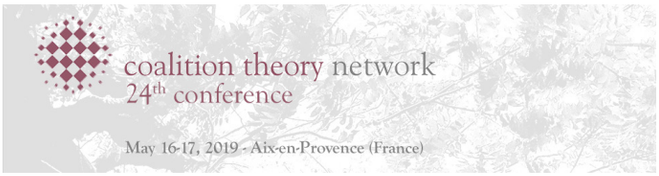
amse Newsletter

April 2019 - Nr 09

Events

May



16-17: Coalition Theory Network 24th conference (CTN)

Location: Maison de la Recherche, Aix-en-Provence
Organized by Sebastien Bervoets, Yann Bramoullé and Frédéric Deroïan

21-24: 2nd GREEN-Econ Spring School in Environmental Economics

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Hubert Stahn and Nicolas Quérou

June

3-7: Quantitative Finance and Financial Econometrics (QFFE) International Conference & Spring School

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Sébastien Laurent and Eric Girardin

13-14: 18th Journées Louis-André Gérard-Varet (LAGV)

Location: Faculté de Droit et de Science Politique, Aix-en-Provence
Organized by Charles Figuières

20-21: Conference in honour of Michel Lubrano

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Emmanuel Flachaire

24-26: "Real and Financial Interdependencies: Instability, International Openness and Regulation Policies" Conference

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Alain Venditti and Thomas Seegmuller

27-28: 19th Doctoral Meeting in International Trade and International Finance

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Nicolas Berman and Lorenzo Rotunno

July

1-2: 7th Workshop On Non-market Valuation (WONV)

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Dominique Ami, Frédéric Aprahamian, Olivier Chanel, Emmanuel Flachaire and Stéphane Luchini

2-4: 1st AMSE Summer School

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Lorenzo Rotunno

5: AMSE-Banque de France conference

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Céline Poilly

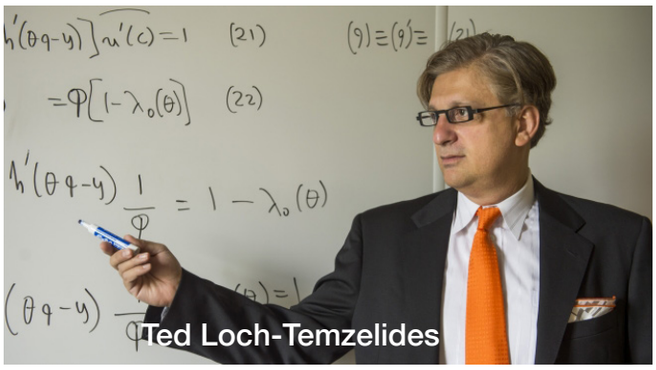
11-12: 4th Workshop on Spatial Dimensions of the Labour Market (SDLM)

Location: AMSE (Îlot Bernard du Bois), Marseille
Organized by Christian Schluter

Outline

AMSE Visitors

Ramses Abul Naga



Ramses Abul Naga from the University of Aberdeen is visiting AMSE, through a joint AMSE-IMERA chair, from January 1st to June 30th 2019. He works on public and health economics, micro-econometrics and the measurement of inequality and well-being.

Ramses is currently working on incomplete preferences and learning to resolve indecisiveness, the distribution and redistribution of indivisible allocations, and problems of statistical inference for multidimensional inequality indices.

Location: IBD, office 358, Marseille and IMéRA.

Ted Loch-Temzelides is a Professor of Economics and a James A. Baker III Scholar at the Institute for Public Policy Center for Energy Studies Scholar at Rice University. His research interests include climate economics, innovation, maritime transportation, and non-standard models of individual decision-making. His main current focus is on the optimal energy transition from a mainly fossil-fuel-driven to a mainly sustainable growth. He has studied optimal carbon taxation in the presence of uncertainty about the damage associated with climate change.

At AMSE, from February 1st to July 31st 2019. Location: IBD, Marseille

Justin Leroux

Justin Leroux is an Associate Professor in the Department of Applied Economics of HEC Montréal. In 2017, he became an associate member of AMSE and a member of Canada's Ecofiscal Commission. His particular research interests are fair division and cost sharing, specifically of public services and in relation to environmental issues like climate change. Prof. Leroux is also involved in consulting for private firms and governments on the optimal pricing of call center services, road networks and water services. During his visit at AMSE, Justin will work alongside Charles Figuières and Alain Trannoy on the design of public policy that links the ideals of equal sacrifice and liberal egalitarian theory.

