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A NOTE FROM
THE EDITOR

Cowles' fifth season

We dedicate this issue to the time of the year that falls between spring and summer; the frenzied fifth season, or what Cowles staff members endearingly call "conference season." With all hands on deck, the foundation held the 13th Annual Conference on General Equilibrium and its Applications in April, and the Cowles Summer Conferences in early June. Both were very successful as was evident by the record number of participants and their feedback. What's more, a new venue at Evans Hall, Yale School of Management, proved to be a welcome change.

Please take a moment to read about the conferences, as well as two articles on Cowles research staff members, Professors Costas Arkolakis and Mitsuru Igami, who are doing exciting research in their respective fields. In fact, both faculty members were recently featured in the Yale News with articles written by Mike Cummings. Mike’s article on Mitsuru Igami is featured in this issue, and you can find Mike's piece on Costas Arkolakis by following the link at the end of Costas’ feature article in this issue.

Enjoy the next few pages of summer reading and stay tuned for future issues. If you have any comments, corrections, or story ideas, please feel free to contact me directly at matthew.regan@yale.edu. Remember to visit the Cowles website regularly for updates and new discussion paper postings, follow us on Twitter, and like us on Facebook.

Matthew Regan
Communications Manager, Cowles Foundation
In this issue we congratulate Costas Arkolakis, Henry Kohn Associate Professor of Economics, who received the 2017 Bodossaki Foundation Distinguished Young Scientists Award for social-economic sciences. A member of the department since 2007, Arkolakis’ research and teaching specializes in general equilibrium trade theory, spatial economics, and macroeconomics.

The Distinguished Young Scientists Award is given out by the Bodossaki Foundation to distinguished scholars of Greek nationality or decent, and who are under the age of 45. According to the organization, “these prizes aim to support the creative work of young Greek scientists and to reward their commitment and effort to the advancement of science as well as to contribute to the promotion of exemplary role models for the society.”

This is the first year the prize has been awarded since 2008 due to the economic crisis in Greece. When the Bodossaki Foundation resumed the prize last fall, there appeared to be a renewed interest which was evident in the uptick in submissions.

“This programme attracted a large number of brilliant candidates making the selection of the prizewinner a particularly difficult task for the Screening Committees,” said Bodossaki Foundation President, Dimitris Vlastos. “Given the strong competition between scientists of the highest level in this field, we believe that Dr. Arkolakis’ distinction is particularly honouring.”

The selection of the prize winners are based on their exceptional achievements in the respective field by a nine-member selection committee of specialists. The committee then makes recommendations to the Board of Trustees who ultimately select the prizewinners. This year’s winners receive a 10,000 EUR prize, and are invited to attend a ceremony in Athens at the beginning of June, where the prizes will be delivered by the President of Greece, Prokopis Pavlopoulos.


For an in-depth interview with Costas, see the Yale News article profiling Costas and his research:

Economist Costas Arkolakis Prizes Cross-disciplinary Approach
For this issue, we dig back in our archives to showcase the Cowles 50th Anniversary Celebration held on Friday and Saturday, June 3-4, 1983. The gathering featured five of the six Nobel Prize winners associated with the Cowles Foundation: Kenneth Arrow, Tjalling Koopmans, James Tobin, Paul Samuelson, and Lawrence Klein. Below is an article from the New Haven Register.

New Haven Register, June 4, 1983

Economic researchers review progress

By JENNIFER KAYLIN
Staff Reporter

From the era of the Great Depression to the days of Reaganomics, a cadre of economists, mathematicians and statisticians have revolutionized the way modern economics is applied to practical problems — an achievement that has required a rewriting of virtually all economics textbooks.

Friday and today the foundation celebrated its 50th anniversary at Yale University. More than 75 of the nation’s leading economists, including five Nobel laureates, gathered at the School of Organization and Management to review the accomplishments of the foundation over the last half-century.

According to Director Herbert Scarf, the foundation was started by Chicago Investment Counselor Alfred Cowles in 1932. Cowles had witnessed the ravages of the Great Depression in 1929 and dedicated scientific methods should be applied to understand what had happened. He wanted to change stock market forecasting from a “guessing game” into a study based on mathematical and statistical facts, Scarf said.

“There is no other example of a private citizen having so profound an influence on the development of a discipline such as economics for such a prolonged period of time,” he said.

The foundation was originally called the Cowles Commission and was located in Boulder, Colorado. It later moved to the University of Chicago and then to Yale, where it has been based since 1956.

