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Ninth IDEI-TSE-IAST
Conference on:

The Economics of Intellectual Property, Software and the Internet

*Toulouse,
January 7-8, 2016*

Dear Readers

After a too long a lapse, we are happy and proud to present a new issue of the TNIT Newsletter. We hope that you will find the content, oriented towards the work of our members, interesting.

There are two articles that are directly concerned with the media industry, one by Matthew Genzkow, the newest member of the Network, and another one by Ananya Sen, a graduate student at Toulouse School of Economics.

Susan Athey presents a provocative discussion of privacy on the Internet and discusses policy options.

Finally, an article by Jacques Crémer and Josh Lerner reminds us that Jean Tirole's Nobel prize was in great part due to contributions to the subjects studied by the TNIT.

Enjoy reading, and, as usual, please do not hesitate to send us your reactions.

The annual meeting of the Network members this year was held in the Microsoft head office at Redmond. It was the stage for stimulating exchanges which we will discuss in a future issue.

The TNIT Newsletter format is under revision. We are aiming to publish it at more regular intervals with a zoom on each members research work and trending topics. Your inputs are valuable!

Jacques Crémer - Scientific Head & Priyanka Talim - Project Manager

The Toulouse Network for Information Technology (TNIT) is a research network funded by Microsoft and managed by the Institut d'Économie Industrielle. It aims at stimulating world-class research in the Economics of Information Technology, Intellectual Property, Software Security, Liability, and Related Topics.

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Competition Policy and the Media¹

by Matthew Gentzkow

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More about M. Gentzkow 

Photo: iStock



Traditional competition policy seeks to limit market power, or its exercise, in order to increase economic welfare. Competition is good - a goal of policy - because it may lead to lower prices, better products, and greater combined surplus of consumers and firms.

These goals apply to media industries like any others, and media are subject to standard antitrust and regulatory standards. Yet regulation of media in the United States and around the world has been profoundly shaped by an additional proposition: that media competition promotes truth, and therefore contributes to the health of democracy.

This idea, already current in colonial America, has been called “one of the earliest and most influential contributions to First Amendment doctrine.” The Federal Communication Commission calls it “one of the basic tenets of our national communications policy.” Allusions to it appear in at least 126 US Supreme Court opinions and at least 87 policy documents of the Federal Communications Commission. The Supreme Court has held that “the widest possible dissemination of information from diverse and antagonistic sources is essential to the welfare of the public” (Associate Press v. United States 1945).

While the proposition that competitive media are more likely to produce socially valuable information has an excellent pedigree, it is far from obvious. Many people have argued that increased competition in the digital era has led to cutbacks in reporting and editorial quality. Firms such as the BBC that are insulated from traditional product market competition are sometimes viewed as especially informative, and competitive private media are often accused of favoring celebrity gossip, car chases, and other stories of dubious social value. Authors such as Cass Sunstein have pointed out that too much competition and variety online may contribute to political polarization, as consumers can self-segregate into “echo chambers” where their own ideological prejudices are reinforced.

What does economics have to say? In recent years, many economists have worked to flesh out the effects of media competition both

theoretically and empirically. This work has clarified the foundations of the traditional argument in favor of competition, the ways in which competition can also be problematic, and the cases in which each is most likely to occur.

In this article, I provide a flavor of the lessons from this literature in the form of two concrete arguments, one in favor of competition and one (potentially) opposed. The discussion suggests a broader lesson: whether competition will be beneficial or harmful will often hinge on whether the distortions or bias we are concerned about are ultimately driven by the supply-side or the demand-side of the market.

Competition and Independence

In mid-April, 2004, CBS News received a dossier of photos and videos graphically detailing detainee abuse by American soldiers in Iraq’s Abu Ghraib prison. This was both an enormously valuable scoop for CBS and a revelation with potentially devastating political and military implications. Aware that CBS had this information, the chairman of the Joint Chiefs of Staff personally called CBS anchor Dan Rather to ask him to suppress the photos and videos, at least temporarily. He gave a variety of reasons, including the effect the information would have on the safety of American hostages. Rather agreed and the planned broadcast was postponed.

A somewhat similar sequence of events had taken place several decades earlier

The press was protected so that it could bare the secrets of government and inform the people. Only a free and unrestrained press can effectively expose deception in government.

