is mostly vulnerable to, but also by the set of instruments that policymakers can effectively rely upon.

To learn more read:

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Corsetti G, E Mavroeidi, G Thwaites and M Wolf (2019) “Step away from the zero lower bound: Small open economies in a world of secular stagnation”, *Journal of International Economics*, 11: 88-102.
Krugman, P (2014), “Currency regimes, capital flows, and crises”, *IMF Economic Review* 62 (4): 470-493.

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THE IMPACT OF TIME LIMITS ON EMPLOYMENT, DIVORCE AND THE SOCIAL SAFETY NET

Research by Hamish Low

In 1996, Clinton's administration radically reformed welfare provision. Aid to Families with Dependent Children (AFDC) was replaced by Targeted Aid to Needy Families (TANF). The key change was the introduction of time limits on the receipt of welfare, with the aim to make welfare support only a temporary recourse rather than a permanent provision of insurance. At the time of the reform, 32% of low-educated single mothers were in receipt of AFDC: there was pressure to reduce claimants, to increase employment and to reduce the number of single mothers. By 2008, the percentage of single mothers claiming TANF had fallen to 8%. The key questions this raises are what has happened to those who would otherwise have been on benefits, why did behaviour change and who has gained and who has lost because of the reform.

The strictness of time limits varied by state, with some imposing 5 year limits, others as strict as 2 years, and some initially had no limits at all. Time limits were introduced alongside other changes to the welfare system: the imposition of work requirements for those claiming benefits, and the devolution of decision making over the allocation of the welfare budget and welfare rules to the states. Part of the challenge in understanding the effect of time limits is in disentangling the effect of time limits from other reforms.

Grogger and Michalopoulos (2003) use an experiment in Florida and a quasi-experimental approach to identify short-run effects of time-limits: a 5 year limit means households where the youngest child is over 13 will not be affected, and this is used

as a control. The key finding is that there is a substantial reduction in welfare use (a 16% decline), but the paper leaves open the longer term consequences and the question of what has happened to those coming off welfare. Chan (2013) incorporates time limits into a life-cycle model of labour supply to explore how benefit use and labour supply are affected, and again finds sizable reductions in welfare use and increases in labour supply. Both these papers, and the bulk of the literature, has restricted the analysis to single mothers. The problem with this is that the decision to be single is likely to be affected by reform: indeed, reducing the number of single mothers was a key motivation for the new welfare structure.

Time limits on welfare reduce the financial options for single mothers, making being a single mother harder. Some will choose to work more, some remain married, and some will move to other benefit programmes. In a recent paper (Low, Meghir, Pistaferri and Voena, 2018), we look at these joint decisions in an integrated framework.

We first provide reduced form evidence to show the effect of time limits on welfare use, employment, marriage and divorce, by comparing changes over time in the behaviour of women that are more likely to be exposed to time limits relative to other women. Figure 1 shows that welfare use declined dramatically and persistently, especially for single women, and that employment increased. Importantly, much of the increase was not just a mechanical effect of people being removed from welfare rolls because they hit the time limit. We provide evidence that people "saved" their entitlement, in anticipation of worse times ahead. However, the increase in employment was only half of the fall in welfare use, meaning a rise in the number of women neither on welfare nor employed.

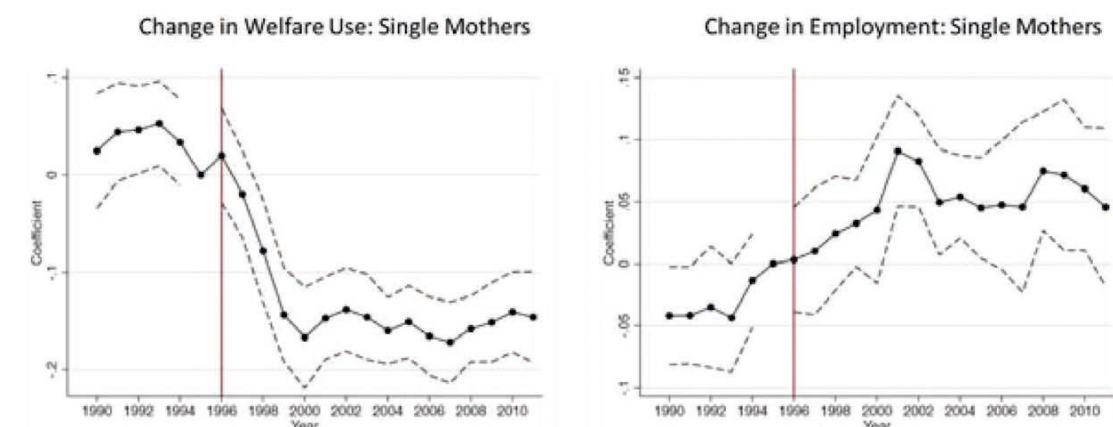


Figure 1: Change in Welfare Use and Employment

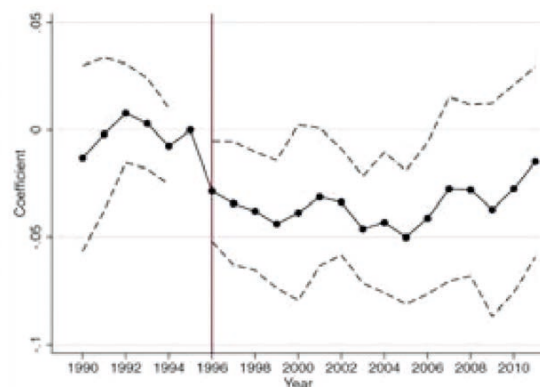


Figure 2: Change in Divorce

In addition, Figure 2 shows that rates of divorce declined with the introduction of time limits, as the difficulty of being single increased. On the other hand, marriage rates and fertility did not change. In other words, once married, individuals were less likely to split up. In itself this is likely to reduce single-motherhood substantially.

It is clear that the new programme has reduced the amount of insurance available; it is however an open question of whether it increased social welfare, by reducing the tax burden of funding the programme, or reduced social welfare by providing less insurance. To investigate such an issue we need to turn to a model.

To understand these different effects and the underlying mechanisms, we estimate a life-cycle model of family formation, welfare programme participation, labour supply and saving. In the model marriage happens for a number of reasons: mutual love plays a key role of course, but being married also offers economic benefits, including saving on commonly consumed goods (such as heating, housing expenses, etc.), bringing up children together and sharing labour market risk. However, these economic circumstances can change, affecting the economic benefits of marriage. For example, if policy makes it more attractive to remain single this will be a force pushing towards divorce. On the other hand, if policy makes single life harder, all else equal, divorce will be less likely. In our case, the imposition of time limits exposes single people to increased risk from adverse labour market outcomes, leading to less divorce.

Our approach is to use pre-reform data to estimate the model and to validate it by checking that it produces the immediate-short-run effect of the reform. The model reproduces the reduced form results accurately: welfare use declined as women deferred claiming benefits until their children were older. Half of this decline was offset by a rise in employment and some women chose not to claim at all after the reform. On the other hand, a large fraction of those not claiming welfare do not work either. For this group of women, who have to rely on food stamps or their partners, there has been a worsening of the outside option to marriage, a decline in welfare of women who remain

married and a decrease in divorce: these women who were the worst off before reform, are now even worse off.

The estimates show clear evidence of forward-looking behaviour: women change the timing of when they claim welfare because of potential future needs.

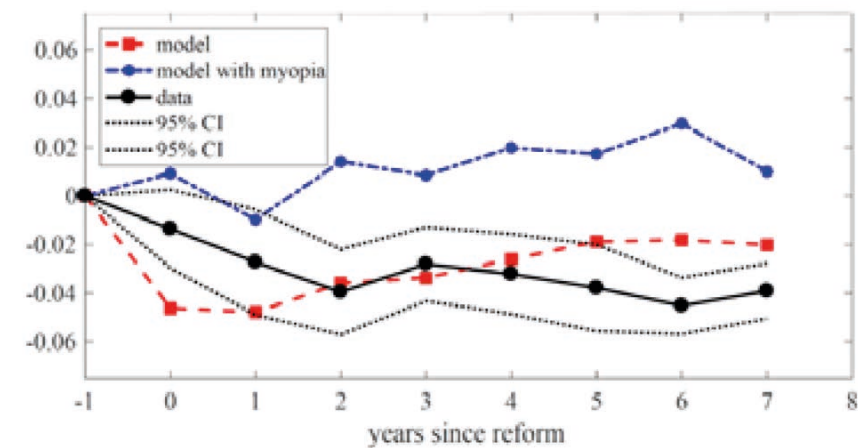


Figure 3: Myopia and Forward Looking Behaviour

In Figure 3, we compare our forward looking model with what welfare use would have looked like if individuals had been myopic and not realised the time limit was going to be imposed. The model with forward looking behaviour and banking of benefits captures what we estimate directly from the data.

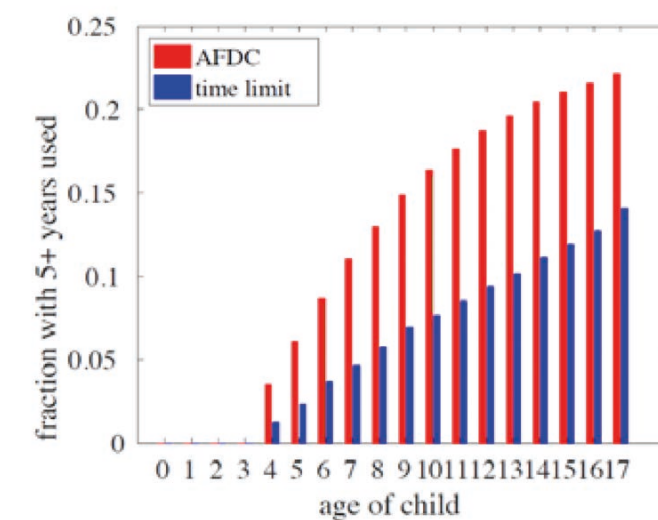


Figure 4: Fraction Reaching 5 Years of Benefit Use

The delay of claiming benefits is shown explicitly in Figure 4 which reports the simulated fraction of low-educated women who reach 5 years of benefit use by the age of their child, before and after the introduction of time limits. The level of welfare use falls and the timing is delayed.

Ultimately, welfare policy has its trade-offs. By imposing time limits it would have been possible to reduce taxes raised from this specific group of people. However, this population is willing to forgo this potential benefit and pay 0.5% of life-cycle income to have access to the original pre-reform welfare system. And single mothers value the unrestricted benefits by about 2% of lifetime consumption. In other words, the insurance value lost as a result of the reform is not offset by the revenue raised, even when spent on this demographic (women with less than college education). This leads to a more general lesson: while it is true that welfare systems can be distorting of both work and family formation decisions, the insurance they offer against adverse effects is highly valued.

Finally, to conclude, we provide evidence that the reform led to a rise in employment and a fall in divorce, as was intended by the law. Further, the sharp rise in the number of single women without welfare or employment, led to substantial welfare costs and left US families with young children with only a very limited safety net when the Great Recession started.

To learn more read

"Marriage, labour supply and the dynamics of the social safety net", by Low,H., Meghir,C., Pistaferri,L. and Voena, A., *NBER Working Paper No. 24356* (2018).

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Chan, M. (2013) "A dynamic model of welfare reform" *Econometrica* 81(3): 941–1001
Grogger, J. and Michalopoulos, C. (2003) "Welfare Dynamics under Time Limits" *Journal of Political Economy* 111(3): 530–554.

UNEMPLOYMENT RISK AND COUNTERCYCLICAL ECONOMIC POLICY

Research by Pontus Rendahl

Traditional macroeconomic analysis focusses on frameworks in which unemployment is of a voluntary nature, reflecting individuals' desire to trade off labour against the more pleasurable choice of leisure, given a prevailing wage. Pontus Rendahl's research broadly attempts to understand which repercussions there may be if such an (unrealistic) assumption is dispensed with, and thereby the consequences of analysing the effects on involuntary unemployment (risk) on individual and policy decision making. His main findings are that the presence of involuntary, and endogenously determined, unemployment can have severe implications for the propagation of small shocks to have large consequences, and that traditional policies, such as government spending and unemployment insurance, can be more effective than previously thought.

In a recently published paper "Fiscal Policy in an Unemployment Crisis", Rendahl (2016) shows that if unemployment is endogenous and persistent demand contracting or stimulating shocks can have a much larger impact than otherwise. If, for instance, there is a shock to consumer sentiments such that demand falls, there is a contraction in output and a rise in the unemployment rate. Since unemployment is persistent, however, any newly unemployed worker will know that his or her income is likely to remain depressed for several months, or even quarters. This knowledge leads to a further reduction in demand and thereby a further rise in the unemployment rate, setting in motion a powerful vicious cycle.

Yet this cycle can also be turned around. If the government taxes and spends – and even if those are taxes are imposed in the moment – the crisis can be mitigated. The underlying reason is that if the government both taxes and spends, net income should remain unchanged (as the spending generates higher incomes, which are then taxed away), and the private sector ought not to have any reasons to expand private spending. However, again, if unemployment is endogenous and persistent, the additional spending leads to new jobs. And as jobs last for a long time, any newly employed person has strong incentives to increase their spending by more than the increase in current income, as they foresee a steady income stream also in the future, and private sector demand increases. Thus the vicious cycle turns virtuous, with a fiscal multiplier of about 1.7 in times of a crisis.

Within this research domain Pontus Rendahl has also teamed up with Wouter den Haan (LSE) and Markus Riegler (University of Bonn). In particular, they have contributed to a new literature containing monetary models with heterogeneous agents and incomplete markets, explicitly modelling the portfolio choice that agents are facing. In their paper "Unemployment (fears) and Deflationary Spirals" (den Haan et al, forthcoming), they ask if unemployment risk, on its own, can magnify cycles, and possibly give rise to new policy insights. They show that if some disruption to the economy occurs which increases unemployment risk, agents tend to save more out of precautionary reasons. It would be easy, albeit erroneous, to draw the conclusion that such an increase in savings equals a shortfall in consumption demand and thereby overall demand. This is not true: the reason is that in equilibrium savings must equal investments, and investments are every part as much of a component of overall demand as consumption. Yet, they show that if nominal wages are rigid, savings may not end up in productive assets such as an investment good, but instead be held as (unproductive) money/bonds, and thereby create a shortfall in demand, with exacerbated unemployment (risk), and so on. Tentatively, they show that higher unemployment insurance benefits may mitigate this spiral, and lead to less pronounced recessions. This paper is forthcoming in the *Journal of the European Economic Association*.

Lastly, Rendahl has started working together with Renato Faccini (Queen Mary University) in trying to understand the joint determination of unemployment movements and gyrations in asset prices. In their paper “Income Risk, Asset Prices, and Unemployment Cyclicalities” (Faccini and Rendahl, 2018), they analyse a framework in which unemployment is mainly created by new firms, and in which entrepreneurs are interested in setting up new firms if those new firms would be highly valued (i.e. if the asset price of such a firm were to be high). They show that the combination of these assumptions leads to a framework in which both unemployment and asset prices react very sensitively to small disruptions to the economy, displaying empirically sound responses to realistically small disturbances. In addition, the framework is not sensitive to critiques raised in the past towards similar approaches, such as the excess volatility puzzle (Shiller, 1981), nor the equity premium puzzle. Moreover, and in a related notion to the aforementioned work (although through very different mechanisms), the economy can be more stable at higher values of unemployment insurance, but this relation is not monotone, and higher unemployment insurance may indeed destabilise the economy if it becomes too generous. Interestingly, the authors show that this relationship is not rejected by the data, but instead rather confirmed. Countries like the United States could possibly have a lot to gain by providing more generous unemployment insurance, while countries like those in Scandinavia could possibly have a lot to lose. This is still early days for this project, but it has been presented at several conferences and federal reserve banks.

To learn more read:

“Fiscal Policy in an Unemployment Crisis”, by Pontus Rendahl, in *The Review of Economic Studies* (2016).

“Unemployment (Fears) and Deflationary Spirals”, by Wouter J. Den Haan, Pontus Rendahl, Markus Riegler, in *Journal of the European Economic Association*, forthcoming.

“Income Risk, Asset Prices, and Labor Market Cyclicalities”, by Renato Faccini and Pontus Rendahl, *Manuscript University of Cambridge* (2017).

3b. INFORMATION, UNCERTAINTY AND INCENTIVES

THE RETIREMENT SAVINGS SYSTEMS Optimal Design of Retirement Savings Systems

Research by Christopher Harris

In joint work with John Beshears of Harvard Business School, James Choi of Yale School of Management, Christopher Clayton of Harvard Department of Economics, David Laibson of Harvard Department of Economics and Brigitte Madrian of Harvard Kennedy School, Christopher Harris has investigated the optimal design of retirement savings systems.

The design of such systems faces a key trade-off: on the one hand, it is important that individuals can access their savings in case of urgent need. For example, an individual might need to pay a medical bill, the college fees of their child or the high (albeit temporary) costs of moving between jobs. On the other, it is important that they set aside enough resources to pay for their retirement. This design also faces a key problem: individuals have a tendency to assign excessive importance to current consumption and, crucially, they vary in the degree to which they do so. In this setting, we find that a good approximation to the full optimum can be obtained by offering individuals three accounts: a liquid account, a penalty account and an illiquid account. Intuitively speaking, the liquid account meets unexpected but moderate demands on the individual’s resources; the penalty account serves as a backup that will only be tapped in a genuine emergency (when it makes sense for the individual to pay the early-withdrawal penalty); and the illiquid account ensures that nobody, not even the most profligate individual, is left in penury in retirement. This system matches the system currently used in the US: the liquid account is self-explanatory; the penalty account corresponds well to the 401(k)/IRA account with its 10% early-withdrawal penalty; and the illiquid account corresponds to Social Security.

