

# The TSEconomist

Student Magazine

ISSUE # 15

MARCH, 2017

## iECONOMISTS



An interview with Susan Athey

The economics of procrastination

A guide to your M2 choices



## Academic

- 4 **The year of contracts**  
*by Yu Fu Wong*
- 6 **Economics, lawyers and competition policy**  
*by Ignacio Parot*
- 8 **The art of keeping up with yesterday**  
*by Tristan Salmon*
- 10 **An interview with Susan Athey**  
*by Maria Paula Caldas and Philip Hanspach*
- 15 **PhD Research**  
Some advice for your future PhD from  
Pascaline Dupas  
*by Matteo Santangelo*
- 17 **Faculty Article**  
Development Economics and Industrial Organization  
*by Josepa Miquel-Florensa*

## French Corner

- 34 **L'intérêt démocratique des primaires**  
*par Arthur Dinhof*

## Professional

- 36 **Interview with the Governor de la Banque de France**  
*by Dominykas Šliažko and Nhu Nguyen*
- 38 **Business talks**  
Electricity and climate change: troubles are coming.  
*by Vincent Lim*  
  
Sectorial risk analysis in a bank  
*by José Alfonso Muñoz*
- 40 **Internship reports**
- 42 **Memoir reports**
- 43 **Alumni News**
- 44 **Alternance report**  
Airbus

## Spotlight

- 20 **iEconomists**  
  
Machina economicus: a rational mind  
*by Zhuxi Li*  
  
On big data, machine learning, and econometrics  
*by José M. Álvarez*  
  
Her Excellency The Machine: Artificial intelligence and policy making  
*by Omar Doghiem*

## On Campus

- 46 **Tirole lectures**  
*by Alfonso Muñoz*
- 47 **Fourth TSEconomist Public Lecture**  
A change in media landscape  
*by Alfonso Muñoz*
- 48 **M2 Choice**
- 54 **Junior Etudes**
- 55 **BDE**
- 56 **The TSEconomist's teaching awards 2016/2017**
- 58 **Gala pictures**
- 59 **Picture Quiz**

## No Economics in the Title

- 24 **Lost in Translation**  
*by Tristan Salmon and Arthur Hill*
- 28 **The open society and its friends**  
*by Philip Hanspach*
- 31 **Thus spoke the Terminator- On AI and morality**  
*by Mahi ElAttar*

## Sources:

Airbus shop • Anissa Belgacem • bigthink.com • Cercle des économistes • europe. newsweek.com • Flickr.com • futureoflife.org • i.imgur.com • Mai Nguyen • nobelprize.org • mjmobbs.com • Paramount Pictures • pnas.org • Pocketfives.com • Poverty actions.org • rauserbegins.files.wordpress.co • stanford.edu • staticflickr.com • wikimedia.org • Wikipedia.com

## Remark

All the writings in this issue remain the strict responsibility of their authors and in no way represent the opinions of TSE and its members.

Article references are available upon request.

## The Team

### Editorial Board

Mariam Aounallah  
Alicia Bassière  
Saí Bravo

Pauline de Villèle  
Omar Doghiem  
Selin Göksel

Kristina Hagen  
Farah Hathout  
Arthur Hill

Victoire Lamarca  
Max Langer  
Zhuxi Li

Vincent Lim  
Gosia Majewska  
Nicolas Martínez

Rose Mebiame  
David Montoya  
José Alfonso Muñoz

Valeria Plata  
Roxana Pozo  
Tristan Salmon

Anna Schulze Tilling  
Fernando Stipanovic  
Andres Villareal

### Section Editors

Mahi ElAttar  
Annie Krautkraemer  
Paul Montesinos  
Lars Nordgreen

Moheb Said  
*Photographer*

### Executive Board

Marina Sánchez del Villar  
*Editor-in-Chief*

José M. Álvarez  
*Deputy Editor*

Maria Teresa Aguilar Rojas  
*Head of Design*

Philip Hanspach  
*Head of Organization*

Catalina Salas  
*Head of Communications*

## The peaceful transition of power

Welcome back, readers! As the academic year draws to an end, we are proud to publish our 15th issue, which also marks the five-year anniversary of the magazine. To celebrate the occasion, current and former members of the Editorial Board got together for a celebratory dinner where we shared anecdotes and stories of our time in the magazine. This event reinforced my belief that one should not let its university years pass by her, but rather make the most of them. For those looking to make a positive impact during their last years as students, I encourage you to join The TSEconomist: for the debates, the skills, but above all, the people you meet and the connections you make.

The highlight of the semester was our Fourth Annual Public Lecture, where Adam Roberts, The Economist business and finance correspondent for Europe, spoke on how the media is reacting to the changing socio-political landscape. We would like to thank the administration for their support in organizing this talk, and Adam Roberts for his interesting insights on the topic. Inside the magazine, the Spotlight team has reflected on one of the hottest trends: artificial intelligence. You will also find the details of our talk with Susan Athey, 2016 Jean-Jacques Laffont prize recipient, during her visit to Toulouse.

Finally, I want my last words as Editor-in-Chief to be of gratitude towards all the members I have had the opportunity to work with during these two years at TSE. In particular, to José, Catalina, Philip and Teresa, for all their hard work and time devoted to this project. Arthur and the team that takes over is an excellent choice that will undoubtedly continue to improve the magazine.



*Marina Sanchez del Villar*  
*Editor-in-Chief*

As a new board has just been elected, The TSEconomist is celebrating its five-year anniversary. We have seen how much each new team has contributed to the improvement of the magazine over the years. And the recent guest speaker to our annual conference, Adam Roberts, gave us a glimpse of what we should aspire for.

With the end of the academic year, a part of our team is leaving us. I would like to thank them for the dedication and the enthusiasm they brought to our magazine. The past year has been full of novelties, and as the final touches are being put to this issue, I would like to acknowledge the outgoing board members' commitment to make our magazine better.

Anneliese, Tristan, Kristina, Nicolas, Sai, and I are thrilled to take on the challenge that is leading the The TSEconomist. We are keen to carry on the good work and bring our collective touch to the magazine. Next year we want to bring the magazine online to keep in touch with our readership, as well as to have a greater impact on campus life through more inter-association events.

The ever growing size of the team in recent years has been the driving force behind the development of the magazine, and we are eager to hear from the new people and their ideas. If you want to write, organise, and foster debate about subjects you are passionate about and shape campus life, contact us and join the team.



*Arthur Hill*  
*Incoming Editor-in-Chief*

**Erratum:** In our previous issue (issue #14) the name of Julie Lassebie, author of *God ensures those who pay?*, along with Eva Raiber, was not included in the printed version of the magazine on page 15.

#### Contact us:

tseconomist@tse-fr.eu

www.tseconomist.com

**New office: MD303**

# The year of contracts

by Yu Fu Wong

Last year marked a milestone in the development of contract theory. The Nobel Memorial Prize in Economic Sciences 2016 was awarded jointly to Oliver Hart and Bengt Holmström, “for their contributions to contract theory.” In the same year, the John Bates Clark Medal, which acknowledges to economists under the age of forty, was bestowed upon Yuliy Sannikov for his new methodologies in game theory and contract theory. It was no coincidence – the two most prestigious awards in economics went to them, in recognition of the growing prevalence of the theory of incentives in the last thirty years. As the faculty at TSE have also made remarkable progress in the field, it is of interest for fellow students to understand the basics of contract theory and the accomplishments of the three laureates.

Contracts are ubiquitous in our daily life. Property owners rent us their apartments, conditional on paying the rent punctually and keeping the furniture



Oliver Hart

intact. In employment agreements, enterprises will compensate us for our labour upon satisfactory performance. For the blessed ones, the bride and groom promise to abide by certain vague code of honour, contingent on each other’s behaviour. For the less fortunate ones, nothing is more vivid than clicking on “I agree” in order to use the latest apps and gadgets without reading the forty-page small print, which now comes into legal effect. Loosely speaking, a contract is an arrangement which specifies some actions or allocations conditional on some observations in the future, usually between two parties.

We can gain many insights studying one common type of informal contract in our early years. It usually reads, “if you behave yourself, you will get ice-cream.” When the young boy behaves, the mother offers ice-cream, with the converse implicitly understood. It is ambiguous how well the boy has to behave to be rewarded and, in that case, how much ice-cream the mother will give in return. When the child does not meet the standard, he may bargain for a smaller portion; even when he does, there might not be any left in the fridge. Some smart kids may realize factors other than their behaviour in this reward scheme, the expiration date of the ice-cream for instance. This example demonstrates the simplicity, incompleteness, negotiability, possibility of default, and lack of commitment of contracts in the society.

## Incomplete Contract Theory

Oliver Hart and John Moore are generally credited for laying the foundation of incomplete contract theory. Incomplete contracts, or simple contracts, focus on the difficulties and imperfections of real-life contracts. Hart has also studied extensively their implications in capital structure, management finance, and

public economics. For an illustration, we shall take the example of the ice-cream reward scheme.

This contract between mother and son is incredibly simple. Both the conditions and outcomes are quite vague as well. Hart argues that such contracts are popular because it is costly to specify the definite allocation for all potential observations. While it may be possible to devise a complex scheme to provide incentives more efficiently, the parties seek simple, incomplete, sub-optimal (constrained-optimal) ones in face of the staggering transaction cost. In our case, it is almost impossible to explain to a child the amount of ice-cream he will get as a function of his behaviour, which is defined formally and precisely in all possible situations.

With such simple contracts, the parties may not be able to commit to the plan. On the one hand, if the child does not behave, the soft-hearted mother may offer a smaller portion to her weeping child, despite their original agreement. On the other hand, even if the child behaves, the mother may not be able to uphold her end when the fridge is empty. Hart shows that the temptation of renegotiation and the transfer of idiosyncratic risk will undermine social surplus in general. Even when there is enough ice-cream, the mother will tend to give out more than she was planning to at the beginning, because the ice-cream purchase is sunk. This issue of excessive incentive is known as the hold-in problem. A parallel dilemma of insufficient incentive is called the hold-up problem. In the context of corporate finance, firms are tempted too often to restructure its debt with small investors who face a hold-in problem. In education economics, workers tend to underinvest in human capital because part of this surplus is captured by their employers, resulting in a hold-up problem.

## Complete Contract Theory

Despite the inefficiencies in simple contracts, Eric Maskin and Jean Tirole proved that the hold-up problem can be solved by writing more complex ones. A natural extension of the study of incomplete contracts is to examine the optimal, potentially complicated, contract for a given information structure. This field of research is known as complete contract theory. Bengt Holmström is perhaps best known for his work on the optimal use of information, which balances risk exposure and incentive provision. He has also looked into various forms of contractual possibilities, such as promotions, multi-tasking, and teamwork.

Before 1987, most of the literature in contract theory was limited to static cases, which presented a few challenges. For one, James Mirrlees shows that the optimal contract does not exist when the agent's utility is unbounded from below – at the limit, which means that the principal can motivate the agent efficiently by punishing him only in the worst scenarios. This contradicts the intuition that the agent is motivated by ordinary circumstances. For another, the analytical complexity grows exponentially when the number of periods in the economic model increases. Under this context, the seminal paper of Bengt Holmström and Paul Milgrom on dynamic contracting sparked numerous discussions in contract theory that continue to this day.



Bengt Holmström

In their paper, the agent can exert costly effort to imperfectly improve the outcome in each period. The contract is terminated after a large number of periods and the principal compensates the agent based on the history of observations. Under appropriate assumptions, the agent's expected value follows a Brownian motion, and the optimal repayment scheme counts the occurrence of each observation, i.e. the optimal contract is effectively a piece-rate contract. The linear compensation function motivates the agent to exert effort in all circumstances, not only in the worst ones. The mathematical elegance of Brownian motion offers analytical convenience and tractability – the authors were able to isolate the compensation into four components: reservation value, cost of effort, incentive provision, and risk-premium. Since the publication, thousands of papers followed their framework to examine various contractual possibilities.

## Dynamic Contract Theory

One deadly criticism of the model of Holmström and Milgrom is that it only considers compensations at the very end. In real life, rents are settled, wages are paid, and relationships are maintained throughout the contracts. This model is defensible at best for impatient agents; however, it cannot capture truly the dynamic tradeoff between efficiency and incentives. This flaw is similar to that of the folk theorem in game theory, where the same conflict de-materializes when players become patient. After twenty years of research, dynamic contracts and repeated games in discrete time seemed to have reached their pinnacles with limited progress. And this is where Yuliy Sannikov came into play.

Sannikov rose into the spotlight in 2004 with his PhD dissertation on repeated games with imperfect observations in continuous time. Instead of discrete time, he attacked the problem with the arsenal of continuous-time methodologies. With the martingale representation theorem, he was able to solve for the set of all public perfect equilibria for any discount rate. In application to contract theory, he has provided a tractable model to study the balance between efficiency, risk-sharing, and moral hazard in both the short run and the long run.



Yuliy Sannikov

With his novel tools for dynamic contracts, he has been working on capital structure, compensation schemes, structural learning, and many other areas.

Sannikov's methodological breakthrough has revitalized contract theory and game theory. Many factors that were once ignored in the name of tractability can now be analyzed in simple models. Here at TSE, Bruno Biais, Thomas Mariotti, Guillaume Plantin, and Jean-Charles Rochet have accomplished a connection between the continuous-time and discrete-time approaches, and gained new insights into the link between asset pricing and corporate finance from the optimal repayment scheme for managers. Macroeconomists can look into dynamic taxation incidence, or equivalently the social contract, which balances between wealth redistribution and moral hazard. Public economists have new tools to inspect the role of the government's reputation in implementing new policies under a relational contract. The list grows longer by the day.

## Remarks

The three laureates, Oliver Hart, Bengt Holmström, and Yuliy Sannikov, signify the flourishing study of contracts. This article serves but a brief introduction to this exciting field of research. ■



in the administrative and judicial proceedings as experts, invited either by the parties or directly by the authorities. Examples of economic influence can be found in some of the guidelines published in the last twenty years: market definition (1997), vertical restraints (2000), horizontal mergers (2004), non-horizontal mergers (2007) and exclusionary abuses (2008). As you can see, these are very recent documents.

Even if we have already experienced an important shift towards economics in competition policy, it is very likely that this trend will continue in the near future. In the last years we have seen larger and more data-intensive merger investigations at both sides of the Atlantic, while the revision of economic evidence by courts will hardly decline in the future. Also, the new Damages Directive from the European Union will standardize and incentivize the procedures for these claims and ensure a very large amount of work for economists in courts around the continent.

After this very brief historical review, TSE students interested in this field should be sure about two things: 1) Economists will continue to be very welcomed to the competition policy world; and 2) They will likely be working with lawyers the rest of their lives if they decide to do so. On what follows, we shall talk a bit about the second point.

Making things work between two professions with such a different background is especially interesting, but has also major challenges. I'm sure you have heard some TSE teachers say ironically (or not) "lawyers don't understand this" or "well, try to explain that to a lawyer" and of course there is, at least, some reality in those expressions.

What does working with lawyers look like in real life for an economist? As was



already said, it means working with people that have completely different thinking frameworks. Lawyers love facts. They may wrap them up many times in complex ways, but they are trained in a world with little space for greys, which is pretty much the opposite of the likely reader of this magazine. So in the first place, lawyers will reach to economists for economic facts (how much of our abilities can be transferred to something considered as a "fact" is a complex topic that could give place to many pages, but let's just define a fact as something we can assure with a high level of confidence and little relevant assumptions). In other words, and even if this is a controversial topic, lawyers are naturally in the search of "bright-line" rules or tests, ones that are as simple as possible and that are not subject to vastly different interpretations. This is quite a challenge for economists, who have been taught various different simplified and limited models for each type of problem they will run into. So your first challenge will

be being able to ponder and balance between the simplicity and clearness expected by lawyers and the likely mistakes you will make when oversimplifying economic problems.

Of course competition law is a lot more than facts. The small space for "per-se" rulings and the advance of the "effects-based approach" have meant, on the other side, that lawyers needed to start adapting a bit to economists as well. And this adaptation has been in various levels mentioned above: They had to adapt to the economic concepts that have been increasingly included in legislation and regulations, to the administrative procedures that follow these regulations and to the jurisdictional dealings that arise in these types of cases. This last point is a growing concern for many judges as well, who are increasingly being asked to rule about topics that are outside of their technical reach and, in most jurisdictions, may need of external assistance to fulfil their tasks.

I have so far mentioned adaptation, tradeoffs and misunderstandings, but my intention is in no case to picture the relationship between lawyers and economists as a difficult one. I believe the challenges stated give way to very high rewards to both parties and lead to great professional and personal development opportunities. Both careers have plenty of the other's missing attributes, which helps each of them move a step out of their limited world, facilitating the real understanding of interactions in what we call markets. ■

~..

***“ Both careers have plenty of the other’s missing attributes, which helps each of them move a step out of their limited world, facilitating the real understanding of interactions in what we call markets. ”***

~..

# The art of keeping up with yesterday

by Tristan Salmon

Oscar Wilde said “I never put off till tomorrow what I can possibly do—the day after.” Putting off work until the last possible moment is a problem many of us struggle with. But can we reconcile this behaviour with economic rationality, or are we behaving inconsistently?

Procrastination has been described by the psychologists Solomon and Rothblum, rather formally, as “the act of needlessly delaying tasks to the point of experiencing subjective discomfort.” Another way to define it could be, as the Urban dictionary puts it, “I’ll put a definition up later.”

Various scientific, economic, and psychological theories have tried to determine why we put ourselves through this self-sabotage leading to the fevered late night coffee whilst desperately trying to prepare for an exam or meet a deadline.

Some psychologists attribute procrastination to low confidence in the probability of success in the task that is being put off, whether we work or not. On a more sombre note, psychologists Blatt and Quilan (1987) claim that procrastination is an attempt to avoid “unconscious death anxiety (...). By being continually late, the procrastinator is expressing rebellion at the finality of his or her existence.”



This is a widespread phenomenon among students. Most of us have procrastinated at some point; someone might even be procrastinating by reading this article. The psychologists Ellis and Knaus estimated that 95% of college students procrastinate.

## The Rational Agent

Time-consistent preferences have been used to explain procrastination, in which people have a discount rate lower than one—consumption today is worth more than consumption tomorrow, a cost tomorrow is less than the same cost today. Putting off tasks based on this may be rational in the traditional sense—people are still “correctly” evaluating their payoffs. However, this implies that individuals will be satisfied if they maximised their expected utility at any time, based on their individual discount rate.

## Enjoy now, regret later

The economists O’Donoghue and Rabin argued that “Casual observation, introspection, and psychological research all suggest that the assumption of time consistency is importantly wrong. It ignores the human tendency to grab immediate rewards and to avoid immediate costs in a way that our ‘long-run selves’ do not appreciate.”

This had led to economic models based on time-inconsistent choices, and a representation of procrastination as a result of “present-biased” preferences. In fact, it shows failures of self-control, i.e. to put off unappealing tasks and to indulge in more fun activities, both due to placing more value on the here and now, and over discounting future costs.

Starting to watch that exciting TV show a few days before exams instead of

studying is a result of privileging the present you over the future you that is having his sixteenth cup of coffee, desperately trying to be ready for a final exam. This behaviour is time-inconsistent if it leads the future you to regret the actions of the past you, taking into account the benefit from procrastinating and the cost from having to work harder later.

So procrastination is associated with future regret. But is it really that bad?

## Relative Rationality

According to the economist George Loewenstein, “In everyday language, the term irrationality is typically applied to impulsive and self-destructive behaviour and to actions that violate generally accepted norms about the relative importance of different goals. The theoretical perspective proposed here views irrationality not as an objective and well-defined phenomenon, but as a subjective perception that occurs in the mid-range of the continuum defined by the influence of visceral factors.” This paper defines visceral factors as “drive” states, such as pain, emotions, thirst/hunger, or craving. The idea is that people are influenced by their state when they make decisions. Thus, a stressful situation may cause procrastination. This is therefore irrational when rationality is viewed as the time consistent decision that would have been made from a removed, dispassionate perspective.

## In defence of the thief of time

In his recent Technology, Entertainment, Design (TED) talk, the blogger Tim Urban described the brain of a procrastinator and a non-procrastinator as both containing a rational decision maker. However, the procrastinator brain





**“I’m not procrastinating. I’m proactively delaying the implementation of the energy-intensive phase of the project until the enthusiasm factor is at its maximum effectiveness.”**

*By Randy Glasbergen*

also contains an “Instant Gratification Monkey” which disagrees with the rational decision maker on when work should be started, but has a strong inclination toward watching YouTube videos now rather than starting the task at hand. Then he goes on to describe the third part of a procrastinator’s brain that allows people to survive, the “Panic Monster”, who wakes up when a deadline is approaching, allowing people to pull all-nighters to avoid missing the deadline.