Hugo Black,
New York Times Co. v. United States (403 U.S. 713 [1971])

¹/ This article is a condensed version of “Competition and Truth in the Market for News” by Matthew Gentzkow and Jesse M. Shapiro.

when the New York Times began printing excerpts from an internal government history of the Vietnam War commonly known as the “Pentagon Papers.” The Nixon administration viewed these papers as potentially damaging to national security. The day after the first story appeared, the Justice Department sent a telegram instructing the Times to cease publication and, through separate communication, threatened legal action. When the Times continued publishing the papers, the government went to court and obtained an injunction to halt their publication.

The oldest and most frequently discussed objection to handing control of the media to a small number of firms is that those firms will be captured by the government. Even in countries where the press is protected by strong constitutional guarantees of independence, the state has many levers by which to influence it. In the case of CBS, a phone call was sufficient to delay broadcast of the Abu Ghraib photographs. To suppress the Pentagon Papers, the Nixon administration used legal action premised on its special powers in the domain of national security. Control of access to reporters and regulatory powers provide additional levers.

How can competition prevent government capture of the media? For one thing, it increases the range of incentives that exists in the market. Suppose that the government threatens to stop returning calls from any firm that reports a particular damaging story. Suppose that both the cost of this lost access and the benefit from reporting the story vary across firms. (The costs might differ because different firms have different levels of initial access; the benefits might differ because of variation in the tastes of consumers or the premium owners put on public service.) Suppose, finally, that if at least one firm reports the story it will be widely rebroadcast and all consumers will learn about it. In this case, the more firms there are in the market, the more likely that at least one of them will have a benefit to reporting that exceeds the cost of government retaliation and the story will be exposed.

The strategic interactions among firms provide additional checks on capture. First, once one firm reports the story, the value to the government of preventing any other firm from reporting it disappears. This means the government cannot bribe some firms but not others. Second, the more firms have been convinced to suppress the story, the greater is the value to any other firm of refusing and reporting it, because they would potentially have an exclusive and a scandal that would damage their competitors. If the story is to be completely suppressed, each firm must be given enough incentive to pass up the opportunity to be the one heroic outlet that reported it.

We can see these forces play out in the resolution of the Pentagon Papers case. The New York Times had originally obtained the documents from an MIT researcher named Daniel Ellsberg. When Ellsberg learned of the injunction against the Times, he contacted the three major television networks and offered them the documents. All three refused to make them public, presumably fearing similar legal action. Ellsberg then offered the documents to the Washington Post, which agreed to publish them. Thus, no sooner had the administration succeeded in silencing the Times, than the Post picked up printing where it had left off. Eventually,

the government pursued legal action against both papers which ended with the Supreme Court’s decision in *New York Times Co. v. United States* (403 U.S. 713 [1971]) and the quotation from Hugo Black at the start of this section, upholding the papers’ right to publish.

Both of the strategic checks are readily apparent in these events. First, as soon as some piece of information was published by at least one paper, the government’s incentives to suppress further publication were dramatically weakened. This was made clear during oral arguments for *New York Times Co. v. United States* in the following exchange between one of the Supreme Court justices and the government counsel:

Question: To the extent anything has been published and has already been revealed, the United States is not seeking an injunction against further publication of that particular item?

Solicitor General: No, Mr. Justice. I think at that point we would agree that it becomes futile. It is useless.

Second, the fact that the *Times* had been barred from publishing increased the Post’s returns to printing the story. As long as the Times could publish, the Post was reduced to “[rewriting] stories that appeared in the Times, crediting the competition with their original publication,” as Publisher Katherine Graham wrote in her autobiography. Once the Times was muzzled, the Post had both an exclusive story and a chance to be seen as a solitary defender of press freedom. Graham called the story “the graduation of the Post into the highest ranks.” She recalled: “One of our unspoken goals was to get the world to refer to the Post and the New York Times in the same breath . . . After the Pentagon Papers, they did.”