COALITION-PROOF MECHANISMS

Research by Mikhail Safronov

Norms and rules of behaviour determine everyday life. It is important for a designer of such rules (or mechanisms) to ensure that people have proper incentives to follow these rules. A standard approach in the mechanism design literature is to consider individual incentives: for any economic agent it is rational to follow the rules if all the other agents follow them as well. However, even if individual incentives are accounted for, there may still exist profitable group violations of the rules. Group behaviour poses a real problem, for example, the second-price auction is designed to ensure that agents submit their values truthfully. Nevertheless, there have been observations of bidding rings, that is, agents were collectively misreporting their values.

This paper addresses the issue of group (or coalitional) deviation by proposing a new mechanism. The paper studies a classic model of social choice: there is a social planner and a group of agents with private values. The planner aims to implement the efficient social allocation that maximises the total payoff of the agents, however, she needs to induce the agents to report their values. The classic mechanisms by Vickrey-Clarke-Groves (VCG), and D'Aspremont-Gerard-Varet (AGV) induce the agents to report truthfully by monetary transfers, such that each agent gets compensated for the aggregate externality that his report imposes on all other agents. An example of a social choice problem is when a CEO of a network of hospitals wants to allocate new expensive equipment to the hospital that needs it the most. In the VCG and the AGV mechanisms, if any hospital claims a high need for the equipment, it will get it, but the hospital will have to indirectly make a monetary transfer since its report left the other hospitals without this equipment. This monetary transfer can be implicit by reducing the funds and grants this hospital gets. Such compensation aligns the incentives of individual agents with those of the social planner, inducing truth-telling. However, the VCG and the AGV mechanisms are vulnerable to coalitional deviations.

The new mechanism proposed in the paper alters the existing mechanisms as follows. Rather than compensating agents for the aggregate externalities of their reports, it forces them to directly compensate each other for the pairwise externalities. The new scheme of pairwise compensation ensures that each agent, if reporting truthfully, gets his efficient payoff from the social choice, regardless of the behaviour of the other agents. Indeed, the truthful agent gets directly compensated by the other agents for any externality of their reports and thus his total payoff stays the same. This is an attractive feature of the mechanism, and it should hold in any society with proper institutions: any agent who follows the rules is guaranteed to do well. This property of truthful agents getting their efficient payoffs ensures that agents do not want to misreport their values, whether individually or in groups. All truthful agents have their payoffs fixed at efficient

level, thus any misreport that leads to the social inefficiency will cause the misreporting group to suffer from this inefficiency directly by having their total payoff decreased. The coalitional deviation is not profitable even if the agents in a coalition can achieve perfect cooperation, that is, they can coordinate on their reports as well as reallocate monetary transfers among the members of the coalition.

To learn more read:

"Coalition-Proof Efficient Implementation" by Mikhail Safronov, in *Cambridge-INET Working Papers Series* No: 2016/03

NETWORKS AND PUBLIC GOODS

Research by Matthew Elliot

When economic agents produce public goods, mitigate public bads, or more generally create externalities, the incidence of the externalities is often heterogeneous across those affected. A nation's economic policies – e.g., implementing a fiscal stimulus, legislating environmental regulations, or reducing trade barriers – benefit foreign economies differently. Investments by a firm in research yield different spillovers for various producers and consumers. Cities' mitigation of pollution matters most for neighbours sharing the same environmental resources. And within a firm, an employee's efforts (e.g. toward team production) will benefit other employees to different degrees. How does heterogeneity in the incidence of externalities translate into outcomes? Which agents contribute the most and least? Whose effort is particularly critical?

An active research programme addresses these questions by modelling agents playing a Nash equilibrium of a one-shot public goods game, in which they unilaterally choose how much effort to put forth. We argue that it is valuable to also study different classes of solutions in a public goods economy – ones motivated by negotiations – and, paralleling the results above, to understand how network properties matter for these solutions. The static Nash equilibrium is a benchmark relevant in cases where decisions are unilateral, with limited scope for repetition or commitment. Players free-ride on the contributions of others, leading to a classic "tragedy of the commons" problem and the resulting inefficiencies can be substantial. Institutions arise precisely to foster multilateral cooperation and avoid these inefficiencies. Global summits, such as the Rio Earth Summit, the World Trade Organisation, research consortia, and corporate team-building practices all aim to mitigate free-riding by facilitating commitment. Therefore, rather than working with the static Nash equilibrium, Elliott and Golub (2018) focus on the complementary benchmark of Pareto efficient public goods provision in the presence of non-uniform externalities.

Elliott and Golub's contribution is to show that taking a network perspective on the system of externalities sheds new light on efficient outcomes and the scope for efficient cooperation. They provide a new characterisation of when Pareto improvements are possible, which relates such improvements to cycles of favor-trading, and characterise certain efficient solutions – the Lindahl outcomes, which have microfoundations in terms of negotiation games. Their analysis helps address questions such as who should be given a seat at the negotiating table or admitted to a team. In contrast to the previous work mentioned above, our characterisations are non-parametric: a “network” representation of marginal externality incidence arises naturally from general utility functions. Finally, they provide new economic foundations and intuitions for statistics that are widely used to measure the centrality of agents in a network by relating these statistics to concepts such as Pareto weights and market prices.

To illustrate their results, suppose there are three towns: X, Y and Z, located as shown in Figure 1a, each generating air and water pollution during production. Because of the direction of the prevailing wind, the air pollution of a town affects only those east of it.

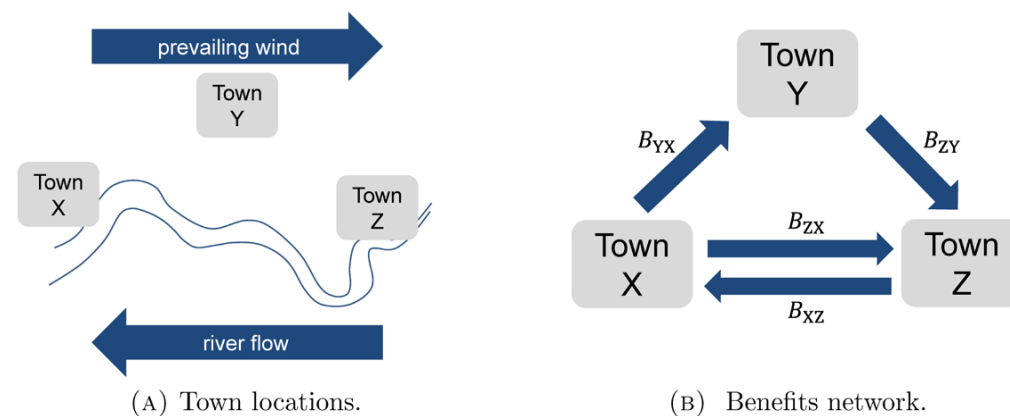


Figure 1:
A river flows westward, so Z's water pollution affects X but not Y, which is located away from the river.

Suppose each town can undertake some costly actions to reduce its pollution, thereby creating positive externalities for others affected by its pollution. Suppose further that the leaders of the towns attend a summit to try to agree on improvements that will benefit all of them. They focus on like-for-like agreements, in which agents trade favours by providing the public good of effort to each other, which is a relevant case for many practical negotiations. Elliott and Golub begin by studying the set of all outcomes that are Pareto efficient, and how they can be characterised in terms of the structure of externalities.

The conceptual platform for this is the system of marginal externalities each town imposes on each other, which varies as the towns change their actions. Their first result shows that actions are Pareto efficient if and only if they are increased to the point where this system of marginal externalities stops being expansive, as measured by the largest eigenvalue of the system. Consider a particular sequence of investments: In Figure 1b, Z can increase its action slightly and provide a marginal benefit to X. Then X, in turn, can “pass forward” some of the resulting increase in its utility, investing costly effort to help Z and Y. Finally, Y can also pass forward some of the increase in his utility by increasing his action, creating further benefits for Z. If all the towns can receive back more than they invest in such a multilateral adjustment, then the starting point cannot be Pareto efficient. It is in such cases that the system is “expansive” and there is scope for everyone to get more out of it than they put in. If instead contributions overshoot this point, then everyone can be made better off by reducing investments. Thus efficient outcomes are those where actions have been increased just up to the point at which the system of marginal benefits is no longer expansive.

One point on the Pareto frontier that is of particular interest is the classic Lindahl solution that completes the “missing markets” for externalities. If all externalities were instead tradable goods, the Walrasian outcome would identify the set of prices at which the market clears. If personalised taxes and subsidies equivalent to these prices could be charged, then the same efficient outcome would obtain. Such an allocation is called a Lindahl outcome. Their second main result characterizes the Lindahl outcomes in terms of the eigenvector centralities of nodes in the marginal benefits network. Eigenvector centralities capture the idea that central agents are those with strong connections to other central agents. The notion of eigenvector centrality recurs in a large variety of applications in various disciplines, and their main conceptual contribution is to relate it in a simple and general way to price equilibria.

To learn more read:

“A Network Approach to Public Goods” by Matthew Elliot and Ben Golub, in *Journal of Political Economy* (forthcoming).

COMPLEXITY AND REPEATED IMPLEMENTATION

Research by Hamid Sabourian

The success of a society often hinges on the design of its institutions (or mechanisms), from markets to voting. From a game-theoretic perspective, the basic requirement of an institution (or a mechanism) is that it admits an equilibrium satisfying properties that the society deems desirable. A more satisfactory way of designing an institution is to have all of its equilibria to be desirable, or to achieve full implementation. Such an approach, sometimes referred to as full implementation (or just implementation), is clearly more reassuring.

Lee and Sabourian (Econometrica 2011, henceforth LS11), extend the scope of implementation to repeated environments in which the agents' preferences evolve stochastically and demonstrate a fundamental difference between the problems of one-shot and repeated implementation. In particular, they establish, with minor qualifications, that with complete information a social choice function is repeatedly implementable if and only if it is efficient, thereby dispensing with (Maskin) Monotonicity assumption. This assumption occupies the critical position in one-shot implementation and yet often amounts to a very restrictive requirement, incompatible with many desirable normative properties, including efficiency. The notion of efficiency represents the basic goal of an economic system and therefore the sufficiency results in LS11 offer strong implications.

Despite the appeal of its results, the implementation approach has often been criticised for employing abstract institutions that neither square up to the demands of real world mechanism design, nor are theoretically appealing. In their recent work, Lee and Sabourian (2016, henceforth LS16) adopt a novel approach that appeals to bounded rationality of agents and seeks also to gain insights into a broader motivating enquiry: can a small departure from fully rational behaviour on the part of individuals work in the favour of the society to broaden the scope of implementability? Specifically, they pursue the implications of agents who have a preference for less complex strategies (at the margin) on the mechanism designer's ability to discourage undesired equilibrium outcomes.

One of the most important limitations of the results in implementation theory (including those in LS11) has been obtained through the usage of unbounded integer games which rule out certain undesired outcomes via an infinite chain of dominated actions. One response in the implementation literature, both in one-shot and repeated setups, to the criticism of its constructive arguments has been to restrict attention to more realistic, finite mechanisms. However, using a finite mechanism such as the modulo game to achieve implementation brings an important drawback: unwanted random (mixed) strategy equilibria.

To deal with the above problem and at the same time to implement efficient social choice functions in a repeated environment, LS16 apply the bounded rationality approach. Specifically, they construct a sequence of simple and finite mechanisms that has, under minor qualifications, the following two features:

- (i) every deterministic equilibrium repeatedly implements the efficient social choice function,
- (ii) all equilibria are deterministic.

The second feature is obtained by making the sequence of simple finite mechanisms non-stationary/history-dependent (different simple mechanisms are enforced at different public histories) and by invoking the assumption that every economic agent has a preference for less complex strategies (at the margin). Specifically, even with simple finite mechanisms, the freedom to choose different mechanisms at different histories enables the planner to design a sequence of mechanisms such that if the players were to randomise in equilibrium, the strategies would prescribe a complex pattern of behaviour (i.e. choosing different mixing probabilities at different histories) that could not be justified by payoff considerations, as simpler strategies could induce the same payoff as the equilibrium strategy at every history. Thus, when faced with complexity-averse agents, the freedom to set different mechanisms at different histories gives the planner an additional leverage to deter undesirable (random) behaviour.

A broader lesson from LS16's analysis is that economic agents' aversion towards complex behaviour may help the planner's cause: by deliberately constructing a complex institution, the planner may guide the agents to adopt desired strategies if they are simple while other avoiding undesired equilibria involve complex behaviour. In LS16 the complexity of institution that exploited these traits was manifested in the non-stationarity of the sequence of simple finite mechanisms enforced. Indeed, one can find many real-world cases of complex institutions that have survived the test of time (for an illuminating example, see the voting protocol for electing the Doge of Venice between 1268 and 1797; Mowbray and Gollmann 2007).

To learn more read:

"Complexity and Repeated Implementation" by Lee Jihong and Hamid Sabourian, in *Journal of Economic Theory* (2016).

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Mowbray, M. and D. Gollmann (2007): "Electing the Doge of Venice: Analysis of a 13th Century Protocol," *Proceedings of the 20th IEEE Computer Security Foundations Symposium*, 295-310.

3c. NETWORKS, CROWDS AND MARKETS

NETWORKS AND MISALLOCATION

Research by Kaivan Munshi

Rural-urban migration is exceptionally low in India. This is also reflected in India's urbanisation rates, which are substantially lower than in other large developing countries. The simplest explanation for India's low mobility is that rural and urban wages are relatively close, reducing the incentive for workers to migrate. However, the real wage gap in India is at least 16 percentage points larger than it is in China and Indonesia. There is evidently some friction that prevents rural Indian workers from taking advantage of more remunerative urban labour market opportunities.

The explanation Munshi and Rosenzweig propose for India's low mobility is based on a combination of well-functioning rural insurance networks and the absence of formal insurance, which includes government safety nets and private credit. In rural India, informal insurance networks are organised along caste lines. Frequent social interactions and close ties within the caste, which consists of thousands of households clustered in widely dispersed villages, support very connected and exceptionally extensive insurance networks. Households with migrant members will have reduced access to rural caste networks for two reasons. First, migrants cannot be as easily punished by the network, and their family back home in the village now has superior outside options (in the event that the household is excluded from the network). It follows that households with migrants cannot credibly commit to honouring their future obligations at the same level as households without migrants. Second, an information problem arises if the migrant's income cannot be observed. If the household is treated as a collective unit by the network, it always has an incentive to misreport its urban income so that transfers flow in its direction.

If the resulting loss in network insurance from migration exceeds the income gain, then large wage gaps could persist without generating a flow of workers to higher wage areas. This distortion is paradoxically amplified when the informal insurance networks work exceptionally well because rural households then have more to lose by sending their members to the city. Munshi and Rosenzweig provide support for this hypothesis by looking within the caste and theoretically identifying which households

benefit less (more) from caste-based insurance. Munshi and Rosenzweig then proceed to test whether it is precisely those households that are more (less) likely to have migrant members.

One way to characterise mutual insurance is that the income generated by the network in each period is pooled and then distributed on the basis of a pre-specified sharing rule. In our framework, households can either remain in the village and participate in the insurance network or send one or more of their members permanently to the city, increasing their income but losing the services of the network. The sharing rule that is chosen in equilibrium determines which households choose to stay. Munshi and Rosenzweig are able to show, under reasonable conditions, that the income-sharing rule will be set so that there is some amount of redistribution in equilibrium; i.e. relatively poor (rich) households in the network consume more (less) than they earn. This implies that relatively wealthy households within their caste benefit less from the network and so will be more likely to have migrant members.

Migration by a male household member diversifies the household's income and so is typically assumed to lower the income-risk that the household faces. The implicit assumption in our framework is that in the Indian context, the loss in network insurance when an adult male from the household migrates dominates this gain from income diversification. It follows that households who face higher rural income-risk and who, therefore, benefit more from the network, everything else equal, will be less likely to have male migrant members. This second prediction is especially useful in distinguishing our theory from alternative explanations for large rural-urban wage gaps and low migration in India. Indeed, if insurance networks were absent, we would expect the opposite pattern to be obtained.

We begin the assessment of the theory by showing that there is substantial redistribution of income within castes. Following up on this new result, we provide support for both predictions of the theory with data covering all the major Indian states. Additional results directly support the key assumption of our model, which is that migration should be associated with a loss in network services. Having found evidence consistent with the theory, we proceed to estimate the structural parameters of the model. Counter-factual simulations that quantify the effect of formal insurance on migration, leaving the rural insurance network in place, indicate that a 50 percent improvement in risk-sharing for households with migrant members (which is still some way from full risk-sharing) would more than double the migration rate, from 4 to 9 percent. In contrast, doubling the rural-urban wage gap, from 18 percent to 40 percent, without any change in formal insurance, would increase migration by less than two percentage points.

To learn more read:

"Networks and Misallocation: Insurance, Migration and the Rural-Urban Wage Gap" by Kaivan Munshi and Mark Rosenzweig, in *American Economic Review* (2016).

FINANCIAL NETWORKS

Research by Matthew Elliott

Globalisation brings with it increased financial interdependencies among many kinds of organisations – governments, central banks, investment banks, firms, etc. – that hold each other's shares, debts and other obligations. Such interdependencies can lead to cascading defaults and failures, which are often avoided through massive bailouts of institutions deemed "too big to fail," or "too interconnected to fail." Examples from recent times include the U.S. government's interventions in A.I.G., Fannie Mae, Freddie Mac, and General Motors; and the European Commission's interventions in Greece and Spain. Although such bailouts circumvent the widespread failures that were more prevalent in the nineteenth and early twentieth centuries, they emphasise the need to study the risks created by a network of interdependencies. Understanding these risks is crucial to designing incentives and regulatory responses that defuse cascades before they are imminent.