At AMSE, from February 1st to June 30th 2019. Location: IBD, Marseille

Pavrita Paul

Pavitra Paul, a researcher at the University of Eastern Finland, works on public health economics. Pavrita is currently studying the dynamic interactions between the efficiency of a health system and equity in health coverage and the relation between self-assessed health and objective medical assessment.

At AMSE from January 1st to June 30th 2019. Location: IBD, Marseille

amse Newsletter

Director of Publication: Alain Venditti
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Designer and producer: Yves Doazan

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Portrait

An academic career as a health economist outside France

Sandy Tubeuf, Professor of Health Economics, Université Catholique de Louvain (Belgium)

What are your current professional commitments?

In September 2018, I joined the Université Catholique de Louvain (UCLouvain) in Belgium as Professor of health economics.

Prior to UCLouvain, I was at the University of Leeds for 10 years, in a health economics unit within the Faculty of Medicine and Health. I was initially planning to move up and apply for a chair in the UK, but Brexit came as a shock. It was important for me to come back to continental Europe in a highly ranked university. I felt truly welcome at UCLouvain; there is a strong will to develop health economics. I only started my new position at Louvain-La-Neuve in January 2019 after a two-month trip on the Trans-Siberian Railway. I saw the journey as a good way to move on from my British experience. The UK academic system is very demanding because in addition to teaching and research, I had an important managerial role as the deputy director of the health economics unit. Furthermore, grants applications with clinicians and health care specialists are given foremost importance since health economics is key to the UK health care system and most innovative health care treatments are economically evaluated. I was co-applicant on about 10-12 proposals a year and I had annual financial targets. This often made me feel frustrated because I couldn't do as much research as I wanted.

At Louvain-La-Neuve, I will set up a team of health economists. I am currently supporting three students for PhD scholarships. I also have two new research projects. The first one is on rare diseases with my PhD student Setti Rais. Rare diseases are a timely research question with a relevant economics component related to the trade-offs between potential health gains for a small number of patients and very expensive treatments. I also plan to write a monograph on my British experience in French, I want to explain how «value for money» is a key guide for healthcare decisions in the UK National Health Service and discuss further cost-effectiveness and trade-offs as concepts for healthcare improvement and fair healthcare decisions for francophone countries.

- Sandy defended her thesis at GREQAM in 2008. Supervisors: Lise Rochaix (PSE) and Alain Trannoy (EHESS, AMSE).
- She joined the Center for Health Economics at the University of York on a postdoctoral fellowship as research visitor.
- She was initially appointed as a Research Fellow in May 2008 at the Academic Unit of Health Economics at the University of Leeds where she was based until 2018 before joining the UCL in September 2018 as Professor of Health Economics.

Can you describe your professional trajectory since you finished the PhD?

I was already based in the UK before I defended my thesis. I had been visiting the University of York since 2004 and I moved there permanently in January 2007 as a postdoctoral

researcher. The University of York is an essential stop for health economists: the first ever master's degree in health economics was created there. Many of the greatest health economists have graduated from York and it was quite prestigious to go there during my thesis.
I joined the University of Leeds in 2008. I was initially appointed as a research fellow and then rapidly went through the next steps (senior research fellow, lecturer); in 2013; I became associate professor. I didn't expect to stay in Leeds for ten years. My Leeds experience allowed me to gain a good knowledge of the use of economics in applied health research, which has now become a standard in the health care system of many countries, including France.

For example, *PharmacoEconomics* recently published a special issue on the inclusion of externalities to family members in the evaluation of medical treatments, and one of my articles is featured: «Parental Health Spillover in Cost-Effectiveness Analysis: Evidence from Self-Harming Adolescents in England». This article uses data from a clinical trial comparing family therapy to treatment as usual in self-harming young people; the trial recruited 800 adolescents aged 11 to 17 between 2010 and 2016. Since we were collecting data on parents' health, we extended the research to examine the treatments' effects beyond the patients themselves. In the paper, we show that parents' health is correlated with their child's health and any improvement in the child's health leads to reduced parental anxiety. This ultimately increases global health benefits and reduces the cost to the health system as a whole. There is still no consensus on how these indirect effects can be taken into account. This type of research could be extended to other diseases, such as rare diseases.

How do you feel about your experience of doing a PhD at GREQAM?