That CBS’s 60 Minutes finally broadcast the photos and videos from Abu Ghraib on April 28, 2004, is also due in large part to competitive forces. Three full weeks after CBS first obtained the information, they learned that investigative reporter Seymour Hersh had also obtained copies of some of the photos and that they would be published in an upcoming issue of the *New Yorker*. Although we do not have detailed documentation on the decision-making process within CBS, Dan Rather made clear to viewers that competition was instrumental in causing the broadcast to go forward: “Two weeks ago, we received an appeal from the Defense Department . . . to delay this broadcast given the danger and tension on the ground in Iraq. We decided to honor that request . . . This week, with the photos beginning to circulate elsewhere and with other journalists about to publish their versions of the story, the Defense Department agreed to cooperate in our report.”

Competition and Demand-Driven Bias

We can think of government capture as a distortion originating on the “supply-side” of the market. Broadly speaking, competition is effective in reducing this kind of distortion because competition makes it more costly for firms to deviate from the kind of content that consumers want. Competition produces truth because we assume that consumers value truth more than falsehood or suppression. This argument suggests that the benefits of competition will be less clear when distortions in news

It is so difficult to draw a clear line of separation between the abuse and the wholesome use of the press, that as yet we have found it better to trust the public judgment, rather than the magistrate, with the discrimination between truth and falsehood. And hitherto the public judgment has performed that office with wonderful correctness.

Thomas Jefferson
1803

reports the evidence and points out that its competitor had suppressed it. How will learning this change the left-leaning consumers' willingness to pay for the first outlet?

At one extreme, suppose that consumers consciously trade off accuracy of a news source against a preference for information that is likely to confirm their beliefs. They want to learn the truth, but will choose a less accurate source or one that avoids reporting certain kinds of facts in order to avoid having their personal beliefs challenged. In this case, consumers who watch the left-wing news station do so because it will avoid reporting facts like the corruption of a Democratic politician. That a competitor highlights this will not change their willingness to pay, and the firm's profits should not suffer as a result.

This description probably captures some kinds of distortions, especially to the extent that the taste for confirmatory information is partly about a desire to be entertained. Readers of liberal magazines may enjoy the fact that they present many negative stories about Republicans and few negative stories about Democrats. An exposé by a competitor about the magazine's unbalanced reporting may not harm its reputation. If Rush Limbaugh devotes a great deal of time to skewering Democrats but ignores misdeeds by Republicans, he may not be punished. Nobody really expects a balanced perspective from a late-night comedian like David Letterman or Jon Stewart. That this kind of "slant" is designed partly for entertainment by no means suggests that it cannot cause real distortions in consumers' beliefs.

Competition will be relatively ineffective in disciplining this kind of bias. Of course, having more sources of information available may lead

markets are driven by the demands of consumers themselves.

Why might consumers demand distorted news? A leading case is that they may prefer news that is consistent with their own ideological beliefs or prejudices. It is a robust fact that conservatives gravitate toward news with a (relatively) conservative slant, and liberals gravitate toward news with a (relatively) liberal slant. Work in both psychology and economics has identified a range of explanations for this phenomenon, both rational and irrational.

How does competition affect the revelation of truth when this kind of distortion is present? The answer depends critically on why consumers prefer like-minded information sources. Suppose a left-wing news outlet chooses not to report an important fact—say evidence of corruption by a Democratic politician—because this fact would conflict with the prior beliefs of its target readers. Suppose that a competing news outlet

consumers' beliefs to be somewhat closer to the truth if consumers are exposed to them. If Rush Limbaugh was the only source of information, right-wing viewers would probably have much more distorted beliefs than if they also watched CNN from time to time. But competition from CNN would be unlikely to lead Rush Limbaugh to moderate his own content.

At the other extreme, suppose that consumers choose like-minded sources because they sincerely believe that they are more accurate. A large body of evidence in psychology shows that subjects tend to remember evidence better, and rate its quality more highly, when it supports their prior beliefs. With respect to direct ratings of news sources, consumers around the world rate the quality of news outlets whose slant matches their own views to be higher on a number of dimensions. This outcome could occur because of information-processing heuristics, coarse thinking, or a rational process of trying to learn which sources are accurate.

To the extent that confirmatory preferences are driven by a desire for accuracy, competition will be more effective in disciplining bias. A monopoly firm will prefer to distort information or suppress important facts to convince consumers that it is high quality. In the presence of competitors, however, firms run the risk that such inaccuracies will be exposed and that consumers' assessments of their quality will fall as a result.