To address this we develop a general model that produces new insights regarding financial contagions and cascades of failures among organisations linked through a network of financial interdependencies. Organisations' values depend on each other – e.g., through cross-holdings of shares, debt or other liabilities. If an organisation's value becomes sufficiently low, it hits a failure threshold at which it discontinuously loses further value; this imposes losses on its counterparties, and these losses then propagate to others, even those who did not interact directly with the organisation initially failing. At each stage, other organisations may hit failure thresholds and also discontinuously lose value. Relatively small and even organisation-specific shocks can be greatly amplified in this way. These discontinuities incurred when an organisation fails can include the cost of liquidating assets, the (temporary) misallocation of productive resources, as well as direct legal and administrative costs.

In our model, organisations hold primitive assets (any factors of production or other investments) as well as shares in each other. The basic network we start with describes which organisations directly hold which others. Cross-holdings lead to a well-known problem of inflating book values (Brioschi, Buzzacchi, and Colombo (1989) and Fedenia, Hodder, and Triantis (1994), and so we begin our analysis by deriving a formula for a non-inflated "market value" that any organisation delivers to final investors outside the system of cross-holdings. This formula shows how each organisation's market value depends on the values of the primitive assets and on any failure costs that have hit the economy. We can therefore track how asset values and failure costs propagate through the network of interdependencies. An implication of failures being complementary is that cascades occur in "waves" of dependencies. Although in practice these might occur all at once, it can be useful to distinguish the sequence of dependencies in order to figure

out how they might be avoided. Some initial failures are enough to cause a second wave of organisations to fail. Once these organisations fail, a third wave of failures may occur, and so on.

A variation on a standard algorithm then allows us compute the extent of these cascades by using the formula discussed above to propagate the failure costs at each stage and determine which organisations fail in the next wave. Policymakers can use this algorithm in conjunction with the market value formula to run counterfactual scenarios and identify which organisations might be involved in a cascade under various initial scenarios.

With this methodology in hand, our main results show how the probability of cascades and their extent depend on two key aspects of cross-holdings: integration and diversification. Integration refers to the level of exposure of organisations to each other: how much of an organisation is privately held by final investors, and how much is cross-held by other organisations? Diversification refers to how spread out cross-holdings are: is a typical organisation held by many others, or by just a few? Integration and diversification have different, nonmonotonic effects on the extent of cascades.

If there is no integration then clearly there cannot be any contagion. As integration increases, the exposure of organisations to each other increases and so contagions become possible. Thus, on a basic level increasing integration leads to increased exposure which tends to increase the probability and extent of contagions. The countervailing effect here is that an organisation's dependence on its own primitive assets decreases as it becomes integrated. Thus, although integration can increase the likelihood of a cascade once an initial failure occurs, it can also decrease the likelihood of that first failure.

With regard to diversification, there are also trade-offs, but on different dimensions. Here the overall exposure of organisations is held fixed but the number of organisations cross-held is varied. With low levels of diversification, organisations can be very sensitive to particular others, but the network of interdependencies is disconnected and overall cascades are limited in extent. As diversification increases, a "sweet spot" is hit where organisations have enough of their cross-holdings concentrated in particular other organisations so that a cascade can occur, and yet the network of cross-holdings is connected enough for the contagion to be far-reaching. Finally, as diversification is further increased, organisations' portfolios are sufficiently diversified so that they become insensitive to any particular organisation's failure. This is shown in Figure 1 on the next page.

Putting these results together, an economy is most susceptible to widespread financial cascades when two conditions hold. The first is that integration is intermediate: each

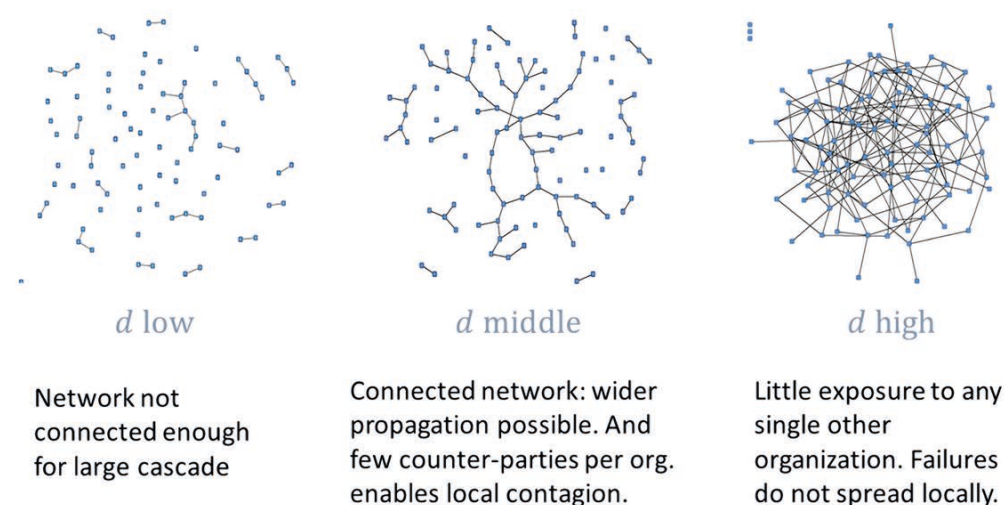


Figure 1: Diversification non-monotonicity in susceptibility to cascades of failures

organisation holds enough of its own assets that the idiosyncratic devaluation of those assets can spark a first failure, and holds enough of other organisations for failures to propagate. The second condition is that organisations are partly diversified: the network is connected enough for cascades to spread widely, but nodes don't have so many connections that they are well-insured against the failure of any counterparty.

To learn more read:

"Financial Networks and Contagion" by Matthew Elliot, Ben Golub and Matt Jackson, in *American Economic Review* (2014)

NETWORKS, MARKETS AND INEQUALITY

Research by Julien Gagnon and Sanjeev Goyal

The relationship between community and markets remains a central theme in the social sciences. The empirical evidence on this subject is wide ranging and mixed. In some instances, markets are associated with the erosion of social relations, while in other contexts markets appear to be crucial for their preservation. What are the economic mechanisms that can account for these empirical patterns?

Gagnon and Goyal (2017) develop a model where individuals located within a social structure choose a network action (x) and a market action (y). Payoffs to action x are increasing in the number of their 'neighbours' who adopt the same action: this captures the personalised and possibly reciprocal nature of network exchange. In contrast, market exchange is anonymous and short-term, and agents are price-takers: payoffs

to action (y) are independent of the decisions of others. The final ingredient is the relationship between the returns to the network and market actions: they allow (f) or both a complements and a substitutes relation. They study who adopts the network and market actions, respectively, and how this choice affects aggregate welfare and inequality.

Consider the trade-offs an individual faces. To fix ideas, suppose first that the two activities are substitutes and focus on the choice between market and network action. The returns to the market action are constant and independent of others' choices. On the other hand, the payoffs to network activity are increasing in the number of neighbours who adopt x: for a neighbour to adopt the network action, she must in turn have enough neighbours who adopt the network action. This leads naturally to the set of individuals who each have a threshold number of neighbours, who in turn each have this threshold number of neighbours, and so forth. The q-core of a network is the maximal set of individuals having strictly more than q links with other individuals belonging to this set. They show that behaviour is characterised in terms of the q-core of the social network. They use this characterisation to study the relation between social structure and economic outcomes.

First consider the issue of who participates in markets and what sorts of social structure facilitate market participation. Building on the characterisation, they show that the answer depends on whether markets and network exchange are substitutes or complements. In the substitutes case, it is the individuals outside the q-core, who benefit the least from network exchange that choose the market action. In the case of complements, the converse holds: individuals within the q-core adopt the market action. Denser networks, having a larger q-core, see lower market participation if the two actions are substitutes; the converse is true.

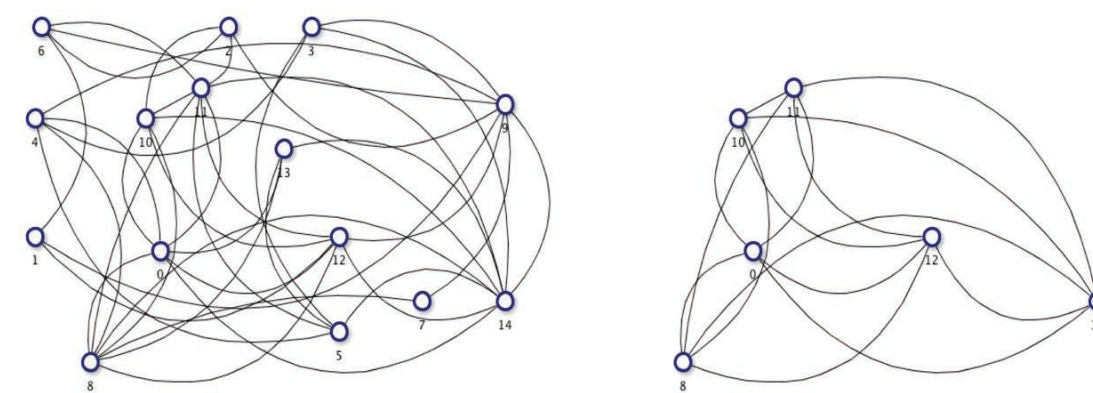


Figure 1: The 4-core when the actions are complements.

The authors then turn to welfare and show that the emergence of markets may lower welfare in the case of substitutes, but that it always raises aggregate welfare when the actions are complements. The intuition is as follows: in the substitutes case when an individual “leaves the network” (stops choosing x) and instead adopts the market action y , she imposes a negative externality on her neighbours who stay with x . This negative effect may be larger than the benefits she achieves by opting for y . Conversely, in the complements case, the availability of market exchange always raises the returns from network exchange and thus has a positive multiplier effect on welfare.

Finally, they examine the impact of markets on inequality. They find that markets lower inequality when the market action and network exchange are substitutes, the converse is true if they are complements. In the substitutes case, the market action offers an outside option to individuals who benefit the least from the network, and therefore has the potential to reduce inequality. In the complements case, the market action enhances the payoffs of the ‘well-connected’ individuals, and this favours those who are already better-off.

To learn more read:

“Networks, Markets and Inequality” by Julien Gagnon and Sanjeev Goyal, in *American Economic Review* (2017).

REPUTATION AND SOCIAL KNOWLEDGE

Research by Edoardo Gallo

The emergence and sustenance of cooperative behaviour is a fundamental factor in the functioning of human societies from hunter gatherers to modern civilisation. In context where external enforcement is not feasible or desirable, cooperation is often undermined by individuals’ self-interested incentives to free ride on others’ contributions. Understanding the drivers of cooperation is therefore crucial to create policies that act on the right levers to promote cooperative behaviour. Research across the social sciences and evolutionary biology has revealed the role of reputation and social networks in promoting cooperation using variants of the well-known prisoner’s dilemma game.

An important driver of cooperative behaviour is the ability to form and break connections, and thereby select with whom to play the game, because the possibility of forming new connections with cooperative individuals encourages defectors to switch to cooperative behaviour even if many of their neighbours are defecting. This network formation process relies on two dimensions of information available to individuals, which we dub

reputational and social knowledge. Reputational knowledge is what individuals know about the previous actions of others in the group. Social knowledge is what individuals know about the structure of the social network within the group, which determines who plays the game with whom.

In our paper we investigate experimentally the role of reputational and social knowledge in the emergence of cooperation and the structural features of the network associated with cooperative activity. The experiment was conducted using UbiquityLab – a novel platform to run interactive, large-scale experiments online – and recruiting 364 US-based subjects in the online labour market Amazon Mechanical Turk (AMT).

An experimental session consists of 13–16 rounds of a multiplayer prisoner’s dilemma game on a network formed by the 13 participants assigned to a group. In stage 1 of each round, subjects can propose costless links to any of the other subjects and can unilaterally remove any of their existing links from the previous round. The formation of a connection requires the consent of both participants, while removal is unilateral. In stage 2, subjects play a prisoner’s dilemma game with each of their neighbours in the network from stage 1 by choosing a cooperate (C) or defect (D) action that applies to all their neighbours.

We conduct four treatments to examine the relative importance of reputational and social knowledge. In the baseline (B) treatment, subjects only have access to local reputational knowledge: a list of their current neighbours with the last five actions chosen by each one of them and a list of the non-neighbours without any information on their past actions. They also have access to local social knowledge only, so they have no information on the structure of the network beyond their neighbours. In the reputation (R) treatment, they have access to global reputational knowledge, so they see a list of the last five actions for every other subject, but they are still limited to local social knowledge. In the network (N) treatment, they have access to global social knowledge, so they see a network figure that shows the connections among all of the subjects in the group, but they only have access to local reputational knowledge. Finally, in the reputation and network (RN) treatment, they have access to global reputational and social knowledge by seeing the whole network and the last five actions for all other subjects.

The figure on page 44 displays snapshots of representative sessions to give a visual summary of our findings. The first finding is that the presence of global reputational knowledge is crucial for the emergence and sustenance of a high level of cooperation. Treatments R and RN achieve a significantly higher level of cooperation and, consequently, welfare compared to treatments B and N, as shown by the large number of participants who are highly cooperative in round 11. High cooperativeness is associated with the emergence of dense and clustered networks with highly cooperative hubs.

In other words, cooperators thrive and amass more connections when reputational knowledge about others is available, increasing in this way the density of the overall network. In contrast, social knowledge does not affect the aggregate level of cooperative activity.

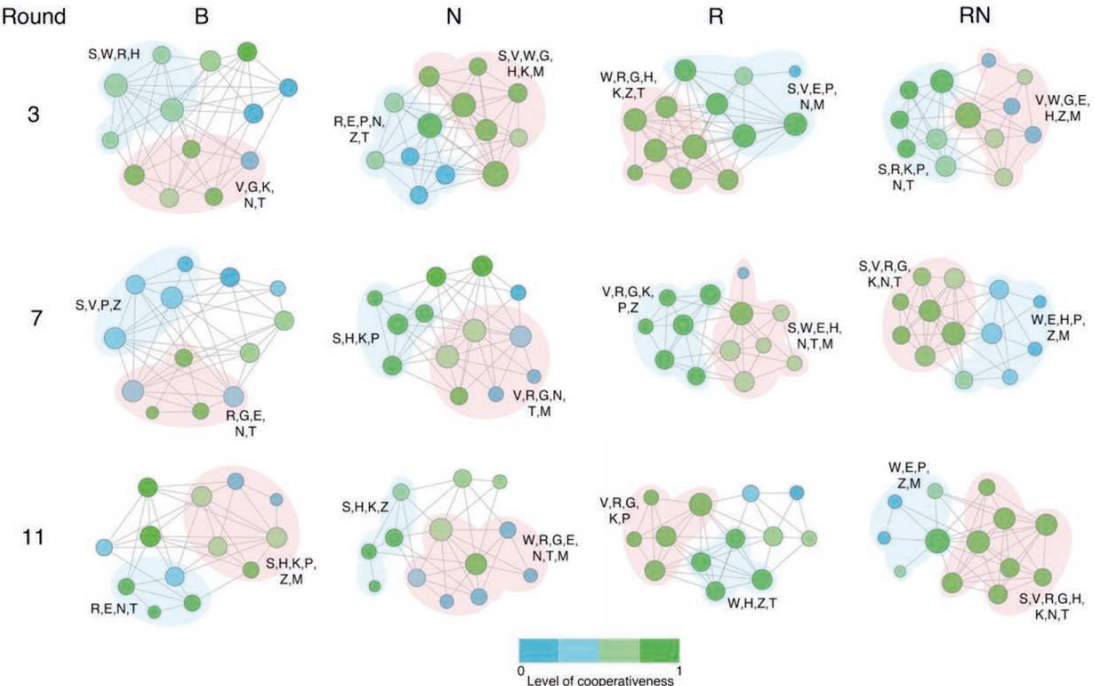


Figure 1: Evolution of the network and cooperative behaviour for representative sessions

The above figure contains snapshots showing the evolution of the network and cooperative behaviour for representative sessions. Each column is a representative session for each treatment, from left to right: B, N, R and RN. Each row is a round: 3, 7 and 11 from top to bottom. The size of a node is proportional to the number of connections. The colour of a node corresponds to the number of cooperative actions in the previous 5 rounds: blue (0 or 1 cooperative actions), light blue (2), light green (3), and green (4 or 5). Red and blue bubbles distinguish the C1 and C2 communities respectively. The labels next to the bubbles list the fictitious IDs of the members of the corresponding communities.

Our second finding is that the presence of both global reputational and global social knowledge affects the distribution of cooperative activity in the group by enabling cooperators to remove links from defectors and reject their proposals in future rounds. In the figure above, participants W, E, P, Z and M form a tight-knit and highly cooperative community in RN which is separate from the community of defectors, while in the other treatments there is no analogous separation of individuals according the

cooperativeness. In this way, cooperators are able to form a community that is more cooperative than the community of defectors, and it generates a larger social surplus from within community interactions.

Mechanisms that collect information about reputation have existed for a long time, but the development of social networking tools (e.g., Facebook, LinkedIn) that augment individuals' social knowledge is a recent phenomenon. We still have a limited understanding of the effects of having access to this additional social knowledge. The results of our study suggest that an effect of these tools is to facilitate the formation of communities whose members share behavioural commonalities. In the context of cooperation, we find social knowledge allows the emergence of a community of cooperators. Exploring whether this type of effect of social knowledge extends to other domains is an important direction for future inquiries.

To learn more read:
 "The Effects of Reputation and Social Knowledge on Cooperation", by Edoardo Gallo and Chang Yan, in *Proceedings of the National Academy of Sciences of the United States of America* (2015).

IEA ROUNDTABLE ON THE ECONOMICS OF RELIGION

Conference organised by Dr Sriya Iyer
 10-11 July 2017

The International Economic Association Roundtable on the Economics of Religion was held at St. Catharine's College on 10-11 July 2017. Organised by Dr Sriya Iyer (Cambridge), along with Dr Jean-Paul Carvalho (UC Irvine) and Dr Jared Rubin (Chapman), the Roundtable brought together some of the world's most distinguished economists and other scholars to debate and discuss the role of religion in society today.

