Taking a Deeper Look into the Brain...

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DEAR READER,

Welcome to Econtrack, our relaunched newsletter to keep you on track with the many activities at the Department of Economics. We have stripped the boring stuff and aim to present some of our most interesting output. Rest assured, we are well aware that not everything we find mouthwateringly exciting exerts the same reaction in our readers. Nevertheless, we believe that much of what we do is interesting and relevant to the wider public: sometimes thought-provoking, sometimes simply confirming existing hunches - but always noteworthy.

In this edition, we look at how we look into the brain. The Department is home to the Laboratory of Social and Neural Systems Research (SNS-Lab), including an fMRI scanner, which records precisely which areas of our brains are active and communicating with each other while we make everyday decisions. Last year, four papers based on research from the SNS-Lab found their way into top journals. Findings included a connection between happiness and generosity, differences in the reward systems of male and female brains, and the possibility of increasing honest behavior through magnetic stimulation of the brain.

At the risk of sounding a bit repetitive: The department continues to grow. Professors Carlos Alós-Ferrer, Nir Jaimovich, Marek Pycia, Florian Scheuer, and Ulf Zölitz joined us in 2017. We are delighted to have these outstanding and interesting academics on board and introduce them in this edition.

Browse, enjoy, and stay in touch.

Rainer Winkelmann
What projects are you currently working on?
In my current projects, my co-authors and I analyze auctions of treasury bills and electricity, externalities in labor markets, statistics used to describe assignments of school seats, the efficiency of trade, the simplicity of market mechanisms, and other questions. Of course, right now, I am also learning German.

What do you believe is your most important piece of research?
The answer depends on what we look for, on the measures we use to assess importance. If we look at the direct impact on markets and human lives, then my work on contracting for future kidney transplants is the most important. If we measure importance by the monetary value of questions studied, then my work on pay-as-bid auctions stands out. Should we use academic or other criteria, changing the ways economists think, my work on the equivalence of various school assignment procedures are top contenders.

If you think about the highs and lows of your academic career so far, what advice would you give?
Knowing what one likes to do and what one can do, finding ways to contribute, as well as integrity and focus are of course generally important. When it comes to PhD studies, in my experience the key challenge for most students is to grasp what makes a contribution to economic research. Ultimately, however, good advice is always very person-specific.
What projects are you currently working on?
One area of research is the connection between job polarization and jobless recoveries. Job polarization refers to disappearance of middle-skill occupations. Jobless recoveries refer to lack of employment recovery following a recession. My work shows that the root of such jobless recoveries can be traced to the disappearance of middle-skill jobs. In more recent work, I discuss how consumer behavior contributes to this. During downturns, consumers consume lower-quality goods. Since these require less labor to produce, the change in consumer behavior exacerbates the recession.

Finally, in more labor-oriented work, I show how in recent decades, the increase in the importance of social skills in the high-paying occupations has shaped the dynamics and evolution of this labor market.

What is your single most important piece of research?
Being an economist, I will let the market decide on this one.

What advice would you give to today’s bright young students?
Graduate school is really exhausting! But, what matters is whether you have the fire and desire to pursue the questions that bother you. If you wake up in the morning, and you feel obsessed about not understanding something, then academic life is exactly for you.

Looking back at the highs and lows of your academic career so far, what advice would you give to today’s PhD students?
Collaboration! Your classmates are the most important resource during graduate school. This is a great time to start working together on research projects and start building coauthor relationships that might last well beyond graduation.
Department News

CONGRATULATIONS

Grants

The European Research Council awarded three ERC Grants to the Department. The recipients are Dina Pomeranz, Florian Scheuer and Rafael Polonia.

Bruno Caprettini received a 4-year SNF Grant Ambizione.

Richard Büchner Grants went to Micah Edelson and Todd Hare, Alexander Soutschek, Joël Floris and Giacomin Favre, Lydia Hellrung and Philippe Tobler, Bruno Caprettini, Guilherme Lichand, Leandro Carvalho, Pietro Biroli and Marcus Grüssow.

