FEDERAL TRADE COMMISSION

COMPETITION AND CONSUMER PROTECTION
IN THE 21ST CENTURY

Wednesday, October 24, 2018
9:00 a.m.

Constitution Center
400 7th Street, S.W.
First Floor Conference Room
Washington, D.C.

FEDERAL TRADE COMMISSION

I N D E X

P R O C E E D I N G S

MS. MUNCK: All right, well, good morning. My name is Suzanne Munck, and I am the FTC's Chief Counsel for Intellectual Property and Deputy Director of its Office of Policy Planning. Welcome back to the Fourth Session of the FTC's Hearings on Competition and Consumer Protection in the 21st Century, where we are discussing innovation and intellectual property policy.

Before we begin the substantive program, I'm going to review a couple of administrative matters from yesterday. If you need to evacuate the building, please leave in an orderly manner through the 7th Street exit. That's the main entrance where you came in. After leaving the building, please turn left and proceed down 7th Street, across E Street, to the FTC emergency assembly area. Please remain there until instructed to return to the building.

If you've received a visitor's badge, please remember to return that. Please be advised that this event will be photographed and will be webcast and recorded with huge thanks to our amazing tech team. By participating in this event, you are agreeing that your image and anything you say or submit may be posted indefinitely at FTC.gov or one of the FTC's

social media sites.

We're taking public comments on these hearings. We hope that you will submit, and the deadline for public comment on this particular hearing on IP and innovation policy is December 21st.

With that, it is my extreme pleasure to welcome Drew Hirshfeld from the PTO. Drew Hirshfeld is Commissioner for Patents of the U.S. Patent and Trademark Office. He was appointed to this position in July 2015. As Commissioner for Patents, Mr. Hirshfeld manages and leads the patent organization as its Chief Operating Officer.

He is responsible for managing and directing all aspects of this organization, which affect administration of patent operations, examination policy, patent quality management, international patent cooperation, resources and planning, and budget and administration.

I'm thrilled that we have the PTO at these hearings because we have been very lucky to have a good working relationship with PTO throughout our exploration of IP issues, going back to the early 2000s and probably before that. So thank you very much, and please join me in welcoming Drew Hirshfeld.

(Applause.)

USPTO REMARKS

MR. HIRSHFELD: Thank you, Suzanne. Thank you to the FTC for having me and my colleagues here at the start -- or at the second day of your two-day hearing on competition and consumer protection. It's my honor and pleasure to be here, and happy to be able to share some words with you this morning before I will join on the panel very shortly.

I thought this morning I would address two questions that I know are central to these hearings. One of those questions is what is the role of intellectual property in promoting innovation. And the second question is, is there a role for the Government in advancing or supporting innovation.

So let me start with the first question, and that's what is the role of intellectual property in promoting innovation, and of course I'm going to focus as Commissioner for Patents, I'm going to focus on patents for my remarks. And I think we all recognize that the patent system creates incentives for inventors. You, of course, have your limited time for a monopoly, where inventors can reap those incentives.

It is certainly my opinion, and I know it's shared by many, that those incentives are what really drive and foster innovation and hence competition that

goes along with it. Of course, the patent system fosters disclosure as well, and that disclosure which you get in return for your patent right, that disclosure helps others see your invention and, of course, that also fosters competition.

So I know I'm starting very basic, but what I thought I would do is give an example of an inventor who I ran into contact with on multiple occasions actually in the last two weeks because I think this inventor can best speak for themselves about the benefit of intellectual property and, in particular, the patent system.

So the inventor I'd like to mention is Dr. Lonnie Johnson. Dr. Johnson was brought to USPTO by Director Andrei Iancu as part of a series to educate our own staff on the larger patent system and what happens after patents are issued by the examiners at the USPTO. And I found Dr. Johnson's story to be very, very illustrative of the benefits of the patent system.

So let me give a little bit of his background, he is what I think you would define as the classic tinkerer. He started in high school as a student and started to make a robot out of his sister's toys. I think he used her walkie-talkie to

get the antenna, and he even started a fire in his kitchen when he was working with rocket fuel to do experiments in his kitchen. And he tells a very funny story about his father not chastising him for working with the rocket fuel but chastising him for creating a fire in the kitchen and asking him to use the rocket fuel outside.

After he graduated high school, he went on to get a bachelor of science in mechanical engineering from Tuskegee University, went on, at the same university, to get a master's in nuclear engineering and an honorary doctorate degree in science. He then proceeded to work for the Air Force and NASA's jet propulsion laboratory, where he worked on space nuclear power safety, non-nuclear strategic weapons technology, and he helped develop some of the nation's most advanced technological achievements, including the Galileo Mission to Jupiter, the Mars Observer Project, and the stealth bomber to name a few. More recently, he has on his own created multiple companies working on advanced battery technology.

So why am I talking about Dr. Johnson related to patents? The reason is because Dr. Johnson is a prime example of how the patent system has fostered his own innovation, and he was able to reap

the benefits from his patents, fostering more innovation by himself, fostering the creation of companies and jobs alike, so it really is a wonderful story.

He has currently issued to him over 100 patents. I know they range in technologies, including, I believe, patents on topics related to space flight, digital technology, as I mentioned, the advanced batteries that he's working on, and his actually most famous invention is the Super Soaker, which I'm not sure if you all know what the Super Soaker is, but if you've ever seen that high-powered water gun that can really spray a huge amount of water at once, he is the inventor behind that. That Super Soaker actually was, I believe, in the ‘90s year after year the top-selling or one of the top-selling toys.

So he's a wonderful example of a variety of technologies ranging from high-tech to water guns, where he has been able to achieve success in what he is working on, all based on the patent system. When he was asked recently when he was at USPTO, somebody asked him about what was key and what role did the patents play, and his response was the patents were a key to his success and particularly his own personal success and it had a huge financial impact, enabling

him to make further successes from that.

So it's a wonderful story, and to me it really illustrates the tangible benefits of the patent system, and, of course, if you're ever asked does it take a rocket scientist to build a water gun, I think now we know that the answer is absolutely, it does, if it's going to be the top-selling water gun that there is.

So, anyway, that's my story about Lonnie Johnson. I think it's a wonderful story. I actually struggled because in the last two weeks, I've run into three or four people whose stories would have been wonderful here to support the same concept, but Dr. Johnson really stands out.

This brings me to my second question that I told you I would address, is there a role for the Government in advancing or supporting innovation. And I, of course, believe that the resounding answer to that is yes, there absolutely is a critical role starting with the USPTO, whose mission is to foster innovation in and of itself.

I wanted to talk today in the remaining few minutes that I have about some of the ways we are very focused on fostering innovation, and I want to share some thoughts of Director Iancu, who is in his first

year at USPTO, who came in with a very laser focus on a few items. At the top of that list, in my opinion, is making sure that we have a narrative that is directed to and focused on the great benefits of the U.S. patent system and what it has done for this country and how it has advanced this country.

And In my own personal opinion, what Director Iancu is acknowledging is that while there are challenges in the patent system, while it is very complex, we can address those challenges. Challenges are not new to the patent system. The challenges, of course, change as we move on, but what is most critical and foundational is to not lose sight of those wonderful inventors like Dr. Johnson who advance technology, who create jobs, who advance our country and really move us forward in an unmatched way. So absolutely part of our job in the Federal Government, and particularly USPTO, is to make sure we are educating and sharing those stories.

Some other areas that we are very focused on are what we've been saying are three main priorities right now at the USPTO. These are to address some of the concerns that have been in the system to make sure that we are able to focus on those great success stories. One of those, and at the top of the list for

me personally, is regarding subject matter eligibility. And I believe FTC is likely planning a hearing on that coming up, and I know USPTO is planning much in this regard.

There has been recent Supreme Court case law. It has changed the landscape, so to speak, in subject matter eligibility. USPTO has been working on guidance to interject more certainty and reliability in the decisions based on what is eligible and what is not eligible so that we can all be on a better field. So we have issued a couple memos that have come out. If you get a chance to read those memos, one is on Berkheimer and Vanda. I don't want to get too weedy here, but I thought I'd mention the names.

If you get a chance to read those, I think you will see we spent a lot of time to make sure that what is in there for guidance is repeatable and puts everybody on the same understanding of what decisions will be made regarding subject matter eligibility. We're also working on new guidance. I don't know exactly when that will come out, but we are working on new guidance with this same concept in mind, again, making sure that decisions are all understood by everybody and there is repeatability to that, adding certainty into the system.

Another area, and I believe it will be a significant topic of the panel to follow, regards the Patent Trial and Appeal Board. I'm happy to have Acting Chief Judge Scott Boalick here on the panel with us. Suffice it to say, we are taking steps to make sure we're addressing concerns that were raised for the PTAB. Of recent, there was a notice on claim construction. We've also taken steps with regard to precedential opinions to increase the transparency and improve the decision-making process in what is precedential for the PTAB, and I'm sure there will be steps on the horizon.

And the last of the three that I wanted to mention, which is a central pillar of what a patent examiner does, is the patent examiner search. We are taking numerous steps to make sure that the best prior art is in front of examiners as early as possible in prosecution so that the best decisions can be made regarding the patentability of any particular patent application that they have.

Ranges of projects we're working on include an electronic system that automatically brings in prior art for the examiner based on related U.S. cases. We actually released a notice yesterday to announce the kickoff of this project. It is starting

in a small way and will scale up once we work out all the details. This is an absolute win-win for not only the Office but also the public, as many of the public's duty-to-disclose requirements are met when we already have the references.

We also have put into place in recent times a global dossier, which is another way to look at related foreign cases and the prior art that was in them. We are kicking off a peer search pilot at USPTO where examiners will work together, both searching a similar application as a training tool, and a couple other steps we're looking at are artificial intelligence. I think that there is a very significant future for artificial intelligence in search.

We have 8,000-plus examiners, they're all searching. We can take best practices and use that to feed back into some type of artificial intelligence system to make the prior art search better. We've taken a number of steps for initial programs that I've been able to see. They're not ready for release yet, but they're certainly going in the right direction. And in September, we had a request for information for the public that was released on artificial intelligence so we can gain much more.

So in any case, I know I am at the end of the time for my remarks. I wanted to share those three priorities with you, and my parting thought before we move on to the next speaker is really all of the goals that we have at PTO are to make sure we are making decisions that are transparent and repeatable and predictable. And we believe that will add a lot of certainty into the system so people will know when their patents -- how those decisions were made regarding those and it puts them in the best position to move forward.

So thank you very much again for having me here. I'm looking forward to the panel after and have a great second day to the hearing. Thank you.

(Applause.)

PANEL 1: EMERGING TRENDS IN PATENT QUALITY

MR. DUBIANSKY: Thank you, Commissioner Hirshfeld. I echo the sentiments of my colleague, Suzanne Munck, that we are very happy to have both you personally join us and also to have the involvement of the PTO in our hearings this morning.