The Roundtable began with an opening address by Bishop Marcelo Sánchez Sorondo, Chancellor of the Pontifical Academies from the Vatican. The highlight of the Roundtable was a panel discussion on the role of state religion, religious freedoms, institutions and growth featuring Robert Barro, Timur Kuran, Tim Besley and Sascha Becker; and a second panel on how religion had shaped the world with Partha Dasgupta, Rachel McCleary, David Maxwell, Larry Iannaccone and Michael McBride. Sessions ranged from exploring economic theory and religion, history and religion, religious giving, and reformations and religious freedoms. Sriya Iyer and Mark Koyama talked about their forthcoming books on the economics of religion in India, and religious freedom and state capacity. Paper presentations also encompassed how personal liberties and religiosity

are related, the effects of the Protestant Reformation, and how religion and politics are related today in the US. The quality of discussion to determine what is the kind of religion we need today and how economic research needs to adapt to aid policy-making, was a key aspect of the Roundtable.

A contributed volume entitled *Advances in the Economics of Religion* is being published under the IEA Series (Volume 158) by Palgrave Macmillan in end-2018, consolidating the many interesting debates and lively discussions. This volume draws together leading commentators from across the world, bringing together expertise to overview and debate key concepts and concerns in the economics of religion, including its implications for conflict, political economy, public goods, demography, education, finance, trade and economic growth.

Microstructure of Foreign Exchange Markets (19–21 May 2016)



3d. EMPIRICAL ANALYSIS OF FINANCIAL MARKETS

THE MICROSTRUCTURE OF FOREIGN EXCHANGE MARKETS

Conference organised by Oliver Linton and Soheil Mahmoodzabeh

Cambridge, 19–21 May, 2016

The conference on the microstructure of foreign exchange (FX) markets was held from May 19 to 21 2016 at Trinity College. This event brought together practitioners as well as academic researchers in the field of market microstructure to address issues of contemporary importance related to foreign exchange markets. The list of invited speakers was as follows: Alain Chaboud, Mark Bruce, Arnaud Mehl, Dagfinn Rime, Francis Breedon, Thierry Foucault, Michael Tseng, Michalis Vasios, Martin Evans, Roel Oomen, Richard Olsen, Michael Moore, Tobias Stoehr and Angelo Ranaldo.

Alain Chaboud gave an overview about many issues in the microstructure of FX markets and how the microstructure and trading arrangements differ from equity markets, while also covering changes in the regulatory framework. First, there was considerable discussion over the Swiss Franc de-pegging, i.e. the sudden decision of the Swiss National Bank (SNB) on January 15, 2015, to no longer hold the Swiss Franc at a fixed exchange rate with the Euro. The latter was a major event in the markets and, as shown below, resulted in a 35 percent price change in 20 minutes with a great deal of price discontinuity and other stability issues.

The second major topic was the introduction of the Minimum Quote Life (MQL) on the Electronic Broking Services (EBS) FX trading platform in June 2009. This measure

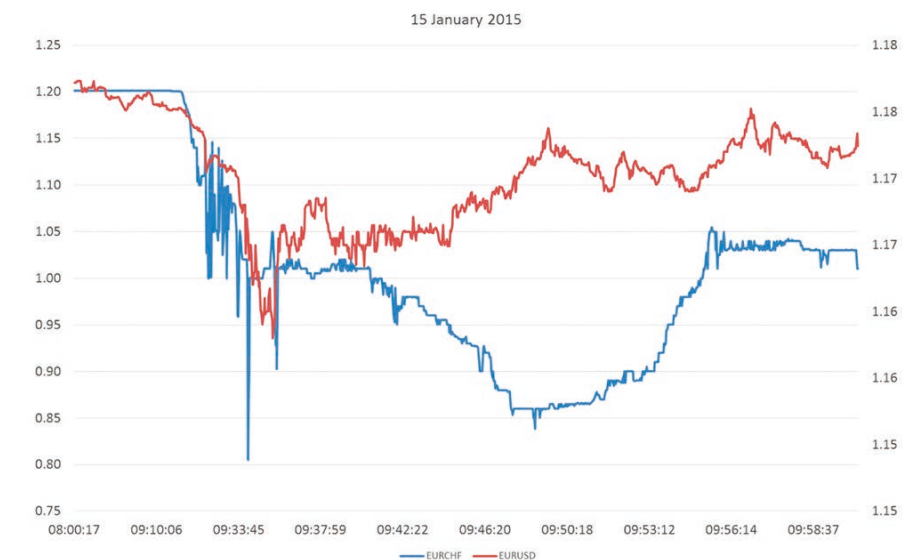


Figure 1: EUR-CHF and EUR-USD exchange rates

implied a minimum resting time of 250 msec on limit orders in major currency pairs and was supposed to prevent so-called “flashing”. Extant research focusing on equity markets has predicted adverse effects of such a measure in the form of wider bid-ask spreads and lower trading volume, particularly during volatile times. Recent theoretical work, however, has much more positive predictions regarding the possible impact of an MQL.

The third fundamental issue was the introduction of the “latency floor” by the EBS between 2013 and 2014, meaning a random delay of 1 to 3 msec that creates a batch of trading instructions. Subsequently, the trading instructions in each batch are randomised before being released to the central limit order book, thereby “scrambling” the original order of execution. By this measure, EBS aimed to ensure that ultra high speed as a stand-alone strategy does not deliver an advantage, reducing the efforts and resources engaged in microsecond latency investigations.

This issue relates to the current debate over the Investor’s Exchange (IEX) for equities that was at the centre of Michael Lewis’ popular book *Flash Boys*. A further topic was the reduction of tick sizes, i.e. minimum price increments, in 2011 when EBS added an additional decimal to its quotes, such that, for example, a EUR- USD FX rate of 1.2345 could now be 1.23451 or 1.23452. Motivated by the question of whether this change mainly benefited high-frequency traders, several major banks complained and threatened to leave the EBS. Ultimately, the major consequence was a reduction in trading volume. After a management change inside EBS, the tick size was widened somewhat, moving it to so-called “half-pips”. Accordingly, the EUR-USD FX rate can now be 1.23450, 1.23455 or 1.23460. These tick size changes have also provided useful natural experiments that can give information about the effects on market quality.

The final major topic was the change in the FX “fix” procedure in 2015. The latter relates to the determination of the WM/Reuters benchmark FX rates that are used as standard rates for portfolio valuation and performance measurement during a period around the time of the fix, which is usually 4 pm in London. The above changes were motivated by reports in 2013, stating that traders were rigging FX rates to profit from their clients, leading to investigations, legal actions and considerable fines. The most significant measure undertaken was the lengthening of the so-called fixing window from 1 to 5 minutes in 2015. This is depicted in the plots opposite with a focus on the resulting (more evenly spread) trading volume patterns. An important implication of the above action was the effect that the fix is no longer dominated by manual traders. Rather, trading algorithms used by banks are now far more active during the fix. The likeliest explanation is that banks automated their fixing trades to avoid accusations of manipulation. For this purpose, many of the banks employ a simple time-weighted average price (TWAP) execution algorithm.

ECONOMETRICS OF NETWORKS WORKSHOP

Workshop organised by Oliver Linton

Cambridge, 17 June, 2015

On 17 June 2015, the Cambridge-INET Institute and the Journal of Econometrics co-organised a workshop on recent advances in the econometrics of networks. The workshop brought together scholars from the US and Europe working on different econometric tools for network data. Speakers included Andreas Dzemski (University of Gothenburg), Bryan Graham (University of California at Berkley), Konrad Menzel (New York University), Arun Chandrasekhar (Stanford University), Aureo de Paula (University College London), Shuyang Sheng (University of California at Los Angeles), and Matteo Barigozzi (London School of Economics).

The first session was centred on network formation and recent advances in modelling dyadic links. This is a crucial topic in network theory as it attempts to understand how physical networks, such as social networks or co-authorship networks, come about. Andreas Dzemski and Bryan Graham presented two alternative approaches to model heterogeneity of dyadic link formation. A well-known property of many observed networks is homophily i.e., agents sharing similar characteristics are more likely to form links than agents sharing different characteristics. Often, agents are also heterogenous in terms of their degree. This means that, whereas most agents in the network have few links, there exist a small number of agents (hubs) that are highly connected, with a large number of links. Bryan proposed a logit panel data model to estimate undirected dyadic links with fixed effects capturing degree heterogeneity. Andreas proposed a framework to model directed links, such as payments between banks, traffic flows, or citations.

Another important aspect of network formation is interdependent link preferences. This is when agents prefer forming links with agents who are already connected (directly or indirectly) to some part of the network. In social networks, for example, this link externality means that two individuals who have a friend in common are more likely to be friends. Konrad Menzel and Aureo de Paula presented two alternative econometric models of network formation that can account for interdependent link preferences. Both models assume that the observed data results from a pairwise stable network formation game. Shuyang Sheng also presented an econometric model of network formation that can handle interdependent link preferences in a simultaneous-move game with incomplete information.

Arun Chandrasekhar presented an alternative model of network formation. Rather than assuming that network formation is the result of strategic interaction, Arun assumes that the observed network is generated from overlapping sub-graphs. Here,

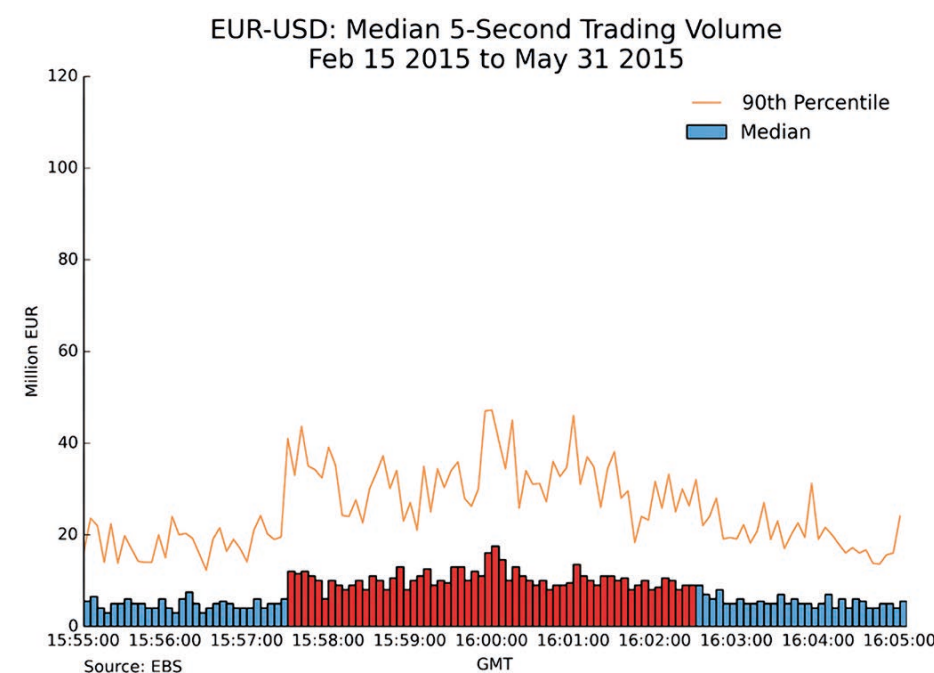
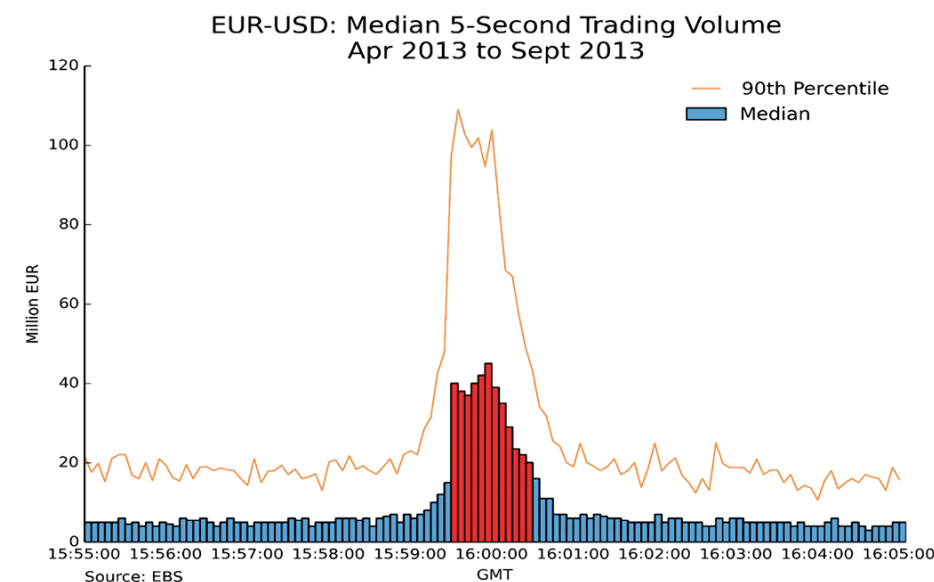


Fig 1: Panel 1: EUR-USD: Median 5-Second Trading Volume, Apr 2013 to Sept 2013. Panel 2: EUR-USD: Median 5-Second Trading Volume, Feb 15 2015 to May 31 2015

link interdependencies are not caused by agents' strategic choices, but by the direct generation of subgraphs. This means that groups of agents join the network together resulting in links that are naturally correlated. For example, students may work on group projects, which lead to friendship ties in the larger surrounding social network. In this framework, Arun showed that it is possible to recover the rate at which the various subgraphs are formed and the parameters governing the network formation.

The final session of the conference dealt with so-called association networks. In these networks, each node represents a variable with a time-series of observations and links between nodes represent some measure of dependence between variables. Matteo Barigozzi, together with Christian Brownlees, developed a statistical procedure to recover the directed network of Granger causal relationships between variables and the undirected network of contemporaneous partial correlations. The underlying network of relationships is assumed to be sparse, as is often the case in financial and economic networks. This allows Matteo to use a novel LASSO-based algorithm that can handle potentially large networks.

TEXT, HERDING, AND SENTIMENT

**Conference organised by Oliver Linton, Wolfgang Härdle, Cathy Yi-Hsuan Chen
Cambridge, 12-13 Sept, 2017**

In September 2017, the Cambridge-INET Institute and CERF, in a joint effort with Humboldt University, organised the first conference on "Text, Herding, and Sentiment" at Trinity College, Cambridge. The conference gathered experts from different fields, including economics, finance, and computer science, to discuss developments in text mining and measures of sentiment in financial markets. Speakers included Josef Barunik (University Prague), Dario Caldara (Federal Reserve Board, FRB), Wolfgang Härdle (Humboldt University Berlin), Bing Liu (University of Illinois), Yuri Marcucci (Bank of Italy), Thomas Renault (University of Paris I), Daniela Sciba (Federal Reserve Bank of Richmond), and David Stidwell (Judge Business School, Cambridge).

Bing Liu opened the first session of the conference with a presentation on lifelong learning. Lifelong learning attempts to mimic human learning by accumulating previously learned knowledge and adapting it to new environments. According to Bing, artificial intelligent systems can only thrive if they can adopt lifelong learning. In this context, big data can offer the opportunity for the potential lifelong learning machine to continually learn and accumulate knowledge.

The discussion continued with two presentations on indicators constructed using text mining. First, Wolfgang Härdle presented a paper on dynamic modelling of text data extracted from popular cryptocurrency community forums. Wolfgang and co-authors used this data to construct an indicator for fraudulent schemes.

Next, Dario Caldara presented his most recent work with co-author Matteo Iacovello (FRB) on a new indicator of geopolitical risk. The indicator is constructed using an

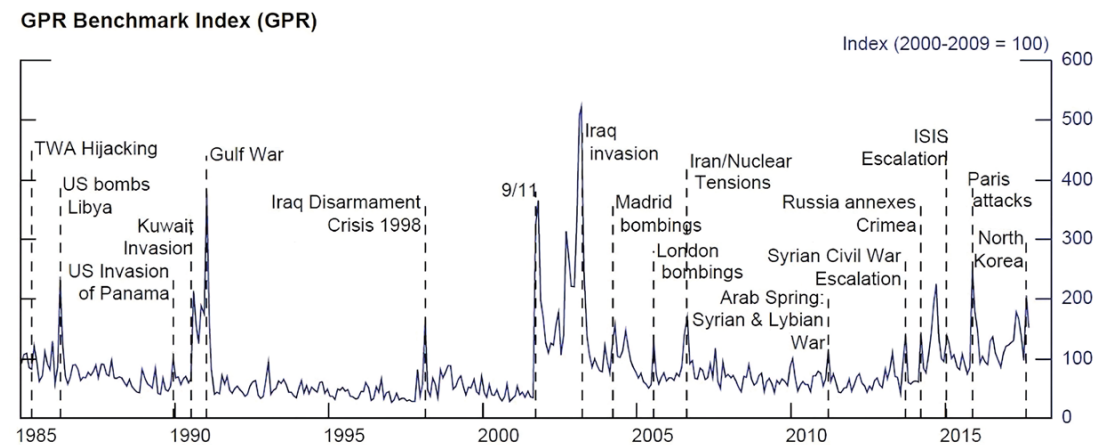


Figure 1: Geopolitical Risk Index from Caldara, D., and M., Iacoviello, "Measuring Geopolitical Risk," working paper, Board of Governors of the Federal Reserve Board, January 2018.

algorithm that counts the frequency of articles related to geopolitical risks in leading international newspapers (see figure above). Dario used this indicator to study the macroeconomic and financial implications of geopolitical risk. He showed that higher geopolitical risk leads to persistent declines in economic activity. By contrast, the stock market response is short lived and depends on the sector. For example, the defence sector reacts positively to geopolitical risk shocks, whereas sectors linked to real economy react negatively.

The conference then covered the topic of identifying causality in a highly connected environment such as the financial system. Yuri Marcucci presented his work with Paola Cerchiello (University of Pavia) exploring the causal relationship between Twitter sentiment and bank financial ratios. Daniela Sciba presented a unifying framework to recover the network of relationships between variables in a spatial econometric model. The framework relies on structural vector autoregressions and machine learning methods. Daniela applied her framework to the network of volatility spillovers between countries. She showed that interconnectedness rose during the 2008 financial crisis and drastically declined after the crisis, consistent with the market freeze that followed the bankruptcy of Lehman Brothers.