Perhaps there is some virtue in procrastination, not just in terms of allowing people to focus and work extremely hard just before a deadline, but also to think more creatively. In the article “Why I Taught Myself to Procrastinate,” the professor, Adam Grant, claims to be a “pre-crastinator”: he prefers to start working right away. One of his students questioned this habit, saying that procrastinating made her more creative. To support her argument, she designed an experiment asking people to come up with new business ideas. Some of the people were told to start right away, others were given five minutes to play Minesweeper first. The latter’s ideas were rated as 28% more creative than those who started right away. The article claims that procrastination “encouraged divergent thinking” by letting the mind wander away from the task at hand.

### Self-procrastinating

The psychologist Angela Hsin Chun presents two types of procrastinators:

passive and active. The former are the “traditional” procrastinators, who are paralysed by their indecision to act and thus fail to complete tasks on time. In this case, as Professor Timothy Pychyl from Carleton University puts it, “You know what you ought to do and you’re not able to bring yourself to do it. It’s that gap between intention and action.”

However, active procrastinators can actually gain from procrastinating, as they prefer to work under pressure, and so deliberately put off work. In their research report, *Procrastination and Performance* (1997), the psychologists Tice and Baumeister claim that procrastinators experience less stress and have better physical health when deadlines are far off. Procrastination could, in this case, be a strategy to manage negative emotions to make the person feel better, at least in the short run.

~~  
**“ So procrastination is associated with future regret. But is it really that bad? ”**  
 ~~

Their results show that “although active procrastinators procrastinate to the same degree as passive procrastinators, they are more similar to non-procrastinators than to passive procrastinators in terms of purposive use of time, control

of time, self-efficacy belief, coping styles, and outcomes including academic performance.” Indeed, non-procrastinators and active procrastinators will have less stress, “greater life satisfaction”, and a better GPA than passive procrastinators. However, there does not seem to be a significant difference between active and non-procrastinators for these characteristics.

### “Stickk” with it

One way to get around the present bias is to make delaying a task costlier for the individual. Deadlines are one way of doing this, but cannot be used for every task, and are not credible threats if set by the procrastinator himself.

Another possible solution is punishment strategies, such as those proposed by Stickk, a company created by two Yale economists. The idea is to buy a commitment contract that will force you to do the task that was being put off. This contract involves paying a certain amount of money, and only receiving it back if you accomplish the task before the set deadline. However, the money does not go to Stickk if you fail—they make money via advertising—but to a random charity or to an organization that you really do not want to give money to. At the time of writing, there was \$27,781,150 on the line, 332,504 commitment contracts, 844,995 workouts completed and 17,645,212 cigarettes not smoked.

### “Time you enjoy wasting is not wasted time.

Procrastination is the scourge of every final exam for most students. The Economist wrote in 2009 about an experiment which gave to different test groups different forms of instructions. Some were given concrete tasks, and some were given tasks that required abstract thinking. The study found that almost all of those who had been “prompted to think in concrete terms” completed their task by the set deadline, whereas over half of the other group failed to answer at all.

The way the task is presented may be the most efficient way of circumventing procrastination. But tomorrow will probably always be the busiest day of the week. ■

# An interview with Susan Athey

by Philip Hanspach and María Paula Caldas

*The Jean-Jacques Laffont Prize recognizes an internationally renowned economist whose research combines both the theoretical and empirical aspects of economics. Last year's recipient of the award was Susan Athey, the Economics of Technology Professor at the Stanford Graduate School of Business.*

*Professor Athey's research spans over a wide range of topics in microeconomic theory, industrial organization and econometric methods. Her current research focuses on online advertising, the economics of the media and machine learning. She regularly advises governments and businesses on questions regarding the digital economy.*

*Professor Athey visited TSE in December to give a lecture on the future of media platforms. The TSEconomist met her for an interview where she spoke on the news industry, women in economics and current trends in economic research.*



**1. During your lecture yesterday, you spoke on the effects of search engines, news aggregators and social media on the dynamics of the news industry. With regards to political news, how much of an impact do you believe that these different news platforms have on actual political outcomes?**

I think they have a pretty big impact. For example, in the most recent US presidential election, on many issues we could see an alignment of people's social networks with their opinions on the issue. If you think about the presidential election between Mitt Romney and Barack Obama, there were many educated people that supported Mitt Romney and many people in cities who supported Mitt Romney. What we saw in this election was that educated people who also lived in cities were overwhelmingly for Hillary Clinton. More than that, Clinton's supporters were very upset by the policies, opinions and values that were promoted by Trump.

As a result, people's social media feeds were very one sided, especially for the people who supported Clinton. The fact that

social media feeds were very strong in one direction made them more different than what you might have gotten from just reading three different newspapers. Had their social network been more diverse, it would have been more reflective of a full range of people's opinions.

~  
“ ... in the most recent US presidential election, on many issues we could see an alignment of people's social networks with their opinions on the issue. ”  
~



TSE conference with Susan Athey

For example, Facebook has shown graphs about what people's social networks look like geographically. So people from California have friends from California and also have friends from Boston. In this particular election, people in Boston were a lot like the people in San Francisco. So I think that these things are very important, and I think probably something similar happened in Brexit, where urban educated people have mostly other urban educated people in their social networks, and they were all mainly in favour of keeping Britain in the European Union, but they were not as connected to the people that opposed it.

## ***2. And in reverse, how do you think these political outcomes may in return influence the reputation of these platforms?***

We are seeing a lot of discussion right now about what Facebook's role is. The same goes to other online platforms.

I think, traditionally, these social networks and search engines have erred on the side of being very open. For example, if you talked to a representative of YouTube, he would say something like this: "Look, if we find someone uploading a YouTube video of a beheading, we are going to take it down, but if someone makes a YouTube video that is just generally racist or sexist, we are not going to take that down because we are an open platform. We want to make sure that if there is an oppressive government, people can put out a video against it, but we are not going to be in the business of making a community that has a set of predefined values."

So I think it is very tricky when you realise that those kinds of "openness" values are actually changing people's informativeness. The people in charge of these platforms are worried about it and are thinking hard about how to change the situation, but it still would be a pretty big change for them to start imposing values.

Some of my former PhD students at Facebook just did a project where they tried to demote what they call "click-bait": headlines that make people want to click but the headline does not really tell you what is in the story. They released this algorithm a few months ago to try to reduce the ranking of articles that had misleading headlines.

However, what I saw in the presidential election is that the problem is not so much completely "fake news", but that you have one-sided news, you have poor interpretation of facts. That is not truly fake news. And then if a bunch of people want to share that information with each other, it is very hard for a social media website to control that.

Traditional newspapers explicitly had a view: "We are going to decide that even though people don't like to read about Syria, we are going to tell them about Syria. Because that is what we do." Newspapers historically made the editorial part separate from the business and advertising part. They also maintained this idea of journalistic integrity, where they gave people stuff that they didn't really want, and then they bundled it together with the things that they did want so that they read it. However, in today's world where people can choose article by article and they can see what their friends share, it is very hard to make people read things.

## ***3. What do you think should be the role of regulators with regards to news aggregators (e.g. Google News, etc.)?***

First of all, I think it is reasonable for news organisations to collectively bargain. Normally, antitrust law would prevent them from doing so. However, when an aggregator or platform aggregates a large set of users, and then on the other side there is a large set of relatively substitutable service providers that must go through the platform to reach the users, those service providers have basically no bargaining power. The platform can control access to the users—this is an example of the competitive bottleneck analysed in the economics literature on two-sided markets. In many such cases, welfare would be improved if the service providers can collectively bargain to reduce access fees or improve terms.

For example, if one newspaper goes away, there is no effect at all on Google News because you can replace all of the stories with stories from other newspapers. Because newspapers are in general very substitutable, one single newspaper has basically no bargaining power. The papers that pull out of Google News then lose all their traffic without hurting Google News.

~••

***“So I think it is very tricky when you realise that those kinds of “openness” values are actually changing people’s informativeness.”***

~••

So, Google says: “Well, a newspaper can always opt out” – but that is kind of an empty statement. So having them somehow collectively bargain is very important.

It is very tricky to think about exactly what regulation is going to fix the problem; the problem being that if ultimately these newspapers don't get enough advertising revenue they are not going to be able to stay in business, or they are not going to have the incentives to produce quality news. I don't think there is an easy answer to this question yet.

~..

*“My research showed that there is a valuable service from reducing search cost from these aggregators and intermediaries, so you do not want to lose that valuable service.”*

~..

My research showed that there is a valuable service from reducing search cost from these aggregators and intermediaries, so you do not want to lose that valuable service. In any case, this is the trend; people are getting their news through these intermediaries. I think that it is not really realistic to think that this trend is going to change, so it is more of a question of how can we make sure we still get enough (good) news, and that the firms that invest resources in reporting on that news see a return on their investment.

There may still be a wider range of policy options, like subsidising some of the investigative reporting, or helping with some of the infrastructure that is required to do some of the investigative reporting. For example, in the US there is a group called ProPublica, and they created databases of government information that made it easier for newspapers to do their research.

Ultimately, I think we are going to see some consolidation because when newspapers are more consolidated, they have more bargaining power, and also save on fixed costs.

**4. We would like to know a bit more about your academic and research career. You spoke yesterday on how Jean Jacques Laffont inspired you to delve into empirical research in economics, where before you had worked solely on theory. How was this transition for you? Why do you find it interesting to do both?**

I was really motivated to go into economics by policy problems, but during my PhD I focused on theory, because you have to focus while you are doing your PhD. Then as a junior faculty my mentors encouraged me to keep my focus, because that is the advice that everybody gets.

Jean-Jacques Laffont had these really lovely theoretical papers about how you do empirical work. He showed me that if you

think clearly theoretically, then you can make a different kind of contribution to empirical work.

There are really two parts to empirical work: one is just the theory of what is possible in empirical work. We call that econometric identification. In other words, you are trying to answer the question: if you had a very large data set, what is it that it is possible to learn from it? That was what I saw Jean-Jacques Laffont do that was so inspiring to me, because I realised that I could do that kind of theory. And there were a lot of open questions like that, especially in the space of problems where you were bringing theory to data.

So auctions were a perfect application of this type of work: I was already doing theory of auctions, but now I could do theory of how to use auction data to answer questions. That connexion then made it easier to transition to just doing the empirical work, for example testing theory with data. So Jean-Jacques showed me a clear path from theory to empirical work.

In my research today I am having kind of a similar type of focus, but this time around I'm thinking about these questions in the areas of big data and machine learning. I am trying to determine the methodologies that allow you to draw inferences from big data sets, in particular causal inference. Machine learning is all about prediction: how do you use some things you observe about individuals to predict an outcome that you observe. Economics and social sciences are mostly about causal inference: what is the effect of Google News on news outlets? What is the effect of trade policy on employment? Machine learning hasn't focused on that as much, and so now I am working on statistical theory for how you use big data to answer this type of causal questions.



~..

***“ I am trying to determine the methodologies that allow you to draw inferences from big data sets, in particular causal inference. ”***

~..

So I have come back to theory. Basically, I started with economic theory, then did theory of empirical work, then empirical work, and now I have come back to statistical theory again. Overall, I think that if you have good training in theory and you apply it to empirical problems, you can really bring a new set of insights to empirical problems.

***5. You were the first woman economist to be awarded the John Bates Clark Medal in 2007. That same year, you wrote for the Committee for the Status of Women in the Economics Profession giving advice to women economists in negotiating senior job offers. Do you think that the challenges facing women in economics are the same today as they were a decade ago?***

I think that the challenges are very similar. A few things have changed and I have also gained more experience.

Ten years ago, I would have said that things are hardest at the beginning and then get easier as you get older. Early on in your career, when you don't know whether you are good at things and nobody else does either, there's a lot of learning. Stereotypes can then matter a lot, given that there is not a lot of information.

In my case, I was trying to do very technical theory but I somehow didn't look like what people expected someone who does economic theory to look like. I didn't even talk the way someone who you expected to be very good at math to talk. I had to counter stereotypes. People would ask: "Is she serious? Can she really be serious? She smiles too much" [laughs]. And in a sense they were right that I was more interested in connection to the world than your typical theorist. So in some ways the way that people sized me up was accurate. But on the other hand, I was perfectly capable of doing hard theory. I was good at math, I just cared about how theory could be used to change the world.

I felt that as I got more experienced and people got to know me as a person, they thought less about my gender and more about my work. So when I met somebody, they would say: "Oh, you wrote this and this paper". And then that makes everything about your work and all stereotypes --about your ethnicity, your gender, your age-- become more or less irrelevant. People just want to talk about your paper. The more papers you have, the easier it is -- you could be purple if you have enough great papers.

So I thought that all my problems would be solved once I wrote enough papers because that is all people would care about. But then I realized -- in the last 10 or 15 years -- that different

problems come when you become more senior because your actual job changes. When you are young, your job is just to write papers and all you worry about is whether people will accept your papers or whether they will stereotype how smart you are. When you are older, you are supposed to be a leader in a lot of different ways. You have to make decisions about hiring; you have to advise students; people listen to you in terms of leadership about where the field is going; you have evaluations. You have power dynamics; one group wants one thing, another group wants something else. I think gender plays a role there too, and in some ways, it's even a harder role to overcome because you can't just write more papers or win more prizes and make people feel comfortable with you being a strong woman. So that is kind of depressing.

Out of that experience, I have somewhat depressing advice as well [laughs], which is that it's actually -- I hope it changes one day -- but it's actually very difficult for women to be involved in conflicts and power struggles. I think there's a big disadvantage there that is hard to overcome. So my kind of depressing advice is just to stay out of it.

But the good thing about this advice is that there are so many other interesting things to do, even outside research or academia. For example, I have found that when a government or company comes to me for my advice, once again, they don't care if I'm purple as long as I'm giving them good advice. They come to me because they want an answer to a question. So that is a way you can have a huge impact. You can have an enormous amount of power through your ideas.

For example, when I worked as consulting chief economist at Microsoft, I changed a lot of things that Microsoft did and that is really cool. Now I am advising start-up companies, among them a company that is trying to reinvent finance. I change



RoboCup 2016

the way money moves around the world. I am advising the US government on how to use big data in statistics—that has a huge impact on public policy. That is probably a better use of my time than worrying about university politics or things like that. Since another stereotype is that women get overloaded with administrative jobs, perhaps my advice can serve as a balance against that.

So my advice to women is that there are some environments where gender is an impediment and there are some environments where it is less so. Being an expert and using your expertise to change the world is something incredibly powerful. If you are the world expert on something, you have all the power. When you have unique skills, when you are the best person to solve a problem, people will come to you, and they will do what it takes to make the situation work for you. On the other hand, if the battle is just about power, about whose opinion or feelings matter more, or who should get to speak in a meeting, then even if you are the expert, gender can get in the way. Rather than fight those battles, when given the choice, change the world through channels where you don't have to waste a lot of time working against gender barriers.

***6. So we are going to ask you for advice for students in general. Right now, there are more and more jobs in technology. How do you think the current teaching in economics helps students to find this kind of jobs?***

First of all, I think Europe is behind the US in terms of educating people for those jobs. So just to think about what the standard is: my ten-year old daughter has been coding in summer camp for four years. Most of upper-middle class kids in the United States will have exposure to coding in elementary school. So when those people get to college, which is only five to eight years away, the standard will be that everybody knows how to code.

At Stanford, we have about a thousand people a year taking our course on machine learning. That is basically saying everybody is going to know this. If you look at business people today, most took some introductory economics. In the near future, everybody will have introductory coding and introductory machine learning. So basically, there are going to be declining industries and growing industries, and people who don't have these skills are in a declining industry. So, don't be in the declining industry [laughs].

You need to have the basic skills. If you are a salesperson at Google and you can't use SQL code to pull your own data and produce a data-driven presentation to your customers, you won't last more than six months. So, you can't even be a salesperson without being able to use data. You have to have these skills. But the good news is that it is easy! If a thousand people can take a class, it can't be that hard [laughs]. And if an eight-year-old can learn how to code, you can, too. You can use Khan Academy, you can use Coursera... It is all available to you; you just take the time to do it.

More specifically, I would say that I am very confident about the fact that economists will have a huge role to play in our society in the future because we know how to use data and we know how to think about equilibrium, feedback effects

and incentives. Those thousand people taking the machine learning class aren't thinking about incentives. They also aren't thinking about causal inference. They don't even necessarily think about how to use data to answer a question beyond prediction. Using data to answer questions and evaluate policies is what economics is all about. Most of our research papers are either modelling equilibrium and incentives or they're measuring the causal effect on something.

And it turns out that is what we need businesses to do. If we have all of these robots and algorithms to do things in the future, we need people to understand them, to manage them, to think about them, to understand how to measure them. We need people in the future to be able to manage and to evaluate algorithms and to put goals on them.

Just as an example, take robo-advising: I am going to have an algorithm to tell you how to invest. Well, how do I know if it's a good algorithm? How do I measure if it's doing a good job? You can imagine that consumers spend more time with it if you show them lots of cool pictures about how great their retirement will be. They might spend less time with the app if you show them that they probably won't be able to retire until they're seventy-five because they haven't saved enough. If you just take an engineering perspective and measure user experience, you can end up with an algorithm that does not serve your consumers well. This is just an example where thinking about things more economically (about the trade-offs, what the goals and objectives are) could lead you to a different answer.

In the future our world is going to be run by these algorithms. If we tell them to do the wrong thing, they will do the wrong thing very well and very fast. So it's important to look at the long term, the short term, how you measure it, what the objectives are and what the economic context is. But economists will not be able to have a seat at the table unless they have enough technical skills. ■



# Some advice for your future PhD from Pascaline Dupas

by Matteo Santangelo



*I had the opportunity to talk briefly with Pascaline Dupas at the end of the 2016 Development Workshop organised at TSE about the relationship between academia and policymakers. I asked her for some advice about the PhD career track and, more specifically, working in the developing countries context.*

*Pascaline Dupas is one of the youngest and more outstanding French economics professors.*

*She completed her Bachelor's degree at the Ecole Normale Supérieure in 1999, she earned a MSc in Economic Analysis and Policy in Paris, and a PhD from the Paris School of Economics in 2006 after three different visiting periods to Harvard, MIT, and NYU. She became an assistant professor at Dartmouth in 2006 before joining UCLA in 2008 and then Stanford in 2011, and became an associate professor in 2014. In 2015 she won the award for best young French economist.*

*During her stays in the US, Dupas met Esther Duflo, another accomplished French economist with whom she quickly started to use Randomized Control Trials (RCT). RCT is a technique initially designed to test drugs in medical science. Applying this technique to test policy interventions such as cash transfer, education or health programs is certainly more complicated, but has been surprisingly successful in recent years at pushing along the research agenda in Development Economics.*

## ***1. Is development economics a new field of economics?***

In my view, it has never been clear why Development Economics even exists as a “field”. Public Finance, Industrial Organisation, Labour, Education, Health, etc -- all these topics are important in both developed and less developed countries, and the theories that frame our research are the same, so why does someone studying education issues in a developing country context get classified as “development” and not “education”? A main reason for Development Economics to exist as a field is that until recently so few people were using developing countries’ data to do research that they looked a bit odd to others, and so they had to bond and become friends. Create a community. But sometime I think it would be great if Development Economics as a field would disappear by virtue of developing country studies becoming mainstream. Then, we would be labelled primarily as experts in Public Finance, Industrial Organisation, and so on, with a specific interest in

development. This could make the discipline more appealing to new students who have not yet decided whether they want to be a “development” person or not. Until not so long ago, Development Economics had a bit of a reputation as a second grade field and people did not really want to study it. This bad reputation is gone for the most part but many PhD programs still have very few faculty members in development economics, and in such programs, the bad rep may persist.

## ***2. Do you have any advice for graduate students who would like to follow your path and become PhD students?***

In my own experience, spending a lot of time in the field was really helpful to come up with research questions that were at the same time important and policy relevant. But it may be because I don’t have much imagination or creativity, and I needed to get first-hand experience and to talk to people to

palliate that. I found it really hard to understand the reality on the ground through reading the literature only.

So, for example, the idea for the paper I presented today comes from a co-author of mine being physically present in a village in Malawi and stumbling upon a village meeting where subsidies were allocated. That got us thinking about the pros and cons of one allocation mechanism versus another.

**3. Do you think it is useful to work as a Research Assistant before doing the PhD?**

I spent a year in Kenya working as an RA for Michael Kremer and Esther Duflo and, during my PhD, I worked with them in the US at NBER. The experience as an RA on the field was really helpful for the reasons I mentioned before, but the experience in the US was also really useful to see how the research is done from A to Z, in particular how researchers think and go back and forth between theory and empirics. These experiences were amazing and helped me learn how to become a researcher myself.

**4. Would you like to advise any particular topic of study to future PhD candidates, or is there a topic that you believe could revolutionise the field, as RCT did fifteen years ago?**

By working in the academia we are permanent students. We can learn everything when we need, so I believe people should not be stressed about making sure they learn the right technique while in grad school. What is helpful is to

~..