I am John Dubiansky, and I'm joined by my colleague, Elizabeth Gillen, and we are both attorney advisers in the Federal Trade Commission's Office of Policy Planning. The first several sessions of today's hearings, both this one and the following one on litigation in particular, are a continuation of a long history of the FTC's policy research and study regarding the patent system.

As our panelists discussed yesterday, in addition to our work enforcing Section 5 of the FTC Act and the antitrust laws, the FTC has a long history of promoting innovation and competition through policy research and advocacy regarding the patent system. This dates back to sessions and a chapter in our 1996 report on competition in a high-tech global marketplace, reflecting the original Pitofsky hearings, as well as subsequent reports, such as our 2003 "To Promote Innovation" report focusing on patent quality and our 2011 Evolving IP Marketplace report

focusing on patent notice remedies. And those reports are just part of a broader and ongoing policy and research program regarding IP rights.

Today's panel in this first session will focus on patent quality. And as we described in the 2003 report, patent quality can reflect, for example, the fact that a poor-quality patent or a questionable patent is one that is likely invalid or contains claims that are likely overly broad. And today's panel in particular will focus on a number of recent developments that may inform patent quality, the most notable of which is the September 2011 passage of the America Invents Act.

The America Invents Act has several provisions which may inform patent quality, such as the institution of expanded post-grant proceedings at the Patent Trial and Appeal Board, as well as the shift from a first-to-invent to a first-to-file system. And in addition to the AIA, there have been other developments, including a number of cases handed down by the Supreme Court, such as the Nautilus opinion regarding claim definiteness.

So with that background, I would like to introduce our panelists today. I think we've got a great panel here assembled to discuss these issues.

Going down the line, we have Commissioner Drew Hirshfeld, who is Commissioner for Patents at the USPTO. Next to him is Professor Alan Marco, who is an Associate Professor at the School of Public Policy at Georgia Tech. And prior to joining Georgia Tech, he served as the Chief Economist at the USPTO.

Next is the Honorable Scott Boalick, who is the Acting Chief Judge for the Patent Trial and Appeal Board. Next is Greg Reilly, an Assistant Professor of Law at the Illinois Institute of Technology, Chicago-Kent College of Law, where he teaches patent law. Next to Greg is Saurabh Vishnubhakat, who is an Associate Professor of Law at Texas A&M University. He teaches patent law, and he also holds a joint appointment as an Associate Professor in Texas A&M's Dwight Look College of Engineering. And he was formerly an adviser to the Chief Economist at the PTO.

And, finally, we have Professor Melissa Wasserman, who is a Charles Tilford McCormick Professor of Law at the University of Texas at Austin School of Law.

Just one note, we'll have opening remarks by Professor Marco, and they will be followed by a panel discussion and questions. And during this panel, we invite the audience to submit questions. Our

colleagues will distribute cards where one can write down questions and they will be passed up to the moderators and we will attempt, if there's time, to field several of those questions.

And now I'd like to invite Professor Marco to give an opening presentation on patent quality.

MR. MARCO: Thank you. It's great to be here talking about a topic that is near and dear to my heart, patent quality. So my job here is to -- I just want to make some brief remarks that will hopefully set the stage for the further discussion. And time permitting, I'll talk about a couple empirical results that may also inform the discussion.

So first, I'm going to claim that to understand patent quality, you really need to understand patent policy, and to understand patent policy, you need to understand patent value, what brings value to the patent. So one could argue about a lot of different features, but I want to kind of stick with these main features here. The classical economic levers where you might affect patent value are length and breadth, right, so what's the statutory term and what's the scope of the patent.

Statutory terms can be affected by the -- or the length of the patent can be affected by the

statutory term itself, by maintenance fees that we may charge, by patent term extension or adjustment that you may request in different circumstances. Breadth is a little bit harder to think about how policy impacts breadth, at least in a direct way. There are statutory provisions about novelty and nonobviousness, but it's a little hard to think about how we would change that if we wanted to think -- in general, we want to give patents broader scope.

So should we make them really nonobvious? You know, would that give them broader scope? Would that change in the statute -- change anything? Changing the wording? Because the courts really influence this on a case-by-case basis.

So again, from a policy perspective, it's difficult to think about how we would broaden or narrow scope in general, and of course the scope itself is influenced by the examination process that is subject to the statutes and to the courts. Of course, if you have a patent that is long and broad but not enforceable, it's still worth nothing, right, so if you can't enforce this thing, everyone may agree, oh, yeah, that's a broad patent, it's got broad scope, it must be very valuable except no one is going to pay you for it if you can't enforce it.

So enforceability is going to consist of some things like error correction in there. If we -- well, I'll leave that for later. And then regarding each of these, we want certainty. We want certainty with respect to length, certainty with respect to breadth, certainty with respect to enforceability. And really that certainty or really the uncertainty about those is about patent quality, so when we think of patent quality.

So I want to sort of propose this potential definition which is similar to what John had mentioned for patent quality. What I want to propose is this, so a patent is of high quality if it adheres to the legal standards of patentability, that is, it's valid, it claims a scope that matches the inventive step, so it claims the appropriate scope. It could be broad, it could be narrow depending on what the invention is.

And, of course, there's some tension between one and two, right? There's some tension between validity and scope in the sense that in a practical sense, the applicant may want to intentionally narrow scope to make it more likely that it's valid, or they may be more willing to claim a scope that goes beyond that and risk some invalidity in order to be able to capture a little bit more market value. But there's

maybe some tension between these two if we don't have perfect information because it's not just if the patent is granted but what is granted. And there's always going to be a tension between those two. You can claim less and have a higher probability that it's granted and a higher probability of validity.

But number three, I want to add this feature, it should clearly articulate one and two, right? So any patent should clearly communicate, disclose, right, what the scope is, what the invention is, and it should be very clear that this patent is valid. And we tend to think of validity as binary, it's either valid or it's not, it’s either granted or it’s not, but I think we need to get beyond that, right? There is a PHOSITA standard, the person having ordinary skill in the art, and maybe that's the right level for patentability, but that's a pass/fail. And anyone who has taught or been a student knows that there's a difference between passing and getting an A.

So it's okay to have patents passing, but what can we do to think about not necessarily changing the standards. But one can think about changing the incentives to make sure that we're getting A papers out there and not C papers, A patents and not passing patents, because we can always improve that

disclosure, we can always improve the certainty around the property right. And that's where I think patent quality really comes in. We can think of something that's valid, its scope matches the inventive step, but it's even of higher quality if that's extremely clear and obvious to the marketplace.

Okay, so next I want to turn to some policy levers, specifically for patent quality. Right, so there are institutional resources, and I'm thinking about this as mostly the time we spend examining, the resources we put into examination. How much time do we have to spend on search, how much time do we give examiners for determining the rejection or allowance? Examiner and applicant incentives are critical in this. Examiners may have incentive to do a certain quantity of production during the year, and they have incentives to do a certain quality of production during the year. How are we balancing those incentives versus quality and quantity? And how can we use things like the count system at the PTO to influence that?

Applicant incentives are also critical. Applicants are influenced by the process, they may have an incentive to claim as broad a claim as they can to see what's whittled down and what's sort of the

just acceptable to the examiner, and also they're influenced by fees, among numerous other things. But thinking about those incentives can be critical for thinking about patent quality.

Of course, we need some sort of error correction, both pre and post-grant. So pre-grant, we want to think about both sorts of areas, we want to think was something allowed when it shouldn't have been, was something rejected when it shouldn't have been. And we have certain procedures for that that have changed over the years.

Post-grant proceedings also are going to be a type of error correction here, and the PTAB is one of those mechanisms that's newly -- been newly created by the AIA but there have been historically other methods to do that. And in thinking about incentives, I want to take a moment here as an example, if we think about opportunities for applicants to make post-grant amendments, to change the claims after the patent is issued. So it gives us just an example of how we might think about incentives here, right, so what are the pros and cons of allowing this.

If we allow for these kinds of post-grant amendments, then applicants have the benefit that if there was some sort of mistake or small kind of error

on their applications, that that could be corrected. We can fix that and it doesn't invalidate the patent itself.

On the other hand, if we have significant opportunities for amendments, post-grant, then does the applicant have the same incentive for quality at the front end? Will they put in as much effort on the patent application itself? Or would they put in more effort on the patent application if there was no possibility of amendment post-grant?

So I'm not going to make a proposal here one way or the other, but I'm saying that for each of these kinds of incentives, we need to think clearly and carefully about when we're changing one part of the system, what incentive does that change in the other part of the system.

Technology, right? So obviously I was glad to hear what Commissioner Hirshfeld was saying about the -- in their investigation looking into new search systems, investigating machine learning and other things and that because I think that's absolutely critical, not just on the search but even the patent -- the quality of the patent document itself.

And I also want to hear about technology in

terms of data ingestion, right? Changing the way that we collect the applications even at the PTO to make sure that everything is text-searchable. Because office actions and lots of information that's in the file wrapper, the patent application, is prior art, and if that's not searchable and easily identifiable to folks, then it's going to decrease our quality.

There's, of course, statutory and institutional reforms that I think a lot of folks here will talk about. But -- and, of course, we have to think about how are the courts going to affect things because from a policy standpoint, it's difficult to affect what decisions the courts are going to make without clearly changing the statute in a way that we can predict.

So before rules -- so oftentimes when I'm talking to lawyers, lawyers like to think about rules first, how are we going to fix this, will this change the rule. But economists like to think about prices, right? Before we think about changing the rules, we can think about prices. So I want to talk about a couple examples of that, and I'm going to skip the first one that I have here. I'm just going to go to a couple sort of empirical results from various papers that I've worked on at different times to think about

incentives.

I'm going to focus on really just this first one. So we find that applicants respond to higher RCE fees, higher fees for sort of in-process continuations, for continuing the patent prosecution and examination process. They respond to these higher fees by narrowing claims ex ante in the application as they're filed at the PTO. There was a rules package back in -- I think it was '07, '08 that was about sort of limiting the number of times an applicant could do an RCE. And there was a lot of controversy about this, and eventually the package was dropped. But as an economist, you think don't prohibit something, just price it, right? You can just price it accordingly. We don't want to prohibit smoking but we could raise the price of cigarettes and that's going to decrease smoking.

So with RCE fees, in fact, they did raise the price of RCEs and raise the second RCE price more than the first to add escalating RECE fees. So applicants did, in fact, respond to that according to our results, anyway, by narrowing the applications when they were filed. So it's the kind of incentive that we want to be thinking carefully about in a systemic way in the whole patent system, the patent

examination system, as we go forward in thinking about patent quality.