First of all, there is a team of excellent professors at Greqam, and this is why the Aix-Marseille School of Economics is well known abroad. The training I received from my thesis at Greqam is robust and solid. I have an anecdote about this. Once I was invited to give a seminar at the University of Dundee. Before I could even finish my presentation, I was subjected to a crossfire of criticism from two econometricians. They were like a dog with a bone and I had to struggle to reach the end of my talk. The next day, I received an email from a professor who had attended the seminar. He praised the tact and intelligence I had used to handle the multiple questions and suggested that this had been taught at Greqam. He remembered how some years earlier Alan Kirman, then professor at Aix-Marseille, in a similar situation during a seminar at Dundee had come out of it elegantly with the same weapons! I must admit I was flattered. My both PhD co-supervisors Lise Rochaix and Alain Trannoy pushed me to give the best of myself; their trust did put me under pressure, but although it was frightening at first, it gave me the opportunity to discover abilities I didn't know I had.

Interview by Yves Doazan

Research Highlights

Targeting the Key-player: An Incentive-based Approach

Mohamed Belhaj and **Frédéric Deroïan**, *Journal of Mathematical Economics*, 2018, 79, 57-64.

The research program

In many economic situations, agents' behaviors depend on their peers. Such interactions are well documented for criminal activities, or for R&D partnerships, or for protective investment against terrorism. These networked interdependencies are exploited by policymakers, either to reduce or to increase the overall network activity. For example, effort reduction may be desirable where criminal activities are concerned, whereas increased effort may be valuable in R&D investment or protection against terrorism. Determining whether, and how, the structure of these interdependencies should be taken into account by public policies is a hot topic.

Paper's contributions

One possible policy consists in trading effort change against transfers. However, contracting costs often substantially increase with the number of contracts. Given a limited budget, the policymaker may then resort to making deals with a limited subset of agents. We study the problem of a policymaker contracting with a single agent in order to minimize or maximize aggregate effort in presence of networked complementarities. The problem can be solved in two steps: first, studying the optimal contract with any agent, and then selecting the best agent, called the key player.

Our analysis shows that, for all agents' utilities with linear best-responses, it only takes two statistics about the position of each agent on the network to identify the key player: the Bonacich centrality, which counts the (weighted) number of walks from the agent to all agents on the network, and the self-loop centrality, which counts the (weighted) number of closed walks starting from the agent. In more detail, we show that the policy effect is the product of the change in targeted agent effort (what we call the individual component) and the change in aggregate effort following a one-unit change in the effort of the targeted agent (the network component). The latter is a pure network multiplier effect and is equal to the ratio of the Bonacich centrality to the self-loop centrality. The former is a function of both statistics, the budget level, the shape of utility, and whether the policymaker maximizes or minimizes effort. The key player depends on all these parameters, but only the Bonacich centrality and the self-loop centrality are network-dependent. We also further characterize the key player under the standard case of linear quadratic utilities, which reveals that the key player is budget-dependent.

We then discuss our modeling assumptions. We first address the issue of contract enforceability. In this model, opportunism is a concern under effort maximization but plays no role under effort minimization. In contrast to enforceable contracts, we find that the key player does not depend on budget level. We also examine the excess-effort linear contract, which is a natural contract given that agents exert effort in the absence of a principal. This contract puts the inter-centrality index in the spotlight, which is reminiscent of the key player analysis of Ballester et al. (2006).

Future research

This analysis raises interesting perspectives. First, it would be challenging to generalize the study to the case of group-player analysis. One difficulty is that it is not only the group that depends on utilities and network structure, but also the sharing of the budget among contracting agents. Second, it would be interesting to study how the agents on the network could protect themselves against the policymaker's intervention, and how this would affect the efficiency of the policy. Third, there may be complementarities between key-player policies and other policies affecting incentives to stay on the network, like increasing wages in the formal market. It would thus be natural to incorporate such complementarities in the comparative analysis of key-player policies.

Short Biography

Frédéric Deroïan

Frédéric Deroïan is a senior research fellow at CNRS affiliated to Aix-Marseille School of Economics. He received his PhD in 2000 from Aix-Marseille University. He entered CNRS in 2002, holding a position in FORUM (Ex EconomiX, Parix X – Nanterre). He joined AMSE in 2007.