*“By working in the academia we are permanent students. We can learn everything when we need, so I believe people should not be stressed about making sure they learn the right technique while in grad school.”*

~..

know what is possible – to know that methods exist to solve this or that problem, even if we do not know how to use all of them. I encourage students to try and do enough of each subfields in economics, to know what is there, even if you cannot fully understand how to do everything. If you never get to do calibration in macro, but you know about its existence, then whenever you need to use that tool to answer a question you are working on, then you can invest time in learning the technique. Whereas, if you do not know about it, the likelihood that you think at it as a possible solution for the problem you are working on is very low. So, in a way, scout for what is there, keep yourself updated by browsing journals, and go to seminars and workshops. ■



Addis Ababa, Ethiopia. June 2016. Photo Credit: Pascaline Dupas



## Development Economics and Industrial Organization or industrial organization in developing countries

by Josepa Miquel-Florensa

A typical morning. An assembled-in-China tablet wakes me up. Half asleep, and still wondering why the made-in-Pakistan ball did not make it in yesterday's soccer match, I reach the kitchen and prepare a strong Costa Rican coffee. Ok, running shoes from Vietnam on, time to get out... need to burn off all the amazing chocolate from Ghana eaten last night.

Access to markets, either national or international, is key for improving the well-being of millions in developing countries. Market frictions are common in these settings, characterized by significant levels of informality and low trust. That is why policy implementation aiming at a fair distribution of benefits from export-oriented industries will be key for the poorest households to benefit from market access.

Given this, why don't we see more work at the intersection of Development Economics and Industrial Organization? Two particular challenges to overcome are access to good micro data, which are not always available in a developing country setting, and making the research relevant for policy. Fortunately, the latest research is showing a lot of progress on both of these issues.

~..

***“ Access to markets, either national or international, is key for improving the well-being of millions in developing countries. ”***

~..

***“ Another relevant challenge of working on Industrial Organization in developing countries is how to make the research relevant for policy. ”***

~..

The growing literature on manufacturing export markets (e.g. Atkin, Chaudhry, Chaudry, Khandelwal, Raza, and Verhoogen (2016) on Soccer Balls) and agricultural cash crop markets (e.g. Macciavello and Miquel-Florensa (2016) for coffee) shows how the data challenge is being overcome, both with the use of administrative and experimental data. The job market papers of Swatz (2016) and Falcao Bergquist (2016) are two clear examples of the trends to creatively answer Industrial Organization questions in developing country settings. Swatz uses a very detailed survey on Nigerian traders to show that search (finding out which goods are available) and contracting frictions (ensuring that the contracts will be honoured) in differentiated goods trade are large, and can have a substantial impact on

welfare in developing countries. Falcao Bergquist studies the gap between producer and consumer prices of maize in Kenya with three randomized control trials. The first one analyses the extent of pass-through of a subsidy to traders, the second one looks at the shape of demand with randomized price discounts to consumers, and the third looks at the effects of entry on market prices with a randomized incentive to the entry of new traders to the market. She concludes that traders have significant market power, and that the entry of new traders in the market has negligible impact on prices, which suggests that entrants collude with incumbents upon entry.

Another relevant challenge of working on Industrial Organization in developing countries is how to make the research relevant for policy. For instance, how should we design programs to reduce informality, improve firm productivity, and obtain a welfare-improving distribution of profits? McKenzie and Woodruff (2016) use data on business practices (marketing, stock-keeping, record-keeping, and financial planning) from two South Asian, three African, and two Latin American countries to show that the variation in these practices explains as much of the variation in outcomes—sales, profits and labour productivity, and total factor productivity—in microenterprises as in larger enterprises. The two authors have done extensive research on how to improve productivity in small and medium enterprises in developing countries: improve access to credit, incentives to formalization, and worker training and incentives programs, among others. Recent work by Blattman and Dercon (2016) sheds light on the challenges to expand the formal industrial sector for workers in developing countries with an interesting experiment with factory workers in Ethiopia.

To conclude, we need to continue to make progress on the challenges of working at the intersection of Industrial Organization and Development Economics in order to help ensure a fair distribution of the benefits gained from market access in developing countries. ■

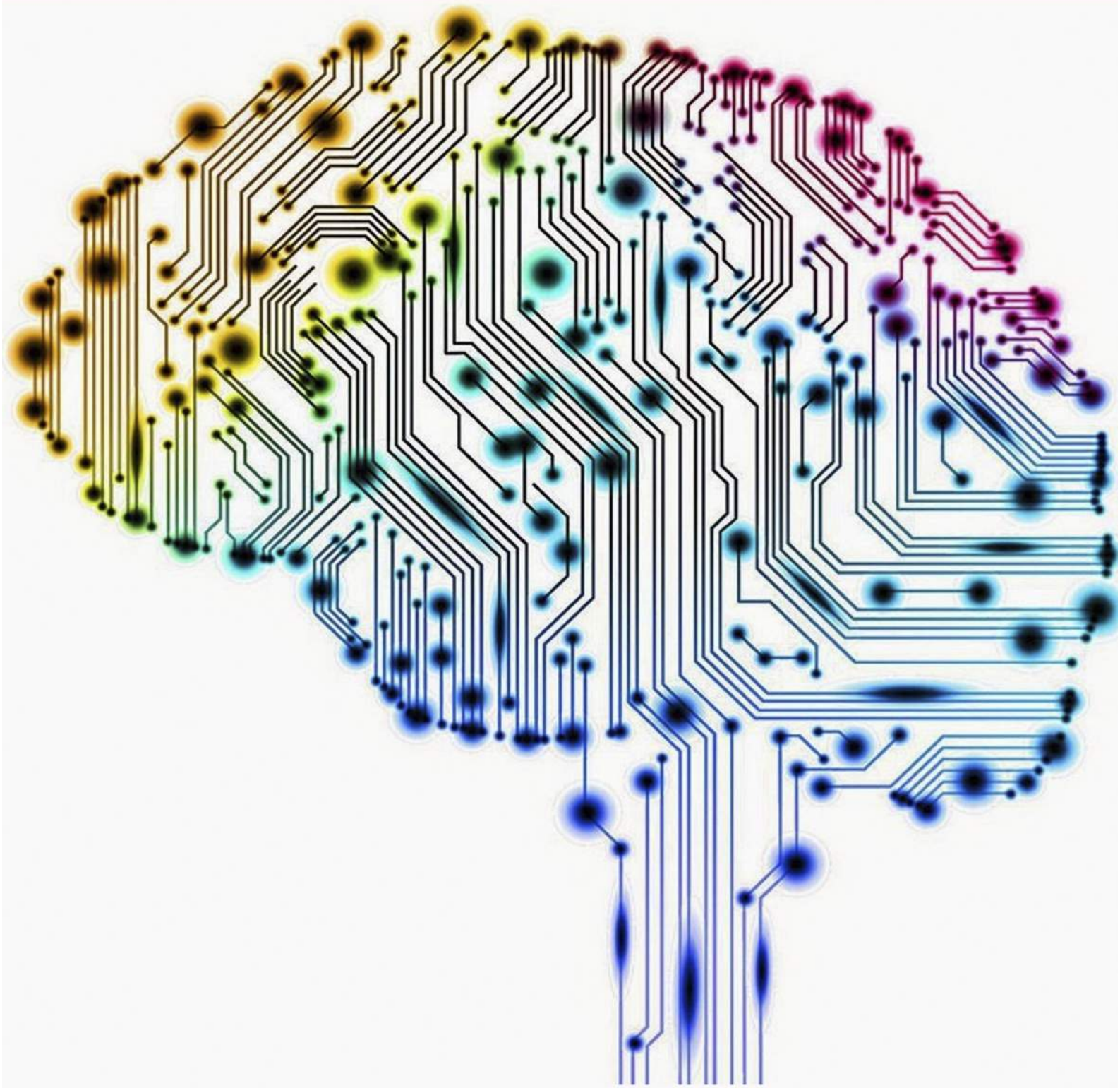
LCL PARTNER OF  
TSE TOULOUSE BDE

The logo features the letters 'LCL' in a bold, yellow, sans-serif font. The letters are set against a dark blue background. A large, stylized blue arc with a white inner edge and a subtle gradient is positioned behind the letters, curving from the top left towards the bottom right. The entire logo is contained within a dark blue rectangular frame.

LCL

BANQUE ET ASSURANCE

# SPOTLIGHT



iECONOMISTS

# iEconomists

*“Are you after truth? Yeah. But I don’t know what we mean by truth in our business. I don’t see economics as pushing that deeply in some respects. We’re programming robot imitations of people, and there are real limits on what you can get out of that.”*

*Robert Lucas in *The New Classical Macroeconomics: Conversations with New Classical Economists and their Opponents* (1984)*



*Grandmaster Garry Kasparov vs. IBM's Deep Blue. The supercomputer would go on to beat Kasparov in 1997, becoming the first computer to beat a human chess player under tournament conditions*

*We live in a time where machines are learning, data is big, and intelligence is artificial. It tends to be the case, at least in the western part of the world, that each generation experiences that tipping point that comes with a given technological innovation. The preceding generations refuse to adapt, while the upcoming ones take for granted the change. But, unquestionably, everything changes. It seems that our generation’s associated innovation will be artificial intelligence (AI). AI will not only impact our personal lives but our professional lives as economists, too. The aim of this piece is not to delve deep into the origins or theory behind AI or machine learning or big data. We leave that to the engineers. Instead, we provide a glimpse into how AI and company are affecting economics today - mainly, how the ongoing technological revolution is affecting the three pillars of modern economics: the theory, the application, and the practitioner.*

# Machina economicus: a rational mind

by Zhuxi Li

What is rationality? Or, more concretely, what is a rational agent? In economic theory, a rational agent tends to always make the best possible choice based on his or her own interests. Rational agents maximize their utility given the preferences, constraints, perceived opportunities, and available information. The rationality hypothesis has its own limits, though. Humans are not clear-minded. Our emotional nature leads to inconsistency in decision making. Our perceptions are often systematically biased by cognitive constraints, such as over-confidence or optical illusions. Overall, humans do not always take into account all the available information simply because, as several studies have shown, our brains are not equipped to do so. But, what if all of this economic theory based on rationality could actually be applied to some sort of rational-by-construction “being” such as a machine?

Imagine that you and an artificially intelligent machine both face the same economic game. Which one out of the two do you think will optimally solve the problem? In fact, which one out of the two is the rational agent economists are looking for? Due to our imperfections as human beings, we might question ourselves whether we, as humans, are the best option of rational agents available to economists.

The emergence of artificial intelligence and machine learning in recent years seems to have an answer to this question. Artificial intelligence (AI), as its name suggests, is the intelligence exhibited by machines. By mimicking cognitive functions of human minds and interactions, an intelligent machine is capable of learning and solving problems in a way that maximizes its chance

of success just like humans do. With its perfectly mechanical decision making process, AI is gradually gaining attention from economists. “Theories of normative design from economics may prove more relevant for artificial agents than human agents, with AIs that better respect idealized assumptions of rationality than people, interacting through novel rules and incentive systems quite distinct from those tailored for people”, as mentioned in a paper written by David C. Parkes, professor in computer science and applied sciences at Harvard. AIs possess greater advantages than us on economic domains such as matching, market clearing solutions, preference modeling, or game theory. Take computer poker as an example. In this typical game with imperfect information, uncertainty and complexity, expert human players have long developed high skills, but game-theoretic algorithms have taken place and predominated over the last decade. Researchers have recently developed AIs having attained perfect rationality in a two player setting of poker. They calculate faster, play wiser, and “think” broader. AI agents have been found to be much more efficient in decision making and strategic reasoning than human beings in some fields. AI may surpass humans in things like playing chess, analyzing massive data, even executing complex financial decisions by exploiting volumes of economic news. Our rationality has been proved no better than these artificial agents made from algorithms.

Since rational AI systems do better than a human in such various ways and do not pursue the identical reasoning of humans, they may have the chance to be an ideal solution of our shortcomings in the context of rationality. The transition from “homo economicus” to “machi-

na economicus” becomes a tendency that we can not overlook. Works in this field have already been carried out, such as articles published on Science by David Parkes and Michael Wellman, discussing how AI can reshape economic theories and the possibility of a specially designed economic framework for machines. Certainly are there challenges. For example, for AIs to make rational choices, they have to treat each other as equally rational agents. Work remains to be done in establishing an interactive multi-agent system for AIs for them to carry out optimal behaviours. Moreover, the absence of common sense, cultural knowledge, and moral reasoning in artificial agents is not likely to be solved in the short term either.

No matter how inspiring the advances in AI techniques are, economists should always keep in mind that there exists no perfect solution. The absolute rationality of economic agents should only be an ideology. Constructing a better vision to see our real life may require the combination of efforts from human beings and artificial intelligence, as they both share advantages and limits. The pursuit of a rational mind is still a long journey. ■



# The LASSO

## On big data, machine learning, and econometrics

by Jose Alvarez

According to an analysis by *The Economist* on keywords in working-paper abstracts by the National Bureau of Economic Research, big data and machine learning have become the latest fad among economists. As with previous fads in the field, there is that inherent risk that comes with the initial hype, where practitioners first implement the new techniques and ask the questions later on whether it actually makes sense to use them. The field's quantitative toolbox increases, but so does the risk of malpraxis and of mediocre empirical work. But big data techniques have useful and important implications to economic research. And it is hard to make the case that nobody knows what they are doing when you have several prominent economists--such as Hal Varian, Matt Taddy, and 2017's Jean Jacques Laffont Prize winner Susan Athey--focusing their research on creating a seat for economists on the big data table.

Big data, put simply, is the term used for referring to considerably large datasets (about two terabytes and over). Machine learning, also simply put, is the act of giving computers the ability to learn as they go. Of course, for a machine to learn it needs a lot of practice, or, in other words, a lot of data, sometimes big data. Machine learning started off as a subfield of computer science, and it manifests itself, along with big data, in economics mainly through the field of econometrics. It is not a surprise, for example, that Varian is the Chief Economist at Google, Taddy is a Principal Researcher at Microsoft Research, and Athey is a Consultant Economist for Microsoft. Some background in mathematics, statistics, and modeling, as well as coding skills are necessary, which implies that as students of economics, there might be a high entry cost for us to properly master this new fad.

Machine learning and econometrics are complements and not substitutes. The former has a focus on prediction; the latter has a focus on finding causality. Economists are good at small data inference, while machine learning can be very good at big data prediction. Such gap is what people like the economists previously mentioned are trying to minimize. The list of "new tricks" for econometrics includes from nonlinear estimation using regression trees or neural nets to the more-or-less familiar bootstrapping method. Here, however, we will only talk about one in particular: variable or model selection.

Machine learning model selection is a data-driven method, where the data tells what variables out of your list of covariates are important. Rather than running your usual regression, you run a regularized regression, where parameter estimates of the "not important" variables shrink to zero. It is worth mentioning that model selection requires (sometimes very) large data sets that are of large dimensions. Nowadays, for example, some empirical questions use datasets with more variables than observations, such as determining which genes are influential on producing a given disease.

~\*~  
**“ Machine learning and econometrics are complements and not substitutes. ”**  
 ~\*~

So where do you fit in all of this? For this I borrow one example Susan Athey used in a recent podcast with EconTalk. Sup-



*Robert Tibshirani, professor of statistics at Stanford University and creator of the LASSO, or the Least Absolute Shrinkage and Selection Operator*

pose you want to test whether a policy intervention has an effect or not on a given outcome. You dispose of a considerable dataset that includes a large list of possible covariates that you can use as controls. You are only interested in the treatment variable, but also want to control for spurious correlation. Rather than trying to fit as many covariates as possible and running the risk of overfitting the model, you first run a LASSO regression (which is the most popular method in terms of model selection) to determine which control variables are relevant to then include them in your model. Athey raises the warning that these variables are not up for interpretation. Your treatment variable can be given a causal interpretation because there is supposed to be a theoretical framework behind it. Your control variables, however, are not up for that type of interpretation. At the end you have a model based on the data itself rather than on factors picked by the practitioner.<sup>1</sup> ■

<sup>1</sup> For those interested, there is a R package for the LASSO.

# Her Excellency The Machine

## Artificial intelligence and policy making

by Omar Doghiem

In the words of Jason Furman, the Chairman of the Council of Economic Advisors of the Obama administration: "I want to start with the biggest worry I have about [AI]: that we do not have enough of AI. Our first, second and third reactions to just about any innovation should be to cheer it—and ask how we get more of it." This powerful statement from Furman, is a strong signal of the inclination towards a more frequent use of AI by policy makers. By policy making, I refer to the synthesis of complex ideas drawn from within the government community, with the collaboration of experts and the public, in order to design a specific course of action.

In practice, economic intuition alone is proven insufficient to capture the complexity of the real world, because no matter how sophisticated the economic model is, it will fail to account for all the phenomena that might be of relevance to design or execute a public policy. Therefore, it is safe to assume that the efficiency of public policies depends fundamentally on how well informed the decision maker is.

Nowadays, the main challenge facing most governments is not the scarcity of available data, but rather the inefficient use of it. Although far from optimal, governments have made a considerable effort to overcome this problem. For instance, the United States introduced recently to its public sector the position of Chief Data Officer, whose primary mission is to gather, standardize, manage, and communicate datasets to different public organizations. Now the remaining challenge is how to use this valuable data to tailor the optimal policy, more importantly, how would the use of AI help us achieve such a target?

In principle, policymaking and machine learning share the same doctrine: they



both rely on the available information and try to predict a certain outcome. By showing to the machine historical data on individuals' characteristics and their respective behaviour for the outcome of interest, we train it to predict the future performance of individuals based on their characteristics.

The powerful prediction ability of AI is a very precious tool for policy makers, as it allows them to target more efficiently the potential beneficiaries. However, what is truly impressive is the variety of fields in which machine learning could contribute. For example, machine learning could help policy makers predict more accurately which students are most likely to dropout of schools based on their socio-economic characteristics or on their previous educational performance. Also, it could be used to predict which patients are most likely to have heart attacks, or to be diagnosed by cancer in the future, based on their medical history and their genetic codes.

If artificial intelligence is so proficient in assessing information and predicting future outcomes, at least better than humans, shouldn't we just replace economists with machines? At least we might avoid another humiliating Michael Fish moment. As a matter of fact,

economics as a profession is more and more criticized for its low ability to forecast and prevent crisis, especially after the financial crash of 2008. Thus, some would argue that AI is a better substitute to human economists, especially when replacing humans by machines has proved to be very efficient in other professions such as weather forecasting.

Whilst it is true that relying on AI might be optimal for economic forecasting, trusting it exclusively for policy making is extremely risky. For instance, the performance of AI is as good as the data it is modelled on. If the data is biased in any way, all the policy implications that follow will be also biased. In other words, there exists an irreplaceable human factor that takes into account all relevant social, political, moral and ideological issues at stake, which AI and machine learning simply fail to do.

In short, it is immature to think of AI as a substitute for policy making. However, it is a valuable tool that must be used more frequently by policy makers as it gives them much better predictive abilities, unreachable otherwise. Finally, it allows policy makers to have a better understanding of the population that they serve, which is crucial to design and implement the optimal policy. ■

# Lost in Translation

by Arthur Hill and Tristan Salmon

“If thought corrupts language, language can also corrupt thought.” In George Orwell’s dystopian novel *1984*, language is increasingly restricted. By removing more and more words from the English language, Big Brother aims to keep the people in line with his oppressive regime. The idea is that if people cannot even talk about rebelling, then how could they think of it?

Are our thought processes constrained by our languages? Or do our languages just reflect the way we think? Are we completely missing the point by asking these questions in English?

## *Linguistic relativism and determinism*

*Smith, Brown, Toman, and Goodman (1947)* showed that perception and cognition can exist independently from the ability to speak a language, however there are many theories as to how the language that a person speaks may influence how they perceive the world.

The idea that language shapes our personality and our perception received a lot of attention in the second part of the 20th century partly due to the *Sapir-Whorf theory*. In its strongest form, this theory claims that the language we speak directly determines the thoughts we can have. This would imply that some thoughts cannot be *thought* by certain people due to the language that they speak. This is called *linguistic determinism*.

“Some thoughts cannot be thought by certain people due to the language that they speak. This is called linguistic determinism.”

“Are our thought processes constrained by our languages? Or do our languages just reflect the way we think?”

This was the idea that the recent sci-fi film *Arrival* was based around [SPOILER ALERT]. The film revolves around humans learning to communicate with aliens who come to Earth, and who bring their language as a gift to us. The language of the aliens changes the perception people have of time, allowing people to experience time non-linearly, i.e. seeing the past, present and future at any moment in time.

While this theory may be fascinating, it was not backed up by solid evidence, and so little further research was devoted to the subject for some time. The main problem behind this theory is that it claims that if a language does not have a word for a concept, then that would prevent anyone who speaks only that language from understanding that concept. However, if a language does not have a past tense, this does not mean that the speaker cannot remember the past, nor understand the idea of a past.

As well, there is a softer version of the *Sapir-Whorf* theory called *linguistic relativity*. This revolves around the idea that language influences how we perceive the world, rather than determining what concepts we can understand and those we cannot. As *Lucy (1997)* puts it in his paper: “Language embodies an interpretation of reality and language can influence thought about that reality”. In other words, linguistic relativity means that the structure of a given language will have consequences on the “patterns of thought about reality”. This is not because language allows us to have these different patterns, but that languages force us to think about some concepts more than others on a regular basis.