So I will leave it with this and say that my one clear recommendation is that Congress should allow the USPTO to continue with their fee-setting authority. So I will make that statement very clearly. Thank you.

MR. DUBIANSKY: Thank you, Alan, for both your framing presentation and the interesting empirical data.

I would now like to give our other panelists an opportunity, both to react to the presentations by Commissioner Hirshfeld and Professor Marco, as well as to make some opening remarks. And I would welcome your views both on the current state of the patent quality landscape and on changes in particular relating to the institution of the AIA and subsequent judicial decisions.

So with that, I think we'll go down the line and, Judge Boalick, if you'd like to give remarks, I'd ask everybody to speak for about five minutes.

JUDGE BOALICK: Sure. Thank you, John. So building on what Commissioner Hirshfeld said, the Patent Trial and Appeal Board, although it had predecessor boards, was created by the America Invents

Act, as well as the post-grant proceedings were established, and so we were tasked with building something brand new.

As with anything new, you know that it's not going to be perfect when it is first formed, and so we've always had the notion that there would be a need to have iterative changes to get the proceedings scoped, you know, and balanced correctly, but the overall goal of the PTAB is to help achieve balance in the system and to make sure that we have strong, reliable, and predictable patent rights, and the PTAB is a part of that, and it fits into the larger PTO. We're all part of the same agency, we all have the same interest in strong, predictable, and reliable patent rights.

And so I'd like to note that under Director Iancu, the PTAB has been taking many steps already to ensure this and to make strides towards achieving this balance. You have probably noticed, and it was mentioned, that we have come out with a claim construction final rule. It goes into effect November 13th of this year, and it's going to achieve greater harmonization with the federal courts and the ITC and will lead to greater certainty and predictability in the overall patent system.

The Director has also mentioned that we are working on motions to amend in the trials and looking to make motions to amend more effective. We also have recently issued new operating procedures. We issued a standard operating procedure that really gives greater transparency to how the PTAB had already been handling cases, but it also is increasing transparency by notifying parties if there is a panel change after the panel has already been publicly disclosed so we'll enhance transparency in that manner.

We also have another standard operating procedure that changes the way that the PTAB does its precedential opinions. It now has established a precedential opinion panel, and two of the three members are here on this panel, Commissioner for Patents, the Chief Judge of the PTAB, and Director Iancu are the three members of that panel who will make precedential opinions for the PTAB that will bind the PTAB and lead to greater certainty and predictability.

And, then, finally I'd just like to add that we have updated our trial practice guide, and we anticipate that there will be another update to reflect other developments in the law. So thank you for the opportunity to give some opening remarks.

MR. DUBIANSKY: Thank you, Judge Boalick.

Professor Reilly?

MR. REILLY: Thank you. With my time in the opening remarks, I'd like to make two points related to the PTAB. The emergence of the PTAB is what I think is the most significant trend in patent quality in recent years. The first point is that we largely -- we frequently describe the PTAB -- I'm using PTAB as a general reference to the various procedures created by the AIA.. We generally think of the PTAB's function is correcting errors in patent examination. That is that patents that should have been issued, if the Patent Office was doing the maximum effective job. There were errors. Inevitable, there's going to be errors, and the PTAB is there to correct them.

But I think we can think of the PTAB's role slightly differently, and that is that the PTAB reflects the dynamic nature of patent quality. We often think of patent quality as being static, that is, at the time the patent issues, a patent has some level of quality, however we're defining that, and that quality remains the same over time. But in reality, patent quality is dynamic. Patent quality can change over time, probably more so in some

industries than others, based on the actions of the patentee and probably actions of the accused infringers, too, as they interact with the patent.

Patent rights are malleable. Patent rights can be changed over time. Patent claims can be kind of stretched, shifted, et cetera, as patentees encounter changes in the technological market and changes in the competitive market conditions. And so over time, the patent rights can shift. Patent claims can shift in terms of their coverage and in terms of their predictability, both because of the inherent difficulties in translating inventions into words, but then also because of our patent doctrines that allow this type of malleability of patent rights.

So when we think of patent rights as malleable, we can see how patent quality can change over time. Most obviously scope can change over time as a patentee attempts to stretch their patent to capture changing technological conditions and changing market conditions, but also the likelihood -- the enforceability in terms of complying with the statutory conditions of patentability, which is directly connected to scope, and then last, also in terms of certainty. The farther the patent is asserted away from the disclosed embodiments, the

harder it is to predict the exact coverage of a patent.

So if we think of patent quality as being dynamic, then we can see another way of describing the role of the PTAB, and that is it gives the Patent Office the opportunity to reconsider its patent grant in light of how the patentee is using the patent in response to changing market and technological conditions. It essentially allows the Patent Office to ask the question, would we have granted this patent if we knew this was the coverage that the patentee was going to seek with that patent?

The second point I want to make about the PTAB is that the PTAB is largely recognized as having had a significant impact in terms of invalidating patents. And the debate in the patent community is largely whether that impact in terms of invalidating patents is ultimately good -- positive or negative, for the patent system. But I think there's another question there, and that question is, why? Why is it that the PTAB has been so impactful in terms of invalidating patents?

To the extent that this question is addressed, it's normally addressed in comparison to litigation. Why is the PTAB more impactful in terms

of invalidating patents than litigation, and, therefore, the natural focus is on differences between the PTAB and litigation, primarily the burden of proof, and up until recently, or up until I think it's November, the claim construction, the difference in claim construction standard.

But neither of these, I don't think, are fully persuasive reasons for why the PTAB has been so impactful because they were equally true of the reexamination procedures that preexisted the America Invents Act. So then the question -- I think the better way of focusing on why the PTAB has been so impactful is to focus on what's different about the post-AIA procedures as compared to reexam. And I see four major ones.

One is the difficulty in getting amendments in the post-AIA procedures, which the Chief Judge spoke about, though I question whether amendments is really jiving the difference in impact. I think there's reasons to doubt that, and that can be discussed more.

The next is the effectiveness of threshold screening. The PTAB denies about -- over 25 percent of petitions it receives compared to less than 10 percent in ex parte reexamination.

The third is the increased adversarialness; and the fourth is increased expertise in the decision-makers. The decision-makers now are experts in both poles of the patent system, the patent law and the technology.

And the final point I'd make is that these last three explanations -- effective threshold screening, adversarialness, and expertise -- are normally seen as positive values in institutional design, which I would think is at least informative of how we evaluate whether the impact of the PTAB has been positive or negative.

MR. DUBIANSKY: Thank you.

Professor Vishnubhakat?

MR. VISHNUBHAKAT: Thank you. Good morning. I would like to focus my remarks today on two features of the Patent Trial and Appeal Board as well and, like Professor Reilly, say a few words about the comparison of the PTAB as a source of error correction with respect to the courts.

So one of those two features is the intended purpose of the PTAB as a substitute for the federal court in patent error correction, and the other is the current moment of institutional maturity that the PTAB has now reached and what is the best way to put that

moment to use.

So when it comes to court agency substitution, I think the PTAB represents a challenge that in some ways simply cannot be avoided. We began from the premise, and I'm perfectly satisfied to begin from the premise, that if we had continued to rely on the courts alone, it would be too hard, it would have been too hard to revoke poor-quality patents, and so we had to make it easier to revoke poor-quality patents.

But making it easier to revoke poor-quality patents necessarily meant that we had to make it easier to revoke all patents. After all, if we knew which patents were poor quality to begin with, PTAB review would be unnecessary. And so now we have administrative review that deliberately departs from judicial process in important ways. And some of these departures are, I think, well advised, at least in principle.

For example, more lenient standing rules means that more of the people who are subject to the exclusionary power of the patent, which, of course, is all of us, can hold that power accountable. It used to be you had to have Article 3 standing to get into court. Now, as I'm fond of telling my patent law

students, anybody with $30,000 and a dream in their heart can go into the PTAB and challenge a patent they think is problematic.

Another example is that relying on technically trained administrative patent law judges rather than lay judges or juries in Federal Court make it more likely that the relevant scientific detail that bears on a patent's validity will not be obscured or distorted. Right, so these features take aim at who can challenge a patent and who gets to decide, and they don't affect the substantive content of a patent's validity. So to that extent, they don't compromise the legitimate value of a properly issued patent. They go after the poorly issued ones but generally tend to leave the poorly issued ones alone.

Other departures from judicial process, I think, are somewhat more questionable. And these include discarding the presumption of validity, failing to require invalidity to be proven by clear and convincing evidence, which the Supreme Court as recently as 2011 told us had to be clear and convincing.

And then, of course, until quite recently, the diversion claim construction standards that were used as between the courts and the PTAB were another

source of inconsistency.

Now, I think I would agree that inconsistency, as such, is not necessarily bad to the extent that the courts were getting it wrong and, therefore, the agencies should reach the inconsistent and now correct outcome. But these procedural differences that bear on the sort of substantive content of validity, I think, are something that undermine all patents indiscriminately, at least somewhat indiscriminately, not just poor-quality patents.

And so as a result, the sum of these desirable and undesirable attributes is that the PTAB, until now, has largely been a substitute of mixed quality when it comes to improving on PTAB -- or patent error correction.

Now, it's fair to say, I think, that only some of these choices were made by the USPTO itself, and a number of them were made by Congress in the statute. And so to be clear, what I'm referring to is the wisdom of the policy choices themselves, not who makes the decision or who should be held to account. The USPTO, for example, has changed course on claim construction and is in the process of reconsidering other doctrinal issues, and I think it's to be

commended for that.

The second point I want to make is just a brief word about the growth of the PTAB as an institution. At the outset, the Supreme Court and the Federal Circuit early in the days of the PTAB, I think, gave the USPTO fairly wide latitude, particularly when it came to deference and discretion in the PTAB. For example, the nonappealability of PTAB institution decisions could have been limited to just forbidding interlocutory review, but the Supreme Court in the Cuozzo case read it to extend through final judgment, gave the PTAB a lot more power, vis-a-vis the Federal Circuit's power to review it.

The USPTO’s power to intervene in appeals could have been limited by Article 3 standing and other doctrinal rules, but that power, too, was read quite broadly by the Federal Circuit in the Knowles Electronics case.

More recently, however, the courts have started to retrench a little bit, and they’ve started to constrain some of the USPTO’s more expensive positions. For example, the en banc Federal Circuit held this year in Wifi I that enforcement of the one-year time bar, which had previously been held unreviewable, is subject to judicial review after all.

And, of course, the Supreme Court held this year in SAS Institute that the PTAB has the power to institute or deny petitions in full but cannot cherrypick some arguments and reject others.

So I think these recent limits, more recent limits that the courts have imposed suggest that the courts see the PTAB as a more fully mature institution that doesn't need more latitude any longer to get itself up and running. And that maturity makes this a particularly valuable occasion in my view to sort of engage in some reflection and reform.