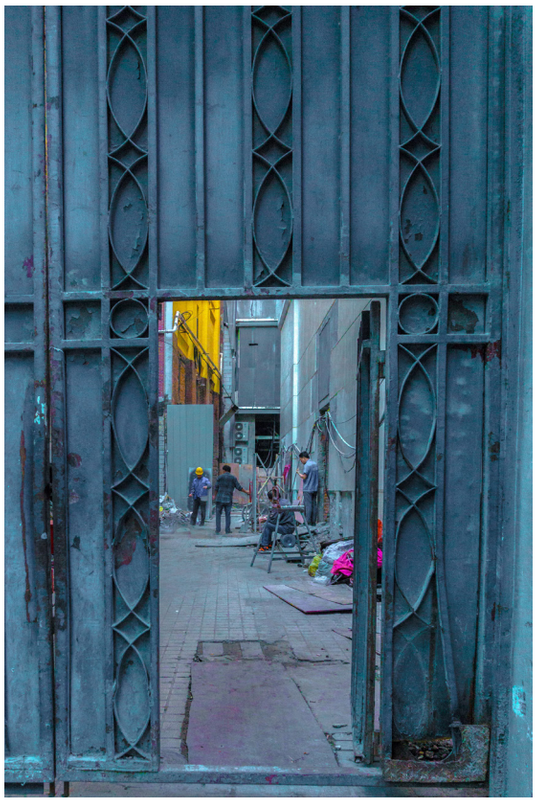
Research Highlights

Measuring Mobility

Frank A. Cowell and **Emmanuel Flachaire**, *Quantitative Economics*, 2018, 9, 865-901.

The research program

Mobility is an important concept in several branches of social science and economics. However, convincing evidence of mobility requires not only good data but also measurement tools that have appropriate properties. Perhaps surprisingly, several commonly-used techniques and indices do not appear to conform well to simple principles concerning mobility and immobility. As an example, consider the commonly-used measure of mobility 1–β, where β is an elasticity coefficient, computed as the ordinary least-squares estimation of the slope coefficient from a linear regression of log-income in period 1 on log-income in period 0. It has been used in almost every empirical study of intergenerational income mobility. However, this index has a major drawback. While a large value of 1–β may provide evidence of significant mobility, a low value does not necessarily imply low mobility. To see why, take three people with log-incomes equal to, respectively, (1,1.5,2) in period 0 and (1,3,2) in period 1. In this case, the index 1–β is equal to zero, suggesting there is no mobility even though there is clear evidence of income mobility (the second person's log-income doubles, while the others remain unchanged). This example shows that the elasticity-based index is inadequate to measure income mobility; it illustrates the need to develop mobility measures with appropriate properties.



Paper's contributions

This paper proposes new ways of determining which types of mobility measures are suitable for the purpose of empirically implementing conventional notions about the meaning of mobility comparisons. We derive a class of mobility indices that satisfy a minimal set of requirements for mobility comparisons, has a natural interpretation in terms of distributional analysis, and for which we develop reliable inference.

What makes our approach to mobility measurement novel is not the introduction of a particular new index, but rather a way of rethinking how to represent the problem, and therefore what theoretical and statistical treatment to apply to this representation of mobility. The key step involves a logical separation of fundamental concepts into (1) the measure of individual status, which could be income, position in the distribution, or something else, and (2) the aggregation of changes in status. The aggregation of changes in status involves applying standard principles to individual histories, which needs to be checked by the mobility measures.

Because our approach can capture income mobility and rank mobility within the same framework, it becomes possible to examine side-by-side mobility comparisons for each of the two underlying status concepts. As illustrated by an example from China around the millennium, this sheds light on the contrasting patterns of mobility through time, interpreted differently according to the type of mobility (up or down) and according to the status concept (income or rank). The use of our mobility measures shows that rank mobility decreased from pre- to post-millennium. By contrast, income mobility has carried on increasing; so has income inequality. An upward/downward decomposition for income-status shows that the story is mainly shaped by upward income movements that significantly increased between the two periods.

Research process

There is a large literature on inequality measurement. The standard theory of inequality measurement assumes that the equalisand is a cardinal quantity, with known cardinalisation. However, inequality comparisons often need to be made in situations where either the cardinalisation is unknown or the underlying data are categorical. In a previous paper, we proposed an alternative approach to inequality analysis that embeds both the ordinal-data problem and the well-known cardinal-data problem. We illustrated how it can be applied to the inequality of happiness and of health. In this paper, we extend the approach to mobility. The new class of mobility measures embeds both the cardinal case (income mobility) and the ordinal case (rank mobility), and it contains the well-known class of generalized entropy inequality measures as a special case (when income distribution in period 1 gives the same amount to each individual).