The current group at Yale consists of 10 members, who are invited to become either lifetime or temporary members. Cowles, who has been the driving force behind the foundation since its inception, was prevented from attending the anniversary because of poor health.

Six American winners of the Nobel Memorial Prize in Economic Science have been associated with the Cowles Foundation, and five attended the anniversary celebration. They were: Professor Kenneth Arrow of Stanford, Professors Tjalling Koopmans and James Tobin of Yale, Professor Lawrence Klein of the University of Pennsylvania and Professor Paul Samuelson of the Massachusetts Institute of Technology. The sixth, Professor Herbert Simon of Carnegie-Mellon University, was unable to be present.

Speeches delivered at the anniversary conference will be compiled and published in a book issued by the Yale University Press sometime next fall.

According to Scarf, the foundation’s early work focused on the development of formal models of the national economy. The models were used to make predictions on the state of the economy for the next six months to a year. Klein’s Nobel prize was awarded for his work in the area of economic forecasting.

Other early scientific breakthroughs involved the development of linear programming methods for solving problems relating to the allocation of scarce resources, for which Koopmans received a Nobel prize, and advances in macroeconomics on the theoretical and practical level, for which Tobin was honored.

Cowles researchers also developed the theory of social and political choice affecting economic policy and formulated the concept of “game theory” to study the economic problem that arises when two or more organizations with different interests come into conflict. This theory is applicable to situations such as strategic weapons considerations.

Future issues that undoubtedly will be studied by the foundation, according to Scarf, will focus on the scarcity of certain minerals and resources.
The 13th annual Conference on General Equilibrium and its Applications sponsored by the Cowles Foundation, was held on April 28-29, 2017. The two-day event hosted upward of 70 speakers and participants from the U.S. and abroad specializing in the study of general equilibrium (GE) economics.

The GE conference was founded in 2005 by John Geanakoplos, James Tobin Professor of Economics, along with UPenn Professor, and former Yale Assistant Professor, David Cass. “We thought general equilibrium was a unifying theme for many different fields of economics. We thought the most exciting work in economics was being done in macro and finance, but we wanted to take a more theoretical approach to these subjects,” said Geanakoplos when asked why the conference was started.

In its simplest definition, “general equilibrium means supply and demand among many different markets at the same time and how they interact with each other,” said Geanakoplos who also serves as the conference lead organizer.

Having humble beginnings with 40-50 paper submissions its inaugural year, the conference has become a prestigious event in the area of GE. The number of submissions grew to nearly 130 papers this year, with only 13 papers selected to present. While competition is quite stiff, it is a testament to the interest the conference has gained over the years, something Geanakoplos is quite proud of. “It is becoming quite a big deal,” he said.

The study of general equilibrium is not new to Yale, with the Cowles Foundation, as it is steeped in tradition with many former members focusing their research in the area. Two of the greatest GE theorists were Kenneth Arrow and Gérard Debreu, both of whom were Cowles research staff members and Nobel laureates. The two economists also ran a conference dedicated to GE in the 1960s and 70s.

Although the number of Yale faculty focusing on GE has decreased over the years with the recent retirement of Don Brown and the death of Hebert Scarf, classes on the subject are still taught by Geanakoplos and Truman Bewley, Alfred C. Cowles Professor of Economics. It is, however, the hope of Geanakoplos to rejuvenate faculty interest in GE, and the annual conference is one way to do so.

“General equilibrium theory has become one of the standard methodologies in macro economics and finance and international trade. It used to be regarded as the most theoretical of the economics fields,” said Geanakoplos. “Now it’s become so successful that it’s permeated many applied fields.”

This year’s complete schedule listing of times, talks, and presenters can be found on the 13th Annual GE conference page: http://cowles.yale.edu/conferences/ge13
Cowles 2017 Summer Conference Series Recap

By Matthew Regan

The Cowles Foundation wrapped up its 2017 summer conference series which featured five areas of economic research. A record number of participants partook in the five-day event coming from as far away as Asia, Europe, and South America.

The annual conference is typically held the second week of June and highlights the economic programs associated with the Cowles Foundation which include Economic Theory, Econometrics, International Trade, Macroeconomics, and Structural Microeconomics.

Each program conference spanned two days except for International Trade which held its inaugural conference, and lasted one day. With an average of six sessions per day, each conference drew 50-80 participants totaling more than 275 attendees over the week.