So as our discussion unfolds, I look forward to exploring these themes further and, in particular, sharing some empirical results about how the PTAB has been fulfilling its intended purpose. And I want to comment the Federal Trade Commission for convening these hearings, and I look forward to our conversation. Thank you.

MR. DUBIANSKY: Thank you.

Professor Wasserman?

MS. WASSERMAN: Yes. So thank you. I would like to use my time today to talk about two future reforms that I would like to see in order of what I think would help increase patent quality. And so we've had a lot of discussion about patent quality for

a while, right, on the quality of patents being issued by the Patent Office, but we've actually had little compelling empirical evidence to put forth that there's any future of the system that's inducing the agency or causing the agency to issue low-quality patents.

And this is a problem, right, because when we have policymakers who are trying to improve patent quality, we're largely trying to do this in the dark. We're not sure which features we should be focusing on that would result in an improvement. So I'm hoping that this is starting to change, right?

In the past few years, we've seen scholars in the U.S. patent system publish a series of empirical studies on the administrative process by which patents are obtained after theorizing how certain features of the agency may incentivize or bias it towards allowing patents. These studies have used a range of sophisticated empirical techniques designed to show a causal connection between those agencies' features and its granting practices.

So pulling on the scholarship, in part, is work of myself and Michael Frakes, and I want to focus on two reforms. So, first, I would love to see the Patent Office consider changing its fee structure,

right? The agency is entirely funded through user fees, but the overwhelming majority of its costs are attributed to reviewing and examining applications. The agency charges applicants fees to help cover those expenses; however, those fees fail to cover even half of the agency's examination costs.

And to make up for this deficiency, the agency relies heavily on two additional fees that are only collected in the event that a patent is granted. And this is the issuance fee, right, that's paid at the time of allowance, and renewal fees that are paid over the lifetime of an issued patent so it remains enforceable.

So one immediate concern of this back-end fee structure is it creates a risk that the agency's fee income will fail to cover its examination expenses. So unexpected dips in renewal fees, for instance, right, is going to result in a budgetary shortfall for the agency. And an equally troubling concern, I think, of this back-end fee schedule is that if the agency finds itself in some financial strain, they could attempt to increase revenue by granting additional patents.

And there's some empirical evidence to suggest that this -- that these concerns are

validated. When the agency is lacking -- or is financially strained, they may be granting additional patents as a result.

Second, I also want to suggest that I'd love to see the Patent and Trademark Office increase the time allocations it gives to patent examiners, right? Right now, examiners have only on average 19 hours to review applications, and because applications come in presumed to be legally valid, right, if an examiner doesn't have enough time to do a sufficient search and who fails to explicitly set forth reasons for why the application's rejected, they must grant the patent, right? So if examiners aren't given sufficient time to do their job, they may be allowing patents that they otherwise would have rejected.

And, again, there's recent empirical evidence that validates these concerns and suggests that the time allocations are binding on examiners and maybe inducing them to grant patents of low quality. But I want to note, harkening back in part to what Professor Marco suggested, that even in light of this, there's open questions about whether we should increase time allocations, right, because there's another institutional body, the courts, that can also remove invalid patents from the system.

And there, I think, has been a number of scholars who have made this argument but perhaps most famously by Mark Lemley, who argued that because so few patents are litigated or licensed, it's better to rely upon litigation to make detailed validity determinations in those rare instances, rather than increasing resources across all -- at the Patent Office for all applications.

And he supported his thesis with a cost-benefit analysis, where he concluded the costs of associating doubling time allocations outweigh the benefits gained by resulting in the decrease in the number of invalid patents the Patent Office would issue. So Michael Frakes and I have a recent article that has revisited this issue where we're employing new and rich sources of data, along with sophisticated empirical techniques, to form novel empirically driven estimates of some of the relationships that Lemley was -- had to assume in his paper.

And armed with these, we actually come to the opposite conclusion, right? That we would be better off, right, increasing the time allocations at the Patent Office than relying on ex post litigation to weed out patents. I think that's -- my time's up.

MR. DUBIANSKY: Great. Thank you. And I'd

like to thank all of our panelists for their opening remarks. Now I'd like to shift into some questions. And, again, I invite our audience to submit questions. Our colleagues are passing around cards to take them in writing.

So, the first question I'll ask builds upon the subject of the PTAB, which I believe everybody has raised in their opening remarks. And my first question is, of course, that the AIA has established both the inter partes review, as well as post-grant review proceedings conducted by the PTAB as a replacement for the prior reexamination proceedings.

And what does the evidence say regarding the effect of the PTAB in practice? Perhaps, Saurabh, if you could start and, everybody else, feel free to join in afterwards.

MR. VISHNUBHAKAT: So I think the place to begin is the sort of baseline of federal court litigation, and we know, for example, that the procedural structure, the statutory structure of the PTAB petitions and they sort of vary from IPR to CBM and so forth. To the extent that the PTAB is supposed to be a substitute for the court, it's interesting, first and foremost, to see where are the petitioners who seek to challenge a patent. In the PTAB, where

are those folks coming from?

And in recent research with my colleagues, particularly Arti Rai at Duke Law School, what we found is that the majority, 70 percent of petitioners in the PTAB, have previously been sued on the patent that they now challenge. They come to the PTAB in a sort of defensive posture to try and have it out over the validity of the patent in an expert tribunal, rather than staying in a court where a judge or a jury might be the one to decide.

That means that a substantial minority, 30 percent, are preemptively striking either because they see the patent as a potential threat by their own screening and vetting or because other rivals in the market have been sued and they think, well, we might be next, so let's strike first. So that being the case, it's interesting next to look, I think, at what the behavior of the courts is once that petition is filed, because if the PTAB is simply one more place to fight, it's not a substitute at all, right? At that point, we're engaging in duplication, which is almost certainly going to be wasteful. And particularly if the forum where this should be playing out is the more expert, cheaper, faster, more accurate forum, the PTAB.

So, to look at the rate at which stays are granted in the courts, the figures vary. They're as low as 40 percent in the Eastern District of Texas, for example, according to one recent study, or as high as in the 70-percent range in the Northern District of California. That variation is itself troubling. I'm not sort of purporting to take a stand on what the right rate of stays is, but surely the variability suggests that the degree to which the PTAB is actually serving as a substitute for the courts needs to be a little more precise.

And I think the reason for that variation, at least one substantial reason, is something that the Supreme Court has only recently stepped in to fix, and that was partial institution. So in a paper that I now have coming out in the Iowa Law Review, I find that although the rate at which cases of partial institution were going down at the PTAB and have been going down since almost the beginning, they began as almost the large plurality of cases, now they only account for something like 18 percent.

Less than a fifth of all the cases that go to the PTAB are partially instituted upon as of the SAS Institute decision. Fifty percent of all of the claimed ground pairs, the sort of real workload of

adjudicating petition that comes to the PTAB's door, is granted, and the other 50 percent is left out. Some of that is full institution, and some of that is full denial. And the rest is made up for by partial institution and partial denial of the same petition.

So that 50/50 split has been remarkably stable. It's been persistent since almost the beginning of the PTAB. And what that means is that, by engaging in partial institution, the PTAB, whether advertently or inadvertently, was muddying up the signal that it would send to the federal courts regarding how much valuable information it would really provide to the courts regarding a patent's validity.

Now the partial institution is off the table, I think the signal we are granting or we are denying review will be much sharper in both directions. And I think that's a salutary trend that will help courts make more informed judges about when to stay their hand. And that institutional structure will go -- I think will do much to help the PTAB fulfill its intended role as a substitute for the courts.

MR. DUBIANSKY: Thank you. Would anybody else like to chime in?

JUDGE BOALICK: Let me make just a few points, and just as was observed, there does seem to be a large overlap between the district courts and the petitions in the PTAB. I would just add that empirically in talking to some district court judges after the SAS decision, they seem to be much more inclined to stay, as well as the impending claim construction rule where there will be fewer differences. It seems to have helped some of them to decide to stay their cases. Again, this is just in conversations.

The other thing that I think I would just like to mention briefly with regarding the PTAB procedures replacing reexam is just to note that the inter partes review replaced inter partes reexam. Ex parte reexam is still conducted at the PTO, and so there is still that proceeding, but that the various AIA trials were meant to address some of the shortcomings of the ex parte reexam process, which could take considerably longer, so there are now statutory deadlines.

There was an internal appeal to the former Board of Patent Appeals and Interferences that added some time to final resolution. So, there have been a few things that were structurally changed in the inter

partes review from inter partes reexam.

MR. REILLY: One point I'd like to make is that when we evaluate the effect of the PTAB and particularly the question of balance that the Chief Judge raised earlier, we frequently see kind of very shocking numbers in terms of invalidation, particularly those pushed by a certain point of view. And I think it's important not to ignore the effectiveness of the threshold screening.

So using the PTO's most recent number -- I think most recent numbers -- in doing some back-of-the-envelope calculations, when I considered all decisions other than all claims -- I treated all claims confirmed and -- or no claims invalidated and petition denied as being favorable to the patentee and treated all other outcomes as being adverse to the patentee, so that includes settlements and things like that that may not actually be adverse to the patentee, what we see is more of like somewhere around a 60/40 split in terms of 60 percent of decisions being adverse to the patentee and 40 percent being favorable to the patentee. And certainly, I mean, that is different than outcomes in litigation.

Selection effects are different there as well, but it's not as perhaps shocking as some of the

numbers you'll see put out there, numbers that are ignoring that so much of -- that a significant portion of petitions aren't even making it to the trial stage.

MS. WASSERMAN: Yeah, and I just want to second Professor Reilly's comment.

MR. DUBIANSKY: Thank you. Well, does anybody have anything further on this point? If not I can move on to a related question.

So building on the previous question, are there any procedural or structural aspects of the PTAB that contribute to its performance as compared to in particular the district court litigation or the previous reexamination proceedings? And in addition, building on this, are there areas of procedure today that are creating inefficiencies or opportunities for improvement?

Melissa, would you like to start?

MS. WASSERMAN: Yes, I'd love to. You know, so, I mean, we all know that these PTAB adjudicatory proceedings were designed to, right, create a faster, cheaper alternative to district court litigation. And in order to get that, right, they have each proceeding provides third parties with this robust, streamlined way to contest the legitimacy of an issued patent at the Patent Office. And I think they share a lot of

features that make them legitimate alternatives to litigation, and perhaps the most salient comparison from the previous proceedings is they take place in this adversarial, court-like hearing where the parties have oral argument and discovery.

But I also think it's important to keep in mind they are not civil district court litigation, right? And a lot of times, I think some of the concerns or the angst that I hear from the patent community loses sight of that, right? And I think the most appropriate comparison when we're thinking about PTAB adjudication and its procedures are two other agency adjudications. And in particular, I think they fall on this idea where they have a hearing but they're not something under administrative law, formal APA-governed adjudication.