According to *The Influence of Our Native language on Cognitive Representations of Colour, Spatial Relations and Time* by Nicholas P. Sarantakis, the impact of language on thought “is mediated by three pathways: (i) the intention of an individual to express their thoughts; (ii) the environmental and cultural context; and (iii) the ability of an individual to learn different modes of reasoning.”

Linguistic relativity has been the object of many studies over the last two decades, there is a substantial amount of empirical evidence in its favour.

### **Where and when are we?**

There are many different ways that languages use to designate space; most of our readers will be familiar with the concepts of left, right, up, and down, but that is not the case for all languages.

In *How does language shape the way we think?*, the author, Lera Boroditsky, talks about how the Kuuk Thaayorre (a small aboriginal community on the western edge of Cape York in northern Australia) describe space. They use north, south, east, and west. This may not seem that different until you learn that this is done for everything, so that your left leg would be your southwest leg.

This means that the Kuuk Thaayorre have a sense of direction that few English speakers could possess, as they must constantly know where all four directions are. If this tribe does

not stay oriented, then they cannot express anything about space. In most other current languages, directions are relative to the speaker, who does not need to know where north is to describe space.

Lera Boroditsky’s study goes on to test the effect of using cardinal directions on the tribe’s perception of time, by giving them pictures with some kind of temporal progression (a man ageing, for instance) and asking them to arrange these pictures in chronological order. English speakers did this from left to right, Hebrew speakers from right to left. The Kurk Thaayorre arranged them from east to west: from left to right if they were facing south and vice-versa if they were facing north (the subjects were not told in which direction they were facing). This seems to be a direct result of the requirements of language on perception.

We can also see different representations of time through language between English and Mandarin. This was studied in *How Linguistic and Cultural Forces Shape Conceptions of Time: English and Mandarin Time in 3D* by Lera Boroditsky *et al.*, which concludes that “converging evidence from two paradigms strongly suggests that Mandarin speakers also think about time vertically more often than English speakers do. It appears that patterns in language and culture can induce differences in thought in even such fundamental conceptual domains as time.”

While these results may indicate that language is influencing perception, could these not be down to cultural habits?



Arrival, 2016

To test this, Lera Boroditsky conducted an experiment in which English speakers were taught some new ways to describe time. They were taught size metaphors (that exist in Greek) for length (larger than a minute for example), and vertical metaphors as in Mandarin. This had a significant impact on the cognitive behaviour of the English speakers, who started to resemble the Greek and Mandarin speakers once they got used to the metaphors described above. It does seem that quirks of language have a causal effect on perception of time.

### *Did you just assume my gender?*

English speakers learning a foreign language have often wondered why on Earth people choose to complicate their language by assigning a gender to all nouns: no one knows why a bridge should be masculine in Spanish or feminine in German.

Or, as the New York Times' *Does your language shape the way you think?* puts it: "Why is Russian water a she, and why does she become a he once you have dipped a tea bag into her?"

It would be easy to dismiss these as simple grammatical quirks, but it seems that it does have an effect on how we perceive these inanimate objects.

~..

*“ Language seems to force people to think certain ways more habitually than others, but does not necessarily restrict the scope of thought. ”*

~..

For instance, when asking German and Spanish speakers to describe a key (masculine in German and feminine in Spanish), a study found that the Germans were more likely to use words like "heavy", "jagged", "serrated". However, the Spanish used words such as "golden", "intricate", "shiny" and "lovely", words that are generally associated as being more feminine.

Again, teaching English speakers these grammatical genders influenced their descriptions so that they started to resemble those of the German and Spanish speakers. The gender of the words does seem to influence our perception of gender-less objects.

Language seems to force people to think certain ways more habitually than others, but does not necessarily restrict the scope of thought.

What does this mean for the increasing proportion of people who speak several languages? Why do some people claim to have different personalities depending on the language they speak?

### *How to think without style by Samuel Beckett*

"More and more my own language appears to me like a veil that must be torn apart in order to get at the things (or the Nothingness) behind it. Grammar and Style. To me they seem to have become as irrelevant as a Victorian bathing suit or the imperturbability of a true Gentleman. A mask."

Despite being a native English-speaker, Samuel Beckett decided that all the drafts of his works would be written in French. With this process, he was forcing himself to unpack his thinking and the way he was building his sentences. He later said that when writing in French he was forced to reflect on what he actually wanted to express, and not to rely on highly stylised English, in which he was bound to be distracted from the meaning by the form.

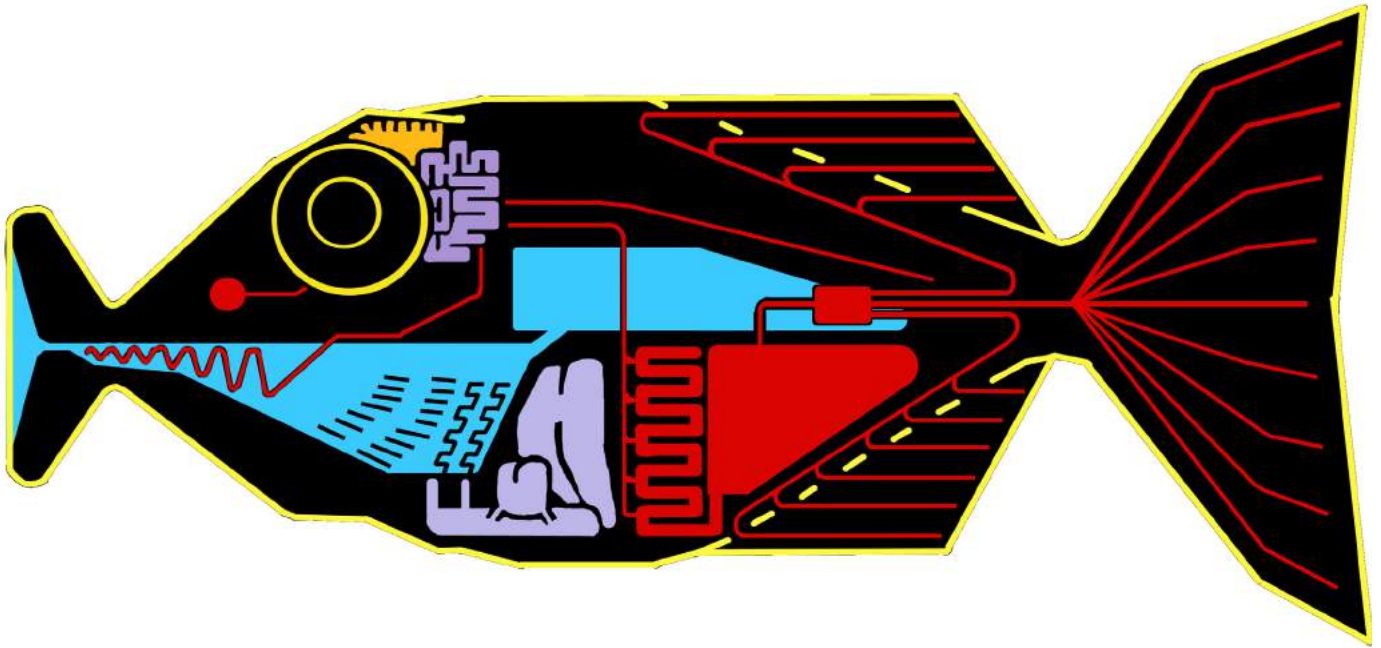
Beckett's point was actually proven right by a 2012 paper that showed that using a foreign language to make decisions makes people more of a rational *homo economicus* than in their first language. Thinking in one's mother-tongue lets the way a problem is presented influence the way one takes into account the odds when making a decision. In this paper, students who were native English-speakers and spoke Japanese as a foreign language were asked either in Japanese or English to answer a modified "Asian disease" problem whose question was: recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made. If you choose Medicine A, 200,000 people will be saved. If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved. Which medicine do you choose? Generally, people are risk-averse so they would prefer to choose medicine A where they are sure to save 200,000 people instead of jeopardizing the lives of 600,000 people. The experience proved that point right with 77% of the people choosing the safe option. But by simply changing the framing of the question and stating the odds in terms of people saved, the odds were expressed in terms of deaths (i.e.: for Medicine A it stated that "400,000 will die," and for Medicine B, it stated that there was a 33.3% chance that "no one will die" and a 66.6% chance that "600,000 people will die."). In this framing only 47% of the participants chose the safe option which is a large shift from the previously 77%.

When the same test is taken in a foreign language, this asymmetry in the answers almost disappears, showing resilience to the framing of the question and actually paying more attention to the substance of what was told to them.

~..

*“ While thinking in a foreign language, the problem is formalised and looked at in terms of concepts. ”*

~..



Babel fish

The approach to a problem is indeed different depending on the language the problem is set up. While thinking in a foreign language, the problem is formalised and looked at in terms of concepts and does not involve the emotional charge of the word.

*As human beings, we are consistently inconsistent.*

### **Stay brainfit, learn a new language**

As a language changes the way one perceives his environment, learning a new one modifies perception, and even changes the physical structure of the brain.

At the Swedish armed forces interpreter academy, researchers were able to closely monitor how learning a language modifies the brain. The students of this academy were learning a language intensively for 13 months, and their brain structure was compared to medicine and cognitive science students who worked equally hard but did not study languages.

Using regular magnetic resonance imaging scans, they were able to monitor the evolution of the brain during the learning process. They witnessed an increase in size of specific parts of the brain, namely the hippocampus (deep lying structure) and three areas in the cerebral cortex, whereas the control group did not see any change in their brain structure.

Interestingly different parts of the brain grew depending on the abilities of the learner: The most successful ones at learning languages saw the hippocampus and language related part of the cerebral cortex growing while the others just saw their motor region of the cortex growing.

This short term study shows how learning a language is affecting the brain. But the areas of the brain that grew were linked to how easy the learners found languages, and brain development varied according to performance.

Such an effect over a few months' interval suggests that

speaking many languages keeps the brain in shape by increasing the cognitive load on the brain.

According to *The Cognitive Effects of Being Bilingual* by Viorica Marian and Anthony Shook, bilingualism can help stave off some degenerative illnesses such as Alzheimer. This paper found that bilingual patients started reporting symptoms of the disease roughly 5 years later than the average for monolingual people.

~ ~ ~  
 “ *Bilingualism can help stave off some degenerative illnesses such as Alzheimer.* ”  
 ~ ~ ~

Perhaps language barriers and the different patterns of thought each one encourages is something to be celebrated. Douglas Adams' classic *The Hitchhiker's Guide to the Galaxy* considers the case of the Babel fish (once inserted into the person's ear, allows the person to understand any form of language) which “by effectively removing all barriers to communication between different races and cultures, has caused more and bloodier wars than anything else in the history of creation.” The languages we speak have a profound impact on how we see the world, and how we think. And we still have a lot to learn about our languages and their implications, as Elisabeth Young-Bruehl wrote in Hannah Arendt's biography “it is the poets or poetic thinkers who live by an expectation that language will deliver us from the temptation not to think.” ■

# The open society and its friends, a comment

by Philip Hanspach



From left to right: Alexander Hamilton, James Madison and John Jay

The liberal bloc is in need of a vigorous defence of economic liberalism, free markets and an open society if it wants to stay relevant against the rising tide of anti-liberal and anti-globalization movements.

After the independence of the British colonies in America, there was considerable debate over the form the new state was about to take. The new constitution of the United States was at the centre of that debate. Three clear-sighted public intellectuals stood up to the task of defending the constitution to ensure its ratification: these men were John Jay, Alexander Hamilton and James Madison. Their essays, today known as the *Federalist Papers*, were an inspiring contribution to the political debate that echoes in US court rulings on constitutional matters even today.

Some of these papers laid out the basic principles of the

nascent democracy: Madison's Federalist No. 10 is considered one of the best essays from the Anglo-Saxon sphere on the protection of minorities from the majority in a democracy. Others tackle democratic foundations such as "checks and balances" and the judicial review of laws. They defended their idea of a strong central democracy against the *Jeffersonians* who wanted a more decentralized country – a historical conflict that doesn't mirror today's political struggles. So why should it still be important for us?

Today, politicians and political movements that contradict conventional political wisdom are on the rise. The past year saw the British vote to leave the European Union and the election of Donald Trump as president of the United States. Both events were followed by a spike in crime motivated by racial hatred and xenophobia. The coming year brings elections in

France, where the far-right *Front National* stands a significant chance of winning; and in Germany, where for the first time in the history of the Federal Republic, a far-right party is bound to enter the federal parliament. These movements and politicians have in common that they disparage globalization and reject the idea of an open society, which have been the hallmarks of Western political tradition at least since the end of the Cold War.

~..

*“Nowadays, few European politicians dare to openly run on a platform that embraces international trade, migration, international cooperation.”*

~..

Critical journalists have attributed these successes to all sorts of reasons, from the anger of the left-behind to ideologically filtered newsfeeds. Liberal, centrist media (or “mainstream media” as their opponents label them) do not lack in debate on how to explain this political trend, nor does it lack in appeals against racism, Islamophobia or any other perceived threat of their liberal worldview. I argue that what the liberal movement lacks is the positive case for the open society.

Nowadays, few European politicians dare to openly run on a platform that embraces international trade, migration, international cooperation (not just on security, but also in environmental and human rights issues). Even the left, who commendably holds up progressive views on human rights and anti-discrimination, is quick to heap blame on capitalism, international trade or any other conveniently capitalistic-looking scapegoat for all the perceived ills of our time.

The problem is that the left tends to only consider the working poor, by claiming that they are representative of the “99%”, including everyone who is not “filthy rich”. This view obviously loses sight of the middle class, all those  $\frac{3}{4}$  of the population that are not poor, according to a 2013 EU-wide survey. Much of the left’s argument for more redistributive social policy relies on a post-factual view on income inequality, usually revolving around the myth that income inequality was rapidly increasing because of greedy bankers and disappearing middle-class jobs. The true changes are due to increasing inter-household inequality from different marriage patterns (educated high-income men and women marrying among themselves as a result of more women working high-income full-time jobs) and to demography (an ageing population has more capital concentrated in the form of lifetime savings from old people). These changes call for answers beyond redistribution: for example, providing high-qualification jobs for the best educated generation of young people the world has ever seen.

A broader point about political parties can be made here: they

often represent political cleavages (or conflict lines, such as church vs. unions, rural vs. urban) that are outdated. As long as old parties, especially formerly popular centre-left and centre-right parties, represent milieus that have massively shrunk in number and relevance in the political debate— such as unionists, churchgoers, landowners— they will continue to fight an uphill battle against young upstart movements on the political fringes, because these movements make use of communication that is tailored to their respective audiences. And angering people by telling them how much these old elites have stacked the economic system against them, adhering to a so called “neoliberal” agenda, has proven to be an effective communication strategy.

Where are the defenders of economic liberalism, the cornerstone of liberal convictions? Where are the public intellectuals who, like Milton Friedman in his TV show “Free to choose”, unapologetically demonstrate to the public that private enterprise and capitalism are not necessary evils, but the only safeguard of political liberties? Prominent liberals of our day that have not succumbed to leftist or anti-capitalist populism include former Belgian prime minister Guy Verhofstadt in the European Parliament, French presidential candidate Emmanuel Macron (sometimes described as a sort-of progressive left, while rejecting left and right labels himself) and German liberal white knight Christian Lindner. Yet no one provides a broader, more basic justification of why we need economic liberalism to guarantee political freedom. This is where we need a liberal remake of the *Federalist Papers*: a series of essays that, by force of logic and conviction, make the case for an economically open and free society.

~..

*“The task of these essays would be to collect fundamental insights into the necessity of a capitalist society as a safeguard of political freedom.”*

~..

The task of these essays would be to collect fundamental insights into the necessity of a capitalist society as a safeguard of political freedom and the further benefits that could be enjoyed by the people in a society that allows the greatest possible freedom for people, capital, goods, services and ideas to move across borders and to reformulate these insights in a way that is fitting for our time.

***Long-forgotten arguments that need to be revived and re-injected into the political debate include:***

**1.** Only in a capitalist society can there be political opposition. Milton Friedman argued his case in “Capitalism and Freedom” by stating that no government can be effectively incentivized to finance subversive forces. Political ideas that go against

government doctrine can only exist if people can put their own money into politics. This argument is important against the loud criticism of money in politics, which is an especially contentious issue in the United States.

~..

*“ There is neither competition nor the possibility of disrupting and dethroning an economic behemoth if it is identical with the government. ”*

~..

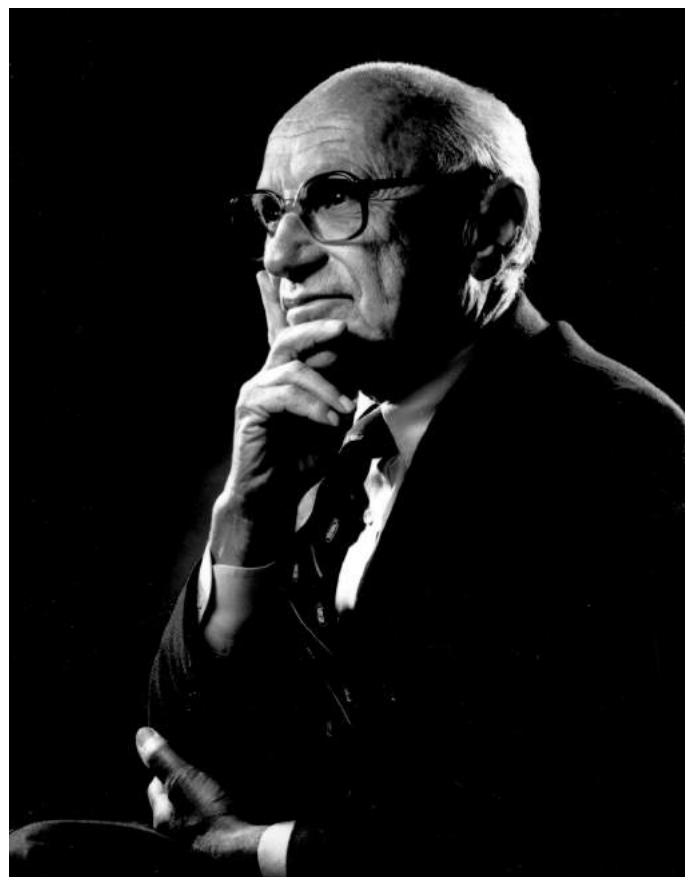
2. Only in a capitalist society people are free to choose non-materialistic endeavours. This surprising but brilliant insight was also popularized by Friedman in the aforementioned book. It follows the observation that the non-capitalist societies of his time like the Soviet Union or China were extremely materialistic: The purpose of its citizens was to fulfil production quotas; the purpose of education was to advance the national economy; jobs were allocated according to political and economic considerations. Only when personal economic freedom and property are held up high, citizens have the choice to reject materialistic endeavours and, for example, decide to become an author instead of a business consultant, choosing self-fulfilment over money.

3. Only in a capitalist society can government be kept in check from assuming ever more control in the lives of the governed, restricting their personal freedoms. This argument was most prominently defended by Friedrich August von Hayek in “The Road to Serfdom”, where he argues how the bureaucratic political decision process of the non-capitalistic countries was prone to grow ever bigger. There is neither competition nor the possibility of disrupting and dethroning an economic behemoth if it is identical with the government.

~..

*“ Anonymity will guarantee that the discussion stays clear of ad-hominem arguments and that the claims are evaluated on their own merits. ”*

~..



Milton Friedman

4. In an open and economically competitive society, competition will provide the most effective pressure towards an integrative, tolerant society and restrict undue discrimination. Milton Friedman argued during the time of the Civil Rights Movement in the US that any business that discriminates against black customers, employees etc. hurts itself more than those it is targeting. This is a versatile argument that can be levied against explicit and implicit racism and discrimination against many minorities and that has therefore lost nothing of its relevance today.

I argue that a series of anonymous essays such as the *Federalist Papers* is the most promising way of re-injecting liberal thought into the public debate, because each of these arguments can be made in a self-contained way and in an easily digestible length to accommodate the attention span of the modern reader. Anonymity will guarantee that the discussion stays clear of ad-hominem arguments and that the claims are evaluated on their own merits. This is especially necessary in this case, as the most outspoken defenders of capitalism are its winners; when it should be argued that a shift towards a more capitalistic society can benefit especially those who are currently kept in poverty, for example by the sclerotic labour markets which we observe in France. This necessitates the realisation that economic freedom and competition are not just under threat from leftist paternalists, but also from global investment firms and the ubiquitous internet monopolists.