Numerous examples show that news firms pay a high price when they are shown clearly to have distorted information. For example, the exposure of fraudulent reporting by the reporter Jayson Blair at the New York Times caused a major scandal that led top editors Howell Raines and Gerald M. Boyd to resign. Similarly, when a CBS News report on George W. Bush's National Guard service was shown to be based on fraudulent documents, the segment producer, Senior Vice President of CBS News, and Executive Producer were all fired or asked to resign. Anchor Dan Rather resigned several months after the broadcast.

A more precise understanding of the way competition affects firms' incentives to slant the news will require knowing more about what drives confirmatory preferences in specific situations. Anecdotal evidence strongly suggests that competition will be effective in preventing firms from catering to consumers through outright distortions or omission of major facts. It is less clear how competition will operate in cases where distortions takes the form of subtle "spin," are harder to expose definitively, or are intended mainly to entertain. Finally, the gains to increased market discipline must be compared to the potential costs of consumer self-segregation. Convincing empirical analysis of these different forces remains an important subject for future research.

An economic view of privacy

by Susan Athey

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[More about S. Athey](#) ↓



The arrival of the “era of big data” has been heralded as transformative for industry, economic growth, and efficiency. Every day brings new headlines about technological advances that have the potential to greatly improve our lives. But we also notice advertisements that are increasingly tailored to our interests, after browsing for autos, we begin to see more ads for cars.

Although we always knew that our data was out there being used, it has become more salient as we see companies use it in new innovative ways. Yet, many of us are happy to hand over personal data in exchange for valuable services. For example, we might use an application that scans our email looking for travel plans and creates travel itineraries, saving valuable time. We might be delighted when the “personal assistant” function on our mobile phone reminds us of appointments. On the other hand, news of widespread government

Market failures in the market for privacy and the role of regulation

Markets don’t function well when it comes to privacy. First, many consumers are not informed about privacy and do not understand the risks and benefits of alternative privacy policies of firms. They are complex and not standardized. Even experts find it difficult to understand governments and private entities make use of data. This first factor contributes to the second, which is that there is little evidence that consumers change their behavior in response to differences in privacy policies.

Third, for many technology products, markets are highly concentrated, and consumers do not perceive choices that are different enough on privacy policy to understand. Thus, a policy of “notify and consent” may not seem meaningful if there is no comparable alternative to a company’s product, or if the consumer has already invested in learning and using a company’s product and does not want to switch when privacy policies are changed. The incentives for consumers to “punish” a firm for poor privacy

surveillance has made many of us nervous, as we had not expected that this surveillance was occurring.

In the face of these trends, it is difficult for policy-makers to know how to respond. Antitrust and privacy regulators both face a classic tradeoff between allowing technological innovation to proceed disciplined only by the market and consumer choice, or intervening and risking doing more harm than good.

Despite the fact that policy-makers profess an acute awareness of these tradeoffs, much of the public discourse around these issues misses fundamental facts as well as economic principles that provide some guidance as to when market solutions are likely to well and poorly, as well as when regulatory solutions might do well and poorly. A deeper understanding is crucial to achieving an appropriate balance between costs and benefits of government intervention.

policy is low. Fourth, and as a consequence it is difficult to measure the consumer benefits of improved privacy policy in a coherent way: it is hard to measure consumer preferences for something that consumers do not understand.

Fifth, consumers may also change their feelings about the risks of a large firm retaining their data after news about government subpoenas or U.S. National Security Administration surveillance. Indeed, Marthews and Tucker (2012) show that users change their search behavior, reducing their queries on politically sensitive terms, after media reports about government surveillance. In such an environment, it is difficult to know how to put a dollar value on benefits to privacy protection to trade off against harm to long-term welfare, innovation, and so on.

Sixth, consumers face a free rider problem faced by consumers—no individual has the incentive (nor the expertise) to audit major technology firms with which they interact. Regulation could, in principle, provide organized and expert-designed information to consumers about the choices that consumers face, helping consumers choose between a better defined set of alternatives.

Regulatory failures

Now let us consider some potential harms from privacy regulation. First and foremost, privacy regulation may interfere with the effectiveness of online advertising and make it harder for new ventures to attract an initial user base or to monetize their content. This lower efficiency of online advertising can lead to decreases in innovation and in the creation of content.