“Each of the conferences has the feeling of a two-day discussion among the leading economists in the area. It’s an intense but immensely rewarding experience,” said Cowles Foundation Director, Larry Samuelson.

Seen as one of the foremost conferences in the field of economics, the event is by invitation only. Samuelson noted that it is a fine line striking a balance between including as many people as possible, with the need to keep the setting relatively intimate.

“The participants routinely indicate that the Cowles conferences are among the best and most productive conferences they have attended,” said Samuelson. “That said, we are constantly looking for ways to improve the experience. Each year the Cowles staff becomes more effective in staging the conferences and ensuring that the conferences run sufficiently smoothly that participants can focus on the research.”

New to the conference series this year was its venue which was held at the Yale School of Management’s Evans Hall.

For the past nine years, the conferences were held at the old School of Management’s Watson Center. Feedback from participants has been positive according to conference coordinator, Darlene Smith. “The modern building with its open space made it more conducive for participants to have intimate conversations between sessions,” said Smith. “The building staff were also easy to work with and provided great service.”

Samuelson agreed saying, “The new SOM building proved to be an ideal venue for the conference. The combination of state-of-the-art rooms for the talks with ample open space for people to congregate and talk proved to be quite effective. The formal talks at a conference set the stage, with much of the work being done in the informal discussions that surround these talks.”

Tentative dates for next year’s summer conferences are scheduled for June 4-8, 2018.

For a complete schedule listing of times, talks, and presenters from this year’s conferences, visit the Cowles Conference and Workshop page.
Kodak, once a giant of global industry, is a shell of its former self — largely undone by the rise of digital photography. Borders, which operated hundreds of bookstores at its height, liquidated in 2011 — a casualty of Amazon’s dominance in online retail. Nokia, an early leader in the smartphone market, proved unable to compete with Apple’s iPhone and Samsung’s Galaxy products.

Economists and businesses have long sought to understand why established companies lag behind younger companies in introducing new technologies and innovative products. In a 1997 bestseller, “The Innovator’s Dilemma,” Harvard Business School Professor Clayton Christensen pinned the phenomenon on irrational decision making by the “old champion” firms. He based his conclusion, in part, on a case study of the hard disk drive industry.

Yale economist Mitsuru Igami, analyzing the same data on the hard drive industry, has arrived at a different conclusion: Established firms can fail to innovate even when their managers behave perfectly rationally. He described his findings in an article published recently in the Journal of Political Economy.

Igami, an assistant professor of economics, spoke with YaleNews about his work. An edited and condensed version of the conversation follows.

**WHAT DREW YOU TO STUDY BOTH THE CONCEPT OF THE INNOVATOR’S DILEMMA AND CHRISTENSEN’S APPROACH TO IT?**

Trying to understand why incumbent firms lag behind new entrants when drastic innovations are happening is an old topic for economists. Karl Marx and Joseph Schumpeter in the late 19th and early 20th centuries, respectively, considered the turnover of technologies. Schumpeter coined the term “creative destruction” to describe the simultaneous turnovers of technologies and firms. New technologies come; old technologies go. New firms come; old firms go.

The term “innovator’s dilemma” focuses on the decision making of established firms. If they are too slow to innovate, they will disappear. Why do they resist innovation?

Christensen resorted to some notion of stupidity or irrationality in trying to explain why these firms failed. As a trained economist, I wanted to answer with simpler logic. Could there be a reason, even if firms behave rationally, that they would be reluctant to introduce new technology? There has been theoretical work on this question, such as late Kenneth Arrow’s paper in 1962, but my study provides the first serious empirical evidence.

**HOW DOES YOUR APPROACH DIFFER FROM CHRISTENSEN’S APPROACH?**

There are three key differences. The first concerns method. He took more of an anthropological approach in conducting what is essentially a business history. He interviewed former executives at failed firms and identified factors and decisions that appeared to explain why those firms failed to grasp new generations of technologies. Christensen was sitting on this pile of quantitative data about the hard drive industry without really using it. I performed an analysis of the same data, which covered the hard drive industry 1976 through 1998, using mathematical models.

Secondly, Christensen mainly focuses on intra-firm politics, which is what he learned from interviewing people. As an economist, I was more interested in inter-firm competition. How many firms are competing? How many are established firms versus startups?

The third difference is the nature of our explanations. He resorted to explanations involving irrationality, including problems that arose from internal resource struggles, bounded rationality, and myopic managerial decision-making. Trained economists are skeptical of “irrationality” as a serious answer.
If you say a company failed because its executives were stupid, it is almost like saying they must have been stupid because they failed. There is some sense of tautology there. I analyzed data to find whether there are fundamental reasons why old firms can behave rationally and still lag behind new firms in innovation.