Let this be a rallying cry for all those who look behind the clichés levied against the free and open world by populists on the left and the right. With more means of publishing than ever before, it is up to every freedom loving citizen to defend the society they want to live in. ■

# Thus spoke... the Terminator

## On artificial intelligence and morality

By Mahi ElAttar

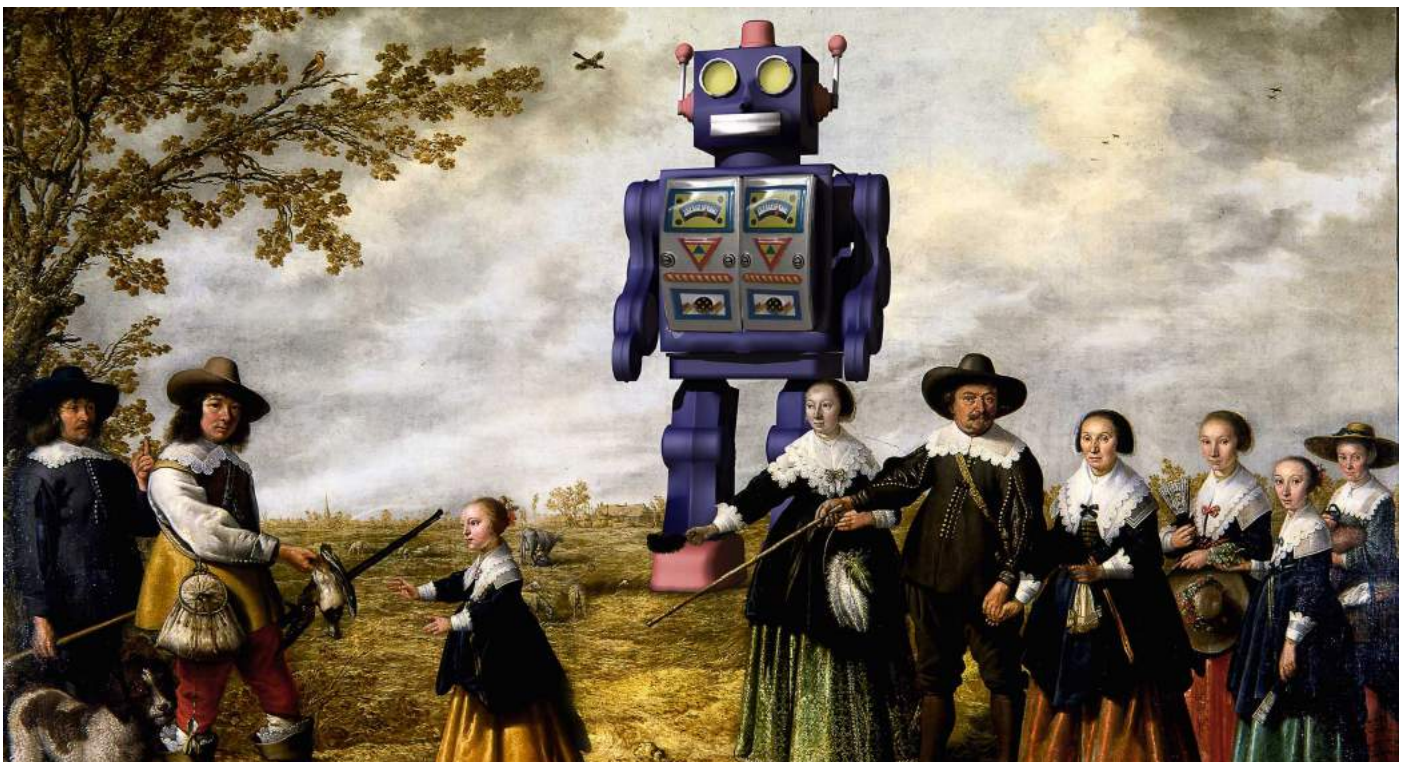
In the not too distant future, self-driving cars can become an affordable reality. You could be, one day, the proud owner of an automobile with a highly intelligent autopilot that will allow you to catch up on the news while commuting to work, without jeopardising road safety. But think about this: would you rather buy a self-driving car that will always save as many lives as possible; or one that will always save its passengers? If, in order to save you, the autopilot decides to crash into a school bus instead of hitting a motorcycle, just because the bus is more likely to withstand the crash with minimal casualties, would you deem this decision wrong? Who should be responsible for the eventual casualties, the autopilot or the programmers of the car?

### *The era of smart machines*

These questions are related to the emerging field of “machine ethics”, which is concerned with creating Artificial Intelligence (AI) that would follow a certain moral code, in order to protect mankind from self-destruction. In the scientific world,

pioneering scientific minds like Stephen Hawking and Elon Musk want to reduce the risk of human extinction by the hands of the man-made machines, by stressing the importance of controlling these intelligent robots, especially if they can match or even surpass human capabilities. They agree that we live in what some call the Fourth Industrial Revolution, where technology is no longer used to replace our muscles, but our brains. This is definitely considered as progress, but it does not come without risk.

In his 1965 paper, Gordon Moore, the co-founder of the firm Intel, noted that computers are becoming smaller and faster at an exponential rate, a statement that is now known as Moore’s Law. This law still holds nowadays: technology is improving exponentially, and soon enough scientists will be able to create a system that is so smart, that it can improve itself. The question is: what if we can’t control this system, or prevent it from turning against humans? This control problem of such a machine should be addressed, and hopefully before the rise of this system, so that society is prepared for this new technology.



~  
“ *An action is considered as moral only when it is undertaken out of respect of the moral law, which means that it is not justified by other motivations such as desire or need.* ”  
~

### **The problem of machine ethics**

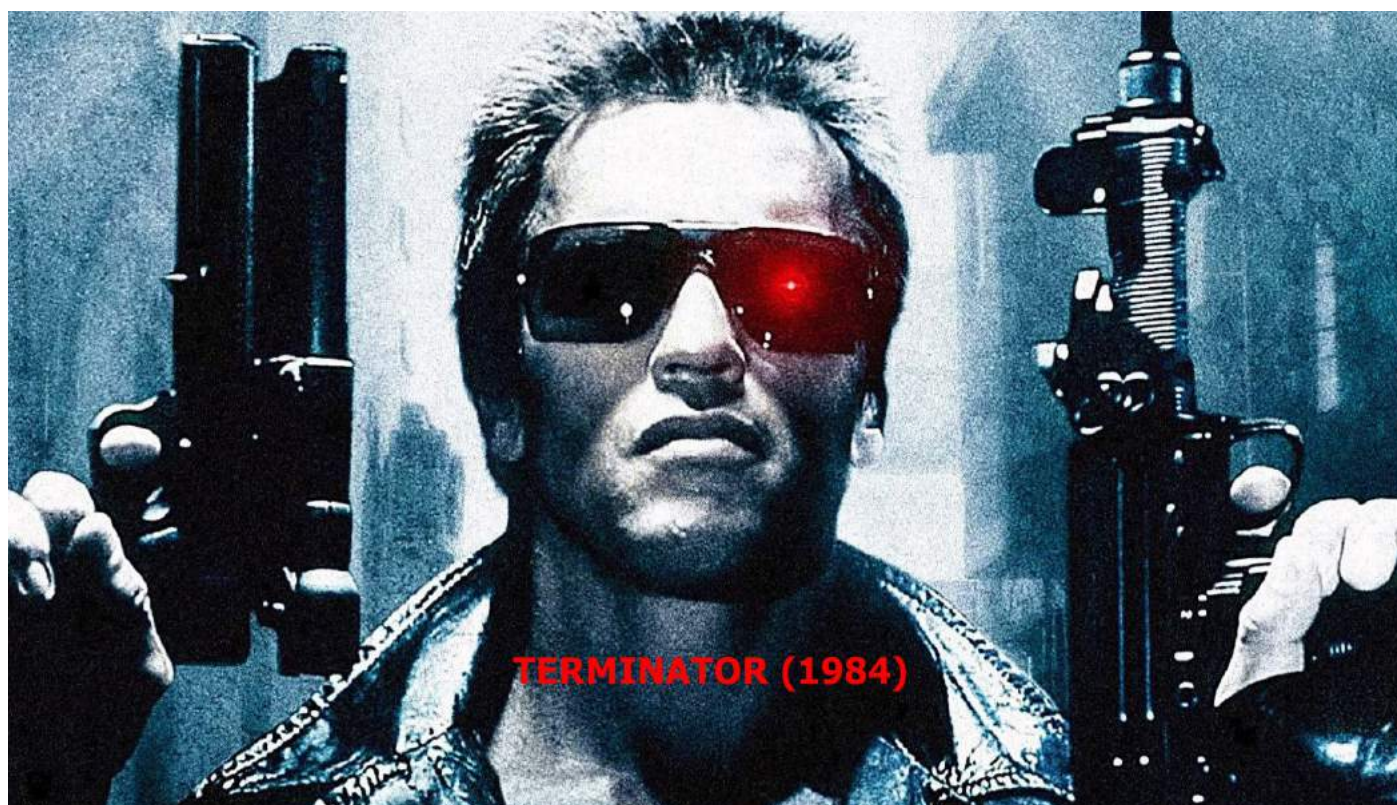
In order to discuss machine ethics, we first need to consider the *philosophy* of ethics. How do you define morality anyway? What kind of moral code would we want to program into the AI systems?

For ages, moral philosophers have tried to solve the deep-seated problem, which is to find a solid foundation for our moral beliefs that goes beyond religion and cultural traditions. One of the most convincing answers can be found in the complicated but influential work of the German philosopher, Immanuel Kant. In his book *Groundwork of the Metaphysics of Morals* (1785), he introduces the concept of categorical imperatives, where morality comes from reason. An action is considered as moral only when it is undertaken out of respect of the moral law, which means that it is not justified by other motivations such as desire or need. In order to solve the fundamental problem and find this pure moral motivation, Kant argued that this moral law should come from a general

formula, a maxim, which should be universal. This maxim is the well known idea that individuals should act in the way that they wish everyone would adopt, and wish to see these actions become a universal law. For example, if one person kills another, then he accepts the idea that murder is moral and that everyone could also kill anyone. However, this will ultimately lead to an unsafe society where even this individual will not be safe. Therefore he should conclude that murder is an immoral act.

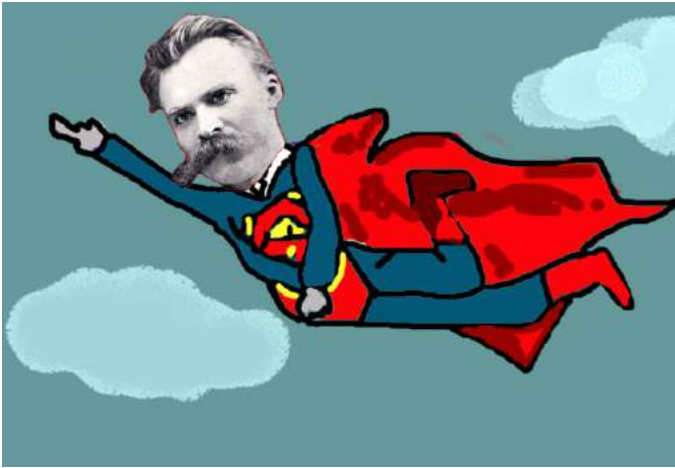
Applying this logic to AI, if we consider that morality comes from reason, then it is possible to create a highly intelligent system that would be moral, regardless of who created it. By definition, AI is logical and reasonable, which should also make it ethical. But the question remains: should AI be able to take moral decisions on its own, or should this moral law be programmed into its code a priori?

It would seem that society in general would feel safer if they know that AI has a built-in moral code where a certain action is allowed only if the answer to the algorithm is “yes”, which makes all actions of the intelligent system predictable. However, some moral dilemmas do not have a straightforward answer, and even humans would not know how to behave in certain situations where there is no correct decision. It would therefore seem that a mix between machine learning of ethics and a pre-set moral code would create that ethical AI. A robot can therefore follow explicit rules, such as Asimov’s Three Laws of Robotics that have moved from science fiction to actual coding, but would also learn from its own experiences. Having learning machines would also help to avoid system bugs, where the AI would not be able to make a decision if it was beyond its coding. These bugs could be very dangerous if the AI is involved in life-or-death decision-making, such as in the fields of medicine or defence.



**TERMINATOR (1984)**





### Science fiction or reality?

But you might be thinking that this is the product of cynical science fiction; that no machine can ever be equal or even “better” than a human being, or at least not in the near future. However, the nightmares of science fiction authors may be gaining on us fast. While the term Artificial Intelligence was first used in 1956, the evolution of such technology has been growing exponentially. And nearly 40 years later, in 1997, the computer IBM Deep-Blue won against the Chess World Champion. Another computer, IBM Watson, won against the world champions of the game Jeopardy! in 2011. The nature of this game has nothing to do with chess, since it involves understanding language and answering real questions about different fields. This means that the technology of AI has reached a point where the system is able to think better than a human...

~..

*“ What if a drone is faced with the choice of either reaching its target or saving a soldier? ”*

~..

Moreover, that ethical problem will especially be important for robots involved in health care services, self-driving vehicles and military drones: what if a patient refuses to take his/her medicine? What if a drone is faced with the choice of either reaching its target or saving a soldier? These questions need to be considered in order to avoid the ethical problems that might arise from using AI in different fields.

This justified concern has also moved to academia, with the creation of the Centre for the Study of Existential Risks (CSER) in 2012, a research centre at Cambridge University. It was created as a joint initiative between a philosopher (Huw Price), a scientist (astrophysicist Martin Rees), and a software entrepreneur and programmer (Jaan Tallin). This multidisciplinary research centre aims to study and limit the possible risks that humanity might face, and that could threaten its very own existence, including the development of AI. The researchers there address in all seriousness the possible scenario of the

emergence of a threat à la Terminator that could harm humans. Reality is finally catching up with science fiction.

### Reaching the final stage of evolution?

Another possible use of AI would be mixing biology with robotics. Soon, robots could be inserted into the human body in order to surpass their biological limits. Humans could live longer, heal faster, have improved eyesight and strength, and many other possibilities that are now taken seriously. Many think that this is a continuation of biological evolution as theorized by Darwin: mankind will continue to evolve and improve its condition using the tools it can create.

But it is important to know how will legislation treat these “cyborgs” if some of their actions were seen as being morally wrong? How would they be punished? These types of questions need to be addressed as soon as possible, in order to minimize the risks that might arise from AI.

In *Thus Spoke Zarathustra* (1883), the influential yet misinterpreted German philosopher, Friedrich Nietzsche, explains what it will be like for a person to overcome the limits of the human condition in order to become what he calls the *Übermensch*, the Beyond-Man. For him, this should be the goal of humanity: becoming an *Übermensch* is to overcome oneself, to be completely free, obeying only the laws one gives to himself, beyond social pressure, religion, and morality.

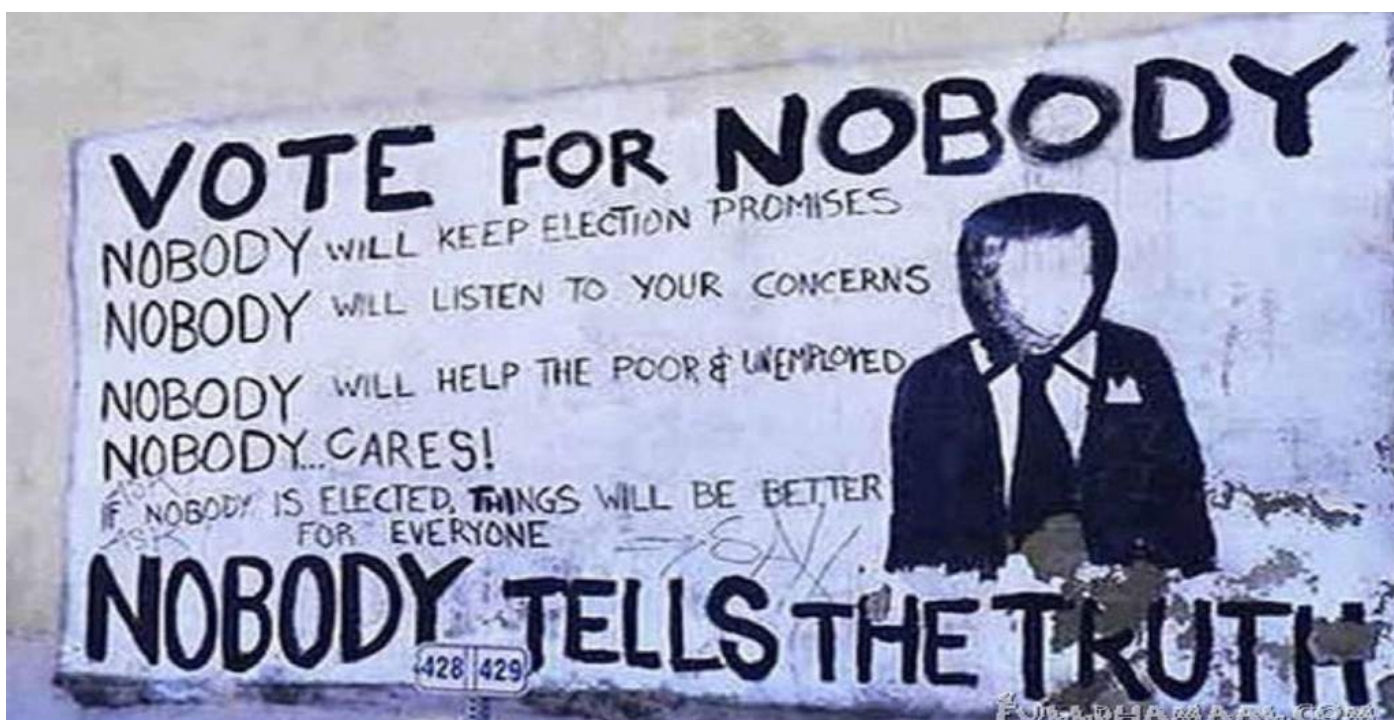
It’s safe to say that Nietzsche’s philosophy is fairly complicated and could seem as highly unrealistic. But what if the Beyond-Man was... no man at all? What if we are now at the dawn of witnessing the realization of Zarathustra’s prophecies, with the emergence of AI? What if overcoming mankind was to become a highly intelligent machine? ■



*Wanderer over the Sea of Fog, Caspar David Friedrich, 1818*

# Les primaires, ou le mirage démocratique

par Arthur Dinhof



Le 22 janvier, au soir du premier tour de la primaire de la Belle Alliance Populaire, le Président de la Haute Autorité des Primaires citoyennes, Thomas Clay, déclarait : « La primaire est entrée dans les mœurs des français et constitue un acquis démocratique. » Développées dans de nombreux pays européens, les primaires ouvertes permettent aux citoyens, sans conditions d'appartenance, de désigner leurs leaders politiques.

Cependant ces primaires restent l'apanage des partis dominants, les seuls capables de mettre en place une logistique aussi lourde. Dès lors, en tant que citoyen, il convient de s'interroger sur ces primaires qui structurent la vie politique française. Constituent-elles réellement « un acquis démocratique » ? Ou n'est-ce qu'une illusion ?

## Les primaires sont le fruit de plusieurs évolutions politiques de fond

La configuration politique actuelle oblige les différents partis politiques à s'unir autour d'un leader commun, désigné par les citoyens. En effet, avec la montée du Front National, ce sont trois blocs équivalents, pesant chacun entre 20 % et 30 % de l'électorat, qui s'affrontent. Sous cette conjoncture, la division au premier tour conduit à une défaite assurée. Les partis doivent donc faire preuve d'unité afin d'assurer leur présence au second tour.

S'ajoute à cette configuration un affaiblissement des partis politiques. Selon l'Institut Montaigne et le Centre de recherches politiques de Sciences Po (CEVIPOF), seulement 12 % des citoyens font confiance aux partis politiques. Cette défiance peut s'expliquer par les nombreuses irrégularités enregistrées

dans les votes internes de ces mêmes partis. De plus, la base militante de ces partis, jugée trop éloignée des citoyens, s'est appauvrie. Face à cette défiance, les partis ont perdu leur principale prérogative : la désignation de leur candidat aux élections présidentielles. Pour Rémi Lefebvre, professeur de sciences politiques à l'université de Lille 2, organiser des primaires représente un « aveu d'impuissance, voire une stratégie de survie » pour les partis politiques.

### L'émergence d'une démocratie d'opinion et d'une personnalisation tous azimuts

Par nécessité pour les partis, la démocratie participative s'est imposée. Cette volonté de faire émerger un leader par des primaires ouvertes mène les partis à se placer dans une logique d'opinion, avec les risques que cela comporte. Pour Anne Muxel, directrice de recherche au CEVIPOF, « l'électeur d'aujourd'hui est à la fois plus réflexif et plus imprévisible, au nom de sa volonté croissante de peser sur l'élection ». Le principal risque est donc la versatilité de l'opinion qui entraîne, dans des laps de temps très court, des retournements saisissants.

~..

*“ Cette volonté de faire émerger un leader par des primaires ouvertes mène les partis à se placer dans une logique d'opinion. ”*

~..

Pour convaincre ce nouvel électorat, les candidats tentent de se distinguer par des contributions personnelles versées au débat d'idées, au risque de tomber dans le populisme et au prix d'une concurrence acharnée. Dès lors, ces primaires personnalisent les campagnes des candidats tandis que la dimension collective et partisane du projet politique est mise de côté.