Short Biography

Emmanuel Flachaire

Emmanuel Flachaire is a Professor of Economics at Aix-Marseille University. He received his PhD in 1998 from the Université de la Méditerranée. His fields of interest include econometrics, machine learning, and the measurement of inequality and mobility.

Research Highlights

Constitutional Rules as Determinants of Social Infrastructure

Eicher, Theo S., **García-Peñalosa, Cecilia**, and Kuenzel, David J., *Journal of Macroeconomics*, 2018, 57, 182-209.

What makes countries rich?

Neoclassical growth theories viewed differences in per capita output across countries as due to either differences in accumulated factors (notably physical and human capital) or differences in the level of total factor productivity (TFP). In a seminal article, Hall and Jones set out to measure the relative share of these two causes and found that factor accumulation accounted for only a third of differences, while two thirds were attributed to TFP discrepancies. Yet, if productivity is simply the capacity to combine factors, is it conceivable that machines and educated individuals are 'combined so much better' in some countries than in others?

The authors argued that factors are more productive in advanced countries due to better social infrastructure, which they defined as the "institutions and government policies that determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output." This concept, borrowed from political science, captures the idea that the right economic environment will reduce transaction costs, hence leading to higher output for a given level of technology and inputs.

From social infrastructure to political institutions

Economists then addressed economic institutions and proposed a social infrastructure index. The strong explanatory power of this index (accounting for 70% of cross-country GDP differences) gave birth to an entire literature seeking to untangle the determinants of social infrastructure itself. A number of authors have suggested that constitutionally-specified political constraints determine social infrastructure. The resulting empirical literature highlights two key constitutional features: whether a democracy is presidential or parliamentary, which provides different checks and balances on the executive, and whether the voting system is proportional or majoritarian, which affects the match between policy choices and the electorate's preferences. Unfortunately, these measures are indirectly and subjectively constructed to proxy for a range of aspects of political institutions. Hence, even if the proxies are significant, it is difficult to identify exactly which institution exerts an influence.

The constitutional dataset

To circumvent this problem, we exploit the data in the Comparative Constitutions Project, compiled by political scientists to code all the world's constitutions. The data covers every aspect of a constitution, which allows us to go beyond the broad categories so far examined. For example, parliamentary regimes are thought to be more accountable than presidential ones, resulting in less rent extraction. The new dataset allows us to ask which rules matter: that budgets are voted in parliament, or that a president is directly elected? Moreover, because it includes aspects of constitutions so far ignored, we can explore new angles such as the role of human rights, an aspect highlighted by Hayek and Sen as providing another layer of checks and balances on decision-makers.

To juxtapose the vast number of candidate regressors, we employ a statistical methodology, Bayesian Model Averaging, specifically designed to address model uncertainty and allowing us to test each individual political institution. Two key results emerge. First, the explanatory power of electoral systems and forms of government is dominated by specific constitutional rules, such as the freedom to form parties or the checks and balances on the executive. Second, we reveal an entirely novel set of social infrastructure determinants: constitutionally-guaranteed human rights. Absence of censorship, separation of church and state, and academic freedom all appear as key variables. These results point towards individual freedoms and responsibilities as core elements of high-quality social infrastructure.

What next?

The estimates we obtain allow us to create an "optimal constitution value" generated by an artificial country whose constitution contains all the variables that exert a positive effect and none of the variables that exert a negative one. We can then construct an index that measures a constitution's distance from the optimal constitution, an excellent predictor of social infrastructure across countries. But does it apply to other aspects of economic life? The index provides a succinct measure of the quality of political institutions, so it could be used to address a number of empirical questions related to growth, to trade or to inequality across individuals, genders or ethnicities. Our approach focused on cross-country regressions that take constitutional features as given and use them to explain social infrastructure. Reverse causality is, however, an important concern, and it would be desirable to examine endogeneity at the constitutional rule level. Addressing this issue by looking for suitable instruments is a promising avenue for future research.

Short Biography

Cecilia García-Peñalosa

Cecilia García Peñalosa is a senior research professor at the CNRS and a member of AMSE. She holds a PhD from Oxford University and has taught in Germany, Spain, Switzerland, and the UK. She works on long-term growth and various aspects of inequality, has been a member of the *Conseil d'Analyse Economique* and has just joined the *European Economic Advisory Group*.