There's an ACA study that's come out that's compared what are the best practices for agency adjudications of the ones like PTAB proceedings, and PTAB fares quite well. They come out having 16 of those 20 best practices, which puts them well into the top third, I think, of the agency adjudicators. There's a couple areas that are pointed out where I think they could do more. One I would consider is doing a more robust or formal disqualification

mechanism for adjudicator bias. It's my understanding they have that, but it's not as formalized as I would like to see.

And another recommendation was to have some higher level consideration. But I think, in part, the changes they've made with how they're making determinations about precedential decisions help address that, and I thought that was a very positive move that I saw from the PTAB.

So where are other areas that you could see improvement? I think one has already been touched on, which is this idea with stays in district court and how much of this are we just sort of getting duplicative litigation occurring in PTAB and district court, which I don't think was the intention and certainly cuts back on the sort of cost-effective saving side associated with PTAB litigation.

Another thing that I wanted to point out, and I know the PTO is doing some of this and I commend them and would like to do more, is the feedback loop, though, that occurs with these new PTAB adjudications and patent examiners, right? So when patents -- when you have a patent denial or an ex parte review, right, the patent examiner is involved in that denial before the PTAB. But in the patent grant side, right, if

you're using one of these PTAB new post-grant proceedings, the patent examiner that issued that patent is usually not intimately involved in that litigation. You have two adversarial parties litigating. And so I think there's room, right, for sort of more feedback to patent examiners on sort of best practices and things that are coming out of PTAB that might also help improve quality.

And I know the Patent Office has had some pilot programs associated with that. But I would love to see more of that implemented.

MR. DUBIANSKY: Alan, go ahead.

MR. MARCO: Yeah, I just had one thing I wanted to add in a more general sense in that when we're evaluating sort of the impact of PTAB and the effectiveness of that, everything that we're -- all the numbers we're looking at so far -- not all -- the majority of the numbers that we're looking at so far on patents that were granted before the PTAB was established, and when we look at the effect of any sort of institutional change, right, the effect is not going to be immediately obvious, especially in a system where the patents can, you know, hang around for a couple of decades.

So, we need to -- when we're evaluating the

institutional change, we really want to be, in the end, looking at how the reforms affect new applications and patenting as it's happening now. That's harder. That takes more time. It requires more data. But we can look to certain experiments where we might be able to look at data and how applicants change their claim-drafting procedures after Supreme Court decisions like Alice, Myriad, Mayo, because we do see that in the data. And so the effect of PTAB on the claim-drafting procedures, you know, we can look at, but it's a little bit more of a difficult process.

MR. DUBIANSKY: Please.

JUDGE BOALICK: I was just going to note a few of the other maybe procedural and structural differences between the PTAB practice, reexam practice, and district courts, and several of these have kind of been touched on, so I'll just run through them quickly, but one is the decision-maker in district court. Of course, you have a generalist Article 3 judge presiding over the trial there. In reexam practice, you have an examiner with a possibility of an appeal to the PTAB. And then in the AIA trials, you have the three legally and technically trained administrative judges conducting the trial.

The standards for institution are different for all of these. The PTAB, AIA trials, it's either reasonable likelihood for IPRs or more likely than not for post-grant review and covered business method reviews. When inter partes reexamine was going on post passage of the AIA, it was also reasonable likelihood. And then, of course substantial new question of patentability as a standard for ex parte reexam. And district court, it's just essentially pleading.

Time for completion, of course, the AIA trials have statutory deadlines. That's had a large impact on the operation of the board, both the three-month deadline for an institution decision after a patent owner preliminary response and then 12 months, extendable by up to six more months for good cause, after an institution decision's made. Reexams are no specific time limit, but they are conducted with special dispatch. And there's no time limit in the district court, but as we know, some districts pride themselves on their speed.

Another aspect is, of course, discovery. The AIA trials by statute have limited discovery. They're in line with finding things that are useful in trying to eliminate expensive fishing expeditions.

There was no discovery in reexam. Of course, district court has much more fulsome discovery.

Claim construction standards we talked about briefly. The AIA trials had been conducted under broadest reasonable interpretations, shifting next month to Phillips. However, I should note that for expired patents, the construction standard has always been Phillips. In fact, the Phillips standard was used in reexam for expired patents. Reexam will continue to use broadest reasonable. Of course, district court uses the Phillips standard.

Amendments, there is a more limited right to amend by statute in the AIA trials. Reexams, there were amendments before final entered as of right, and then there was, you know, an after-final practice. And, also, you had an examiner search as part of the reexam amendment practice. Of course, in district court, there's no amendment.

And just I think, you know, areas of potential improvement, really the only thing I would add is just to say that the PTAB and the patent organizations are, in fact, actively collaborating and sharing information to feed that information back from the AIA trials to the patent examiners, and maybe I'll see if Drew wanted to add anything.

MR. HIRSHFELD: Thank you, Scott. I was just going to jump in on the same point. So, first of all, I agree with Professor Wasserman that the more feedback we can give from PTAB to examiners is important. And I think as the last few years have rolled on, we have been certainly making progress in this regard.

First, every examiner now has access in their regular desktop to related U.S. -- or anything that's in an appeal, they get -- they get those cases if they have a trial. So -- I'm sorry, I'm not being clear on that. So an examiner who has a related case that's in a PTAB proceeding, they will be able to have access to all of those papers and documents so that they can review that. We also have in each -- an examiner is even timed on their production system to review those papers as well. So I think that is a huge step.

And then we have in each area of the technology centers, we have people who go through the PTAB decisions looking for trends. You know, are these a one-off decision that there's not a teaching point, or are there trends or are there learning points that we can get the feedback to examiners, and we have staff doing that.

And I know Scott mentioned the precedential opinion panel. I believe that will be very instrumental in getting the Patent Operations Division under me and the PTAB under Scott together on the same page as we will both be on those panels with, of course, the Undersecretary of Commerce, and I think that is a very helpful step, and that is very recent.

And then we've also created a new position, which we've never had before, which is actually being currently occupied by our previous chief judge, David Ruschke, whose responsibility is to be working on issues of collaboration between patents and the PTAB. So these are all steps, I think, that are taking us in the right direction.

MR. REILLY: I just want to make one additional point on the amendments question. I think one of the things I know the Commission does is investigate issues and try to develop information. And I think one question is the role of amendments in post-issuance proceedings. The most common outcome of reexamination was amended claims, and that's a very stark difference from the post-issue -- from the AIA proceedings.

And I think it would be -- when you look at some of the reports from reexam, there was -- kind of

from practitioners there was a sense that the amendments in reexam weren't that significant a lot of the time, that they were minor, that they could actually be advantageous to the patent owner. So it's not clear to what extent those were doing a lot of work in explaining the difference in validation rates between reexam and PTAB, but we need to know more about what the amendments were like in reexam.

And then on the other hand, you see there's -- according to the PTO's numbers, there's just not a lot of requests for amendments in the AIA procedures. Of course, that's potentially circular, because people don't make requests because they think they'll be denied. But it's also -- it also would be interesting to know to what extent amendments that a patentee would want to make -- of course, they might not want to make an amendment because it would eliminate their ability to prove infringement -- but to what extent amendments applicants -- or patentees would want to make would save the validity of patents in AIA procedures.

MR. VISHNUBHAKAT: If I could sort of touch on something that Professor Marco pointed out and then make a related point. So the change in regime -- AIA was widely touted, and I think correctly touted, as

the most substantial change to the patent law in over half a century. And that's right, but it's not as if the patent system, even in the decade or two preceding the AIA, had not suffered substantial discrete shocks along the way.

And one sort of interesting measure of that is that inter partes review, being retroactively applicable to patents that were issued prior to AIA being enacted, at the outset, 100 percent of IPR petitions were on patents that issued before AIA went into effect. So retroactivity is almost sort of tautological in that sense, but it’s worth pointing out, too, that 30 percent at the outset of the patents that were challenged in inter partes review -- and that number's been going down -- but 30 percent were pre-inter partes reexam patents. So these were patents issued prior to the American Inventors Protection Act, which passed in 1999 and went into effect in 2001. Right?

So what happened in that time? Well, a number of important Federal Circuit decisions came down. And certainly the Supreme Court had already by that point begun what we now know was a very substantial tetralogy of cases on Section 101 eligibility. So when we talk about the AIA and

particularly PTAB as a system for correcting errors in patent examination due to resource constraints, inadequate search, improper application of law to fact, and these sorts of things, that is distinct in kind from the problem of the law changing under our feet, which happens commensurately and sort of correspondingly highly.

And as a result of that, we need to be able to disentangle them if we're going to engage in the kind of evaluation that a substantial reform to PTAB practice would really require. And I think in order to do that, it's worth pointing out some of the data that have already begun to use, the USPTO has put out a large and very rich data set on office actions, and the grounds on which patent applications were rejected, and the prior art that was cited and all these sorts of things.

So by applying that data set to the set of patents that are being challenged in litigation, in inter partes review or post-grant review, which is a project I'm already undertaking, those sorts of more specific questions can help us disentangle whether it's really examination process that was to blame for a patent that was issued and is now being invalidated or simply a change in the law, which the Patent Office

can't do very much about at all, because it's the courts who are ultimately responsible for that. So that's the point about changes in regime.

Now, the related point is, I think -- and this goes back to the original question that John posed about structural aspects of the PTAB. I think deference and discretion in the PTAB, it's an area that's gotten some study, and I think it merits further study, because the Patent Office historically, of course, did not get substantive rulemaking authority, was not on the receiving end of Chevron deference like most other agencies in the modern administrative state.

And there are, of course, reasons for that, but to the extent that the PTAB now engages in what might be termed formal adjudication, right -- yeah, formal enough -- I think the fact that we still don't see a lot of oxygen going to the issue of Chevron deference is well summarized by my coauthor Arti Rai in a paper from a couple of years ago that PTO could ask for Chevron deference and it's choosing not to, and that's fine.

But as I've discussed in recent scholarship of my own, it's not as if they're not asking for discretion or trying to immunize themselves from

interference from the courts because there is, of course, this non-appealability provision. And Cuozzo, at the outset, was the opening salvo. We think that this isn't just a ban on interlocutory review; it extends all the way through final judgment. That was contested, and the Supreme Court told us the answer. After that, there was the question of partial institution. And along the way, there was a question of the one-year time bar. Right?

So at each step along the way, further and further expansive views of what non-appealability covers and what non-appealability immunizes has been, I think, an area that has not gotten a lot of attention. And, ultimately, if the agency enjoys non-appealable discretion to do whatever it wants, then functionally I don't see any difference between that and Chevron deference, because they're still doing what they're doing without a lot of interference from the courts. And that can be good or bad, but it needs to be sort of better theorized and better understood.