### Des électeurs sociologiquement typés

Pour ses partisans, les primaires ont principalement pour but de réconcilier les citoyens avec les partis. Or, force est



de constater que cet exercice ne permet pas de reconnecter les catégories populaires et la jeunesse avec la politique. Les électeurs qui se déplacent ont un intérêt marqué pour la politique, leur permettant de se forger une opinion entre des candidats d'une même famille politique. Il s'agit donc de certaines catégories de la population : urbaine, intégrée, aisée et informée. Pour le Think Tank Terra Nova, qui a étudié le taux de couverture en bureaux de vote par habitants, « la primaire de la droite et du centre a enfermé l'élection dans un "bocal sociologique" en sélectionnant les publics susceptibles d'y participer ». Déjà, lors de la primaire de la gauche de 2011, alors qu'il y avait en moyenne 512 votants par bureau de vote, la Seine-Saint-Denis (département le plus pauvre de France) n'en comptait que 270.

Selon Rémi Lefebvre, les primaires permettent donc aux partis de « justifier l'incapacité à élargir la base ou l'abandon de la vocation à défendre les catégories populaires devenues politiquement minoritaires et donc négligeables bien qu'elles soient socialement majoritaires ».

### Vers une lassitude politique des Français ?

Enfin, avec la primaire, l'élection présidentielle dure un an. La primaire de la droite a commencé en juin 2016 et les élections législatives se termineront en 2017. Une année de surmédiatisation et de déluge rhétorique permettra-t-elle de reconnecter réellement les français avec la politique ? ■

Join our ranks and help us prepare the next issue!

Come to one of our weekly meetings or write to us to [the.tseconomist@gmail.com](mailto:the.tseconomist@gmail.com)

# Interview with the

# Governor de la Banque de France

by Dominykas Šliažko and Nhu Nguyen

In October 2016, François Villeroy de Galhau, Governor of the Banque de France, visited Toulouse for a talk at the BdF's local headquarters. *The TSEconomist* met up with Mr Villeroy to ask him some questions on the state of Europe after the Brexit vote.

**1. Brexit has been a central topic for the past months. How do you expect Brexit to impact financially and economically the EU countries?**

Brexit is bad news, first and foremost for the UK and its economy, and to a lesser extent for Europe. Obviously we have to respect it as well as the choices of the British government in the negotiations to come. A key question is what solution the UK will choose regarding its single market access. Will it want full access or will it favour a third-country type of agreement? Even though we cannot make any assumptions at this stage as to the outcome of the negotiations, we can still state clear principles and stick to them: if the UK wants to keep full access to the European single market, it will have to apply all its rules, including the free movement of persons and workers. And there can be no free riding, and no cherry picking.

**2. Do you have any specific fears for the French-British trade relations?**

Trade policies are not a domestic responsibility in the EU, and that is a very good thing. I have no concerns about British-French trade relations specifically.



**3. After Brexit, London may no longer act as the financial centre of Europe. Many argue that Frankfurt, Amsterdam, or Paris might be the main beneficiaries of this shift. However, for the French capital, experts name taxation and less flexible labour laws as the main obstacles for Paris to possibly succeed London. How do you rate the potential for success of the French financial capital and what should be done to allow Paris to prosper in the future?**

The answer to this question will greatly depend on the kind of financial agreement we reach with the UK. If the UK were to choose a "hard Brexit", this would in particular mean the end of the European passport for the City of London. Again, for the UK to maintain access to the single financial market, all the usual EU rules must be strictly respected. Without this, some financial institutions based in the UK would have to adjust their legal and operational frameworks in order to continue to operate in Europe, including relocating to the continent - be



Representatives from the Banque de France with professors at TSE

it in Paris, Frankfurt, or elsewhere. That is the rule of the game. If this is the case, there will be probably friendly competition between the various places mentioned. Paris has a number of advantages: its size as a large international city, the most robust banking system in the euro area, major players in the insurance sector, financial know-how and a highly-skilled workforce, as well as new initiatives to enhance attractiveness with notably tax measures. And the French authorities, including the Banque de France, attach importance to ensuring that Paris is one of Europe's strongest and most attractive financial centres, and even more so after Brexit.

**4. It is no secret that current monetary and economic union cannot function without institutional and fiscal convergence. Having an EU finance minister is one of the ways to approach this dichotomy and reach some coordination. In the long run, do you see the EU reforming itself within the framework of existing treaties? If not, what has to be changed?**

Our monetary union is a success: we built a solid and internationally-recognised currency, the euro, which is one of the very strong assets of the Europeans together with the single market. But we have failed to follow it up sufficiently with other economic policies. Indeed much remains to be done for economic union.

I suggest three steps to achieve this. The first can be done quickly as it does not require any treaty change. Europe needs to build what I call a Financing and Investment Union to steer its abundant savings – a 350 billion surplus each year – into productive investment. There are two objectives: increasing the diversification of firms' financing – with more equity financing, and enhancing the resilience of the euro area thanks to private risk-sharing across domestic borders.

The second step for the euro area is a collective economic strategy, combining more structural reforms where they are needed, such as in France, and more fiscal support in those

countries with room for manoeuvre, such as Germany. In practice, for this level of coordination to exist, the euro area would need an institution that fosters confidence, which could consist of a "Finance Minister". In terms of timing, this second step can only reasonably come after the elections scheduled for next year in some euro area countries, as it requires changing the European Treaties.

In the longer run, the third and final step would be to complete the Economic and Monetary Union with a European fiscal capacity. This would first require greater convergence and deepening the sense of trust between Member States. ■



# Business talks

## Electricity and climate change: troubles are coming

by Vincent Lim

In January, TSE received Nicolas Couderc, executive vice-president at EDF Energies Nouvelles for a business talk. He took this opportunity to share with us his concerns about the future of the electricity sector.

Once upon a time, there was a world in which energy seemed to be limitless, a world in which the crude oil was around one dollar the barrel (around \$15 in today's value). However, today people are –slowly– waking up from this dream, and we are –very slowly– starting to understand that we should diminish our consumption of fossil fuels. This will decrease the rate at which CO2 and NOx are increasing in the atmosphere, slowing down global warming.

### Unlimited energy?

Resources on our planet are limited. However, year after year, the exploitable fossil resources increase. This is mostly due to innovation: today we can dig deeper, extract oil from a larger area around the initial hole, and progress in the chemical industry allows companies to reopen platforms in places they thought depleted in the past. Unconventional oil and gas exploitation will soon allow the United States to achieve energy independence from Saudi Arabia. Global warming will also allow us to dig closer to the poles, as they will become warmer.

This increase of the energy reserve is more than welcome. Since the 19th century, the number of people having access to electricity has been multiplied by four; during the same period, the consumption per capita has been multiplied by the same number. At the same time, world population has been

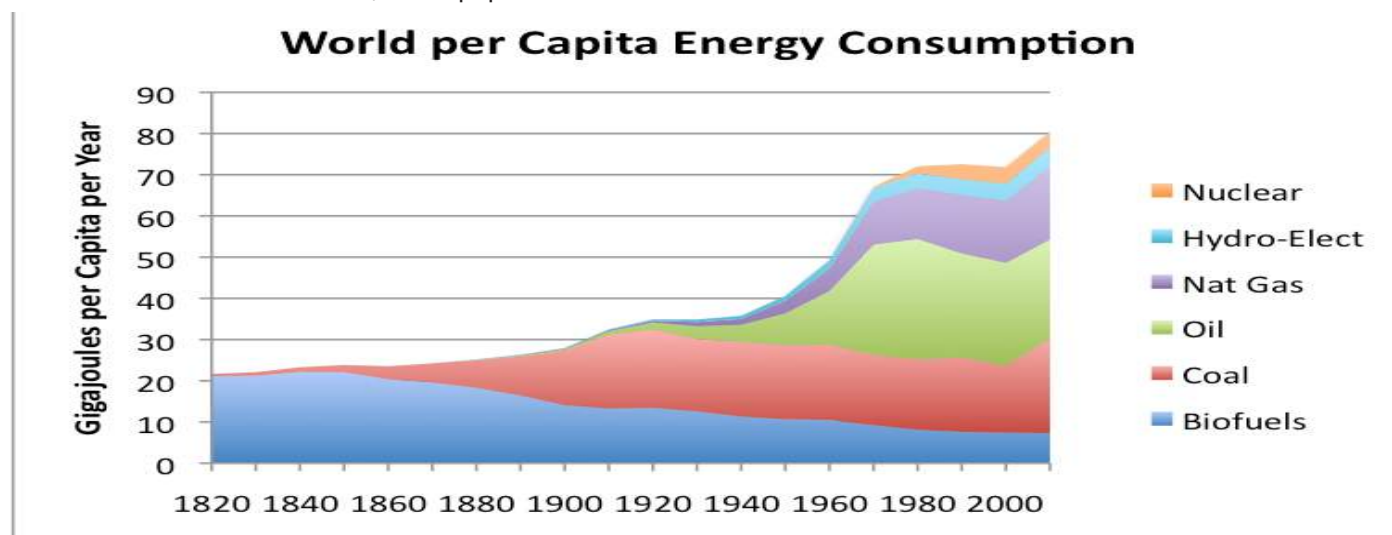
increasing at a fast rate. It is estimated that in 40 years people without access to electricity in Africa will be more than those with.

In fact three contradictory issues are opposing today: energy equity, energy sustainability and energy security. Giving access to electricity to the greatest number of people possible will inevitably affect energy sustainability. By seeking energy independence, countries tend to use more and gas and oil extracted from fracking and coal, thereby sacrificing sustainability.

### Technology and competitiveness

The main challenge today is to find solutions to make renewable energies competitive. Today it is often cheaper to pollute than not, and it is even worse when most of the countries of the world are still developing. EDF Energies Nouvelles is trying to develop solar energy all over the world, but with a focus on Southeast Asia where inside an area including 1/14th of the world (with China and India inside it), there is more than half of the world population. For Mr Couderc, there are far too many projects aiming to increase energy sustainability that do not take this part of the world into account.

A perfect world would be a world where technology would allow clean energy to be cheaper than the others. We can't wait for people to become aware of the issues linked to global warming and restrain themselves. In Mr Couderc's own words: "Do not bet on human kindness." ■



# Sectoral risk analysis in a bank

by Jose Alfonso Muñoz



As the second semester of this academic year is starting, it is time for most of the students from TSE to start looking for internships or jobs, to start the professional life at the beginning of April. For this, the School has prepared a series of Business Talks where alumni from the University comes and explain their different experiences as professionals. Inaugurating this new term, the School received Clementine Galles from Société Générale, one of France and Europe biggest bank.

Ms. Galles works as Head of the MacroSectoral and Microfinancial Analysis. She briefly spoke about the different branches in the risk department of Société Générale and the joint work her department do with other departments, including interaction with non-economists and experts in different sectors to be able to analyse the different risks and financial vulnerability in each market. Her presentation was divided in two parts. The first part consists on explaining how to follow all the sectors. Some of the most important sectors they follow are oil and gas markets, electrical, housing, telecom, and pharmaceutical sectors. All the sectors are divided and rated geographically, for example oil in a global way, telecoms in a European and America way, and real estate in a national one. The sectors are studied in a way to understand the risks present in each one of them, that could harm the vulnerability of the bank and its clients. Société Générale has developed a operating model, using engineers and expert's opinions, from other departments of the bank, obtained through a questionnaire about their work on each sector. As an example, they asked about regulation in a sector and its impact on the market.

During the second part, she mentioned the hot topics in a macroeconomic level. The first one was global trade. She

explained, how before the global crisis, there was a long period of important level of exports, more important than GDP, also because of the commercial integration in Europe, horizontal integration too, and China joining the World Trade Organization. After the crisis, the exportation rate growth has decreased, mainly due to re-onshoring of the value chain, vertical integration, protectionism, and services, therefore leading to less global trade. Complementing this regulation has been increasing on the borders, is expected that the effect of Brexit and president Trump election to increase this tendency in global trade. The question now is which sectors would be firstly affected from this?

Then Ms. Galles talked about interest rates, where the global macro picture of debt since it's being increase for the companies, because of the low interest rates. Before the crisis, there was a huge increase in the level of debt firm in the private sector. For the public sector, the dynamic is the reverse, the debt increased after the crisis. Due to the fact that low interest rates, slow growth mergers and acquisitions are financed by debt.

At the end, Ms. Galles presented a couple of real cases currently analyzed, where the main question was: *What are the implications of the European energetic transition?* She explained how, due to the new trend of renewable energy, the financial ratios in Europe are deteriorating, since the price of electricity is dropping. This can have an important incidence on the vulnerability of clients and the bank. At the end, there was a short session of questions from the audience, mainly concerned from the effect of America's president Trump's forecoming politics and how to apply for an internship in Société Générale. ■

# Internship reports

## Andrés Villareal, INRA



Andrés Villareal

### What was your role during the internship?

The French National Institute for Agricultural Research (INRA) is the leading such institution in Europe, and the second worldwide. INRA focuses on a broad range of subjects that are often beyond traditional research issues in the field of agriculture. At INRA, I worked with a team of researchers on the implicit and explicit weight discrimination in the European labour market. My main tasks included collecting data on the

European labour market. Moreover, I analysed information gathered from different experiments and surveys from Spain, France, Italy and Germany. I also developed an empirical model tackling the research issue, which allowed me to use my knowledge of econometrics. I had the pleasure to work with a great team of researchers: Francis Lagos and Juan Locomba from the University of Granada in Spain, and Catarina Goulao from Portugal (also a TSE student), who generously shared their experience with me.

### How did your experience at TSE help you on the job?

Research skills such as how to properly write an academic document and handling vast databases, acquired from different projects in Applied Econometrics and Databases courses, were definitively a plus. My experience at TSE allowed me to be productive very quickly, even though I arrived at INRA in the middle of the project. Statistical and econometric tools, both on IT and in theory, were key elements to achieve

a good performance. Furthermore, various elements I could learn during my experience at the INRA were very good supplements to the skills I acquired at TSE, especially in R programming, empirical industrial organization and econometrics.

### How did you get the internship?

I found the internship through the TSE Alumni website, which I highly recommend to the students. It is really useful to find interesting job and internship offers in France and worldwide, thanks to the vast TSE Alumni Network. After sending my resume and my covering letter, I had an interview. We talked about my skills and my coursework at TSE. I had a positive answer fairly fast. I know that several former INRA interns come from TSE.

My first advice would be to apply to internships that best fit your interests. Also, do not be afraid of the duties - you are hired as an intern to put into practice what you have been taught at school. So, always be full of good energy and willingness to learn! ■

## Greg Beaumont, UNDP Regional Service Centre for Africa

### 1. What was your role during your internship?

The United Nations Development Programme (UNDP) Regional Service Centre for Africa is based in Addis Ababa, Ethiopia. It services 45 Sub-Saharan African UNDP Country Offices, drafts high level policy and knowledge products, and acts as the institutions focal point of interaction with continental and regional bodies including the Regional Economic Communities and African Union. It is also in charge of the UNDP's Regional Program for Africa's implementation.

My responsibilities as an economist within the Private Sector Unit, which was part of the Inclusive Growth and Sustainable Development Cluster, largely focused on supporting the publication of knowledge products in eight key areas (such as impact investing, the informal economy, private sector development, business innovation, and value and supply chain bottleneck identification to name only a few) to accelerate the diffusion of information, as well as engaging in senior level policy dialogue to work with governments. In addition, the role included helping to facilitate

the development of private sector partnerships with institutions such as the African Development Bank, European Union and Massachusetts Institute of Technology.

Due to the lack of data, which in many cases ruled out the use econometric techniques, I learnt the importance to be flexible and to quickly adapt to new challenges by drawing on a wider range of skills and techniques, but also to research and find new ones to meet the task in hand. Moreover, working within an interdisciplinary environment I also learnt the importance of being able to



undertake and read technical reports and then being able to explain them to colleagues in a straight-forward manner.

However, the most fundamental lesson I learnt was one of cultural sensitivity. Working with individuals from all over the world, it was important to understand how different cultures influence their behaviours. This regularly meant being patient when meetings got delayed due to individuals being late, and being able to continue working on other daily tasks whilst waiting, as not to lose time. The inability to do so could tarnish relationships, and make our ultimate goal of fighting poverty harder to reach. By understanding our personal differences, it allowed us to work together to effectively meet common goals.

The role also included engaging with a wide range of stakeholders from the African Development Bank, to the World Bank and European Union to partner on projects but also to participate in workshops. I would regularly review reports and best practice guides produced by my team, as well as undertake analysis to formulate new strategies. These would include undertaking stakeholder mappings to survey what has already been done, and where we can add value and overcome current constraints hindering development.

### 2. How did your experience at TSE help you on your job?

Being, living, and working in an international community was extremely helpful, as the United Nations is a very diverse and multicultural organization, and moving to a new country can sometimes be a shock. Having experience in this type of environment and of adapting to different cultures definitely helps.

Academically, the M1 in economics gave me a wealth of tools, credibility and the confidence to be able to start working and to add value from day one, as well as to think analytically and explain my viewpoint with a strong economic rationale. More specifically, however, and with regards to working in the field of policy, I would have to credit both of Jean-Paul Azam's courses for providing an invaluable insight into development. These courses taught me to understand theories and to be able to apply them to real life cases, as well as to be able to explain complex economic concepts in language accessible to those without any training in economics.

Furthermore, here I was able to gain access to his condensed wealth of experience in two short courses, which allowed me to have the knowledge and skills of someone more experienced in the field of development than myself. This helped me to stand out in conferences and meetings, but also to show a rich and intricate knowledge of development issues and case studies when networking. His teaching style also forced me to comprehensively understand the technical economic models and the intuition behind them, instead of just reciting mathematical proofs. Whilst knowing the proof is always essential, this ability to be able to explain complicated ideas in simple terms was essential when consulting with high level policy officials and diplomats, and especially key to working in a multi-disciplinary environment.

### 3. How did you get the internship? Do you have any advice for students looking for a job in a similar field?

It sounds very cliché, however, the key to getting an internship is to find something that you are passionate and feel strongly about, and then to not give up until you achieve your dream job. Whether your passion is matrix algebra or being in the field in a developing country, it is instantly noticeable to interviewers. Furthermore, two to six months is a long time, so make sure you put some extra effort in to find something you really enjoy, as life is too short to waste time doing something you do not feel passionate about! To this end, they say, when you want something as much as you want to breathe, you will probably get it.

In regards to the process itself, you will need to go on the UN, or the UNDP careers website. Then, find an internship, a consultancy position, or a UN Volunteer role that you are extremely interested in and that suit your skill set. Then apply, apply, apply! Personally, I submitted applications for numerous positions, and only received offers for roles where my skills, experience and interests were a good fit, such as in finance and private sector development. Some jobs can be posted online for only two weeks, so it pays to keep looking. It is also never too late to apply, as sometimes they want people to start right away, and other times for the next year.

Lastly, a lesson which is as important in internship searching as it is in life in general is to believe in yourself, and find others who also believe in you. My parents, friends, and loving partner questioned my decision to go to Ethiopia at first, but they knew it was what I had set my mind on, what was important to me, and what I wanted to achieve. After they had recovered from the initial shock of me telling them about my planned adventure, they lovingly supported me. Following my arrival in Ethiopia, I then found it to be far safer and friendlier than any city, or country, I have previously lived in! From walking around Addis Ababa (the capital) at night, to visiting the amazing (and cheap!) restaurants and nightlife with fellow expats, to traveling every weekend around Africa, I hope I proved to my friends and family how misleading stereotypes can be!

**Students who are interested can contact Greg Beaumont for a sample cover letter. ■**



Greg Beaumont

## Amelie Abadie, Thailand Development Research Institute, Bangkok

### 1. What was your role during your internship?

The Thailand Development Research Institute (TDRI) is the oldest think tank of Thailand. Researchers at the TDRI deal with a broad range of social issues, such as Sectoral Economics, International Relations, Macroeconomics, Resource and Environmental Economics. I worked as a research assistant in the Industrial and Rural Economics department, as well as in the International Organization of Migration. In particular, I studied a program aiming to upskill migrant workers from neighbour countries. I also contributed to two publication projects. The first one was about studying the impact of macroeconomic characteristics on migrant labour market in Thailand. The second project was about characterizing the influence of seasonal agriculture on occupational choices.

### 2. How did your experience at TSE help you on the job?

First, I was happily surprised to discover how useful economic modelling and econometrics are on a daily basis. For example, we often had to develop econometric strategies such as finding the best instrumental variable or choosing between logit or probit models. Also, theoretical courses in game theory or competition helped me model interactions, and formulate relevant hypothesis. I learnt a lot during the internship. For instance, I improved my communication skills by adapting my writings to the audience: NGOs may rather read action-based works than academic papers, in which great emphasis is placed on methodology description. Most of all, I learnt that no matter how strong the theory is, economics are based on field experience and subtle observations.

### 3. How did you get the internship? Do you have any advice for students looking for a job in a similar field?

I found out about the TDRI on the internet. I directly contacted some of the researchers who work for the think tank. In my opinion, finding internships or jobs is easier through direct contacts with the recruiters. Looking for email addresses and trying to communicate with the key people (RH or the manager of the department you are interested in), in addition to applying online, is always profitable. I found that the TSE BND and the TSE Alumni website are great tools to get contact information.