The first day of the conference ended with a presentation by Joseph Barunik on sentiment driven tail events. Together with Cathy Yi-Hsuan Chen and Wolfgang Härdle, Joseph developed a dynamic quantile model for asset pricing with sentiment. The model represents a step forward from classical models of asset pricing formulated using expectations. The model uses sentiment as an additional factor to the classical Fama-French model. In this case, sentiment was measured using distilled web scraped information from Nasdaq articles. This information is used to construct several sentiment

indicators with machine learning and lexicon projection tools. Applied to a panel of 100 stocks, the model showed that sentiment heavily influences the tails of stock price returns. In particular, there are asymmetric effects such that sentiment influences the left tail, which captures extreme losses, more than the right tail, which instead captures extreme positive gains.

The second day of the conference dealt with new advances coming from social media. Social media platforms, such as Twitter, allow to voice an unlimited number of opinions on financial markets. However, not all opinions are informative and some might deceptively fuel price bubbles or trigger price downfalls. This was the topic of the presentation of Thomas Renault, who analysed millions of Twitter messages regarding small firm stock prices. He found that abnormally high activity on Twitter was associated with price hikes that would successively revert. This shows that there is market manipulating activity occurring through Twitter. The cutting-edge work of Thomas provides tools coming from network science to identify suspicious accounts and postings promoting such activities.

The conference closed with a session on adaptive dimension reduction methods and text analysis. Larisa Adamyan (HUB) presented her work on adaptive weight clustering of research papers. The proposed methodology analyses abstracts of over 700 papers in economics, and classifies them according to clusters in an unsupervised learning context. Larisa showed that the resulting classification offers insights that go beyond the classical JEL classification. In the same session, Anastasija Tetereva (University of St Gallen) presented her work on international spillovers of news related to sentiment. Together with Francesco Audrino (University of St Gallen), she analysed news sentiment indices of 10 US and non-US sectors using an adaptive LASSO approach and Granger graphical methods to map the network of spillovers between sectors. Her work showed that stock returns are not driven solely by their sector specific news but by news coming from a multitude of sectors. Furthermore, sectorial specific returns are also influenced by news from other sectors and countries. These sentiment news transmission effects were particularly important during the financial crisis.



MEASURING FINANCIAL INTERCONNECTEDNESS

Research by Marco Valerio Geraci

The Financial Stability Board (FSB) and the Basel Committee for Banking Supervision (BCBS) define financial interconnectedness as the network of contractual obligations that can potentially channel financial distress and determine systemic risk. By their very nature, contractual obligations, and hence interconnectedness, continually change over time and are often contingent on the prevailing economic environment.

Since the outbreak of the financial crisis, academics and regulators have developed statistical measures to monitor financial interconnectedness and systemic risk. Various studies have combined statistical measures of association (e.g. correlation, Granger causality, tail dependence) with network techniques, in order to map and analyse financial interconnectedness. However, these standard statistical measures presuppose that the inferred relationships are time-invariant. To retrieve a dynamic measure of interconnectedness, the usual approach has been to calculate these statistical measures over rolling windows of data.

In a new article published in the *Journal of Financial and Quantitative Analysis*, Marco Valerio Geraci and Jean-Yves Gnabo develop a new framework, based on Bayesian estimation of time-varying parameter vector autoregressions, that models the dynamic nature of connections between financial institutions. The framework allows connections to evolve gradually through time as opposed to the classical approach that favours sudden, often unjustified, changes in interconnectedness. Paired with graph theory, the time-varying framework allows the authors to reconstruct a continuously evolving network of directed spillover effects.

Marco Valerio applies the framework to study the evolution of interconnectedness between publicly listed US financial institutions over the past two decades. Results uncover two main events in terms of interconnectedness: the 1998 Long Term Capital Management (LTCM) crisis and the 2008 financial crisis. After these crisis events, there is a gradual decrease in interconnectedness, concurring with the credit freeze that occurred (see figure opposite).

At the individual institution level, American International Group, Goldman Sachs, and Merrill Lynch were found to be among the largest propagators of financial spillovers, highlighting their potential widespread influence. By contrast, Bear Stearns did not play a major role in the propagation of spillovers but rather was very receptive of incoming spillovers. These results were confirmed in an out-of-sample exercise using only data up to the end of 2007.

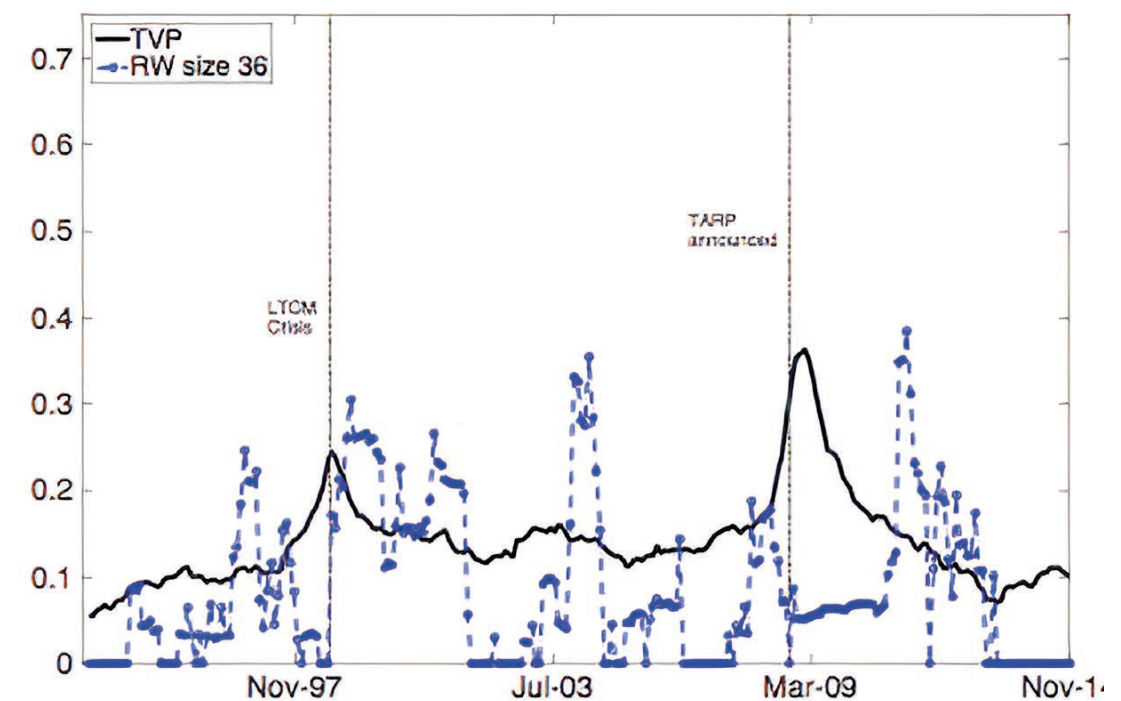


Figure 1: Sectorial density estimated by the TVP-VAR approach (bold solid) and by Granger causality testing with rolling windows of 36 months (blue dashed). Significant events are indicated by the dashed vertical lines.

To learn more read:

"Measuring Interconnectedness between Financial Institutions with Bayesian Time-Varying Vector Autoregressions", in *Journal of Financial and Quantitative Analysis*, vol.53, (2018): pp.1371-1390.

4. SUPPORTING YOUNG RESEARCHERS

a. POSTDOCTORAL RESEARCH FELLOWS

LEONIE BAUMANN

2016–2019

Theme: Networks, Crowds and Markets

Research Interests: Microeconomic Theory, Social and Economic Networks, and Game Theory

Leonie's research interests are in microeconomic theory, social and economic networks, game theory, and mechanism design. She focuses on weighted network formation and mechanism design with knowledge networks and evidence. Leonie joined Cambridge-INET in 2016 from the University of Hamburg. She is now Assistant Professor at McGill University, Montreal, Canada.



JUAN BLOCK

2014–2017

Theme: Information, Uncertainty and Incentives

Research Interests: Game Theory, Microeconomics, Experimental Economics

Juan specialises in microeconomic theory, with a particular interest in game theory. He studies the fundamental economic incentives driving cooperation and reputation in environments where individuals only observe imperfect information about others' behaviour. He has investigated the role of learning processes based on social comparisons used by economic agents to make decisions about production, consumption, policy and investment. Juan joined Cambridge-INET in 2014 from Washington University in St. Louis. He is now a Greta Burkill Fellow and College Lecturer in Economics at Murray Edwards College, University of Cambridge.





VESSELA DASKALOVA

2013–2016

Theme: Networks, Crowds and Markets

Research Interests: Behavioural and Experimental Economics, Microeconomic and Game Theory, Political Economy

Vessela's broad research interests are in behavioural and experimental economics, microeconomic and game theory and political economy and she studies questions surrounding discrimination, social identity, bounded rationality, individual and collective decision making. She joined Cambridge-INET in 2013 from Queen Mary University of London. She is now a Postdoctoral Research Fellow at the Institute for Advanced Study in Toulouse and at Toulouse School of Economics.



MAREN FRÖMEL

2014–2017

Theme: Transmission Mechanisms and Economic Policy

Research Interests: Macroeconomics, Fiscal Policy / Macro Public Finance, International Finance and Economic History, Quantitative Macroeconomics.

Maren joined Cambridge-INET in 2014 from the European University Institute, Italy. She dedicates her time to researching quantitative and empirical macroeconomics. She focuses particularly on the role of heterogeneity and financial frictions in the transmission of monetary policy. Other areas of interest include fiscal policy and international finance. She left the Institute in 2017 joining London Business School as a Research fellow. She is now a Research Economist at the Bank of England.



ABHIMANYU KHAN

2014–2017

Theme: Information, Uncertainty and Incentives

Research Interests: Microeconomic Theory, Game Theory, Networks and Industrial Organisation

Abhimanyu's broad research interests are microeconomic theory, game theory and networks with a particular focus on evolutionary game theory and applications to industrial organisation. He joined Cambridge-INET in 2014 from Maastricht University, The Netherlands and he is now an Assistant Professor at the Department of Economics at Shiv Nadar University.

ROHIT LAMBA

2014–2015

Theme: Information, Uncertainty and Incentives

Research Interests: Mechanism Design, Economic Theory, Public Finance, Bubbles and Market Microstructure, Economic Policy

Rohit is an economic theorist doing research on dynamic contracts, dynamic choice, treasury auctions & growth puzzles. His broader research interests are in mechanism design, public finance, market microstructure, and economic policy. He joined Cambridge-INET in 2014 for one year and is now Assistant Professor at the Department of Economics, Penn State University.



SOHEIL MAHMOODZADEH

2015–2017

Theme: Empirical Analysis of Financial Markets

Research Interests: Market Microstructure, High Frequency Trading, Financial Economics, Applied Econometrics

Soheil's research spans financial economics and the econometrics of financial markets, with a particular focus on the implications of high frequency and algorithmic trading. Soheil joined Cambridge-INET in 2015 from Simon Fraser University, Canada. He left in 2017 and currently is the Chief Econometrician at Canadian Western Bank.



PETER MALEC

2014–2017

Theme: Empirical Analysis of Financial Markets

Research Interests: High-Frequency Econometrics, (Co-)Volatility Modeling and Forecasting, Applied Nonparametric Methods

Peter's research interests are time series econometrics, (co-)volatility modeling and forecasting, applied nonparametric methods. His research focus is on the analysis of high-frequency and high-dimensional data. He joined the Institute in 2014 from Humboldt University, Berlin and is now a Senior Machine Learning Engineer at Cognite AS, Oslo, Norway.





MIGUEL MORIN

2014–2017

Theme: Transmission Mechanisms and Economic Policy

Research Interests: Macroeconomics and Economic History

Miguel's research interests are macroeconomics and economic history. His research focuses on the effects of technology adoption on the labour market, namely computers in recent decades and electricity in the 1930s and how changes in the US road network between 1930 and 1940 influenced the development of traded and non-traded manufacturing industries. He joined the Cambridge-INET Institute in 2014 from Columbia University. After Miguel left Cambridge-INET he joined The Alan Turing Institute in London and now works as an entrepreneur in digital early childhood education.



ANJA PRUMMER

2013–2016

Theme: Networks, Crowds and Markets

Research Interests: Applied micro theory, social networks

Anja's research focuses on social networks with potential applications in gender, culture and politics. Social network theory can add to the understanding of economic questions as an individual's decision might be partially influenced by his reference group. Taking this into account may offer new explanations for empirically observed facts and patterns. She builds theoretical models that incorporate social network components and have testable empirical implications. Anja joined Cambridge-INET in 2013 from the European University Institute and is currently a Lecturer at Queen Mary University of London School of Economics and Finance.



CHRISTOPHER RAUH

2014–2017

Theme: Transmission, Mechanisms and Economic Policy

Research Interests: Macroeconomics, Political Economy, Labour Economics

Chris Rauh studies how inequalities emerge and persist. In particular, his research focuses on how inequality in later-life outcomes can be explained by differences in educational attainment and household structure. Chris joined Cambridge-INET in 2013. After he left Cambridge-INET Chris joined Université de Montréal as Assistant Professor. Chris is currently a University Lecturer at the Faculty of Economics, University of Cambridge.

MIKHAIL SAFRONOV

2015–2018

Theme: Information, Uncertainty and Incentives

Research Interests: Microeconomic Theory

Mikhail's research interests lie broadly in the field of microeconomic theory. He is interested in mechanism design, repeated games, bargaining and renegotiation, and search and experimentation. Mikhail joined the Institute in 2015 from Northwestern University. After Mikhail left the Institute he joined the University of Nottingham as Assistant Professor. He is currently a University Lecturer at the Faculty of Economics, University of Cambridge.



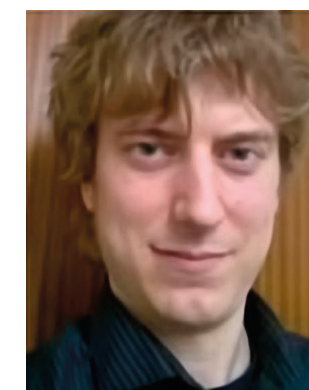
SCOTT SWISHER

2014–2017

Theme: Networks, Crowds and Markets

Research Interests: Networks, Industrial Organisation, Macroeconomics, Economic History

Scott joined the Institute in 2014 from the University of Wisconsin-Madison. His research involves applications of the theory of strategic network formation, specifically to real-world transportation and communication networks. In previous work, he has estimated the macroeconomic effect of transportation networks and financial exchanges using historical data. He has also examined the role of product reviews and information aggregation in the entertainment industry.



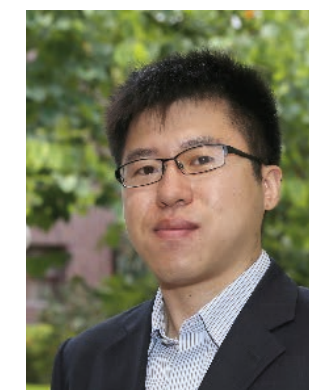
CHEN WANG

2015–2018

Theme: Empirical Analysis of Financial Markets

Research Interests: Random Matrix Theory, Large Dimensional Statistical Inference

Cheng Wang's research interests are time series analysis and large dimensional statistical inference. During his time in Cambridge he worked on developing new tests for cointegration. Chen Wang joined the Institute in 2015 and he joined University of Hong Kong as Assistant Professor when his postdoctoral fellowship ended.





HUI JUN ZHANG

2013–2014

Theme: Empirical Analysis of Financial Markets

Research Interests: Time Series and Financial Econometrics

Hui Jun joined the Institute in 2013. Her research focuses on the statistical analysis of causality and volatility in econometrics with financial applications. She is also interested in employing econometric methods to investigate monetary policy issues. After Hui Jun left the Institute she joined McGill University, Canada as a Research Fellow.

b. AFFILIATED POSTDOCS

DR JAKE BRADLEY

Research interests: Labour, search and matching models, structural estimation

Jake is now an Assistant Professor at the University of Nottingham.



DR FREDERIC MOISAN

Research interests: Game Theory, Behavioral Economics, Experimental Economics, Interactive Epistemology, Rationality, Social Preferences, Cooperation, Social Networks, Collective Intentionality, Social Identity, Moral Psychology, Logic

Fred is currently a Cambridge-INET Postdoctoral Fellow. He has also been a Researcher in Economics and AI at Fetch.ai.



DR JOAO DUARTE

Research interests: Macroeconomics, Real Estate and Monetary Policy

Joao is now Assistant Professor at the Nova School of Business and Economics in Lisbon.



DR CLAUDIA HERRESTHAL

Research interests: Information Economics, Game Theory
Secondary fields: Public Economics

Claudio joined Cambridge-INET from Oxford University. Claudia is now a Postdoctoral Researcher at the University of Bonn.



DR JAMIL NUR

Research interests: Labour Economics, Public Economics, Public Finance, Applied Microeconomics

Jamil is now a Post-Doctoral Scholar at the Department of Architecture, Martin Centre for Architectural and Urban Studies at the University of Cambridge.



DR TIM UY

Research interests: International Economics, Macroeconomics, Economic Growth and Development, Computational Methods, Networks

Tim is now a Senior Consultant with Deloitte Management Consulting US, focusing on tax.



C. STUDENTSHIPS AND SCHOLARSHIPS

JIN DENG KEITH CHAN

STUDENTSHIP

2016-2019

Theme: Information, Uncertainty and Incentives

Research interests: Bargaining and Matching Models

Keith received a studentship from Cambridge-INET in 2016 for 3 years. His research interest lies in bargaining and matching models, where he analyses the strategic interaction among buyers and sellers in various market settings.