Lydia Hellrung received a Marie-Curie Individual Fellowship Grant.

Honors & Awards

Ernst Fehr was named the first foreign honorary member from a Swiss university by the American Economic Association (AEA), awarded the Oskar Morgenstern Medal from the University of Vienna and received an honorary doctorate from the University of Antwerp.

Bruno Caprettini received the Mercator Award for outstanding research at the University.

Thank You

The Marlene Porsche Foundation supports the Department by establishing the Marlene Porsche Graduate School of Neuroeconomics, which will enable 14 students to obtain a PhD in the field of Neuroeconomics over the next decade.

Thank you to the Family Larsson-Rosenquist Foundation for donating the Larsson-Rosenquist Foundation Professor of Economics of Child and Youth Development with a Focus on Breastfeeding and a corresponding center at the Department of Economics. This will allow us to research the long-term effects of early childhood nutrition with a focus on breastfeeding.

Notes

Research from the Department was featured in three of the top ten media releases by the University of Zurich in 2017.

Noteworthy

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Zurich Graduate School of Economics - Young Talent

Young Economist Award for Liu Liu

Congratulations, Liu! What was the title of your paper and what is it about?

The title is How Nations Evolve: Political Accountability and Development Trajectories. The paper uses a very microfounded model, a dynamic game between the government and citizens, in which the signal distribution is endogenized, to explain the joint evolution of nations’ political and economic development. This approach offers a new angle to look at a big question. The driving force is unique, while the model can generate various features in nations’ long-run development.
**Department News**

**Rankings**

**Zurich ECON #1**

The Department of Economics is consistently placed among the best European economics departments in research based rankings, demonstrating the high quality and impact of our research.

We primarily evaluate our own academic performance in comparison to other departments based on the Tilburg Ranking for international comparison and the Handelsblatt Ranking for the German speaking area. We believe that these two rankings are best able to capture academic contributions as they are based solely on qualified scientific output.

The latest German Handelsblatt ranking was published in Fall 2017. Our Department ranks number one by far and is home to a considerable share of the experts. In the under-40s category, 7 of the strongest researchers are from our Department. Florian Scheuer and Ralph Ossa both rank among the top 5 of this category. Also, young Zurich Professors have a significantly higher number of top tier publications to their name.

**How was it to receive your first award?**

I did not expect it, nor was I informed (it was meant to be a surprise). To be honest, I was taking a walk around the beautiful Lake Geneva when the announcement was made. A friend said, “you missing your own celebration sounds just like you”. This also means that I missed the opportunity to timely express my sincere gratitude towards the organizers and Prof. James Robinson in whose honor I was given the award. So, I was actually feeling slightly ambivalent for several days.

**What are you aspiring to as an economist?**

At this academic age, I feel a strong sense of responsibility as a spectator, as in Adam Smith’s *The Theory of Moral Sentiments*.

Liu Liu received the Young Economist Award from the Swiss Society for Economics and Statistics, and nearly missed receiving it.

A study by David Yanagizawa-Drott and co-authors published in the August 2017 edition of *The Quarterly Journal of Economics* explains why advances in agricultural development in Africa are slow. New agricultural technologies (fertilizer and hybrid seed) are subject to low adoption rates in local markets in Africa, and farmers are unlikely to buy new products. His research looks into the reasons for this reluctance and finds that the quality of the seed is fairly low and, more importantly, varies greatly. In addition, price is not a reliable indicator of quality. Therefore, farmers cannot infer quality based on price. This also reduces the incentive for a high-quality producer to invest in quality and establish a reputation. In combination, all these effects result in low yields for the farmers, although better quality seed is available in their markets.