WHAT DID YOU FIND?
It’s very simple: Incumbent firms — the old champions — are by definition very good at operating with the existing technology and churning out old products. To the extent that the new products and old products compete with each other, or substitute for each other — a phenomenon called cannibalization — it makes incumbent firms less inclined to embrace innovation. If you are an old champion firm introducing new products, to some extent you are just replacing your old source of profit with a new one. You might earn 5% or 10% more profits, but that’s it. By contrast, if you are a startup, you are starting from zero profits. By definition, incumbent firms have less incentive to introduce new products.

DO THE “OLD CHAMPION” FIRMS POSSESS ADVANTAGES OVER STARTUPS? HOW DO THOSE ADVANTAGES FACTOR INTO THE QUESTION?
It’s a good point. My model allows for potential differences in efficiency and capability. I’m letting data speak in terms of whether, on average, old firms or new firms are better at innovating. There are competing theories. When Schumpeter was young in the 1920s and 1930s, he argued that younger entrepreneurial firms should be leading innovation. He changed his mind as he grew older and moved from Austria to Harvard, and began arguing that established firms might have accumulated knowledge and other advantages. The only reasonable course for an empiricist like me is to let this be a free parameter in my model.

Incumbents, on average, seemed more able to innovate than new firms. This makes sense because, while my data crosses generations, it essentially involves the same hard drive engineering technology, which should give incumbents an advantage. But even with this advantage, cannibalization turned out to be a more powerful factor that pulls established firms behind.

YOU ALSO EXAMINED THE EFFECTS OF PUBLIC POLICIES MEANT TO STIMULATE INNOVATION. WHAT DID YOU FIND?
There are many different ways people consider designing public policies to foster innovation and/or competition. I tried simulation experiments to find a combination of policies that would be most effective, because I cannot actually go back 40 years and tweak government policy on Silicon Valley. All you can do is build a theoretical model, flesh it out with data analysis, and conduct these simulation experiments.

One of my experiments concerns the patent system, such as making patents stronger or broader. The other explores whether there might be a structure of patents and licensing fees — fees charged by patent holders for use of their idea — that would foster innovation and competition simultaneously. What constitutes the optimal fee structure is an open question, so I tried many different fee structures. Nothing really convincingly outperformed the actual history of the hard drive industry.

An ideal patent system might do a good job of fostering innovation. In reality, the patent system is messy. Nobody knows who owns what patent on what piece of technology. It is hard to envision a better functioning system that could exist in reality. That sounds like bad news, but the flipside of the finding is that the actual historical trajectory of the hard drive industry is very hard to beat with clever schemes. That’s kind of encouraging.
| CFDP 2082 | David F. Hendry, Peter C. B. Phillips, "John Denis Sargan at the London School of Economics," (March 2017) [20 pp, abstract] |
| CFDP 2079 | Brian Adams, Kevin R. Williams, "Zone Pricing in Retail Oligopoly," (February 2017, Revised April 2017) [44 pp, abstract] |
| CFDP 2078 | Dirk Berghmann, Francisco Castro, Gabriel Weintraub, "The Scope of Sequential Screening with Ex-Post Participation Constraints," (February 2017, Revised June 2017) [52 pp, abstract] |
| CFDP 2077 | John Geanakoplos, Kieran James Walsh, "Inefficient Liquidity Provision," (February 2017) [26 pp, abstract] |
| CFDP 2073 | Donald W. K. Andrews, Vadim Marmer, Zhengfei Yu, "A Note on Optimal Inference in the Linear IV Model," (February 2017) [28 pp, abstract] [Supplemental material, 70 pp] |
| CFDP 2071 | John C. Chao, Peter C. B. Phillips, "Uniform Inference in Panel Autoregression," (January 2017) [41 pp, abstract] [Supplemental material, 282 pp] |
| CFDP 2070 | David A. Keiser, Joseph S. Shapiro, "Consequences of the Clean Water Act and the Demand for Water Quality," (January 2017) [90 pp, abstract] |
| CFDP 1923R2 | Xiaohong Chen, Timothy Christensen, "Optimal Sup-Norm Rates and Uniform Inference on Nonlinear Functionals of Nonparametric IV Regression," (August 2013, Revised February 2017) [43 pp, abstract] [Supplemental material, 51 pp] |