MR. DUBIANSKY: Thank you. I think, in the interest of time, we're going to move on to a few other subjects. So my colleague, Elizabeth.

MS. GILLEN: So a few of you mentioned the new claim construction role, and we want to shift

gears a bit and talk about the interpretation of granted claims. We've had several Supreme Court decisions in recent years, the 2014 Nautilus decision, the Teva decision 2015. And so I'd like to hear the panelists' views on what the implications of these changes are both in district courts and PTAB proceedings.

Maybe Professor Reilly can start us off.

MR. REILLY: Sure. So Nautilus, which made it easier to prove indefiniteness of a patent claim, and Teva, which gave deference to district court findings on claim construction, to the extent they were factual findings, the factual underpinnings of claim construction, they were widely acclaimed as significant decisions for patent clarity and patent quality at the time. And by most reports they've had minimal impact.

And the best conclusion is that they really haven't had that substantial of an impact. And it's easy to blame that on one of the two punching bags of the patent system, either the Supreme Court or the Federal Circuit. The Supreme Court in both cases took a middle-ground approach. It clearly rejected the Federal Circuit's approach, but it didn't go to the opposite extreme. Instead, it took a middle road

where there has to be reasonable certainty for a claim to be definite. And there would be deference but only for factual findings.

And both of these standards are relatively unclear and leave a lot of room for implementation. And the evidence suggests that the Federal Circuit has largely used that room for implementation to change some of the language, change at the margins, but largely follow its prior approaches before each of those decisions.

But I think it's important to go beyond just the easy targets of blaming the Supreme Court or the Federal Circuit because I don't think either decision was well positioned to have that significant an impact on patent clarity or patent quality. And Teva is the easiest example. And Teva, despite -- its claim construction standard, despite its popularity in the patent community, was never going to do that much for patent quality or patent certainty.

And the reason for that is Teva only affects what I'll call ex post certainty. If only affects the likelihood that the claim construction will remain after the claim has been construed in litigation. Teva says it makes it more likely that that will stay throughout the remainder of litigation. And that can

be important. That can reduce -- potentially reduce litigation costs; it can encourage settlements, et cetera. But Teva was never going to have any effect on ex ante predictability of claim scope. It never was going to have any effect on how a party before litigation or before potentially infringing activities could evaluate the scope of the patent claim. And Teva wasn't directly about our method of claim construction either, so it wasn't really going to affect breadth.

Nautilus, one of the problems with Nautilus is the court tried to resolve it and the issue was posed for the court, the indefiniteness issue separate from claim construction. And you can't really decide indefiniteness without deciding claim construction. Words in patent claims, like any other words, have no meaning without context. They are neither definite nor indefinite in the abstract. They only take on meaning from context, whether that context be extrinsic evidence of the use in the field or whether it be intrinsic evidence in the document itself.

And claim construction is the process of giving meaning from context. And so trying to resolve the definiteness of a patent without also addressing how claims are try -- are construed, how claims are

given meaning from context, was always going to be a losing or at least minimally impactful proposition in my view.

MR. VISHNUBHAKAT: So if I may, I have a question for Professor Reilly. So I'm not sure that I understand or agree -- it might be one or the other -- your point about ex post certainty, because it's certainly the case that if a patent has been construed or the claims of a patent have been construed and if Teva had gone the other way, if it were de novo review, right, and it goes up to the Federal Circuit, they lay down what the claims of that patent mean. If that's litigated again, there is ex ante certainty in a dynamic sense. The first time it's construed, it's not.

Now, the fact the Teva went the other way, I think, has a substantial effect because the court was much more concerned about vertical certainty. It's less likely to change course from trial court to appeal court and not very much concerned at all, it seems, with horizontal certainty because inconsistent claim constructions in two different district courts on the same patent claim term are likely to persist and not be overturned. Even though they conflict with each other, on appeal, they're going to get that clear

error deference.

So it seems to me there is an effect on ex post certainty as well as ex ante certainty in the dynamic sense. Would you agree with that?

MR. REILLY: I'd agree that -- yes. Once a patent has been construed and gone to the Federal Circuit, that will impose presumably some level of predictability of claim scope for future activities. I was focusing on before a patent is litigated. If I am a party trying to decide whether I have the freedom to operate in this area and the patent hasn't been litigated yet, which I think is the most common situation --

MR. VISHNUBHAKAT: Got it.

MR. REILLY: -- if I'm trying to evaluate the freedom to operate, I need predictable rules of claim construction. I can't -- I mean, we always think of claim construction as a litigation thing, but everyone in the patent system has to engage in claim construction, right, to know what the scope of coverage is. And if we have predictable rules of claim construction, then it's more likely that my evaluation, ex ante, will be the same as the court ex post in litigation. And to me, I think that's much more significant than predictability once a court has

construed the claims, because, A, very few patents are litigated; B, a lot of the patents are litigated -- or litigated patents are settled without a claim construction; and, then, C, a lot of patents that receive a claim construction, of those, only a small number go to the Federal Circuit on appeal where Teva would ever have an effect.

MR. VISHNUBHAKAT: Got you.

MR. DUBIANSKY: Great. Well, again, in the interest of time, we'll move on to another question, which is that the AIA authorizes the Director of the USPTO to adjust or set patent fees, and how has the Patent Office used this authority and how has this influenced incentives to apply for and maintain patent rights?

Actually, Commissioner Hirshfeld, I was wondering if you could speak to that first and then Professor Marco.

MR. HIRSHFELD: Sure, I'd be happy to. Thank you for the question. So the USPTO, as was just mentioned, does -- was given fee-setting authority, and the irony now is we are currently in a fee-setting making process, which I will explain in a minute, and we're very close to but not having yet, I believe, an extension to our fee-setting authority. It actually

did lapse, and the House and the Senate have passed a bill to extend that, and I believe that is over to the President for signature as we speak.

So how have we used this in the past and since the AIA? We have used this to set fees where needed. Historically before the AIA, fees would change, but they would usually be cost-of-living changes. What the AIA has enabled us to do is put fees to how they should be used most effectively, so we are still are cost recovery in the aggregate, but we don't necessarily need to be cost recovery for any particular item. So if we want to do -- make some changes, we will.

As I mentioned, we are in a fee-setting process right now, which, of course, started with our -- with our authority. And one I'd like to mention because it touches on a point earlier, and this is a segue to incentives, is in the fee-setting process now, we are looking at for the first time having a surcharge for documents that are not filed in what we -- DOCX, and that is intentionally an incentive so that people will start filing in DOCX, giving us the ability to make office actions and all documents text-searchable, which was a comment that was raised earlier. So it is fees like that that we could

change.

I also -- if you take a look at some of the fees we are proposing, we actually are in the -- slightly moving some of the fees from the back-end costs up front, although I -- which is a point Professor Wasserman raised earlier, and I did want to address that in the bigger picture as well since we're talking about fees. The structure to the fees at the USPTO is intentionally that the up-front costs of fees are very low compared to the back-end costs.

The reasons for that are so that you're incentivizing people to join into the patent system and seek patent protection, and then those who are successful, i.e., getting the patents and successfully marketing those patents so they want to pay their maintenance fees, subsidize the cost of all. That's been the structure for as long as I'm aware of the patent fees themselves.

So, I agree with Professor Wasserman that there is a balance that is important to the front-end and the back-end fees, and it's something we're always discussing at USPTO. But the reason behind that again is so that the successful people are subsidizing the rest.

The comment about USPTO having an allowance

rate based on money, quite frankly, I do disagree with that. I've been at the USPTO 24 years as an examiner and virtually I've held every management position. Not once have I uttered or seen an instruction to any examiner to raise fee -- raise allowance rates for any fee purposes. We want examiners making the decisions for the right reasons.

The maintenance fees start at three and a half years, and there's one at seven and a half years and 11 years. If we needed fees down the road, we would engage in the fee-setting approach, which would be the most effective way to raise fees, if needed, as opposed to changing the allowance rate. Again, we want people to make the decisions for the right reasons.

Last point on the fees is since we are in the process, this process is a long fee-setting process. We're actually setting the fees now for 2021. Our public advisory committee has had a public hearing on the fees. They shortly will be issuing a report on their views of our proposed fee-setting. Then the next step to that would be USPTO receives that report and makes a notice of proposed rulemaking with a comment period so that all of you can weigh in and everybody can weigh in on our proposed fees. We

would, of course, take those into consideration, and then there would be a final rule upon the issuance, and that is set for January 2021 at this point.

JUDGE BOALICK: If I could make just one comment, you know, just to follow Commissioner Hirshfeld for the PTAB/AIA trial fees. Those are set to recover the costs using the best available data. Of course, when we first stood up the trials, there was no data. We used estimates based on other proceedings at the office, and as data has become available, we've used the data as best available to set it at a reasonable cost recovery level. So I just wanted to add that for the AIA trials.

MR. MARCO: Yeah, and so let me add just a couple of comments about the fee setting. So -- and having been involved in it, I guess, one and a half times. It is a long process, and for an economist certainly, that was a frustrating process because we just want to change the fees, right? So -- and one of the hard parts about it is that the fees -- because it's a long process and because they haven't been changed very frequently, it means there's not a lot of data on how applicants can respond to those fees.

And this puts the PTO in kind of a bind, because it says, well, we need to change the fees, but

if we wanted to sort of incentivize some applicants -- some applicant behavior or other behavior, it's hard to know what the response is going to be, so -- because we don't have the evidence, it's hard to say what the response of those is going to be, and so it's hard to know how to change them.

So, I would say two things. So I am glad to hear about the DOCX. I think that's fantastic. But some people do argue about the Office using fees to, you know, change or incentivize applicant behavior. And I think this is something that we just need to get past for this reason. The purpose of the patent system is to create patent rights, right, that we're giving for a purpose for progress in the useful arts, right? It's for progress.

So the design of the patent system is for that purpose, and so if the fees help us to accomplish that purpose, right, the purpose -- the patents themselves change behavior. They're designed to incentivize behavior, right? So the fees themselves are just part of that system. So, it's a -- they are used to change behavior.

So one recommendation that I would make in order to get more data is something that government agencies have been doing a little bit more in the last

decade or so, is through experiments. Right? There are some possibilities in certain areas where one may be able to do experiments on, let's say, maintenance fees. So you're granted a patent and it says, congratulations, you've been given a 90 percent discount on all your patent fees. And by looking at how applicants respond -- you know, for a small portion of grants, we could give -- we could give a discount of some amount. And to see how applicants respond to that can tell us more about the fees without having a huge impact on revenue so long as the PTO could have authority to actually run those sorts of experiments.