Dina Pomeranz et al. recently published a paper in the *American Economic Journal: Applied Economics* on the limits of countering tax evasion in developing countries. Using third-party data to estimate the revenue of a company, tax authorities in Ecuador found that a quarter of the companies significantly underreport their revenues. Confronted with the mismatch, an amended tax return was requested, with which only a few companies complied. However, the corrected tax returns had not only changed regarding stated revenue - compared to the first submission they also reported higher costs. In combination, these two effects led to a relatively small increase in net tax revenue to the state. Pomeranz and her coauthors conclude that using third-party data can help, but will not suffice to reduce the tax compliance problem, as long as the enforcing infrastructure (capacity to follow up on evasion, poor legal regimes, and corruption) is weak.


The Female Brain Reacts More Strongly to Prosocial Behavior

Behavioral experiments have shown that women share a sum of money more generously than men. To gain an in-depth understanding of this effect, Alexander Soutschek, Philippe Tobler et al looked at the areas of the brain that are active when making such decisions. They found that the striatum, located in the middle of the brain and responsible for the assessment of rewards, is more strongly activated in female brains during prosocial decisions than during selfish decisions. In contrast, selfish decisions lead to a stronger activation of the reward system in male brains. Their findings are the first to demonstrate that the brains of men and women respond differently to prosocial and selfish behavior. These physical differences, however, are not necessarily innate or of evolutionary origin, as learning and reward systems work in close cooperation and there are significant cultural differences in the sensitivity of the reward system.


Falling Labor Share in Superstar Companies

Although the decline of labor's share within the GDP of the United States and many other countries in recent decades is well documented, its causes remain uncertain. In an often-cited working paper, David Dorn and his co-authors show how market consolidation across all sectors has led to the top four companies of a sector significantly increasing their market share and profitability, allowing them to reduce unit and workforce costs. Therefore, the aggregate share of labor (and thus wages) decreases. The research offers empirical evidence of national income shifting from employers towards equity owners and shows how the consolidation has effects on innovation incentives as well as income inequality.

Asking someone to explain the thinking behind their actions will not suffice to really understand human behavior. At the Department of Economics, we take a deeper look at what goes on in our brains while we take everyday and not so everyday decisions.
However much data one manages to generate, simply observing behavior, or asking people to explain the thinking behind their actions, will not suffice to fully understand it. This is most visible in the case in which behavior is not in line with one’s own preferences, is inconsistent, or contradicts rationality. Until recently, such contradictions were conveniently put into a black box labeled “subconscious.”

For a scientist, a black box is an unsatisfactory answer. Advances in neuroscience have given us insights into the brain and paved the way for a new area of research: neuroeconomics combines the fields of neuroscience, biology, psychology, and economics. The findings shed light on the subconscious and help us understand the causes of human behaviors such as altruism, egoism, risk-taking, or self-control at the neural level.

In 2007, thanks to a generous donation by Branco Weiss, the Department had the unique chance to establish the Laboratory for Social and Neural Systems Research (SNS-Lab) in the basement of the University Hospital Zurich. The heart of the lab is an fMRI Scanner, allowing visualization of active brain areas during cognitive processes. In addition, the lab is home to EEG and TMS apparatuses (see box on next page) as well as eye-tracking tools and a behavioral experiment lab. Whereas researchers in other institutions only have access to fMRI scanners when these are not needed for medical patients – which means late evenings and nighttime – our researchers have unlimited access. The scanner runs around 2,000 hours a year, an average of 40 hours per week. Having a dedicated fMRI scanner for research purposes puts the Department in an advantageous position and has led to it becoming a pioneer in the field.

The SNS-Lab shares this privilege by opening the scanner to researchers outside the Department for 20 percent...
of the time. Currently the University Hospital Zurich and the Psychiatric Hospital of the University of Zurich as well as the Institute for Biomedical Engineering and the Department of Health Sciences and Technology of the ETH use the scanner regularly for research purposes. The research topics are broad: overweight, toothache, and, of course, economic behavior in all its shapes and sizes.

On an average day a team is at work to understand impatience and self-control. Based on findings of a previous behavioral experiment, the scientists know the scanner is asked to make decisions by pressing yes or no buttons while the scanner is running and taking images of his brain. As the scientists want images of brain activity milliseconds before the subject makes the decision, the timing of the automated questions and scanning have to be aligned very precisely. The Department has a dedicated IT Engineering team for this.