Second, harming the efficiency of online advertising is typically regressive. Advertising supports free products, typically more appreciated and used by low income people. For instance, the evidence suggests that disadvantaged women are harmed by the lack of medical information, whose diffusion is financed by advertising, when they come to the hospital

Third, past attempts at privacy regulation results in privacy policies which are typically too difficult to read. “Notice and consent” has had little impact on consumer behavior; only a tiny fraction of users read such notices, and an even smaller fraction understand them.

Fourth, in concentrated sectors privacy regulation can be used by incumbents to keep users out. For example, incumbent firms may have more data than entrants for targeted advertising. Privacy policies can make it hard for small, new firms to get a toe-hold (Goldfarb and Tucker, 2011).

What kinds of policies, then, have some hope of balancing the costs and benefits appropriately? One approach, promoted by Microsoft’s Craig Mundie, is to attach metadata to every piece of personal information, which would describe the uses to it can be put, as per the instructions of the individuals it concerns. A very large penalty would be enacted for violating the rules. Under this proposal, efficiency enhancing innovations such as targeted advertising could be used, but users could control the use of the data even in a complex ecosystem whose details they might not understand. Although it might have seemed technologically challenging to implement such a shared database, recent innovations in decentralized ledger technology such as Bitcoin have shown that a large public ledger can maintain security. One could envision blockchain technology keeping a ledger of personal data (described by a hash, not the data itself) as well as its permissions; and users would have the key that could be used to revoke privileges at any time. This kind of proposal can be contrasted with an approach of banning particular technologies. Policy aimed primarily at forbidding, e.g., cookies can be undermined through the use of other technology that accomplishes a similar goal. And cookies may not even be relevant in new form factors or settings (like the “internet of things,” the “smart home,” “wearables,” or mobile).

Limits on data retention

Another type of policy provides broader protection through limits on data retention. Chiow and Tucker (2014) provided evidence from recent data that changes in retention policy did not change the quality of search engine results, consistent with general industry understanding that recent data is much more useful. A potential policy would require the data to be anonymized and/or aggregated after a certain time period.

Although there is always some value to having older data, particularly for research and development and for analyzing trends over time, there are also large potential costs to keeping that data. To see why, let us take

the perspective that an individual values privacy because of the risk of economic harm or reputational risk due to discovering information about the individual. (Of course, there are many other perspectives on privacy, as outlined above.) Note that there may be many sources of information about an individual’s current behavior. One could observe their shopping physically, for example. On the other hand, over time, it is more likely that a user might have changed their preferences and behavior, and thus face some costs if their previous behavior was revealed. At the same time, as time passes, there are fewer and fewer ways for an outsider to find detailed data about a user’s past behavior, other than the digital data retained by online firms. Thus, eliminating the digital data has a material impact on the risk that the information is revealed.

Limits on retention are easy for consumers to understand. A consumer can have confidence that something that happened two years ago is more or less “gone” unless they have specifically opted in to retention (e.g. retaining old credit card or bank statements, or historical orders on an e-commerce site).

Limits on retention may seem like a blunt instrument, but, although historical data does have real value, and in some contexts (such as studying health conditions that develop over many years) may be indispensable, in many online contexts, the benefit of long retention of non-anonymized historical data may not outweigh the privacy costs and risks. If limits on retention help consumers become more comfortable with richer uses of current data, and thus policy permits the use of current data to create more value and efficiency (for example in online advertising for small websites and apps), such a policy may have substantial welfare benefits.

Conclusions

Privacy policy needs to consider carefully economic costs and benefits, and it must also be sensitive to the mechanisms through which firm behavior is impacted. Relying on uninformed individual consumers to police firms through “notice and consent” policies is unlikely to result in efficient outcomes. Policy should recognize the limitations of markets in environments where consumers get limited return from the substantial investment they would need to make to understand how privacy practices impact them. Themes in effective policy include simplifying and standardizing information, and making sure that the most important aspects of privacy from a cost/benefit perspective are highlighted to consumers in ways they can understand. In some cases, there may be industry standards that should be enforced by governments, since consumer behavior cannot be relied upon to provide sufficient incentives.

More robust policies may include the establishment of property rights for data, which at least have the potential to allow the efficiency benefits of using data for personalization to be realized, as well as broad measures such as limits on retention that are easy for consumers to understand and also solve a wide range of potential privacy and security concerns simultaneously, without limiting technology. Even retention policies must be carefully considered in each domain, however, because in some domains (such as health), longer retention of data may be justified.