Research Highlights

On the Interplay Between Speculative Bubbles and Productive Investment

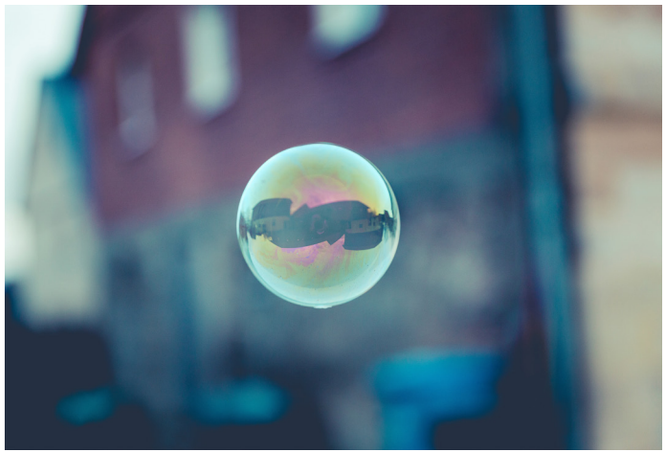
Xavier Raurich and **Thomas Seegmuller**, 2019, *European Economic Review*, 111, 400-420.

The research program

In recent years there has been renewed interest in studying the link between productive and purely speculative investments. Questions that naturally emerge are whether speculative investments are good or bad for capital accumulation and production, whether bubbles are compatible with dynamic efficiency, and what role speculative assets actually play. To address these issues, most of the literature assumes that people can invest either in productive capital or in an asset without fundamental value, which is a pure bubble when its price is positive. These two assets provide returns in the same period and are traded in each period, i.e. both assets have the same liquidity.

Paper's contribution

The purpose of this paper is to examine whether bubbles still exist, and how they affect production, when a differential is introduced into the liquidity of assets. We introduce a speculative asset giving returns in the short run and that can be traded in each period and a productive asset providing returns in the longer run. This distinction implies that the speculative asset is more liquid than the productive one. A clear example of investment with returns in the long term is investment in human capital through education. This investment takes place during youth, implies lifelong returns, and depreciates with death.



The model we examine is an overlapping generations model with three-period lived households. When young, households can borrow through debt and invest in two assets: human capital used in production and providing returns in middle and old age, and an asset without fundamental value, also traded in middle age. This asset is a bubble when it is positively valued. The amount invested is limited by a credit constraint using human capital as collateral. In middle age, agents finance credit and can invest only in the bubble to transfer purchasing power to old age.

In accordance with empirical evidence that bubbles occur in periods of high GDP, we show that bubbles may be productive because they are able to increase production through larger investments in human capital. Considering that the credit constraint is binding at the bubbleless steady state (i.e. without bubbles) and that this steady state is dynamically efficient, we show that the bubbly steady state (i.e. with bubbles) fosters production. This is because the bubble is used to finance productive investment and relax the binding credit constraint. Therefore, our model is also with empirical evidence that credit is higher in periods of expansion and of bubbles.

Short Biography

Thomas Seegmuller

Thomas Seegmuller is a senior research fellow at CNRS. He obtained his PhD from the University of Strasbourg in 2001 and joined AMSE in 2009. His research interests are macroeconomic dynamics and environmental economics.

The mechanism behind all this is based on the interaction between two effects, a crowding-in effect through credit and a crowding-out effect through saving. The first effect is caused by young agents selling the speculative asset short to finance investment in productive human capital. In other words, the agent is selling an asset acquired by borrowing that will be repaid next period. This leads to greater human capital and production than in the credit- constrained bubbleless economy. Selling the speculative asset short can lead to an equilibrium, because middle-aged agents repay the loan and also buy the speculative asset to transfer purchasing power to old age. This is the crowding-out effect, which allows the golden rule to be respected and gives the bubble a positive value.

Since long-term investment in human capital is a key element of our story, we show that a biased technological shock implying a larger return in the longer term may reduce capital. This happens because the bubble may disappear and, hence, can no longer be used to finance productive investment. Contrastingly, if the technological shock is biased toward short-term returns on capital, or increases both short- and long-term returns on capital in like manner, we observe an increase in capital, production and bubble size. These shocks are typically the result of innovations. Our results thus explain why episodes of bubbles are associated with innovations, as documented in several contributions.