To ensure ongoing precision, a physicist recalibrates and tests the scanner every week. However, there is an imperfection that cannot be corrected so easily: mag-

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**A FULL SCAN TAKES BETWEEN 1.5 AND 3 SECONDS**

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following; if the temporo-parietal junction, the area responsible for mental projections and considerations concerning the future, is disrupted through Transcranial Magnetic Stimulation (TMS), people tend to make more impulsive and selfish decisions. However, this observation alone does little to tell us if the change in behavior is based on a change of self-control mechanisms, i.e. a change in temporal discounting preferences, or a completely different reason. To understand the underlying mechanisms, the original behavioral experiment is repeated in the fMRI scanner in order to identify the activity of the various areas in the brain during the decision-making process with and without the TMS treatment.

Watching this from the control room through the mirrored window, one gets a sense of the precision, speed, and teamwork necessary. After the test person has gone through the experiment in a first round, he or she is rolled out and a coil generating Transcranial Magnetic Stimulation (see box opposite) is positioned just behind and above his/her ear, precisely where the temporo-parietal junction lies. A crackling sound accompanies the stimulation for about 40 seconds and then he is rolled back into the scanner. The lab manager and two scientists quickly leave the room, close the door and the experiment is repeated.

The scanner generates around 40 slice images of the brain in two seconds. Each of these slices is around 3mm thin. Depending on the research question and the areas of the brain in concern, different settings and scanning speeds are required. A full scan of the brain takes between 1.5 and 3 seconds. Usually, the subject in the magnetic fields do not have perfectly even structures. These irregularities have an influence on the images the scanner creates and the results need to be recalculated to exclude the distortion created by the inhomogeneity of the magnetic field.

The strong magnetic field generated by the fMRI also means that special rules apply in the lab. Anything magnetic turns into a dangerous weapon within the vicinity of the scanner. Therefore, only people who have run through an intensive lab security training are allowed to use the machinery, as security is a top priority.

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**GLOSSARY**

**fMRI** stands for Functional Magnetic Resonance Imaging. In the scanner, a strong magnetic field and radio waves create detailed images of the brain. Whenever an area in the brain is active, more blood flows into that area. In the scanning process, these changes in blood flow become visible and help us understand more about how the brain works.

**TMS** stands for Transcranial Magnetic Stimulation. An electromagnetic coil is placed on the head and delivers a magnetic pulse that stimulates and activates the nerve cells in the region. This activation leads to (temporary) changes in the neurological interplay, i.e. it disrupts or switches off an area in the brain for a short time.

**EEG** stands for Electroencephalogram. Sensors are placed on the head and measure the electrical activity. It is then visualized in waves with varying frequency patterns (brainwaves). There are five basic patterns (gamma, beta, alpha, theta, and delta). Each pattern serves a purpose, e.g. learning, relaxing, mood regulation.
Changing how the World Trades Coffee

A confident claim from a company founded just four years ago. But algrano, a small team with a big idea, the right tools and a perfect timing, is revolutionizing the way the second most traded commodity is being bought and sold.

Raphael Studer obtained his PhD from the Department of Economics in 2013 and started out as a trading analyst for a large Swiss energy company just as digitalization was changing the trading floors of the sector. For Raphael Studer, however, things were not moving fast enough. He saw the enormous potential of digital trading platforms and decided that it was time to disrupt a market.

As many start-up stories go, algrano was born over a cup of coffee in a shared flat with a group of friends bringing their experience to the table. The idea was as simple as it is effective: to offer an online platform which allows coffee growers and roasters to interact with one another directly. Previously, growers and producers had to rely on a broker, who was in contact with an exporter or importer who then sold the grains to the coffee roaster. Shipping, quality assurance, taxation, warehouse space, and final distribution generated a lot of coordination and paperwork. These middlemen also added to the cost of the coffee, usually reducing the margin of the grower. Such processes are predestined to be tackled and simplified through digitalization, Raphael Studer and his colleagues thought, and decided to create a digital one-stop platform to connect growers and roasters.