MS. WASSERMAN: So can I just say a few words? I want to follow up. So I think all of this is great, and I definitely support the Patent and Trademark Office extension and their fee-setting authority and utilizing fees to help address applicant incentives. I think -- I agree with that as well.

I just think it's important to keep in mind, right, when we think of the fee structure, it's not just applicant incentives but agency incentives as well that can be -- that are created by the fee structure. And so I agree there's wonderful reasons to keep renewal fees, and we should definitely keep

them from a social welfare perspective, but there are other agencies, for example, the European Patent Office, right, that has renewal fees, but they are not themselves funded off of those renewal fees. Some of those renewal fees go to the national patent offices, so there are ways to sort of decouple the incentives that may be set up from agencies by the fee structure and allow them to then just sort of utilize it to maximize applicant incentives.

MR. DUBIANSKY: Thank you. Unfortunately, looking at the clock, I realize we're about at the end of our hour, and this has been a fascinating discussion that could likely continue for days. I would like now to give each of our panelists an opportunity to make some final statements. I'd ask you keep it to a minute or two just in the interest of time. And perhaps let's go down the line.

So Commissioner Hirshfeld, if you could go first, please.

MR. HIRSHFELD: Sure. Thank you very much. Well, and, again, thank you to FTC for having this hearing and including us at USPTO. I will just reiterate some of the points that I tried to make earlier, that I think the Patent and Trademark Office's role is very critical. We can take a lot of

steps to make sure that the scope of patents is very clear and those patents withstand challenges.

And you'll hear the words -- the phrase "certainty and reliability" spoken by me and my colleagues at PTO. That is our focus, to make sure that as much as we can put certainty and reliability so that when somebody gets a patent, they know they can count on it. They know it will withstand a challenge. When somebody is applying for a patent application, they understand the guidance that is going to be used by examiners to determine whether that is deserving of patent protection or not. That is our main focus and will continue to be so that we are helping those great inventors move this country forward.

MR. DUBIANSKY: Thank you.

MR. MARCO: Yeah, thanks. So, very briefly, keep fee-setting authority with the PTO. Focus on incentives and examination incentives. Examiners are -- it's easy to count the amount of actions they do. It's easy to count the production. It's harder to identify -- estimate quality in the examination, the quality of the examination itself, but there does need to be a reward system in place that incentivizes the quality as well as quantity and allows for a tradeoff

between those and the examination level that's hard to do, but it's certainly worth continuing to work on.

Applicants are incentivized by fees, and I think by thinking carefully about those incentives, we can get to a place where we are incentivizing A-plus patents instead of pass/fail kind of patents. Thank you.

MR. DUBIANSKY: Thank you.

JUDGE BOALICK: So, as Commissioner Hirshfeld mentioned, we are seeking balance in the system to achieve strong, reliable, predictable patent rights. As I mentioned in my opening remarks, the PTAB proceedings in particular were meant to be iterated. It was always contemplated that there would be iterations in order to achieve this balance. We've undertaken many such iterations. We're going to look forward to the input of the public and look forward to future iterations to achieve that balance. Thank you.

MR. REILLY: In speaking about the claim construction issues, I suggested Teva and Nautilus didn't have much impact on questions of patent clarity and patent quality. And I did want to flag one issue that I do think is worth addressing that would have an impact on -- one claim construction issue that would have an impact on patent clarity and quality.

And that's a persistent split within the Federal Circuit as to the method of claim construction, whether to -- essentially the role of the specification, whether you start with some sort of abstract ordinary meaning in the field and then only look to the intrinsic evidence, the patent and prosecution history for express disclaimer or disavowal of -- or to clear definition, or whether you start with the specification and develop a contextual understanding from the document with limited reliance on extrinsic evidence.

And Professors Wagner and Petherbridge showed empirically before Phillips that this drove most disputes on claim construction in the patent system and importantly re-created that study several years post-Phillips to show that Phillips didn't address it. In fact, most disagreements in the Federal Circuit and most disagreements between the Federal Circuit and the district courts relate to that -- to which of those two approaches to claim construction to take.

MR. VISHNUBHAKAT: So, I'll close simply by pointing to the sort of -- recalling the moment of institutional maturity that I spoke about at the beginning of my remarks. I think the way forward and

the way in which this iteration that Chief Judge Boalick spoke about should proceed is something that the Patent Office has already been doing I think an excellent job of, and sort of two ways in which I hope that they continue doing that is to continue to publish data for use by empirical scholars and policymakers to engage in, you know, exactly the kind of rigorous examination that we would like the patent system to use.

And then the other is bringing in experts into the agency, which has been going on now for the better part of this last decade, through programs like the Edison Scholars, the chief economist visiting speaker series. I think these are extraordinarily helpful uses of human capital that the Patent Office has taken, I think, very good advantage of. And these are the ways in which the agency will stay connected to a very rich ecosystem of expertise and opinion. Thank you.

MS. WASSERMAN: Yeah, and I want to echo a little bit of that. I think that when we move forward with patent quality and we're looking to make changes in order to improve it to the extent possible, it's fantastic we can do so using empirical guidance in those determinations. And I think both Professor

Marco's comment about experimenting would be a fantastic way to get more information on that, and then also, you know, commend the Patent and Trademark Office who has -- is just released huge amounts of data that I think has really resulted in a large and growing number of scholars that are doing empirical work in this area.

MR. DUBIANSKY: Great. Thank you. And I appreciate our panelists keeping their remarks brief. That actually allows us perhaps two minutes to field one of the many wonderful questions we received from the audience. And this is actually directed to Commissioner Hirshfeld.

Could you speak to the use of artificial intelligence and other resources during examination, both on their impact and also on the time that it may save examiners while they're conducting examination?

MR. HIRSHFELD: Sure. So right now I don't think there is a significant use in practice of artificial intelligence for examiners. That being said, we have examiners and others working on artificial intelligence tools to help us potentially move forward. I actually saw a tool that was written by an examiner on her own time to make her life easier where she could highlight text. It would go to

databases and take her search areas into consideration and rank results for her and give them back.

I've seen another tool that takes search data that examiners and any particular art unit work on and evaluates that data so that any subsequent examiner can put in potential search terms and get synonyms of those terms based on the particular technology they work in. And then, of course, they can rate the results of that so that it's learning for future examiners to improve from.

These are all tools that are being discussed and not in use yet, and they're being worked on. I think the sky is absolutely the limit to this. I mentioned our request for comments that came out in September. That is -- we are hoping to get additional feedback that we can -- and potentially more information that we can use to further enhance and accelerate our efforts to incorporate AI into the examiner's search.

I personally feel it's like the -- just the perfectly ripe place for artificial intelligence, given that you have, you know, thousands and thousands -- over 8,000 people -- doing searches. Now, they're not all doing the same in the same technology, but doing similar searches. You can learn having machine

learning best practices and looking at potentially years of data to be able to figure out how to move forward.

The second part of the question was about time. I'm actually really happy you asked about time. I don't necessarily foresee the artificial intelligence taking time away from an examiner. You know, Professor Wasserman touched on this earlier about the constraints of examiner time. I also agree that there are concerns about examiner time, so any efficiencies we can gain, I think, are important. It's not necessarily meaning we're going to take away time and really in my opinion is likely not to take away time from an examiner. Efficiencies can be put back into the system is what I would think.

On the note of time, we are evaluating examiner time, and that is something I think you will see in the coming months. I mean, it's a system that we're under, is ripe for change, and we are looking at that now. And so that is likely to -- of course, all the tools that we have now and in the future will play into the amount of time examiners have.

MR. DUBIANSKY: Great. Well, I think on the subject of time, it appears as if our hour is up. I would hope that you could all join me in thanking our

panelists and my colleague, Elizabeth Gillen. I think it's been a very productive conversation and really appreciate your lending your expertise to our hearings. Thank you.

(Applause.)

MR. DUBIANSKY: We are now going to take a break, and we'll resume at 11:00.

(End of Panel 1.)

PANEL 2: EMERGING TRENDS IN PATENT LITIGATION

MR. DUBIANSKY: Well, we are going to go ahead and get started with our next session, which will be taking place until lunch today. So our next session is on emerging trends in patent litigation. And building on themes discussed earlier this morning, we are now going to discuss and receive testimony from experts on recent trends and developments that relate to patent litigation practice or that have an influence on patent litigation practice.

Again, the passage of the America Invents Act in 2011 had introduced measures such as change in joinder roles. In addition, there have been subsequent decisions from the Supreme Court such as the TC Heartland decision involving venue and many other developments that we will discuss today.

So, our panel today will consist of two presentations, one from Shawn Miller from Stanford, who along with two of his colleagues will present data from the Stanford MP litigation database, and then a second presentation from Professor Colleen Chien of Santa Clara, and then we'll move into questions from the panel and also again will invite the audience to submit questions written on cards.

So, with that, I'd like to go ahead and

introduce the panel this morning. First, we have Shawn Miller, who is an IP research fellow at Stanford Law School, where he is managing the creation of the Stanford MPE Litigation Database. Colleen Chien, who is Professor at Santa Clara University School of Law and a fellow of the Stanford Computational Policy Lab. And she also served in the Obama White House as Senior Adviser for Intellectual Property and Innovation.

Next is John Golden who is the Loomer Family Professor in Law at the University of Texas at Austin School of Law. Then David Schwartz, who is the Stanford Clinton Sr. and Zylpha Kilbride Clinton Research Professor of Law at Northwestern University Pritzker School of Law, where he teaches patent law and intellectual property. And then to his left is Professor Neel Sukhatme, who is an Associate Professor of Law at Georgetown University Law Center.

So, we're going to begin with two presentations. And the first will be from Shawn Miller and his students, Rebecca Weires and Joshua Rosefelt. So if you'd please take the lectern. Thank you.

MR. MILLER: Thanks, John, so much for having us be part of these hearings. So, I'm going to introduce a little more information about my two star

research assistants that I'm bringing with me today. Josh Rosefelt and Rebecca Weires, both are future -- not too far in the future patent attorneys, who summered at Fish & Richardson's Silicon Valley office last summer. And Rebecca is actually concurrently working on her master's in biomedical engineering, and Josh was a patent examiner for two years. So, they are -- I'm very lucky to have this caliber of research assistants at Stanford.

And for the last two years, they've been helping me build this Stanford MPE research data set. And what that is is it's a five-year effort started by Mark Lemley and myself to categorize patent plaintiffs in every lawsuit going back to 2000 as either practicing entities or as one of 11 types of nonpracticing entities.

So the big reason that we started this project is that we're convinced that -- how patents are used in the system and how they're litigated depends a lot on the type of patent owner and on the business model. And so then if we're going to look and try to figure out how different legal changes have impacted the patent system, we believe that it's going to depend a lot on who the patent owners are.