We further apply our framework to the debate on the design of fiscal policy aimed at promoting long-term investment. This reveals that the most effective fiscal policy crucially depends on the existence and the nature of bubbles.

Future research

As we have seen, this paper identifies a new mechanism explaining the positive relationship between bubbles and GDP. Our model can be used to study several related topics. It has already been extended to take into account the trade-off between education and fertility choices. Another interesting extension is to in-depth examination of the link between bubbles and inequalities.

Research Perspectives

Networks: From the Periphery to the Core of Economics

Economics is a young science and for much of its existence, the study of social networks was considered as largely outside its realm. At some point in the 1990's, however, this situation changed radically. Following an initial wave of high impact papers by Matt Jackson, Sanjeev Goyal, Rachel Kranton and their coauthors, the economics of networks grew fast. Its reach widened in terms of the papers published, the questions asked and the methods used. The economics of networks has now become of a field of research in its own right, with dedicated JEL codes, conferences, textbooks, summer schools, massive open online courses. It has already branched out, the first handbook on the topic containing surveys of 27 distinct subfields (Bramoullé, Galeotti & Rogers 2016).

A network describes the structure of relations between agents. This concept is versatile and powerful, and social networks appear to play a major role in many traditional fields of economics research. In labor, social networks connecting job seekers and employees play a key role in matching job seekers and jobs. In international trade, trade flows and trade agreements can be represented as networks and social networks between exporters and importers facilitate trade in the presence of frictions. In development, informal institutions are generally organized through social networks and interact in complex ways with emerging formal institutions. The importance of networks is, of course, not confined to economics. Economics has actually joined a broad interdisciplinary effort across the social sciences - sociology, anthropology, demography, political sciences - and the hard sciences - physics, biology, statistics, computer science - to analyze the impact and determinants of networks. The economics of networks thus constitutes the economics branch of an emerging science of networks.

The analysis of networks in economics has evolved in roughly three phases. The first phase was initiated by game theorists, with the study of two new kinds of strategic interactions: games of network formation, where agents can form and sever links with each other, and games played on fixed networks, where agents are embedded in a network and play a game with their network neighbors. Games of network formation have proved difficult to analyze, due to a combination of strategic and network complexity, leading to a diminishing interest over time. By contrast, the study of games played on networks has led to important advances, such as microfoundations for Katz-Bonacich centrality and other graph-theoretic concepts (maximal independent sets, lowest eigenvalue). A key message from this literature is that local interactions give rise, in equilibrium, to global interdependence. These games notably provide useful tools to analyze the propagation of shocks throughout the network. In a second phase, economists considered economic applications of network models and started to analyze network data. Economists notably developed models to explain patterns of homophily (the tendency of similar individuals to be connected), models of jobs and networks, of trade, bargaining and intermediation in networks, of Bayesian and non-Bayesian learning in networks and of financial networks. They also turned their attention to network data, leading to the birth of a new field – the econometrics of network formation – and to the revival of an old field – the econometrics of peer effects. Peer effects operate in many contexts: individuals are affected by others in the way they smoke, eat, drink, exercise, vote, take up social programs and adopt new technologies. Obtaining credible causal estimates of peer effects is difficult, however, because of deep endogeneity problems. In an early study, we showed that network interactions essentially solve one of those problems, called the reflection problem (Bramoullé, Djebbari & Fortin 2009), and many empirical studies since have looked for, and found, evidence of peer effects in social networks.

In the third phase, macroeconomists are starting to incorporate networks into their models and analysis. In an influential study, Daron Acemoglu and his coauthors consider the economy as a fixed network of producer – supplier relationships and analyze how local shocks propagate and give rise to aggregate fluctuations. The literature on production networks, input-ouput linkages and supply chains is currently very active, and researchers are starting to analyze granular network data on all economic transactions between all firms in an economy. Network concepts and ideas have thus reached the core of economics and now permeate all branches of our discipline, bringing economics one step closer to maturity.

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Short Biography

Yann Bramoullé

Yann Bramoullé has been a CNRS directeur de recherches at AMSE since 2012. He obtained his PhD in 2002 from the University of Maryland, College Park. He was a postdoctoral fellow at Toulouse between 2002 and 2004. He was first an assistant professor and then an associate professor at Laval University in Québec between 2004 and 2012.