(EDWARD) RAFE MARTIN

STUDENTSHIP

2013-2016

Theme: Transmission Mechanisms and Economic Policy

Research interests: Macroeconomics

Rafe's research interests are macroeconomics of the zero lower bound and the microeconomics of labour markets. His main thesis paper studies the effects of productivity shocks at the zero lower bound, finding that in a model with a New Keynesian model with a frictional labour market where labour demand plays a key role, productivity shocks are generically expansionary, contrary to the prediction of the canonical New Keynesian model. His other papers study respectively, learning about statistical discrimination in an online freelancing labour market, and the unemployment-reducing effect



of a short time work policy in the United States. Rafe is now an Economist at the Department for Work and Pensions in the Civil Service.

DAVID MINARSCH

STUDENTSHIP 2014-2017

Theme: Networks, Crowds and Markets

Research interests: Microeconomics in the context of social and economic networks

David's research focuses on investigating traditional microeconomic topics in the context of social and economic networks. David's thesis covered two broad topics: intermediation in networked markets and conflict. In the first paper David analyses how intermediaries' knowledge of each other's competitiveness affects prices and welfare in networked markets. In other papers, he studies international conflict, spying and political party competition and polarisation. David is now an Entrepreneur in Residence at Entrepreneur First (EF).



EKATERINA SMETANINA

STUDENTSHIP 2013-2017; SCHOLARSHIP 2017-2018.

Theme: Empirical Analysis of Financial Markets

Research interests: Econometrics, Finance

Ekaterina works in the fields of econometrics, financial economics, empirical finance, and



forecasting. Her main research aims to develop new econometric models to analyse different aspects of financial markets and in particular forecasting. She also works on developing robust forecast evaluation methodologies, designed to be applicable in a wide variety of real-world situations. Ekaterina is now Assistant Professor of Econometrics and Statistics and Asness Junior Faculty Fellow, at the University of Chicago Booth School of Business.

ANIL ARI

SCHOLARSHIP 2014-2015

Theme: Transmission Mechanisms and Economic Policy

Research interests: Macroeconomics, Sovereign Debt Crises and Financial Economics

Anil's research interests are in Macroeconomics, International Finance and Banking. During his graduate studies, he received funding for his project on "Sovereign Risk and Bank Risk-Taking", which was later awarded the Klaus Liebscher Award by the Oesterreichische Nationalbank. Anil is now an economist in the Research Department of the International Monetary Fund (IMF).



TEODORA BONEVA

SCHOLARSHIP 2014-2015

Theme: Networks, Crowds and Markets

Research interests: Public Economics, Behavioural and Experimental Economics, Applied Microeconomics.

Teodora's research fields are Applied Microeconomics and Labour Economics, and



her research also relates to Behavioral and Experimental Economics. She is currently investigating the role of beliefs in educational investment decisions and the role of educational interventions in fostering skills in childhood. Teodora is now an Associate Professor in the Department of Economics at the University of Oxford. She was also a British Academy Post-doctoral Fellow at University College London (Department of Economics) for three years.

JÖRG KALBFUSS

VICE-CHANCELLOR'S AND CAMBRIDGE-INET SCHOLARSHIP 2017-2020

Theme: Networks, Crowds and Markets

Jorg's research revolves around socio-economic stratification, inequality and conflict. He has also worked on the impact of medical marijuana laws in the U.S. on mental health outcomes. Jorg has won the Vice-Chancellor's and Cambridge-INET Scholarship for 3 years.



ALEXANDRE KOHLHAS

SCHOLARSHIP 2013-2014

Theme: Transmission Mechanisms and Economic Policy

Research interests: Macroeconomic Theory, Information Economics

Alex's research seeks to combine Information Economics with Macroeconomics and Finance. He is especially interested in the optimal design of communication policies. Alexandre is now an Assistant Professor in Economics at the Institute for International Economic Studies, Stockholm University.



FREDERICO LIMA
SCHOLARSHIP 2014-2015

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:
Macroeconomics and
Public Economics.

Frederico's research project examines how school infrastructure projects affect local economies. Using a new dataset on school bond referenda, he found that bond approval had large, positive effects on per capita income and employment, and that it led to persistent increases in local population, house prices and residential construction. These results suggested an important complementarity between fiscal multipliers and the marginal utility of government spending. Frederico is now an Economist at the International Monetary Fund (IMF) in Washington, D.C.



SEUNG HYUN MAENG
CAMBRIDGE TRUST
CAMBRIDGE-INET
SCHOLARSHIP 2017-2020

Theme: Transmission
Mechanisms and
Economic Policy

Research interests: Macroeconomics
Fred is currently researching sovereign debt crises and international macroeconomics. The title of his PhD dissertation is "Debt Crises, Fast and Slow", a theoretical piece on self-fulfilling equilibria by which investors' expectations may drive debt run and undermine government solvency.



CHRISTIAN RÖRIG
VICE-CHANCELLOR'S
AND CAMBRIDGE-INET
SCHOLARSHIP 2017-2020

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:

Macroeconomics
Christian has won the Vice-Chancellor's and Cambridge-INET Scholarship for 3 years.



IRINA SHAORSHADZE
SCHOLARSHIP 2013-2014

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:

**Development Economics,
Labour Economics and Microeconometrics.**
Irina's research investigates economic and social determinants of income inequality and intergenerational mobility with particular emphasis on the role of credit constraints on college choice. She is now Vice-President at the Bank of America Merrill Lynch.



RICCARDO TREZZI
SCHOLARSHIP 2013-2014

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:
**Macroeconomics, Open
Economy Macroeconomics,
Econometrics and Statistics**

Riccardo's research interests lie in the broad areas of Applied Macroeconomics and Public Finance and his dissertation focused on the estimation of fiscal multipliers of large reconstruction projects. Riccardo Trezzi is now an Economist at the Board of Governors of the Federal Reserve Bank in Washington, D.C.



MARYAM VAZIRI
CAMBRIDGE TRUST AJIT
SINGH CAMBRIDGE-INET
SCHOLARSHIP 2017-2020

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:

Macroeconomics, International Trade
Maryam Vaziri's research interests are in international trade, industrial organisation and macroeconomics. In her thesis she has studied the determinants of sequential entry into export markets and is currently working on the rise of market power and predatory pricing strategies. Maryam has won the Cambridge Trust Ajit Singh Scholarship for 3 years.



JASMINE XIAO
SCHOLARSHIP 2013-2017

Theme: Transmission
Mechanisms and
Economic Policy
Research interests:
**Macroeconomics, Financial
Economics, Firm Dynamics**

Jasmine's research is at the intersection of macroeconomics and finance, with a particular emphasis on the evolution of firms' balance sheets over their life-cycle and how precautionary savings motives by firms might serve as an amplification mechanism for macroeconomic shocks. Jasmine is now an Assistant Professor of Economics at the University of Notre Dame.



YASHUANG DING
CAMBRIDGE TRUST
CAMBRIDGE-INET
SCHOLARSHIP 2017-2020

Theme: Empirical Analysis
of Financial Markets
Research interests:
**Financial Econometrics,
Continuous Time Finance, Empirical Asset
Pricing.**

Yashuang Ding has won the Vice-Chancellor's and Cambridge-INET Scholarship for 3 years. His research involves deriving the diffusion limit of real time GARCH (RT-GARCH) model developed by a previous C-INET scholar Ekaterina Smetanina. He shows that the RT-GARCH converges weakly to the standard GARCH model, which has a bivariate diffusion limit when the sampling interval goes to infinity. Simulation results confirm that it is impossible to distinguish these two models for high frequency data. The result extends Nelson's theorem (1990) of ARCH discretisation and explains the empirical success of RT-GARCH model in volatility forecast.



5. OUR ACTIVITY

a. VISITORS

b. EVENTS

c. SEED FUNDED PROJECTS

d. WORKING PAPERS

e. PUBLISHED PAPERS

f. VIDEOS

a. VISITORS

TRANSMISSION MECHANISMS AND ECONOMIC POLICY

Acconcia, Antonio (CSEF)

Barrett, Garry (University of Sydney)



Bloom, Nicholas (Stanford University)

Bordo, Michael (Rutgers University)

Campbell, Jeff (Federal Reserve Bank of Chicago)

Caunedo, Julieta (Cornell University)



Challe, Edouard (CNRS, Ecole Polytechnique and CREST-ENSAE)

Chatterji, Shurojit (Singapore Management University)

Congleton, Roger (West Virginia University)

Dahl, Gordon (University of California, San Diego)

Dedola, Luca (European Central Bank)

Den Haan, Wouter (LSE)



Dhingra, Swati (London School of Economics)

Dippel, Christian (UCLA Anderson)

Dixit, Avinash K. (Princeton University)

Draca, Mirko (University of Warwick)

Engel, Charles (University of Wisconsin)

Erce, Aitor (European Stability Mechanism)

Etheridge, Ben (University of Essex)

Fernández-Villaverde, Jesús (Pennsylvania)

Ferraz, Claudio (Pontifical Catholic University of Rio de Janeiro)

Gallipoli, Giovanni (University of British Columbia)

Galor, Oded (Brown University)

Gehring, Kai (University of Zurich)

Gilchrist, Simon (Boston University)

Glaeser, Ed (Harvard University)

Grassi, Basile (University of Oxford)

Greenwood, Jeremy (University of Pennsylvania)

Gürkaynak, Refet (Bilkent University)

Hopenhayn, Hugo (University of California, Los Angeles)

Huggett, Mark (Georgetown)

Jørgensen, Thomas Høgholm (UCL)

Kohlhas, Alex (Stockholm University)

Leeper, Eric (Indiana University)



Lipinska, Anna (Federal Reserve Board)

Magerman, Glenn (ECARES, Université libre de Bruxelles)

Martin, Fernando (Federal Reserve Bank of St Louis)

Mavroeidi, Eleanora (Bank of England)

Merlo, Antonio (Rice University)

Mertens, Karel (FRB Dallas)

Michaillat, Pascal (LSE)

Mitman, Kurt (IIES)

Mitra, Aruni (University of British Columbia)



Mokyr, Joel (Northwestern University)

Mueller, Gernot (Bonn University)

Nanda, Ramana (Harvard Business School)

Neto Aurelio Duarte, Joao Bernardo (University of Illinois)

Ni, Shawn (University of Missouri)

Nirei, Makoto (Ministry of Finance, Tokyo)

O'Clery, Neave (University of Oxford)

Oberfield, Ezra (Princeton University)

Redding, Stephen (Princeton University)

Schoenle, Raphael (Brandeis University)



Senay, Ozge (University of St Andrews)

Simonelli, Saverio (CSEF)



Song Shin, Hyun (Bank for International Settlements)

Trezzi, Riccardo (Federal Reserve Bank)

Ventura, Jaume (Barcelona GSE)

Vives, Xavier (IESE)

Walsh, Kieran (Yale University)

Wiederholt, Mirko (Goethe University Frankfurt)

Wolf, Martin (University of Bonn)

INFORMATION, UNCERTAINTY AND INCENTIVES

Abreu, Dilip (Princeton University)

Bergemann, Dirk (Yale University)

Bird, Daniel (Tel Aviv University)

Blume, Larry (Cornell University)

Carmona, Guilherme (University of Surrey)

Chassang, Sylvain (Princeton University)

Chatterjee, Kalyan (Penn State University)

Corchon Diaz, Luis (Charles III University of Madrid)

Cripps, Martin (UCL)

Das, Kaustav (University of Exeter Business School)

Dutta, Bhaskar (University of Warwick)

Ely, Jeff (Northwestern University)

Friedman, Dan (University of California, Santa Cruz)

Hart, Sergiu (The Hebrew University of Jerusalem)

Heinsalu, Sander (University of Queensland)

Juang, Wei-Torng (Institute of Economics, Academia Sinica)

K Levine, David (European University Institute)

Lee, Jihong (Seoul National University)

Li, Yingying (HKUST)

Liu, Qingmin (Columbia University)

Lombardi, Michele (University of Glasgow)

Lu, Jay (Princeton University)

Maskin, Eric (Harvard University)

Myerson, Roger (University of Chicago)

Newton, Jonathan (University of Sydney)

Okada, Akira (Hitotsubashi University)

Ollar, Mariann (University of Pennsylvania)

Pavan, Alessandro (Northwestern University)

Penta, Antonio (University of Wisconsin)

Rahman, David (University of Minnesota)

Renou, Ludovic (University of Essex)

Robson, Arthur (Simon Fraser University)

Rustichini, Aldo (University of Minnesota)



Samuelson, Larry (Yale University)

Segal, Ilya (Stanford University)

Sobel, Joel (University of California, San Diego)

Sutherland, Alan (University of St Andrews)

Vartiainen, Hannu (University of Helsinki)

Watson, Joel (University of California, San Diego)

NETWORKS, CROWDS AND MARKETS

Baliga, Sandeep (Kellogg School of Management, Northwestern University)

Bikhchandani, Sushil (UCLA Anderson School of Management)

Bloch, Francis (Paris School of Economics)

Bouchard St-Amant, Pier-André (INET)

Chandrasekhar, Arun (Stanford University)

Chatterjee, Kalyan (Penn State University)

Choi, Syngjoo (UCL)

Dai, Ruochen (Peking University)

Demange, Gabrielle (Paris School of Economics)

Dhingra, Swati (LSE)

Ductor, Lorenzo (Middlesex University)



Dupas, Pascaline (Stanford University)



Durlauf, Steven (University of Wisconsin-Madison)

Dziubinski, Marcin (Warsaw University)

Easley, David (Cornell University)

Eaton, Jonathan (Brown University)

Elliott, Matthew (Caltech)

Erce, Aitor (European Stability Mechanism and Bank of Spain)

Fang, Hanming (University of Pennsylvania)



Galeotti, Andrea (European University Institute)

Goenka, Aditya (National University of Singapore)

Golub, Benjamin (Harvard University)

Hiller, Timo (University of Bristol)

Jadbabaie, Ali (University of Pennsylvania)

Janssen, Maarten (University of Vienna)

Kariv, Shachar (University of California, Berkeley)

Kearns, Michael (University of Pennsylvania)

Kets, Willemien (Kellogg School of Management, Northwestern University)

Koszegi, Botond (Central European University)



Kranton, Rachel (Duke University)

Leduc, Matt (International Institute for Applied Systems Analysis)

Luttmer, Erzo (Dartmouth)

Meghir, Costas (Yale University)

Mikhailov, Vladimir (Central European University)

Mogstad, Magne (University of Chicago)

Mookherjee, Dilip (Boston University)

Morris, Stephen (Princeton University)

Nava, Francesco (LSE)

Newman, Andrew (Boston University)

O. Jackson, Matthew (Stanford University)

Odlyzko, Andrew (University of Minnesota)



Ormerod, Paul (Volterra)

Palfrey, Thomas (Caltech)

Polanski, Arnold (University of East Anglia)

Reis, Ricardo (Columbia University)

Rosenzweig, Mark (Yale University)

Rossi-Hansberg, Esteban (Princeton University)

Rostek, Marzena (University of Wisconsin)

Seabright, Paul (Toulouse School of Economics)

Szeidl, Adam (CEU)

Talamas, Eduard (Harvard University)

Tamuz, Omer (Caltech, MIT and Microsoft Research)

van der Leij, Marco (University of Amsterdam)

Vega-Redondo, Fernando (Università Bocconi)

Vriend, Nick (Queen Mary University of London)



Watts, Duncan (Microsoft Research)

Wolitzky, Alexander (Stanford University)

Wooders, John (NYU)

Xing, Yiging (John Hopkins University, Carey School of Business)

Yildiz, Muhamet (MIT)

Zhang, Xiaobo (Peking University)

EMPIRICAL ANALYSIS OF FINANCIAL MARKETS

Anderson, Gordon (University of Toronto)

Andrews, Don (Yale University)

Armstrong, Tim (Yale University)

Chaboud, Alain (Federal Reserve)

Chandasekhar, Arun (Stanford University)

Chang, Yoosoon (Indiana University)

Chen, Xiaohong (Yale University)

Chen, Songnian (Hong Kong University of Science and Technology)



Chen, Mingli (Warwick University)

Chernozhukov, Victor (MIT)

Dufour, Jean-Marie (McGill University)



Fan, Jianqing (Princeton)

Gao, Jiti (Monash University)

Ghysels, Eric (University of North Carolina)

Guinnane, Timothy (Yale University)

Hallin, Marc (ECARES and Princeton)

Hansen, Peter (European University Institute)

Hautsch, Nikolaus (University of Vienna)

Härdle, Wolfgang (Humboldt University)

Jansson, Michael (University of California, Berkeley)

Karos, Dominik (School of Business and Economics at Maastricht University)

Kitamura, Yuichi (Yale University)

Koenker, Roger (University of Illinois)

Lee, Simon (Seoul National)

Levy, Haim (The Hebrew University of Jerusalem)

Lieberman, Offer (Bar-Ilan University)

Mendoza, Faustino Prieto (University of Cantabria)



Mincheva, Martina (Fox School of Business, Temple University)

Moreira, Marcelo (Escola Brasileira De Economia e Financas)

Newey, Whitney (MIT)

O'Hara, Maureen (Cornell University)

Panz, Sven (Goethe University Frankfurt)

Park, Joon (Indiana University)

Patton, Andrew (Duke University)

Post, Thierry (University of Bangor)

Rahbek, Anders (University of Copenhagen)

Rothenberg, Thomas (University of California, Berkeley)

Soberon, Alexandra (University of Cantabria)



Wellner, Jon (University of Washington)

Whang, Yoon-Jae (Seoul National University)

Zakoian, Jean-Michel (CREST)

Zhao, Vera (Lancaster University Management School)

NB: Affiliations are those at time of visit.

b. EVENTS

TRANSMISSION MECHANISMS AND ECONOMIC POLICY

READING GROUPS AND SEMINARS:

76 Reading Groups and Seminars were organised from 2012–2018

The New Malthusianism: A Symposium

Organised by Dr Toke Aidt and Professor Tim Swanson

Event date: Dec 2018

Office for National Statistics Economic Forum Roadshow

Organised by Vasco Carvalho and Meredith Crowley

Event date: Nov 2018

Savings, Labour Supply and Social Insurance

Organised by Thomas Crossley, Kai Liu, Hamish Low, Joachim Winter

Event date: May 2018

Sam Annual Conference

Organised by Coen Teulings, Axel Gottfries, River Chen

Event date: May 2018

Heterogeneity in Macroeconomics

Organised by Vasco Carvalho, Giancarlo Corsetti, Pontus Rendahl, Gianluca Violante

Event date: May 2018

Department of Work and Pensions: Areas of Research Interest Workshop

Organised by Hamish Low

Event date: Apr 2018

CFM & Cambridge-INET talk: Khalid Rashid Alkhater

Organised by Vasco Carvalho and Hamish Low

Event date: Dec 2017

Uncovered Interest Parity in the Short, Long and Very Long Run

Organised by Vasco Carvalho and Hamish Low

Event date: Dec 2017

Workshop in Political Economics

Organised by Toke Aidt and Felix Grey

Event date: Nov 2017

Prof Maurice Obstfeld (IMF)

Organised by Vasco Carvalho and Hamish Low

Event date: Oct 2017

Trade & Brexit Mini-Conference

Organised by Meredith Crowley and Oliver Exton

Event date: Sep 2017

A Conversation with Prof. Maurice Obstfeld (IMF)

Organised by Sanjeev Goyal and Kaivan Munshi

Event date: May 2017

Labour Markets, Human Capital and Public Policy

Organised by Hamish Low and Kai Liu

Event date: May 2017

Mini Conference: Political Economics

Organised by Toke Aidt

Event date: May 2017

Labour Market Dynamics and the Macroeconomy Mini Conference

Organised by Pontus Rendahl and Charles Brendon

Event date: Oct 2016

Debt Sustainability and Lending Institutions

Organised by Giancarlo Corsetti and Timothy Uy

Event date: Sep 2016

Firms in Macroeconomics

Organised by Ufuk Akcigit, Nicholas Bloom, Vasco Carvalho, Giammario Impullitti

Event date: Aug 2016

Macro/Trade Mini Conference

Organised by Giancarlo Corsetti, Vasco Carvalho, and Pontus Rendahl

Event date: May 2016

Mini Conference on Heterogeneous Agents and Macroeconomic Modelling

Organised by Giancarlo Corsetti, Vasco Carvalho, and Pontus Rendahl

Event date: May 2016

Growth Mini Workshop

Organised by Giancarlo Corsetti, Vasco Carvalho and Pontus Rendahl

Event date: May 2016

CEPR Annual International Macroeconomics and Finance (IMF) Programme Meeting

Organised by Giancarlo Corsetti

Event date: Apr 2016

Macroeconomics of Financial Frictions Mini Conference

Organised by Giancarlo Corsetti, Vasco Carvalho and Charles Brendon

Event date: Apr 2016

ADEMU Lecture – Eric Leeper

Organised by Vasco Carvalho and Hamish Low

Event date: Mar 2016

Search and Matching Conference

Organised by Coen Teulings and Jake Bradley

Event date: Sep 2015

Persistent Output Gaps: Causes and Policy Remedies Workshop

Organised by K. Adam, Giancarlo Corsetti, Elisa Faraglia, Gabriel Perez Quiros, Ricardo Reis

Event date: Sep 2015

Talk by Ramana Nanda

Organised by Vasco Carvalho and Hamish Low

Event date: May 2015

17th Babbage Lecture – Prof. Coen Teulings

Organised by Cambridge-INET

Event date: May 2015

Financial Crises: Lessons from History

Organised by Cambridge-INET

Event date: May 2015

International Trade, Finance, and Macroeconomics Conference

Organised by Ambrogio Cesa-Bianchi, Giancarlo Corsetti, Fabio Ghironi, Ida Hjortsoe, Simon Price, Jumana Salaheen

Event date: Dec 2014

Andy Haldane (Bank of England) Public Talk

Organised by Vasco Carvalho and Hamish Low

Event date: Nov 2014

Breaking the Triple Coincidence in International Finance

Organised by Vasco Carvalho and Hamish Low

Event date: Oct 2014

Joel Mokyr (Northwestern University) “A Culture of Growth”

Organised by Vasco Carvalho and Hamish Low

Event date: Sep 2014

Aggregate Demand, the Labor Market and Macroeconomic Policy Conference

Organised by Giancarlo Corsetti, Greg Kaplan and Pontus Rendahl

Event date: Sept 2014

INFORMATION, UNCERTAINTY AND INCENTIVES

READING GROUPS AND SEMINARS:

80 Reading Groups and Seminars were organised from 2012–2018

Economic Theory Workshop

Organised by Hamid Sabourian

Event date: May 2018

Economic Theory Workshop

Organised by Hamid Sabourian, Juan Block, Abhimanyu Khan, and Mikhail Safronov

Event date: Jun 2016

Game Theory and Transplantation Workshop

Organised by Hamid Sabourian

Event date: Mar 2016

Workshop on Microstructure Theory and Application

Organised by Oliver Linton and Hamid Sabourian

Event date: Mar 2015

15th SAET Conference on Current Trends in Economics

Organised by Tiago Cavalcanti, Hamid Sabourian, Nicholas Yannelis

Event date: Jul 2015

NETWORKS, CROWDS AND MARKETS

READING GROUPS AND SEMINARS:
103 Reading Groups and Seminars were organised from 2012–2018

Cambridge IBSEN International Conference 2018
Organised by Sanjeev Goyal and Frederic Moisan
Event date: Jul 2018

Workshop on Firms in Development
Organised by Kaivan Munshi and Gabriella Santangelo
Event date: Jun 2018

Job Talks
Organised by Sanjeev Goyal and Kaivan Munshi
Event date: Feb 2018

IEA Roundtable on The Economics of Religion
Organised by Sriya Iyer, Jared Rubin and Jean-Paul Carvalho
Event date: Jul 2017

Workshop on Networks
Organised by Sanjeev Goyal and Leonie Baumann
Event date: Apr 2017

Cambridge IBSEN Workshop: Large Scale Experiments
Organised by Sanjeev Goyal and Frederic Moisan
Event date: Mar 2017

Networks in Trade and Macroeconomics
Organised by Vasco Carvalho
Event date: Jun 2016

Behavioural Economics and Networks
Organised by Sanjeev Goyal and Julien Gagnon
Event date: Jun 2016

Networks and Search Workshop
Organised by Sanjeev Goyal and Matthew Elliott
Event date: Feb 2016

Andrew Odlyzko Public Talk
Organised by Sanjeev Goyal and Kaivan Munshi
Event date: Oct 2015

The Economic Development of India Workshop
Organised by Cambridge-INET and the Centre for History and Economics
Event date: Jun 2015

Third European Meeting on Networks
Organised by Vasco Carvalho, Andrea Galeotti, Sanjeev Goyal and Adam Szeidl
Event date: Jun 2015

Lunch Workshop in Economics
Organised by Julien Gagnon
Event date: Jun 2015

Symposium on Contagion
Organised by Sanjeev Goyal, Hamish Low and Hamid Sabourian
Event date: Apr 2015

Workshop on Networks, Institutions, and Economic History
Organised by Sanjeev Goyal and Kaivan Munshi
Event date: Jul 2014

Summer School in Social Economics
Organised by Steven Durlauf and Sanjeev Goyal
Event date: Jun 2014

Workshop in Microeconomics
Organised by Sanjeev Goyal and Vessela Daskalova
Event date: Apr 2014

Public Talk: Duncan Watts
Organised by Cambridge-INET
Event date: Mar 2014

Workshop on Networks
Organised by Sanjeev Goyal
Event date: Mar 2013

Joint ESRC/Cambridge-INET Conference on Networks
Organised by Marcel Fafchamps, Andrea Galeotti and Sanjeev Goyal
Event date: Dec 2012

EMPIRICAL ANALYSIS OF FINANCIAL MARKETS WITH THE SUPPORT OF CAMBRIDGE ENDOWMENT FOR RESEARCH IN FINANCE (CERF)

READING GROUPS AND SEMINARS:
20 Reading Groups and Seminars were organised from 2012–2018

Workshop on Market Liquidity and Microstructure Invariance
Organised by Oliver Linton
Event date: Oct 2018

Big Data in Financial Markets Conference
Organised by Oliver Linton
Event date: May 2018

Masterclass with Alain Chaboud
Organised by Oliver Linton and Alexei Onatski
Event date: Oct 2017

Workshop on Microstructure
Organised by Oliver Linton
Event date: Oct 2017

Text, Herding and Sentiment
Organised by Wolfgang Härdle, Oliver Linton and Cathy Yi-Hsuan Chen
Event date: Sep 2017

Panel Data Workshop
Organised by Oliver Linton and Martin Weidner
Event date: May 2017

Stochastic Dominance Theory and Applications Masterclass
Organised by Oliver Linton and Alexei Onatski
Event date: Sep 2016

Econometric Methods Symposium
Organised by Oliver Linton and Richard J. Smith
Event date: Jun 2016

Microstructure of Foreign Exchange Markets
Organised by Oliver Linton and Soheil Mahmoodzadeh
Event date: May 2016

Information-Theoretic Methods of Inference Conference
Organised by Alastair Hall and Richard Smith
Event date: Apr 2016

Big Data Big Methods Conference
Organised by Alexei Onatski
Event date: Sep 2015

Econometrics of Networks Workshop
Organised by Cambridge-INET and The Econometrics Journal
Event date: Jun 2015

Big Data Conference
Organised by Victor Chernozhukov, Andrew Chesher, Oliver Linton and Lars Nesheim
Event date: Jun 2015

Workshop on Tail Event Driven Risk Modelling
Organised by Oliver Linton and Alexei Onatski
Event date: May 2015

Workshop on Developments in Time Series
Organised by Oliver Linton
Event date: Apr 2015

Workshop on Microstructure Theory and Application
Organised by Oliver Linton and Alexei Onatski
Event date: Mar 2015

Empirical Microstructure Workshop
Organised by Oliver Linton and Alexei Onatski
Event date: Nov 2014

Masterclass with Wolfgang Härdle
Organised by Oliver Linton and Alexei Onatski
Event date: May 2014

Understanding Financial Markets Event, at the British Academy
Organised by Oliver Linton and Alexei Onatski
Event date: May 2014

Skewness, Heavy Tails, Market Crashes, and Dynamics Workshop
Organised by Oliver Linton and E. Renault
Event date: Apr 2014

Workshop on Forecasting in Financial Markets
Organised by Oliver Linton
Event date: Mar 2014

Masterclass with Marc Hallin

Organised by Oliver Linton and Alexei Onatski
Event date: Feb 2014

Conference on Nonparametric and Semiparametric Methods

Organised by Oliver Linton
Event date: Feb 2014

Masterclasses with Paul Embrechts & Eric Ghysels

Organised by Cambridge-INET
Event date: Apr 2014

ERC/Cambridge-INET Conference on Stochastic Dominance and Related Themes

Organised by Oliver Linton
Event date: Jun 2013

OTHER EVENTS

Rules Versus Discretion: Macro And Financial Economics

Organised by INET New York and Cambridge-INET
Event date: Sep 2016

Keynes Fund & C-INET Research Day

Organised by Keynes Fund & Cambridge-INET
Event date: Jul 2016

The UK and the EU Event

Organised by Cambridge-INET
Event date: May 2016

Job Talks

Organised by Sanjeev Goyal, Kaivan Munshi, Vasco Carvalho and Matt Elliott
Event date: Jan 2016

International Conference on Smart Infrastructure and Construction (ICSIC)

Organised by Coen Teulings
Event date: Jun 2016

New Directions in Quantile Regression

Organised by Cambridge-INET
Event date: Dec 2015

Til Schuermann Public Talk

Organised by Giancarlo Corsetti and Filippo Vergara Caffarelli
Event date: Oct 2015

Empirical Process Theory Tools for Statistics – Jon Wellner

Organised by Cambridge-INET
Event date: Oct 2015

Reassessing the EU Monetary and Fiscal Framework Conference

Organised by Giancarlo Corsetti and Charles Brendon
Event date: Oct 2015

Cambridge-INET Research Day

Organised by Cambridge-INET
Event date: Jun 2015

Colloquia on the European Crises

Organised by Giancarlo Corsetti and Filippo Vergara Caffarelli
Event date: Jun 2015

Economics and Policy in a Historical Mirror: The 'Thirties and the Noughties'

Organised by Giancarlo Corsetti
Event date: Apr 2015

The Annual Meeting of the European Public Choice Society

Organised by Toke Aidt
Event date: Apr 2014

Economics May Gala

Organised by Cambridge-INET
Event date: Feb 2014

The Causes and Consequences of the Long UK Expansion: 1992 to 2007 Conference

Organised by Jagjit Chadha
Event date: Sep 2013

Microeconomics Theory Conference

Organiser: Hamid Sabourian
Event date: Dec 2013

Macroeconomics Conference

Organiser: Giancarlo Corsetti
Event date: Autumn 2013

S. Durlauf – Lectures on Social Interactions

Organised by Cambridge-INET
Event date: Mar 2013

c. SEED FUNDED PROJECTS

2018

Dr Kai Liu

Faculty of Economics, Family Environment and Child Development

2017

Dr Edoardo Gallo

Faculty of Economics, The Cognitive Limits of Cooperation

2016

Dr Solomos Solomou

Faculty of Economics, The Economic Effects of Global Weather Shocks

Dr Christopher Rauh and Teodora Boneva

Faculty of Economics, School Success and the Importance of Parental Beliefs in Parental Investment Decisions

2015

Alexander Kentikelenis

Department of Sociology, Activities of the International Monetary Fund

2014

Prof. Giancarlo Corsetti

Faculty of Economics, Effective Mechanisms of Fiscal Policy Coordination in the EU

2013

Dr Sriya Iyer

Faculty of Economics, An Evolutionary Study of Religious Fundamentalism

Dr Flavio Toxvaerd

Faculty of Economics, Asymptomatic Disease Propagation in Structured Populations

Dr Sean Holly

Faculty of Economics, Subsidy to the Conference The Causes and the Consequences of the Long UK Expansion: 1992 to 2007

Dr Toke Aidt

Faculty of Economics, Subsidy to the European Public Choice Society Annual Meeting

Prof. Raghavendra Rau

Judge Business School, Local Bias in the Issue of Self-Issued Bonds

2012

Dr Pramila Krishnan

Faculty of Economics, Observational Learning in Consumer Products

d. WORKING PAPERS

2018

Limited Cognitive Ability and Selective Information Processing, Leung, B.T.K. – wp1819

Identifying Global and National Output and Fiscal Policy Shocks Using a GVAR, Chudik, A.,Pesaran, H., Mohaddes, K. – wp1818

Debt Sustainability and the Terms of Official Support, Corsetti, G., Erce, A. and Uy, T. – wp1817

Economic Shocks and Temple Desecrations in Medieval India, Ticku, R., Shrivastava, A. and Iyer, S. – wp1816

Invoicing and Pricing-to-Market – A Study of Price and Markup Elasticities of UK Exporters, Corsetti, G., Crowley, M. A. and Han, L. – wp1815

Do Minimum Wages Increase Search Effort?, Laws, A. – wp1814

Production Networks: A Primer, Carvalho, V. M. and Tahbaz-Salehi, A. – wp1813

Culture and Colonial Legacy: Evidence from Public Goods Games, Chaudhary, L., Rubin, J., Iyer, S. and Shrivastava, A. – wp1812

Community Networks and the Growth of Private Enterprise in China, Dai, R., Mookherjee, D., Munshi, K. and Zhang, X. – wp1811

Renegotiation of Trade Agreements and Firm Exporting Decisions: Evidence from the Impact of Brexit on UK Exports, Crowley, M. A., Exton, O. and Han, L. – wp1810

Debt Seniority and Sovereign Debt Crises, Ari, A., Corsetti, G. and Dedola, L. – wp1809

Exchange Rate Misalignment, Capital Flows, and Optimal Monetary Policy Trade-offs, Corsetti, G., Dedola, L. and Leduc, S. – wp1808

Gender & Collaboration, Ductor, L., Goyal, S. and Prummer, A. – wp1807

One Money, Many Markets – A Factor Model Approach to Monetary Policy in the Euro Area with High-Frequency Identification, Corsetti, G., Duarte, J. B. and Mann, S. – wp1806

Markets and Markups: A New Empirical Framework and Evidence on Exporters from China, Corsetti, G., Crowley, M., Han, L. and Song, H. – wp1805

A Network Approach to Public Goods, Elliott, M. and Golub, B. – wp1804

Heterogeneity and Networks, Goyal, S. – wp1803

Time-Consistently Undominated Policies, Brendon, C. and Ellison, M. – wp1802

Implications of High-Frequency Trading for Security Markets, Linton, O. and Mahmoodzadeh, S. – wp1801

2017

The Behaviour of Betting and Currency Markets on the Night of the EU Referendum, Auld, T. and Linton, O. – wp1722

Targeting Interventions in Networks, Galeotti, A., Golub, B. and Goyal, S. – wp1721

Commitment and (In)Efficiency: A Bargaining Experiment, Agranov, M. and Elliott, M. – wp1720

Decentralized Bargaining in Matching Markets: Efficient Stationary Equilibria and the Core, Elliott, M. and Nava, F. – wp1719

Reorganise, Replace or Expand? The Role of the Supply-Chain in First-Time Exporting, Spray, J. – wp1718

Returns to On-the-Job Search and the Dispersion of Wages, Gottfries, A. and Teulings, T. – wp1717

Wage Posting, Nominal Rigidity, and Cyclical Inefficiencies, Gottfries, A. and Teulings, T. – wp1716

Unconventional Monetary Policy and the Interest Rate Channel: Signalling and Portfolio Rebalancing, Lloyd, S. P. – wp1715

Estimating Nominal Interest Rate Expectations: Overnight Indexed Swaps and the Term Structure, Lloyd, S. P. – wp1714