While I encountered some problems to get official papers to live in Thailand, the TSE Careers Office, other TSE pupils and teachers truly helped me. So, do not hesitate to ask for help! ■

## Memoire report

### Hung-Thuy Nguyen

#### 1. How would you describe your experience writing your memoir?

At TSE, a M1 thesis can take various forms, from an empirical project to a very theoretical one. Mine can be seen as a literature review on the topic of discount rate in environmental projects. The main difference between environmental projects and regular projects is the fact that the former involves in general a lot more uncertainties and an extremely long time horizon. Some can extend to several hundred years and as a result, there exists no markets from which we can take the return for use as discount rate in evaluating those environmental projects. Instead, researchers have to come up with theoretical models to solve this question. Two prolific authors on this

topic are Martin Weitzman from Harvard University and Christian Gollier, who is a professor at TSE. Both advocate the use of a decreasing discount rate even though they offer different benchmark values for various policy maturities.

Given my lack of background in math and economics, the topic was challenging but at the same time, an exciting learning experience. It helped intensify my existing interest in environmental economics.

#### 2. Why did you choose to do a research memoir?

I came to TSE with the objective of do a PhD in economics afterwards in mind and hence, doing a thesis for M1 was a

natural option for me. It was an opportunity to gain first experience in academic research. To be honest, it was not yet an actual research project but it was totally different from what I did for my bachelor's thesis and it was fun. In addition, I intended to use the thesis as a writing sample in case I have to apply for a PhD at other schools. It could add to the application package.

#### 3. How did you find your supervisor? Do you have any advice for students interested in doing a memoir?

My supervisor was Professor Takuro Yamashita, my professor in microeconomics during the second semester. Right after I found the topic to work on, I

came to talk to him after the lecture and he was willing to be my supervisor even though it was not really his specialization. He was very supportive, and provided all technical support I needed to understand and prove the results in the papers that I had chosen to cover.

My advice for those who want to do a

thesis is that even though you do not have a detailed topic in mind yet, you can still go talk to professor(s) to discuss the general theme or field you want to work on. Of course, if you already have research experience and you have come up with a specific research question that would be perfect. In all cases, their

advice and guidance from the beginning would save you a lot of time and effort. Furthermore, choose a professor who is available and is willing to spend some time, maybe 30 minutes per week for your questions. For this, I think you can consult people who did the M1 thesis in the past. ■

## Alumni testimony

### Agne Pupienyte, PPD

#### 1. What is your position today?

I am a research associate at Innovations for Poverty Action (IPA) Uganda.

#### 2. What was your path from your Master's graduation to this current post, and what are the key elements, which helped making your choice?

Almost immediately after my final PPD exams I left for my internship at IPA. Upon finishing my contract there, I hunted for new project openings across the entire IPA network. Then I drafted an application, which caught the eye of the research staff at the Kampala office, and thus, combined with good timing, I got my current position.

The thing that largely helped to me get my post was that I applied knowing

exactly what I was signing for. The internship was the key to understand the realms and challenges of being a research assistant at IPA, and allowed me to strongly defend my case during the interviews. Besides a STATA test, one goes through two rounds of interview: first is usually with the Research Manager, and the second with the principle investigator of the study (usually professors or researchers). This, in most cases, even applies for the internal hiring process (when transferring offices or projects).

#### 3. According to your professional experience, what are the most useful skills you obtained during your degree?

I can't stress enough how useful technical knowledge of RCTs has been to my

work. In fact, econometrics, data analysis, and statistics are too. All courses I have taken on these subjects at TSE have been at the core of my work.

#### 4. What advice would you like to give to the TSE students, or to the school?

Many apply for jobs and internships at IPA, but so many of them do not have the technical skills for it. I think TSE stands out as an institution with a high level of technical training and a very research-oriented teaching approach. My advice would be not to try to get away without exposing yourselves to those tougher courses. In the long run, this knowledge will make you stand out from the crowd and leave a good impression. They will also help you to have a nice recommendation letter for future jobs or a PhD. ■



ipa  
INNOVATIONS FOR  
POVERTY ACTION

# Alternance report

## Jeff Binivigat, Airbus

### 1. What is an alternance and how does it work?

Alternance is a program in which students spend around half of their time at school, and the other part in a company. From Monday to Wednesday, I am at TSE, and the rest of the week at Airbus Helicopters near Marseille. When school will be over, around the end of March, I will work full time in the company until the end of September.

### 2. That sounds busy. How do you find the time to do it?

Students in the alternance program have a lighter planning. We have three semesters (versus two in the classic program), and some classes are followed online on our free time (courses in the field of computer science for instance can easily be learnt alone).

However, travels are time consuming. To manage correctly my weeks I have to be well organized, and do everything I can do in advance (projects, etc).

### 3. Can you tell us a bit about your role at the job?

I work in the Marketing department of Airbus Helicopters. This part of Airbus Group develops and produces helicopters for the civil and military market.

My role is to produce some forecasts of the volume of fleets (numbers of helicopters for a country, at a time  $t + h$  for instance). This is interesting to have this information at short

term (5 years), to have an idea of how many helicopters Airbus has to build since it takes time and locks a huge amount of capital. At long term (20 years), it helps to identify the need for innovation.

### 4. How is your experience from TSE useful to you?

My job is not really demanding in terms of economics knowledge, but I think that TSE gave me a good view of how markets, incentive, and behaviour work. In my job, I do modelling using econometrics and data science. I think that TSE taught me to be rigorous in my work and to think out of the box when it is needed. Finally, I would say that TSE teaches us how to learn : data science is a deep field, and I often have to find out new methods by myself.

### 5. How did you get the alternance?

I met people from Airbus Helicopters at the 2015 BND (one of them was a TSE-graduate). At that time I already had an internship in a Parisian start-up. I told them that I was looking for an alternance, and a few weeks later, they sent me an e-mail saying that they were willing to open an alternance position. Meanwhile, I lost my internship (betting on start-ups can be risky...) so I asked Airbus Helicopters for one.

During this one, I followed the recruitment process for the alternant position. ■



Find us on  
**Facebook**



**Like**



[www.facebook.com/TSEconomist](http://www.facebook.com/TSEconomist)

# Tirole conference series

by Arthur Hill



Jean Tirole

Having a Nobel Prize recipient as part of the staff is considered by many university ranking systems as a great indicator of the quality of the education of that institution. Directly benefiting from the presence and experience of such a person is less of a straightforward consequence.

In the spring semester of this year Mr Tirole (2014 Nobel Memorial Prize in Economics Sciences recipient) decided to give a series of conferences on various economic topics.

The goal of these lectures was to give students an insight into how economic intuition was built, and how the theories of the last decades were actually getting their intuition from very simple modelling.

Jean Tirole tells us more about the genesis of this conference series: *“The idea was to take selected and current policy issues (climate change, unemployment, some specific questions related to business models and antitrust, the financial and Sovereign crises) and to show that simple modelling often goes a long way toward understanding issues and guiding policy.*

*As in other disciplines the art of modelling consists in isolating economically relevant features in a tractable way and ignoring those dimensions that may be relevant, but whose consideration will not overturn the insights”.*

The lectures covered current issues and policies using a modelling framework, to check for inconsistencies or if the policy was designed to give the right

incentives to economic agents. The goal was to illustrate the explanatory power of modelling. These topics were aimed at gaining an understanding of the driving forces of the markets and how to then properly design the policies that will regulate them.

Mr Tirole also tells us more about the benefits of modelling, both before a given policy is implemented, but also to keep research moving forward: *“Modelling has multiple purposes. First, modelling forces us to make our implicit assumptions explicit. Second, it helps check the logic of our arguments and to think about caveats concerning our recommendations, pointing at the need for further work. As Dani Rodrick says in his recent book, we employ mathematics not because we are intelligent, but because we are not intelligent enough. Third, empirical work is hard to interpret and provides little guidance for policy without a conceptual framework.”*

On the topic of transplanting this type of learning approach to economics, Jean Tirole gives us a balanced approach:

*“Obviously this approach cannot substitute for more structured learning. It also requires motivation and intellectual curiosity (clearly students in the class have self-selected, making the exchange with students very rewarding on my side). But it is useful to sometimes step back and think about what it means to be an economist and learn how to approach concrete problems by making use of techniques that one learns elsewhere in the TSE program.”*

These lectures were a great opportunity for students to exchange ideas with Jean Tirole and to get to know more about the research in progress and topics that we would not necessarily cover in more conventional lectures. ■

*“The vast majority of economics students will not become researchers, but for all, learning how to approach a complex real-world question through the lens of abstraction and to understand the back-and-forth between this abstraction and reality is part of what it means to become an economist, besides being intrinsically rewarding.”*

# Fourth Annual TSEconomist Public Lecture: A changing media landscape

by Philip Hanspach

On February 23rd, the TSEconomist welcomed students and faculty for its 4th annual Public Lecture. Every year the student magazine of TSE invites a notable speaker to look at an interesting topic. This year, we were honored to welcome Adam Roberts, the Paris-based European Business Correspondent of The Economist, as our guest. Having worked as a journalist in places all over the world, such as Delhi, London, Johannesburg and having reported from many more places, including the Balkan and the United States, he had a wealth of experience about the media sector to share with us. In spite of a long trip all the way from India, he was fresh and energetic when he joined us as our guest speaker.

After a brief introduction by yours truly, Mr. Roberts presented us an insider's view on the changes in the media industry, from the well-known decline in ad revenue to the different adaption strategies: For example to make readers pay like The Economist and other quality media outlets like The New York Times do, or to go with a digital advertisement based financing model without paywalls and voluntary premium subscriptions

like The Guardian. The talk also covered strategies to acquire paying readers: this includes reaching out to the potential audience on social media to make them aware of The Economist, but also getting recommended by teachers and professors. There was plenty of room for laughs, as well, as we went over some of Mr. Roberts favorite title covers of the last few years. We learned that according to him, the humorous, yet on point title cover is indeed the best part of the magazine. There was also an abundance of journalistic anecdotes, not few of them all too familiar to the team of the TSEconomist. For example, the eternal struggle between a writer and his proofreader. We learned: A good writer who is asked to write a 500 word article ideally writes 503 words to leave his proofreader with the joy of striking out just those three word that could have been left out.

The lively Q&A session with the circa 200 audience members was proof of how much students and professors were engaged during the talk and were curious to find out more. Many questions revolved around our personal, everyday interaction with the news. For example, why The Economist postings

on Facebook always seem a tad less analytical than the average print article. The role of the media during the two big political surprises of the past year: The United Kingdom's vote to leave the European Union and the election of Donald Trump as president of the US were also vigorous fights about the meaning and relevance of truthful journalism. There was even a challenge from the floor to the speaker to justify his journalistic standards against those put forward by media groups such as Russia Today. Mr. Roberts defended the mission of classical quality journalism to stand up to the challenge of what he saw as propaganda like Russia Today or non-quality journalism like Breitbart. He conceded that it's expensive and increasingly challenging to finance the fact-checking that is required to claim high journalistic standard.

After some 90 minutes, the Public Lecture concluded and the attendees had the possibility to continue their vivid discussions over a drink and some snacks at the university. The TSEconomist would like to acknowledge the support of the IDEI in providing for the reception. ■



Adam Roberts before the Public Lecture

# M2 choice

## International Masters Programs

### EMO - Economics of Markets and Organizations



Valeria Plata Franco

#### Current student: Valeria Plata Franco

##### 1. Which aspects of your chosen program were the most challenging?

The EMO Master allows you to find a middle point between theoretical and applied approaches to different questions. That being said, a challenging aspect, in my opinion, is to be able to adapt to both approaches when you are confronted with an issue yourself. Offering a great variety of electives, the 2nd year of master gives you a great chance to carefully select the courses you want to take and, therefore, learn what you wish to learn. Although, I personally enjoy that flexibility for the opportunity of discovering new interests it provides, I also deem such responsibility as a (positive) challenge, as it makes you think about the professional field you would like to continue in.

Furthermore, since you can make your master what you want it to be, the academic challenges you face correspond, to a certain measure, to your passion and interests. That is why I wouldn't say the most challenging aspect is how difficult the courses are, since you feel motivated to work hard.

To finalize, this year I have found myself doing quite a lot of presentations (in groups or by myself) which to me is quite a challenge, as well.

##### 2. Which was your favourite course(s) and why?

I am going to sound very cliché but I have enjoyed and learned

greatly from every course I have taken so far. If I had to choose, it would be according to my personal taste on the topic. I really liked learning about competition more in depth (even though it is hard to cover it all). I also enjoyed choosing a more specific topic for one of my courses, which was the Energy Markets and Networks class ■

#### Current student: Max Langer

##### 1. Which aspects of your chosen program were the most challenging?

Having completed the M1 program at TSE I feel like I was well prepared for EMO in terms of theoretical knowledge, empirical skills and management of the workload. However, not having any TDs any more was a novelty to me and required working in a more independent style than previously experienced at TSE.

##### 2. Which was your favourite course(s) and why?

In the first semester I enjoyed "Competition and Market Strategies" in particular, and so far "Topics in Applied Industrial Organization" appeared to provide some compelling insights as well. On a general note I have to say that all of my classes have been very interesting.

"Competition and Market Strategies" appealed to me because it involved a series of IO theories that were presented in a simple fashion but were indeed based on esteemed academic papers. This combination allowed us to obtain a good overview of the literature while enabling us to deepen our knowledge according to our interests. ■



Maximilian Langer



## ETE - Economic Theory and Econometrics

**Current student: Stefan Pauly**

### 1. Which aspects of your chosen program were the most challenging?

The most challenging part of my program so far has been to remember myself sometimes, why I am studying all of this. But then you take a little more applied course and realize that it can actually be pretty useful to explain real-world problems.

### 2. Which was your favourite course(s) and why?

My favourite course was microeconomics. It was nice to learn the foundations of stuff we use every day as economists, like utility functions. Then you kind of understand how economists came up with these concepts. In general, the content of our courses last semester was interesting, just a little bit too much sometimes. ■

**Current student: Anonymous**

### 1. Which aspects of your chosen program were the most challenging?-

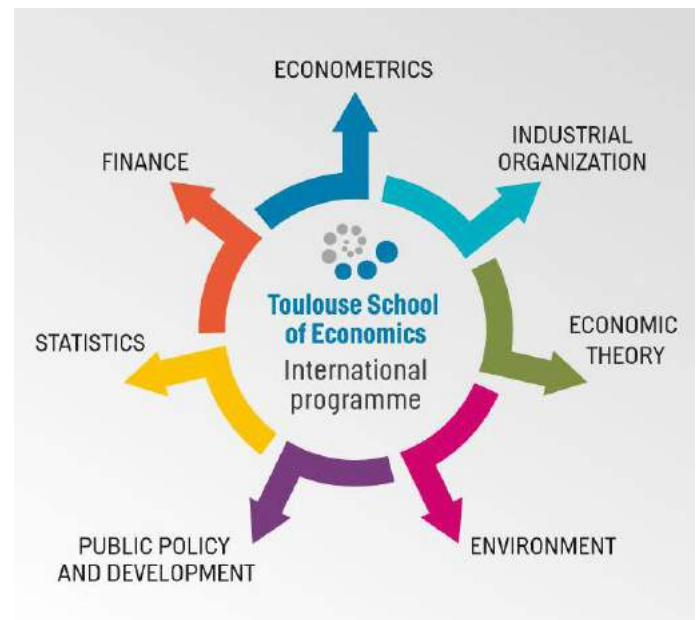
In the first semester the material in our core subjects (micro, macro, econometrics) was very challenging and not particularly interesting. While you can get used to the latter, the sheer amount of theory you have to digest and its difficulty will overwhelm you till the day of the exam. In the lectures you mostly rewrite the never-ending sequences of definition-theorem-proof-proposition-proof from the blackboard. Often you don't really know how to even approach the problem sets until the solutions are published. Your grades depend in 100% on final exams. You never feel like you study enough and probably you do not. This brings us to the greatest challenge of the second semester: having seen your exam results. You have to dust off your shoulders and find the strength to keep fighting.

### 2. Which was your favourite course(s) and why?

From the core, I liked micro because I like micro in general but I also felt like it was the most structured course. The lectures followed closely the textbook (and, which was not that obvious in other classes, there was a textbook we could refer to) and in the tutorials we solved problems from previous years' exams. These two features of the course were quite reassuring, although in the end the exam was still very difficult. ■

\*\* Additional comment

ETE is the equivalent of 1st year of a PhD - I came to TSE to do this program only because I would really like to do my PhD here. For anyone who is not convinced that this is their goal, probably the school has better options to offer.



## ERNA - Environmental and Natural Resources Economics

**Current student: María Teresa Aguilar Rojas**

### 1. Which aspects of your chosen program were the most challenging?

In terms of coursework, the system is quite different to the M1, since most of the courses require you to do projects, instead of exams. Time management, and teamwork skills become crucial in order to get the work done.

### 2. Which was your favourite course(s) and why?

I particularly enjoy "Natural Resource Economics". Since it is macro-oriented, it is probably the most theoretical course of the master, but nothing to be afraid of. It explores many different growth and sustainability models.

"Econometrics of Program Evaluation" is also fascinating and very useful. It provides you with the main tools to address empirical questions. A must-take for the ones who want to learn more of econometric methods, and perfect for the empirical enthusiasts! ■



María Teresa Aguilar

## PPD - Public Policy and Development

**Current Student: Carlos Vasallo**

*1. Which aspects of your chosen program were the most challenging?*

Working in groups as it requires a lot of interpersonal skills, cooperation, and coordination, which can be hard when under tight deadlines and with multiple projects with different people.

*2. Which was your favourite course(s) and why?*

Favourite course was Mohamed Saleh's Historical Perspectives on Development. The course was expertly organized, and because I am a history buff, I was very captivated by the material. Personally, Dr Saleh is a super nice person that was really nurturing as a teacher and always encouraged discussion and debate. He's also amazing at explaining econometric concepts! ■

**Current student: Catalina Salas**

*1. Which aspects of your chosen program were the most challenging?*

I would say this master is a lot about personal effort. Most of the courses do not have a final exam, but have projects, which demand a considerable amount of time. As a student is quite normal to leave everything for the end. I guess the challenge is to organize yourself in order to work constantly during the semester, advancing in your projects. Additionally, it is important to prepare the material of every course in advance, so you take the most possible advantage of each lecture.



Catalina Salas

*2. Which was your favourite course(s) and why?*

Even though all my courses were very interesting, I particularly enjoyed Historical Perspectives on Development. This course covers many different topics, which not only make you understand development from diverse perspectives, but also the role history can play in economic studies. Moreover, is a quite vivid course with a lot of discussion, which at the end helps you to go deeply into each topic. ■



## StatEco - Statistics and Econometrics

**Current student: Juliette Troadec**

### 1. Which aspects of your chosen program were the most challenging?

The most challenging thing about being in the Master 2 in Statistics & Econometrics is that you have to choose the topics you want to invest time in because you cannot study everything in the short time you are given. Honestly, you must learn to be confident while knowing you won't succeed everywhere. This is a very applied master and we are given a lot of projects, everything won't be perfect because of the lack of time. The good thing is that you learn a lot of useful and interesting techniques that you will use later in your job. The bad thing is that you can feel you lose control sometimes. The second challenging thing of this year is to find a good and motivating internship while managing to study and to handle multiple projects in a hurry. You must take time to seriously think about what you want to do next.

### 2. Which was your favourite course(s) and why?

Entering this master, I was glad to give up with theoretical and abstract courses in order to use what I had learned in Master 1 through concrete applications, using raw and credible data. The project we carry out in the context of the Statistical Consulting course is really attractive because it gives us a taste of what our future job could look like. By concretely conducting a study for a company like Airbus, we are given the opportunity to manage huge amount of data and run a solid analysis that will be presented to the company's representatives at the end of March. I feel like working for a company, setting goals and discussing possibilities is more interesting than just studying in order to obtain good marks at the exam, but this is my personal point of view! ■

**Alum: Anna Maria Hupas**

### 1. What are you up to now?

I am working as an Analyst in Trust & Safety team at Google in Dublin. My work consists in improving the quality of the search results provided to the users through spam fighting. Our algorithms are extremely good at detecting spam, and in most cases we automatically discover it and remove it from our search results. Although our team takes a data-driven approach to evaluate search quality on a full-time basis we're also willing to take manual action to remove spam from our search results.