The Time is Ripe

Market maturity and liberalization have strengthened the negotiating position of the growers. With high levels of internet penetration in developing countries, they can now connect internationally. Instead of having to rely on the skills and integrity of a broker, the coffee growers enter descriptions of their ware into the platform. Coffee-roasters can contact them directly and order the amount they require. algrano automatically generates the necessary paperwork for shipping and taxation, and even warehouse space if required. It simplifies the process, while generating market data in a single location.

With three-digit growth rates over the last few years, customers in 16 countries and four of the top ten Swiss roasters buying their coffee through the algrano platform, the current team of six obviously had the perfect idea at the right time. They are currently expanding into more markets.

More: www.algrano.com
Five Things I Did Not Learn at University

Jorge Paulo Lemann

On September 27 2017, the Department of Economics welcomed 110 students to a lecture by the Brazilian-Swiss investor and banker Jorge Paulo Lemann. He told the students that he learned as much from his errors as a businessman and investor as he did from his formal training at Harvard University.

Current Challenges in International Development Cooperation

Manuel Sager, DEZA

Manuel Sager held a Department Lecture on March 26 to a full hall. He presented how the Swiss Agency for Development and Cooperation (DEZA) ensures that the funds for development cooperation are implemented efficiently and effectively and discussed current challenges as well as learnings from the past.

Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty

The Department and its partners, the UBS International Center of Economics in Society and Swiss Re, held a public lecture with Abhijit V. Banerjee and Esther Duflo on September 21 2017. 450 guests attended the lecture presenting evidence on a wide range of interventions to improve the situation of the poor, e.g. that handing out microcredits can also lead to people buying a TV instead of food, or how the math skills of market children differ from those of children who attend school on a daily basis.

Dollars and Sense: How We Misthink Money and How to Spend Smarter

On January 24 2018, Dan Ariely, James B. Duke Professor of Psychology & Behavioral Economics at Duke University, presented his most recent Book Dollars and Sense in a very entertaining yet thought-provoking way at the University of Zurich. Peppered with anecdotes and bits of trivia, his lecture demonstrated how our ideas about money are often wrong and cost us more than we know, providing the audience with practical tools to understand and improve financial choices, save and spend smarter, and ultimately live better.
Other Events

Zurich Conference on Public Finance in Developing Countries

The second Zurich Conference on Public Finance in Developing Countries took place on December 18/19 2017. Over 60 economists and social scientists from across the world gathered at the Department to hear evidence from research on the effects of a wide range of taxation policies.

More: www.ced.uzh.ch

Social Entrepreneurship Seminar Award to Innovative Startup

Saving the world while still making a profit – quite a challenge! The Department offered a seminar during which students could acquire first-hand knowledge of what it means to be a social entrepreneur, and have the chance to realize their idea. Six teams pitched their business plans to a jury, with the winning team being awarded CHF 10,000, sponsored by the Excellence Foundation Zurich, to kick-start their business idea. Rúben Marquillas and Raphael Metzler won the prize with their business model focusing on incentives to increase teacher attendance in schools in South America, with a simple, low-cost solution for schools to implement.

UBS Center Forum 2017

How to Deal with the Globalization Backlash?

This was the question posed to the leading thinkers and academics at the UBS Center Forum for Economic Dialogue on November 13 2017 in Zurich. The speakers offered different perspectives on this fundamental issue of our time, covering resurgent nationalism, rejection of free trade, opposition to immigration, growing global inequality, and a retreat from multilateralism. The prevailing opinion was that globalization is not yet in reverse, but that there is need for a fairer and more sustainable globalization than we presently have in order to prevent a backlash.

More: www.ubscenter.uzh.ch
Publisher
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Cover: Flickr | Dierk Schaefer |
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