Overnight Indexed Swap Market-Based Measures of Monetary Policy Expectations, Lloyd, S. P. – wp1713

Official Sector Lending Strategies During the Euro Area Crisis, Corsetti, G., Erce, A. and Uy, T. – wp1712

Fixed on Flexible Rethinking Exchange Rate Regimes after the Great Recession, Corsetti, G., Kuester, K. and Müller, G. J. – wp1711

Socially Embedded Preferences, Environmental Externalities, and Reproductive Rights, Dasgupta, A. and Dasgupta, P. – wp1710

Can Italy Grow Out of its NPL Overhang? A Panel Threshold Analysis, Mohaddes, K., Raissi, M. and Weber, A. – wp1709

Integration and Diversity, Goyal, S., Hernández, P., Martínez-Cánovas, G., Moisan, F., Muñoz-Herrera, M. and Sánchez, A. – wp1708

Reassessing Railroads and Growth: Accounting for Transport Network Endogeneity, Swisher IV, S. N. – wp1707

Policy Shocks and Wage Rigidities: Empirical Evidence from Regional Effects of National Shocks, De Ridder, M. and Pfajfar, D. – wp1706

Aggregating Elasticities: Intensive and Extensive Margins of Female Labour Supply, Attanasio, O., Levell, P., Low, H. and Sanchez-Marcos, V. – wp1705

Why is Europe Falling Behind? Structural Transformation and Services’ Productivity Differences between Europe and the U.S., Buiatti, C., Duarte, J. B. and Saenz, L. F. – wp1704

Holy Wars? Temple Desecrations in Medieval India, Iyer, S., Shrivastava, A., Ticku, R. – wp1703

The Strategy of Conquest, Dziubinski, M., Goyal, S. and Minarsch, D. E. N. – wp1702

A Discrete Choice Model for Large Heterogeneous Panels with Interactive Fixed Effects with an Application to the Determinants of Corporate Bond Issuance, Boneva, L. and Linton, O. – wp1701

2016

Macroeconomic Stabilization, Monetary-fiscal Interactions, and Europe’s Monetary Union, Corsetti, G., Dedola, L., Jarocinski, M., Mackowiak, B. and Schmidt, S. – wp1627

A Coupled Component GARCH Model for Intraday and Overnight Volatility, Linton, O. and Wu, J. – wp1626

Supply Chain Disruptions: Evidence from the Great East Japan Earthquake, Carvalho, V. M., Nirei, M., Saito, Y. U. and Tahbaz-Salehi, A. – wp1625

Experimentation and Learning-by-Doing, Safronov, M. – wp1624

Corporate Debt Structure, Precautionary Savings, and Investment Dynamics, Xiao, J. – wp1623

Sovereign Risk and Bank Risk-Taking, Ari, A. – wp1622

Estimation of a Multiplicative Covariance Structure in the Large Dimensional Case, Hafner, C. M. and Linton, O. – wp1621

Falling Real Interest Rates, House Prices, and the Introduction of the Pill, Lu, J. and Teulings, C. – wp1620

Birth and Death, Dasgupta, P. – wp1619

Investment in Productivity and the Long-Run Effect of Financial Crises on Output, De Ridder, M. – wp1618

Narrow Identities, Dasgupta, P. and Goyal, S. – wp1617

Networks and Markets, Goyal, S. – wp1616

The Earned Income Tax Credit: Targeting the Poor but Crowding Out Wealth, Froemel, M. and Gottlieb, C. – wp1615

The Impact of Earthquakes on Economic Activity: Evidence from Italy, Porcelli, F. and Trezzi, R. – *wp1614*

Reconstruction Multipliers, Trezzi, R. and Porcelli, F. – *wp1613*

Consumer Spending and Fiscal Consolidation: Evidence from a Housing Tax Experiment, Surico, P. and Trezzi, R. – *wp1612*

Step Away from the Zero Lower Bound: Small Open Economies in a World of Secular Stagnation, Corsetti, G., Mavroeidi, E., Thwaites, . and Wolf, M. – *wp1611*

The Case for Flexible Exchange Rates in a Great Recession, Corsetti, G., Kuester, K. and Müller, G. J. – *wp1610*

Are Bubbles Bad? Is a Higher Debt Target for the Euro-zone Desirable?, Teulings, C. N. – *wp1609*

Secular Stagnation, Rational Bubbles, and Fiscal Policy, Teulings, C. N. – *wp1608*

Alternative Asymptotics for Cointegration Tests in Large VARs, Onatski, A. and Wang, C. – *wp1607*

A Semiparametric Intraday GARCH Model, Malec, P. – *wp1606*

Reading Between the Lines: Prediction of Political Violence using Newspaper Text, Mueller, H. and Rauh, C. – *wp1605*

Simple Nonparametric Estimators for the Bid-Ask Spread in the Roll Model, Chen, X., Linton, O. and Schneeberger, S. – *wp1604*

A Coasian Approach to Efficient Mechanism Design, Safronov, M. – *wp1603*

Financial Linkages, Portfolio Choice and Systemic Risk, Galeotti, A., Ghiglinoy, C. and Goyal, S. – *wp1602*

Religion and Depression in Adolescence, Cooley Fruehwirth, J., Iyer, S. and Zhang, A. – *wp1601*

2015

Information Acquisition and Exchange in Social Networks, Goyal, S., Rosenkranz, S., Weitze, U. and Buskens, V. – *wp1523*

Conflict and Networks, Dziubinski, M., Goyal, S. and Vigier, A. – *wp1522*

Quantifying the Productivity Effects of Global Value Chains, Formai, S. and Caffarelli, F. – *wp1521*

Attention and Saliency on the Internet: Evidence from an Online Recommendation System, Helmers, C., Krishnan, P. and Patnam, M. – *wp1520*

Networks and Misallocation: Insurance, Migration, and the Rural-Urban Wage Gap, Munshi, K. and Rosenzweig, M. – *wp1519*

Religious Riots and Electoral Politics in India, Iyer, S. and Shrivastava, A. – *wp1518*

Nonparametric Euler Equation Identification and Estimation, Escanciano, J. C., Hoderlein, S., Lewbel, A. and Linton, O. – *wp1517*

Beyond Competitive Devaluations: The Monetary Dimensions of Comparative Advantage, Bergin, P. and Corsetti, G. – *wp1516*

Aggregating Elasticities: Intensive and Extensive Margins of Female Labour Supply, Attanasio, O., Levell, P., Low, H. and Attanasio, O. – *wp1515*

Contagion Exposure and Protection Technology, Cerdeiro, D. – *wp1514*

Large Firm Dynamics and the Business Cycle, Carvalho, V. M. and Grassi, B. – *wp1513*

Discrimination, Social Identity, and Coordination: An Experiment, Daskalova, V. – *wp1512*

The Labor Market Consequences of Electricity Adoption: Concrete Evidence from the Great Depression, Morin, M. – *wp1511*

The Consumption Response to Liquidity-Enhancing Transfers: Evidence from Italian Earthquakes, Acconcia, A., Corsetti, G. and Simonelli, S. – *wp1510*

An Investigation into Multivariate Variance Ratio Statistics and their Application to Stock Market Predictability, Hong, S. Y., Linton, O. and Zhang, H. J. – *wp1509*

Networks in the Laboratory, Choi, S., Gallo, E. and Kariv, S. – *wp1508*

Input Diffusion and the Evolution of Production Networks, Carvalho, V. M. and Voigtländer, N. – *wp1507*

Social Structure, Markets and Inequality, Gagnon, J. and Goyal, S. – *wp1506*

Networks in Economics: A Perspective on the Literature, Goyal, S. – *wp1505*

Contagion Risk and Network Design, Cerdeiro, D., Dziubinski, M. and Goyal, S. – *wp1504*

Efficiency and Equilibrium in Network Games: An Experiment, Gallo, E. and Yan, C. – *wp1503*

Community Networks and the Process of Development, Munshi, K. – *wp1502*

The New Economics of Religion, Iyer, S. – *wp1501*

2014

From Micro to Macro via Production Networks, Carvalho, V. M. – *wp1418*

Discrimination Without Taste – How Discrimination can Spillover and Persist, Ramachandran, R. and Rauh, C. – *wp1417*

Institutions and the Preservation of Cultural Traits, Prummer, A. and Siedlarek, J.-P. – *wp1416*

Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence, Bibinger, M., Hautsch, N., Malec, P. and Reiss, M. – *wp1415*

The “Mystery of the Printing Press” Monetary Policy and Self-fulfilling Debt Crises, Corsetti, G. and Dedola, L. – *wp1414*

Network Cognition, Dessi, R., Gallo, E. and Goyal, S. – *wp1413*

Gender, Social Networks and Performance, Lindenlaub, I. and Prummer, A. – *wp1412*

Categorization and Coordination, Daskalova, V. and Vriend, N. – *wp1411*

Multivariate Variance Ratio Statistics, Hong, S. Y., Linton, O. and Zhang, H. J. – *wp1410*

Interaction, Protection and Epidemics, Goyal, S. and Vigier, A. – *wp1409*

Trading in Networks: Theory and Experiments, Cho, S., Galeotti, A. and Goyal, S. – *wp1408*

Fiscal Policy in an Unemployment Crisis, Rendahl, P. – *wp1407*

Winning the Oil Lottery: The Impact of Natural Resource Extraction on Growth, Cavalcanti, T. V. D., Da Mata, D. and Toscani, F. – *wp1406*

The Effect of Fragmentation in Trading on Market Quality in the UK Equity Market, Körber, L., Linton, O. and Vogt, M. – *wp1405*

The Cross-Quantilogram: Measuring Quantile Dependence and Testing Directional Predictability between Time Series, Han, H., Linton, O., Oka, T. and Whang, Y.J. – *wp1403*

Attack, Defense and Contagion in Networks, Goyal, S. and Vigier, A. – *wp1402*

How to Defend a Network?, Dziubinski, M. and Goyal, S. – *wp1401*

e. PUBLISHED PAPERS

2018

Short Selling in Extreme Events, Geraci, M. V., Garbaravicius, T. and Veredas, D., *Journal of Financial Stability*, 2018, Vol. 39, pp 90–103

Production Networks: A Primer, Carvalho, V. M. and Tahbaz-Salehi, A., *Annual Review of Economics*, forthcoming, 2018

Macroeconomic Stabilization, Monetary-Fiscal Interactions, and Europe's Monetary Union, Corsetti, G., Dedola, L., Jarocinski, M., Mackowiak, B., and Schmidt, S., *European Journal of Political Economy*, 2018, Vol. 57, pp 22–33

Implications of High-Frequency Trading for Security Markets, Linton, O. and Mahmoodzadeh, S., *Annual Review of Economics*, 2018, Vol. 10, pp 237–259

The US Oil Supply Revolution and the Global Economy, Mohaddes, K. and Raissi, M., *Empirical Economics*, 2018

Tariff Scares: Trade Policy Uncertainty and Foreign Market Entry by Chinese Firms, Crowley, M. A., Meng, N., and Song, H., *Journal of International Economics*, 2018, Vol. 114, pp 96–115

Testing in High-Dimensional Spiked Models, Johnstone, I. M. and Onatski, A., *Annals of Statistics*, forthcoming, 2018

Semiparametric Ultra-High Dimensional Model Averaging of Nonlinear Dynamic Time Series, Chen, J., Li, D., Linton, O., and Lu, Z., *Journal of the American Statistical Association*, 2018

Measuring Interconnectedness between Financial Institutions with Bayesian Time-Varying Vector Autoregressions, Geraci, M. V. and Gnabo, J.-Y., *Journal of Financial and Quantitative Analysis*, 2018, Vol. 53, Issue 3, pp 1–20

Slamming The Door On Trade Policy Discretion? The WTO Appellate Body's Ruling on Market Distortions and Production Costs in EU-Biodiesel (Argentina), Crowley, M. A. and Hillman, J.A., *World Trade Review*, 2018, Vol. 17, Issue 2

Diagnostic Pathways and Direct Medical Costs Incurred by New Adult Pulmonary Tuberculosis Patients Prior to Anti-Tuberculosis Treatment – Tamil Nadu, India, Veesa, K.S., John, K.R., Moonan, P.K., Kaliappan, S.P., Manjunath, K., Sagili, K.D., Ravichandra, C., Menon, P.A., Dolla, C., Luke, N., Munshi, K., George, K., and Minz, S., *PLoS ONE*, 2018, Vol. 13, Issue 2

Rising Public Debt to GDP can Harm Economic Growth, Chudik, A., Mohaddes, K., Pesaran, M. H. and Raissi, M., *Economic Letter, Federal Reserve Bank of Dallas*, 2018, Vol. 13, Issue 3, pp 1–4

The Dynamics and Determinants of Kuwait's Long-Run Economic Growth, Burney, N. A., Mohaddes, K., Alawadhi, A., and Al-Musallam, M., *Economic Modelling*, 2018

Alternative Asymptotics for Cointegration Tests in Large VARs, Onatski, A. and Wang, C., *Econometrica*, 2018, Vol. 86, Issue 4, pp 1465–1478

A Network Approach to Public Goods, Elliott, M. and Golub, B., *accepted, Journal of Political Economy*, 2018

Decentralized Bargaining in Matching Markets: Efficient Stationary Equilibria and the Core, Elliott, M. and Nava, F., *Theoretical Economics*, forthcoming, 2018, Vol. 14, pp 211–251

Religious Riots and Electoral Politics in India, Iyer, S. and Shrivastava, A., *Journal of Development Economics*, 2018, Vol. 131, pp 104–122

Additive Nonparametric Models with Time Variable and Both Stationary and Nonstationary Regressors, Dong, C. and Linton, O., *Journal of Econometrics*, 2018, Vol. 207, Issue 1, pp 212–236

2017

A Discrete-Choice Model for Large Heterogeneous Panels with Interactive Fixed Effects with an Application to the Determinants of Corporate Bond Issuance, Boneva, L. and Linton, O., *Journal of Applied Econometrics*, 2017, Vol. 32, Issue 7, pp 1226–1243

Do Sovereign Wealth Funds Dampen the Negative Effects of Commodity Price Volatility?, Mohaddes, K. and Raissi, M., *Journal of Commodity Markets*, 2017, Vol. 8, pp 18–27

Information Acquisition and Exchange in Social Networks, Goyal, S., Rosenkranz, S., Weitzel, U. and Buskens, V., *The Economic Journal*, 2017, Vol. 127, Issue 606, pp 2302–2331

Are Prices Enough? The Economics of Material Demand Reduction, Aidt, T.S., Lili, J. and Low, H., *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 2017, Vol. 375, Issue 2019

Socially Embedded Preferences, Environmental Externalities, and Reproductive Rights, Dasgupta, A. and Dasgupta, P., *Population and Development Review*, 2017, Vol. 43, Issue 3, pp 405–441

Fixed on Flexible Rethinking Exchange Rate Regimes after the Great Recession, Corsetti, G., Kuester, K. and Müller, G. J., *IMF Economic Review*, 2017, Vol. 65, Issue 3, pp 586–632

Trading in Networks: Theory and Experiments, Choi, S., Galeotti, A. and Goyal, S., *Journal of the European Economic Association*, 2017, Vol. 15, Issue 4, pp 784–817

Semiparametric Identification of the Bid-Ask Spread in Extended Roll Models, Chen, X., Linton, O. and Yi, Y., *Journal of Econometrics*, 2017, Vol. 200, Issue 2, pp 312–325

Individual Security, Contagion and Network Design, Cerdeiro, D.A., Dziubinski, M. and Goyal, S., *Journal of Economic Theory*, 2017, Vol. 170, pp 182–226

An Investigation into Multivariate Variance Ratio Statistics and their Application to Stock Market Predictability, Hong, S.Y., Linton, O. and Zhang, H.J., *Journal of Financial Econometrics*, 2017, Vol. 15, Issue 2, pp 173–222

China's Slowdown and Global Financial Market Volatility: Is World Growth Losing Out?, Cashin, P., Mohaddes, K. and Raissi, M., *Emerging Markets Review*, 2017, Vol. 31, pp 164–175

Oil Prices and the Global Economy: Is it Different this Time Around?, Mohaddes, K. and Pesaran, M. H., *Energy Economics*, 2017, Vol. 65, pp 315–325

The Use of Structural Models in Econometrics, Low, H. and Meghir, C., *Journal of Economic Perspectives*, 2017, Vol. 31, Issue 2, pp 33–58

Fair Weather or Foul? The Macroeconomic Effects of El Niño, Cashin, P., Mohaddes, K. and Raissi, M., *Journal of International Economics*, 2017, Vol. 106, pp 37–54

Is There a Debt-Threshold Effect on Output Growth?, Chudik, A., Mohaddes, K., Pesaran, M.H. and Raissi, M., *Review of Economics and Statistics*, 2017, Vol. 99, Issue 1, pp 135–150

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f. VIDEOS

Events

IEA Roundtable on the Economics of Religion
Introductory Address, Panel 1 and Panel 2 videos - 10th and 11th July 2017

ADEMU and Cambridge-INET
Part of the ADEMU Project “A Dynamic Economic and Monetary Union”

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EEA Schumpeter Lecture
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Cambridge-INET Summer School in Social Economics
Videos from the Summer School in Social Economics 2014

Economics and Policy in a Historical Mirror: The ‘Thirties and the Noughties’ – Debate
The debate was based around the latest book by Professor Barry Eichengreen

Steven Durlauf Seminar
During his visit to Cambridge, Steven Durlauf gave three seminars on “Social Interactions”

Conversations in Economics

Short, accessible interviews with Institute visitors and researchers

Prof. Coen Teulings
Videos on 'Low Interest Rates and the Introduction of the Pill'

Video 1: Interest rates and the pill
Video 2: Three solutions to the savings glut
Video 3: Savings glut and stability pact

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Research Directions: Networks and their Roles in Economics

Duncan Watts
Social Science, Small Worlds and Big Data

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