### 2. Which skills, acquired from studying at the TSE, have you found useful?

The knowledge of programming languages is extremely useful at Google however you can learn a lot once you are here. If I were to choose the most useful courses I took at TSE I would say: Multivariate Data Analysis (Google is a data-driven company), Data Mining and Data Bases. Finally, speaking foreign languages is more than necessary in every international company: everyday I speak at least 3 different languages. The last, but not least: the communication course is actually more helpful that you may think! ■



## EEE - Econometrics and Empirical Economics

**Current student: Jose Alvarez**

### 1. Which aspects of your chosen program were the most challenging?

The program is essentially econometrics 24/7, starting from the strong assumption that you already master the material from the M1 courses on Econometrics and Applied Econometrics. Although the focus is not theoretical, you'll be presented with both the theory and the applications of the different econometric methods. The program is fast-paced and very demanding in terms of projects: you'll have at least one empirical project per class. Overall: a lot of econometrics (with the usual math and statistics that comes with it), a lot of coding (mostly in R), and a lot of modelling. The program will also take you out of your comfort zone, as you'll have courses outside of economics, such as Big Data or Large Dimension Models.

### 2. Which was your favourite course(s) and why?

I really enjoyed Large Dimension Models. The class is very challenging since most of the material comes from statistics or electrical engineering, but it's extremely rewarding if you're interested in the whole Big Data trend. I also really enjoyed Nonparametric Methods and Programming in Python. ■



Jose Alvarez

**Current student: Nicola Benigni**

*1. Which aspects of your chosen program were the most challenging?*

The Master 2 in Econometrics and Empirical Economics focuses on the most important and widely used methods to gain valuable information from data. At the end of the degree, given almost any type of data—may it be time series, panel data, multinomial data, large dimensional data, big data, biased data, survey data, financials data—students will possess the necessary methods to investigate the data and gain from them the most truthful information possible. Non-parametric methods are taught in the program.

The degree has both a theoretical and an applied component: almost every course provides first some theoretical insight on the methods and eventually requires students to apply the techniques on some real life data in a small-evaluated project.

The Master is very stimulating and it feels right to learn something useful at the frontier of modern research. The most challenging aspect of the degree is to keep up with the day-to-day review of the lectures and the day-to-day empirical application of the methods, since there many courses taking place at the same time. However, it is recommended to follow up

the courses every day and this can certainly be achieved with some appropriate time management.

*2. Which was your favourite course(s) and why?*

When a dataset is made of a number of columns, i.e. variables, which are larger than the number of rows, i.e. observations, the usual regression techniques fail to work. This type of data is called large dimensional and the EEE course Large Dimensional Model is about to deal with this type of data. Large Dimensional Model was my favourite course overall, in part because of the relevance of the topic, in part because of the intense research activity that is still happening in the field. One concrete example where large dimensional techniques can be useful is the investigation of the genes related to cancer. Humans have more than thirty thousand genes, some of which could help to explain a specific form of cancer. However, DNA analysis is still very costly and only a sample of a limited number of patients is usually available for research. Therefore, the number of genes, the explanatory variables, is of some order greater than the number of patients, the observations. How to find out which genes have a significant effect on the development of cancer? This and many other questions can be answered taking Large Dimensional Model within the Master 2 in Econometrics and Empirical Economics. ■

**ECL - Economie de Droit de la Concurrence**



Alice Hebrard

**Current student : Alice Hebrard**

*1. Which aspects of your chosen program were the most challenging?*

The most challenging part of the program is to pursue two Master’s degrees simultaneously. Both demand work and organisation but we are used to it from the undergraduate level. We take most of the economics courses with the EMO master and law courses with the ‘M2 Parcours Juriste d’Entreprise’. Our weeks are a bit busy, but the Master 2 is giving us a real picture of what our capacity is and what our future jobs may be like.

*2. Which was your favourite course(s) and why?*

The M2 offers many interesting classes. Econometrics of Competition requires a lot of work but gave us great practice.

Market Energy and Topics in Law - antitrust law - introduced us to new fields. But the most passionate course was Topics and Cases in Competition with professor Lefouilly. The quality of the class, the cases studied, and the visiting professors as Jim Venits and Jorge Padilla make this course both essential and inspiring. ■

**Alum: Jean-Gabriel Despeyroux**

*1. What are you up to now?*

Since my graduation from TSE in 2013, I’ve been working with in a consultancy based in Paris (MAPP) specialised in micro-economic analysis applied to competition issues.

*2. Which skills, acquired from studying at the TSE, have you found useful?*

As one might expect, “hard” skills – explicitly taught at TSE – such as economic reasoning, abstraction and formalisation abilities, writing and oral ease or computer programing are must-have skills in consultancies.

Nevertheless, “soft” skills – also taught at TSE – are also useful and necessary, such as time management, communication or teamwork.

Last but not least, numerous “soft” skills might also be acquired while studying at TSE, depending upon each and every student’s habit. For example, an active participation during lectures or student associations can offer challenges and a very rich environment fostering interaction with other students and teachers, allowing the development of soft skills such as the ability to simplify complex issues, build arguments, persuade and so on. ■

## IAE/TSE

## FiT - Finance et Technologies de l'Information

**Current student (FIT): Jules Bstock****1. Which aspects of your chosen program were the most challenging?**

The most challenging aspects of the program were the programming as well as the new financial terms and definitions.

At TSE programming limits itself on the R homework but as one of our teachers said "R c'est du bidouillage". Thus it is important to get a better understanding of other programming software, as it will be essential in our future jobs.

The second challenge is the terminology. By coming into finance you are basically entering a new world where optimisation is oxygen and hedging is water. If those things interest you, then you have found your master!

**2. Which was your favourite course(s) and why?**

My favourite classes were those where I felt the most challenged that is excel VBA and asset pricing. Excel VBA is just an amazing tool, and you get as excited as when you discovered R for the first time, realizing all the new things you are able to do, and how your life will be easier from that point on.

For asset pricing it was a class I took in the second semester of my M1 at TSE, and this class is in continuation of that class. It is theoretical and practical and very challenging, and thus impossible not to like! ■

## FiRE - Financial Markets and Risk Evaluation IAE



Aurelie Prefumo

**Current student: Aurelie Prefumo****1. Which aspects of your chosen program were the most challenging?**

The most challenging aspect was to discover and learn various new things; whether it is learning about financial products (derivatives and structured products), corporate finance theory, or even learning new programming languages (VBA and Python). However, this really motivated me as I am passionate about finance and I like challenges. Therefore, if you are considering the Financial Markets and Risk Evaluation Masters then I would definitely recommend taking the following electives: Market Finance and Corporate Finance taught by Marianne Andries and Milo Bianchi, respectively. These lectures really helped me.

One thing I particularly value in my masters is that we have lectures with researchers and professionals who have a wealth of experience and who are always keen to share their knowledge

and experiences with us.

**2. Which was your favourite course(s) and why?**

My favourite courses so far has been Asset Management and Trading taught by Sebastien Pouget, and Asset pricing taught by Sophie Moinas. In Asset Management and Trading, we learned about the different investment strategies used by traders and funds. Moreover, we made computerised implementation of portfolio formation and had an asset management and trading simulation over several months. This simulation was the perfect opportunity to implement the strategies we learned about. In Asset Pricing, we learned about all sorts of derivatives and the different pricing models that are used. ■

**Alum: Romain Salin****1. What are you up to now?**

I am currently Senior Business Consultant in Ernst and Young Advisory at the Toulouse Office. My work consist in advising clients and help them to formalize their needs, especially concerning the Information System, Change Management and Process reviews in order to improve productivity and efficiency. I also realize every year IT (Information Technology) audit within the framework of statutory account audit every year for companies like Airbus, Pierre Fabre, etc.

**2. Which skills, acquired from studying at the TSE, have you found useful?**

The high level of requirements asked by TSE help in the professional world. Beyond the topics taught, all of them are taught by renowned professors, the very high pace of work and the complexity of the subjects dealt with allow students to adopt analytical reasoning and to analyse any type of complex problems. These qualities are really essential in all types of companies, especially consulting firms, for which the majority of missions consist to answer to complex customer issues in an increasingly intense competitive environment. ■

# Junior Etudes Note

Please meet Mélanie, who joined TSE-Junior Etudes last year, and who passed a test that has given her a special place in the National Confederation of Junior-Enterprises.

## 1. What is your cursus ?

I entered TSE last year in L3 Economics & Mathematics after 2 years of « Classes Préparatoires » in Social Sciences, Literature and Mathematics. Now, I am preparing my Master's Degree in Econometrics & Statistics, following the international track.

## 2. Why did you join TSE-Junior Etudes ?

When I arrived at TSE, I did not know many people, so I decided to join an association to meet other people with different backgrounds and also to acquire new skills. That is why I have chosen to join TSE Junior-Etudes: I was interested in the fact that TSE Junior-Etudes works as an economics and statistical consulting company directed by and composed of students with such a good atmosphere. I remember some days when we have played cards for hours.

## 3. What is your job in TSE-Junior Etudes ?

Now, I am the treasurer of the association. I am the one who deals with the money! More precisely, I edit bills and students pay slips, I fill tax returns, and I monitor the budget. I participated in some conferences organized by the association, which gathers all the Junior-Enterprises in France, called CNJE (Confédération Nationale des Junior-Entreprises). It was a great experience to meet people who come from other

Junior-Enterprises all around France.

## 4. We know that you have a particular job with the CNJE, what is it ?

In the last congress, organized in Toulouse by our neighbor ESCadrille (the Junior-Enterprise of TBS), I decided to take a test in order to become auditor in treasury for the CNJE. In December, I took the final test during a weekend in Paris, and after it, I became auditor. It means that some weekends, I will be called to pay a visit to other Junior-Enterprises. I will study their internal functioning, check if they respect the rules and give them some advice in order to enhance their performance. With this new position, what I do for my association is recognized at a national scale. I also participate in the reputation of TSE Junior-Etudes, and of TSE in a general way!

**TSE Junior Etudes recruits members like Mélanie at each beginning of the semester, but constantly recruits consultants, remunerated for working on studies for the clients of TSE JE ; if you're interested, please contact us !**

You can follow us on Facebook, Twitter, LinkedIn, or contact us at [contact@tse-junioretudes.fr](mailto:contact@tse-junioretudes.fr). You can also check for further information directly on our website: <http://tse-junioretudes.com>. ■



TSE Junior Etudes members

# BDE Note



BDE Ski-weekend 2017

First of all, we wish you all a Happy New Year for 2017. This year was a good year for us, and we are pushing hard to continue on this way. For the time being, we organized 19 events since September 2016, which is actually 5 more than last year. We also tried to diversify our events, and we hope you enjoyed what we organized for you.

After the amazing Alumni's classy party, the first edition of TSE'nema, the pool-night, the last party of the year (XMas party), and the very first one of the year 2017 (Tse Get Down), we guess your expectations for the Ski Weekend were really high.

In the end, the 2017 Ski Weekend was a real success: 90 people, a private and magnificent family house, ski lessons, goodies and gifts (a free spot and a pair of skis), an exclusive pre-party on a snow groomer, a tropical themed party, and so on. We really hope you enjoyed it, because we did.

Goodies are finally available, and we are very proud of them. You can drop by and buy in our office (MC205) and discover our new collections (sweaters with and without hoodies, mugs, caps and tote bags) designed by our good guys from Pole Design. Also, it is the very first time we can ship parcels, so do not hesitate and order, even if you are far from Toulouse. Talking about new feature, you can even order online here at <http://www.bde-tse.com/online-shop>

Also, an exclusive and new event in TSE took place on the 28th of November: the very first FIFA tournament in amphitheatres.

It was a good way to enjoy video games in a different way: not in your sofa, but in your classroom, and not alone, but with your friends and the BDE. It was a great event, and a such a funny way to spend time in our lovely school.

Now, we are focusing on three things.

First, we are preparing the Gala. We keep in mind that last year's wonderful Gala stayed in everyone's minds, and we are pushing hard to meet your expectations. We keep you in touch about this, you will not be disappointed, we promise.

Second, we are focusing on the next BDE TSE elections taking place in March. So if you feel you can manage such a team, and have the charisma and the energy to replace our actual president, do not hesitate to introduce your board's list.

Last but not least, we are preparing next year's first events: the Buddy Program, the Integration Program and so on. The level is really high this year, and we will try to do better next year.

As you can see, there are no holidays for the BDE TSE.

Do not forget to subscribe to BDE Snapchat account to live the events & contests from the inside: SNAPBDETSE

There is also a Instagram: BDETSE

And of course our website:

<http://www.bde-tse.com>

See you very soon champ's!

BDETSE ■

# The TSEconomist's teaching awards 2016/2017



**Christine Maurel**  
L3 Teacher of the Year



**Laurent Bakri**  
L3 TA of the Year



**Jean-Paul Azam**  
M1 Teacher of the Year



**Elodie Alet**  
M1 TA of the Year



**Nicolas Treich**  
M2 Teacher of the Year

Champagne, great food, and happy faces abounded at this year's gala. The event, organized by the BDE of our beloved school, is truly one of the highlights of every student's year. We believe this might also apply to numerous teachers - especially to those who were awarded the TSEconomist teaching awards! The best professors and TAs were chosen based on a survey the magazine conducted among all L3, M1 and M2 students. It gave students a chance to finally reward their best teachers for their hard work and the effort they make every day, thus promoting good spirits among everyone on campus. The results were obtained thanks to over 250 students who submitted their votes online and on campus.

So without further ado, the TSEconomist is honored to present this year's winners:

- L3 Teacher of the Year: Christine Maurel
- L3 TA of the Year: Laurent Bakri

- M1 Teacher of the Year: Jean-Paul Azam

- M1 TA of the Year: Elodie Alet

- M2 Teacher of the Year: Nicolas Treich

We at the TSEconomist congratulate all the winners, and thank them for inspiring and supporting their students. And in order to keep up the positive spirit, here are the most heart-warming student comments submitted in the survey:

## L3

"She was really a joyful teacher and an inspiration to us all." **On Christine Maurel**

"Mamiko: sweetest person ever!" **On Mamiko Yamashita**

"Albert Grillo, you're the best." **On Albert Grillo**

"Succeeded at explaining hard problems!" **On Albert Grillo**

"They are all excellent teachers. They have helped us understand Mathematics in the simplest of ways." **On Clément Bruche, Jean Paul Ibrahim, Jérôme Bolt, and Pascal Begout**

"LAURENT BAKRI IS THE BEST" **On Laurent Bakri**

## M1

"I would like to congratulate the following professors for their excellent job. They have great teaching skills and make their lectures very interesting!" **On**





**Abdelaati Daouia, Takuro Yamashita, J-P Azam, Patrick Fève, Shruti Sinha**

"We all <3 Rohit!" **On Kumar Rohit**

"Kumar Rohit was really awesome, always trying to go deeper in important things. He really helped us understand hard concepts seen in lecture. Always available and always kind with us. Without a doubt the best TA I had since I got here." **On Kumar Rohit**

"A true inspiration, a worthy successor of Adam Smith and John Stuart Mills!" **On Jean-Paul Azam**

"He is very innovative. His haircut is very innovative too!" **On Rossi Abi-Rafeh**

"Elodie is the best!" **On Elodie Alet**

"Very funny, always smiling, and very pedagogical." **On Julia Hoefler**

"A combination of rigor, knowledge, and an excellent sense of sarcasm made her courses enjoyable." **On Shruti Sinha**

"Johannes Horner is a very good professor and despite all the work that we had to provide for his class, I genuinely enjoyed it. It will not be easy to forget the

analogies between some of the games we studied and his personal life, such as the war of attrition when it comes to doing the dishes." **On Johannes Horner**

"Incentives was beautiful suffering :)" **On Johannes Horner**

"What I like the most about them is their passion for teaching." **On Francois Poinas and Julia Hoefler**

## M2

"He's a shark of economics!" **On Nicolas Treich**

"Great energy, inspiring, with an intuitive explanation of the concepts." **On Emmanuelle Auriol**

"Prof. Saleh's course was one of the most interesting and interactive classes I have ever attended. He was able to capture one of TSE's main qualities, which is the rich diversity that comes along with the international students. The course was a delight!" **On Mohamed Saleh**

"Besides being an excellent lecturer, Nicolas is deeply committed to his students and has been great at conveying

what research is." **On Nicolas Werquin**

"I love that you are expanding the frontier of econometric knowledge and that you make us part of that. You really appreciate the questions of your students and you question your own work in the process." **On Sylvain Chabé-Ferret**

"Nicolas Treich is very good at engaging the students. His class is very interesting and the topic is motivating." **On Nicolas Treich**

"Sylvain Chabé-Ferret really cares about whether his students understood or not, which motivates them to follow the course. He also makes some funny comments during the class." **On Sylvain Chabé-Ferret**

"Renato is one of the best professors I've ever had." **On Renato Gomes**

"They were two amazing teachers. I got passionate about the discipline they were teaching and learned a lot about empirical methods." **On Sylvain Chabé-Ferret and Ana Maria Gazmuri**

"You made me a poet <3" **On Renato Gomes** ■

# TSE Gala 2016/2017



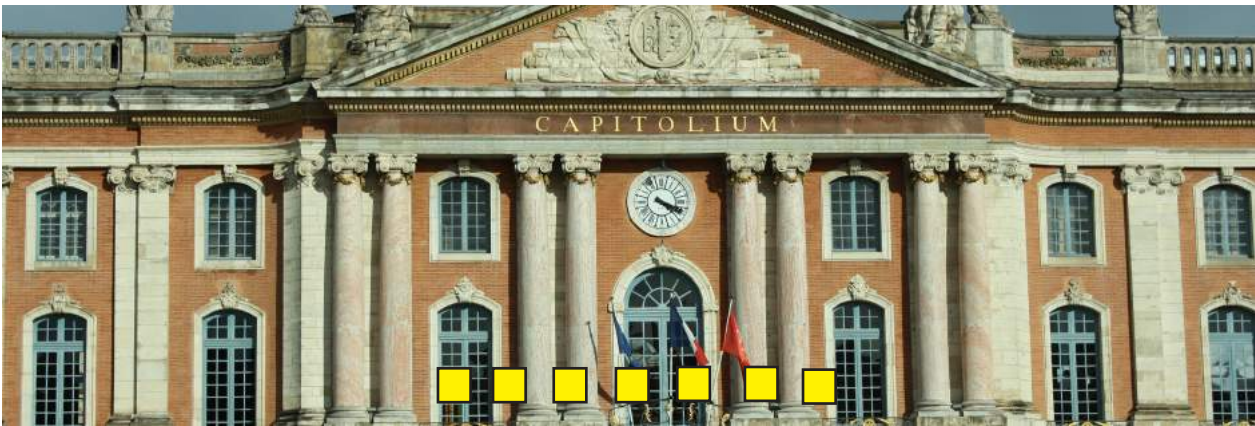
Special thanks to the BDE TSE. Photographers: Anissa Belgacem and Mai Nguyen

# Picture Quiz

Can you guess these terms from Economics 101?

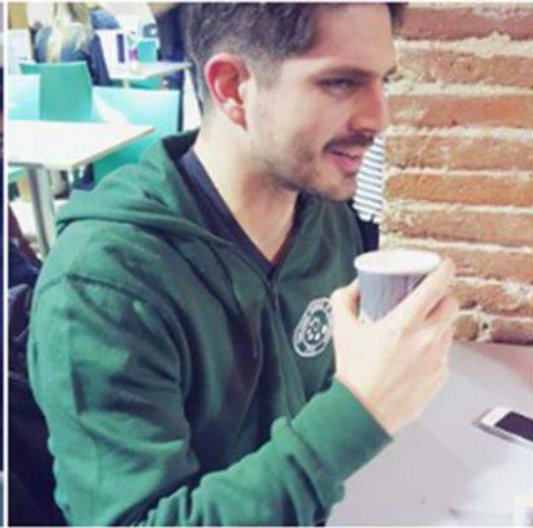
Submit your four answers by September 15<sup>th</sup> to [www.tseconomist.com](http://www.tseconomist.com) and enter the draw to win one of two TSE sweatshirts!

# Knowledge

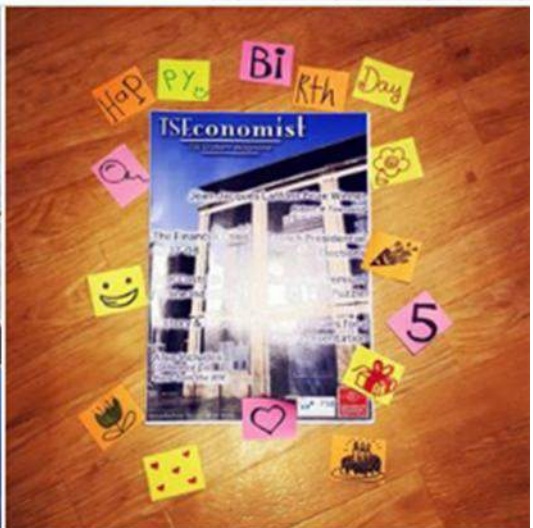


Last Issue's Answers: 1. Benevolent Dictator 2. Common Pool 3. Median Voter Theorem 4. Arrow's Impossibility Theorem

Want to share your favorite economic jokes with us?  
Send them to: [the.tseconomist@gmail.com](mailto:the.tseconomist@gmail.com)



JOIN US  
@TSECONOMIST



SOCIAL, POLITICAL AND  
ECONOMIC CONSEQUENCES



A view from

**The  
Economist**

with Adam Roberts,  
European business editor