How does the popularity of news stories affect coverage

by Ananya Sen

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[More about A. Sen](#)



There is overwhelming evidence that news affects a wide variety of outcomes ranging from voting, judicial outcomes, and policy, to financial decisions. Despite this large body of research, how coverage decisions for stories are made by news editors essentially remains a ‘black box’.

In research conducted jointly with Pinar Yildirim of the Wharton School at the University of Pennsylvania, we attempt to open up this ‘black box’ with a focus on the role of popularity of online news stories. We ask whether news stories which get a larger number of clicks initially, due to reasons independent of story ‘quality’ or ‘importance’, get covered more by follow-up articles. Moreover, we ask whether the clicks received by a ‘hard’ political or business news story are treated symmetrically to those received by ‘soft’ entertainment stories.

Whether or not news editors systematically follow up on clicks and how they allocate resources across different types of stories has wide ranging implications. There is a growing concern about the ‘dumbing down’ of news content online due to editors focusing on clicks rather than on story ‘quality’ or ‘importance’. More formally, theoretical models show, that selective coverage of stories due to their ‘sensational appeal’ can distort the beliefs of readers and make them demand a sub-optimal policy. These leverage on the fact that news is not a standard product and has a public goods dimension to it with informational externalities. These issues gain greater importance in the context of the Paris attacks carried out by the ISIS and the debate around why Paris got so much more media attention than the bombings in Beirut carried out by the ISIS as well.

To study these issues, we collected information on page views from a leading English language Indian national daily newspaper. Each page view corresponds to an “article”. We are interested in the decision to cover a “story” over several days in different articles. To do so, we first identify the similarities between news articles based on proper nouns occurring in the articles and classify

sufficiently similar articles into stories using a method borrowed from the computer science literature.

Obviously, an article that has received more clicks is more likely to be continued in subsequent article covering the same story. But this might just reflect the fact that editors and readers agree on the importance of a story, and does not indicate that editors are influenced by the behavior of readers. To get around this problem and establish a causal link, we focus on two shocks, orthogonal to the importance of stories, to reader clicks: days with rain and with electricity shortage. On rainy days, readers are constrained in the number of activities they can carry out and may choose to remain indoors which can increase the time online. Second, power shortages may limit the ability of the reader to connect to the internet to visit the news site.

Indeed, stories whose first articles are published on rainy days receive a significantly larger number of clicks. Similarly, stories whose first articles are published on days with electricity shortages receive a significantly smaller number of clicks. We also find that this increase in the number of views of the first article significantly increases the coverage provided by the newspaper on the same issue. Given that there is no reason to believe that stories published on rainy days are more important or that stories published on days with electricity shortages are less important, this proves that editors are significantly affected by the popularity of stories.

In terms of the impact of a clicks based strategy on the type of content, we carry out the estimations on two sub samples of hard news and soft news. To guide story classification, we use the ‘section’ references of articles. Hard news consists of stories in the

National, International, Business and Opinion sections while soft stories are those which are slotted in the Entertainment, Sports, Technology and Lifestyle sections of the newspaper. We find that the editors follow an extremely asymmetric strategy. They follow up articles based on the clicks received only by hard news and not soft news. Moreover, to determine the direction of crowding out, we focus on the breakout of the biggest corruption scams and celebrity scandals during the year, as big hard and soft news events respectively. Days on which news breaks out about a corruption scam, the proportion of clicks on hard news articles increase significantly which also leads to an increase in the

proportion of hard news articles by more than 2% on those days but this effect does not hold for celebrity scandals.

To our knowledge, this is the first study to quantify the impact of popularity on online editorial coverage decisions, and furthermore the first to conduct this analysis at story level. We provide evidence that the newspaper does not respond to the clicks received by soft news stories, allaying concerns about the dumbing down of content online. This is in line with the evidence provided by Salami and Seamans (2014) who find that the quality of news content has improved with the introduction of the internet.

Ninth IDEI-TSE-IAST Conference on: The Economics of Intellectual Property, Software and the Internet

Toulouse, January 7-8, 2016



➔ OUR BI-ANNUAL CONFERENCE IS TURNING ANNUAL!

Thanks to generous funding provided through the [“Chair of the Digital Economy”](#) to TSE and to the IAST (Institute For Advanced Studies in Toulouse), and in order to provide space for the fast developing work on its topic, this conference will now meet every year.

This year, we focus to the understanding of the consequence of digitalization for the economy and for society.

Preliminary program available here:



FURTHER INFORMATION is available on the conference web page, and more specific information will be sent to those who have pre-registered. Travel on the basis of economy class, accommodation and local expenses will be provided for speakers and discussants. For further information contact the conference secretary:

softint@tse-fr.eu

Questions about the scientific content of the conference should be addressed to Eunata Mayor, Project Manager:

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Jean Tirole's contributions to the economics of innovation

by Jacques Crémer & Josh Lerner

[More about J. Tirole](#) ↓

[More about J. Crémer](#) ↓

[More about J. Lerner](#) ↓



The Nobel prize that Jean Tirole obtained last year was the reward for a remarkable set of contributions to economics. The readers of the TNIT newsletter may not realize that for the general public in France, Jean is better known for his contributions, in collaboration with Olivier Blanchard, now chief economist to the International Monetary Fund, to the public debate on reforms of the labor market! The Nobel prize committee rewarded him for his work on Industrial Organization, the study of the structure of industries, where as they put it “Tirole’s overall scientific contribution is greater than the sum of his individual contributions”. But Jean has also contributed to economic theory, the regulation of banks, finance, the theory of organizations of firms, the theory of financial bubbles, economics and psychology and many other fields.

Jean was born and brought up in Troyes, a provincial town of about 60,000 inhabitants a bit more than 100 miles to the south east of Paris. He studied in Paris at the Ecole Polytechnique from which he graduated in 1976, and then entered the French public service by becoming an engineer in the ministry of transportation. At the same time as he was studying at the Ecole des Ponts et Chaussées, the school that prepares the top civil servants of the Ministry, he obtained a doctorate in Applied Mathematics, but had already begun working in economics. He went to MIT in 1978 and obtained his PhD in 1981. For the next three years, he was a researcher in Paris and crossed the Atlantic again to become Professor at MIT up to the beginning of the 1990s where he settled in Toulouse, where he not only continued to produce an amazing flow of top level research, but where he also has taken major administrative responsibilities.

There are three major strands of his work that led Jean to the highest honor that can be bestowed to an economist. First, during his days as a graduate student, he realized that game theory, which had just graduated from being a fringe field of study to a fundamental element of mainstream economics, could provide the intellectual structure for the study of the strategies of firms. The list of his articles on the topic, including some with his graduate school friend Drew Fudenberg, is impressive, but even more impressive is his classic book *The Theory of Industrial Organization*, published five years only after he obtained his PhD. It provided at the same time a structure for understanding the field as it stood at that point and a roadmap for future developments. It is still a much used reference.

Whereas the first set of contributions studied the behavior of unfettered markets, the second focused on the intervention of governments to

regulate industries. Spurred by the debate around the regulation of “natural monopolies” which raged in the 1980s, Jean, in collaboration with Jean-Jacques Laffont, used the new theories of information economics to explore the way in which regulators should provide incentives for the firms under their purview - Electricité de France and France Télécom (now Orange) were among the sponsors of Jean and Jean-Jacques’ work in Toulouse. This work has revolutionized the way in which regulation is done the world over.

Finally, in the first years of the 21st century, along with Jean-Charles Rochet then professor in Toulouse, Jean was the major contributor to the development of the theory of two-sided market, which has revolutionized the study of platforms, and which forms the underlying intellectual framework for much of the research discussed in the TNIT Newsletter.

Although the work for which the Nobel committee rewarded Jean is theoretical, it is grounded in a determination to understand the real world and a dialogue with policy makers. Let us give two examples: Laffont and Tirole applied the insights of their theoretical work to write a primer on the regulation of the Telecommunications industry; the work on two sided market was inspired by a study of the payment card industry.

In recent years, Jean has turned some (he does lots of other things!) of his attention to another important aspect of industrial organization: the study of innovation. This represents both a new field of study for him, but also a new methodology: in this work, done in collaboration with Josh Lerner, he not only developed the theory, but also tested it.

This research on innovation has focused on the growth of new organizational structures to promote the development and diffusion of

ideas. Perhaps the most intriguing of these new models is open source, which seems very unlike what most economists expect. Private firms usually pay their workers, direct and manage their efforts, and control the output and intellectual property thus created. In an open-source project, however, a body of original material is made publicly available for others to use, under certain conditions. Many of the contributors, individuals or firms, to open source projects are unpaid. Indeed, contributions are made under licenses that often restrict the ability of contributors to make money on their own contributions. Open source projects are often loosely structured, with contributors free to pursue whatever area they feel most interesting. Despite these unusual features, recent years have seen a dramatic rise of open source projects.

Jean's work on open source has focused on two questions. The first has been the understanding the motivation of individual contributors. Lerner and Tirole¹ argue that the standard framework of labor economics can be adapted to capture activity in the open source environment. Even if there are no short-run monetary returns from working on open source projects, they argue that participation can have important signaling benefits in the long-run. The paper highlights the importance of programmers' desire to signal their quality - e.g., the desire to impress prospective employers and financiers, as well as obtain peer recognition - as a spur to contributions to open source projects. The presence of these signaling incentives will lead to more success for open source projects where contributions are more visible to the relevant audience (such as peers or employers) and where the talent of the contributor is better discerned from their contributions. The empirical evidence, particularly the survey work of Hann² et al., is largely consistent with the belief that individual contributors to open source projects do ultimately benefit financially from their participating in these projects.

A second area is the legal rules under which open source projects operate. The licenses differ tremendously in the extent to which they enable licensors and contributors to profit from the code that is contributed. Lerner and Tirole³ argue that permissive licenses, where the user retains the ability to use the code as he sees fit, will be more common in cases where projects have strong appeal to the community of open source contributors - for instance, when contributors stand to benefit considerably from signaling incentives or when the licensors are well-trusted. The evidence is largely consistent with these suggestions.

But many of the issues posed by open source are not unique to this setting. Open source can be seen as at the end of a spectrum of technology sharing institutions. Many of these other institutions, such as patent pools and standard setting bodies, have encountered similar conflicts.

To cite one example, how "open" a standard is can critically affect its evolution. The rapidity with which the standard is adopted and the incentives to innovate may be shaped by this decision. For instance, the Internet today runs on a non-proprietary architecture largely because the Internet Engineering Task Force had in its early years a strict policy of only incorporating technology where the developer agreed to license it

on "reasonable and non-discriminatory" (RAND) terms. Had the SSO had a more permissive policy (as indeed they adopted in the mid-1990s), the development of the Internet may have been very different⁴.

In a recent paper, Lerner and Tirole⁵ (2014) examine the challenges that occur when there are multiple routes to solve a given technological problem. Each one of these may be equally viable, but often a standards body will choose only one avenue. After the decision is made, however, the chosen patent becomes a "standard-essential patent (SEP)," and the patent owner can ask for a high royalty even when other patents could have offered comparable value, had the technology been morphed differently.

Standard setting bodies must therefore regulate the licensing of the patents chosen to be part of the standard. To restrain firms from taking advantage of the essentiality of their patents, standards bodies commonly require firms to commit in advance to license their patents on fair, reasonable and non-discriminatory (FRAND) terms. The problem with this approach is that FRAND commitments are very ambiguous; what exactly is a fair and reasonable rate? The substantial ambiguities associated with FRAND commitments have resulted in dozens of enormously expensive litigations. This paper proposes an alternative approach for addressing these issues, which we term structured price commitments. Requiring price commitments is theoretically appealing, rather risk-free, and, we think, definitely worth experimenting with.



Click to see more about Jean Tirole's Nobel Prize



Jean's co authors congratulate him



1/ Lerner, J. and Tirole, J. (2002), Some Simple Economics of Open Source. *Journal of Industrial Economics*, 50: 197–234. doi: 10.1111/1467-6451.00174.

2/ Hann, Il-Horn; Roberts, Jeff; Slaughter, Sandra; and Fielding, Roy (2002), "Economic Incentives for Participating in Open Source Software Projects," ICIS 2002 Proceedings. Paper 33. <http://aisel.aisnet.org/icis2002/3>.

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4/ Bradner, Scott (1999). "The Internet Engineering Task Force" in *Open Sources: Voices from the Open Source Revolution* DiBona, Chris, and Sam Ockman, eds., O'Reilly Media, Inc.. 47-52.

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