And so, for our presentation today, Becca,

Josh, and myself, we're using the data from the Stanford MPE litigation data set, as well as additional data from Lex Machina, and also we were able to get some PTAB data from Unified Patents. And we're going to give a brief descriptive survey of changes in litigation around recent patent reform.

Becca.

MS. WEIRES: Hi. So as Shawn alluded to, with our data set, we're able to look -- separate out trends in litigation activity of practicing entities and patent assertion entities, PAEs, and see how they've responded differently to reforms that have happened over the past eight years. So I'll start by reviewing patent lawsuit filings since 2000 to just give an overview of what's going on and with a particular eye toward the AIA joinder rule. Josh will present on the relationship between PTAB filings and litigation; and Shawn will share how choice of venue and total lawsuit filings have changed in the wake of the TC Heartland decision.

So first, we'll look at the number of patent lawsuits filed. We'll break that down by PAEs and practicing entities to get some insight into whether reforms were actually effectively targeting PAEs. So here we have total lawsuit filings from 2008 to our

2018 projections from a 20 percent random sample of our data set. Here, we note the stability of practicing entity litigation -- that's shown in blue -- and relative to the instability and variability in PAE litigation. And so we see an uptick in PAE litigation before the AIA, and that also increased following the AIA joinder rule in 2011, to peak in 2013 to 2015 and a decline since then.

And so narrowing in on 2011 and 2012, we see an increase in the number of lawsuits filed, and that's pretty consistent with our expectations about the AIA joinder rule. Of course, we can't totally isolate those effects because of all the changes that happened around the same time, but we would expect that the joinder rule, because it essentially split these large multidefendant suits into multiple lawsuits, we'd expect an increase in the total number of lawsuits, and we'd expect a bigger effect for PAEs because they were the ones that were bringing these multidefendant lawsuits in the first place.

So that previous graph presents sort of a skewed view of the overall patent litigation activity because the joinder rule itself affected the size of each lawsuit, so here we look at defendant lawsuit

pairs, so we looked at a lawsuit that has ten defendants here is plotted as ten separate disputes. And this we get a good picture of the effect of the joinder rule here. We see, again, an increase in PAE litigation activity from 2007 to 2011, a major upswing there, but in contrast to the last, we don't see continued increases following the AIA and the subsequent reforms.

And then, of course, things like macroeconomic trends are going to affect both PAE and practicing entity litigation. So to get a better idea of the effect of reforms that target PAEs, we look at the share of total lawsuits brought by PAEs. And here again, we see a general upward trend from 2007 to 2011. We see that more recently PAE litigation accounts for pretty much as much of litigation activity as practicing entity litigation, but that that upward trend has really leveled off since the AIA.

So, overall, we've seen since the mid-2000s to 2011 an increase in PAE activity. That's leveled off in light of the joinder rule change and subsequent reforms. But we see that through all of those reforms practicing entity litigation has been fairly stable. So I'll pass this off to Josh to talk about the PTAB.

MR. ROSEFELT: Thank you, Becca. So, as she just stated, I'm going to talk briefly about the impact that PTAB has had on patent litigation. We'll primarily be looking at whether the availability of post-grant proceedings had an effect on the overall number of patent suits, that is, whether it decreased the number, and also whether the availability of post-grant proceedings disproportionately affected PAEs and pharmaceutical patent owners. We would expect that the availability of post-grant proceeding would reduce the amount of PAE litigation because it is a cost-effective tool to help eliminate low-quality patents.

So, here, this graph shows the total number of lawsuits, the total number of PAE suits, the total number of PTAB petitions, and the total number of petitions filed against PAEs since the formation of PTAB in 2012. First focusing on the period between when PTAB was formed and when the Alice decision came out, focusing on the light-colored lines, that light blue line that represents the number of PAE lawsuits remained relatively flat as the light orange line, which represents the number of PAE PTAB petitions, steadily increased. Interestingly, however, post-Alice, the number of PTAB petitions filed against PAEs stopped increasing while the number of PAE suits

appeared to decrease.

Next, we show the percentage of suits filed where a patent has been the subject of a PTAB petition. That is either an IPR or a CBM. And as this graph shows, between 30 and 40 percent of recent lawsuits involve a PTAB petition, indicating the important role that PTAB now plays in dispute resolution.

And here we break down the lawsuits with PTAB challenge patents by industry. Over the entire period, we see that 74 percent of the lawsuits with PTAB-challenge patents are from the high-tech industry. Think of this as computer science, electrical engineering, stuff that comes out of the Silicon Valley. Twelve percent are from medical technology, and 14 percent are from other areas of technology.

And although it's not surprising to see a high number of PTAB-challenge patents from the high-tech sector, as this graph shows, it's also clear that medical technology is also being challenged. And as this next graph indicates, interestingly, we see that the percentage of ANDA involved suits and non-ANDA involved suits with PTAB petition occur at similar rates.

Finally, we had time for a cursory look at the impact of PTAB petitions on litigation outcomes. Focusing first on the duration and settlement boxes, we see that lawsuits with PTAB-challenge patents last longer and settle less frequently, regardless of whether they're ANDA or non-ANDA patents.

Regarding the lower settlement rates, we think that this may be capturing the fact that patents that are both subject to the litigation and PTAB petitions are potentially of either higher value or have more validity issues. Additionally, we're going to refrain from interpreting the summary judgment in the trial win rates outcomes since there are various interpretations based on selection effects. More research is needed to determine how PTAB has impacted litigation success. However, we do want to note that the trial win rates are pretty similar, both before and after PTAB was formed.

So in sum, PTAB post-grant review proceedings -- I'm sorry, post-grant proceedings may have dampened the number of PAE suits. They appear to have been used against ANDA patents and non-ANDA patents in similar rates. And they also appear to increase the duration of suits involving both ANDA and non-ANDA patents.

Now, I'm going to hand it off to Shawn, who will discuss the impact of venue on impact litigation.

MR. MILLER: Thanks. Thanks, Josh and Becca. So, the impact of venue in May 2017, we had this big Supreme Court decision TC Heartland vs. Kraft Foods, and we're going to take sort of a surface-level look at the impact of that decision on changes and where patent cases are filed and also whether or not we think there's indication that there is a large increase or decrease in the number of lawsuits because of the decision, and also again, using our MPE data set sort of compare the impact on PAEs against practicing entities.

And here we look -- we've already seen this chart showing the relatively stable filings for practicing entity lawsuits versus highly variable changes in PAE filings with what I like to -- I've affectionately started to think of as the Alice crater centered around 2014. Here we have TC Heartland pointed out, though. And one thing that I think is interesting is, so we had all these changes between 2011 and 2015, and the last couple of years, it looks like there's actually been an uptick in practicing entity litigation, and also that PAE litigation has started to stabilize a bit.

And so perhaps there hasn't been a big change in the number of lawsuits filed due to TC Heartland. However, there's clearly a big change in where suits are filed. So we see here what I'm looking at is the before and after, so nationally and then for the busiest patent districts, how many cases were filed the calendar year before TC Heartland and the calendar year after. And we see nearly a 70 percent decline in filings in the Eastern District of Texas. And then in green-shaded, big declines in several of the busy districts that tend to be the ones where lots of companies are located, of course, or in the case of Delaware, incorporated. And we see that Delaware has been -- it appears to be the big beneficiary of TC Heartland with year-over-year gain of about a third of the Eastern District's loss.

And so one of the things -- so, again, this idea, and I jumped a slide too quickly, but what we saw in the previous slide is that the Eastern District of Texas lost 1,100 cases or had 1,100 fewer cases the year after TC Heartland as compared to the year before. Nationally, we had 500 fewer cases the year after than the year before. So, this might beg the question whether or not we think there are lots of patent claims that would have filed in the Eastern

District of Texas in the absence of TC Heartland but then are not filing at all because that's no longer an available option with more restrictive venue.

And here, I'm just pointing out, going back four years before TC Heartland, it looks like the year before, the year before TC Heartland, Eastern District of Texas had lost about 500, had about 500 fewer cases than the prior year. So it's possible that the -- that a big chunk of the loss in the Eastern District of Texas that we observed the year after TC Heartland is due to these other changes like Alice and the availability of PTAB.

So now looking at some of the busiest districts, breaking down the changes before and after by practicing entities and nonpracticing entries, first of all, at the top, looking at the whole country, and I'd ask you to focus on the totals in parentheses, that practicing entity litigation has been pretty stable throughout the country, whereas PAE litigation, we saw there's about 25 percent decrease in litigation the year after TC Heartland.

Eastern District of Texas, sort of the reverse, not that there was a lot of practicing entity litigation going on in there in the first place, but about 70 percent less PAE litigation the year after.

Delaware and Northern District of California saw about -- about, I think, three -- an increase in about three times as much PAE litigation the year after with, of course, Delaware starting from a larger basis.

And so this is another part of my current research on venue, looking at the impact of cost and convenience. And one thing I think I'm seeing here is potentially a tendency for some plaintiffs' attorneys that are in PAE-heavy districts, including the Southern District of Florida and the Eastern District of Texas, shifting towards neighboring districts post TC Heartland.

And so, finally, what we're seeing so far is that we've had a dramatic decrease in filings in the Eastern District of Texas, big changes across the country in where patent cases are filed. However -- with the biggest winner being Delaware, however, it's quite possible that TC Heartland has not had that big of an impact on total filings.

Thank you so much.

MR. DUBIANSKY: Thank you. And if you'd join us in thanking both Shawn and also students Joshua and Rebecca.

(Applause.)

MR. DUBIANSKY: Now we'll hear from

Professor Chien.

MS. CHIEN: Thank you. It's an honor to be here today, and I have to say, I remember early in my career attending hearings at U.C. Berkeley School at Haas School in the audience. It could have been the Pitofsky hearings actually because I went to school back that long ago in 2002. I remember thinking when I was in the audience what they're doing up there is really cool. I'd like to do that someday. So I'm just warning you, if you're in the audience and you feel the same way, you'll probably be here on the podium in a much shorter time than it took me, but I hope that people enjoy the presentation today.

So, this is a presentation that I worked on with my students, Nicholas Howkowski, Marvin Ricotto, and Pria Voss (phonetic). And we decided to sort of complement the work of the Stanford group and look a little further into not only the filings but what was actually being filed, so the complaints themselves and applications, and really get to this overall question of policymakers are not making changes just to sort of shift around where cases are being filed, but they're trying to increase the quality of the patent system and help it serve the constitutional purpose more fully.

So we want to really look at is quality improving even if quantity is going down? So just this is a picture of the team, just so you know who are here. And most of these folks are in an artificial intelligence class that I teach. We did some work with AI, which didn't make it into the presentation, but this is just to say that this is an ongoing project and we're excited that we can just be part of this conversation.

So, a number of these folks are also machine-learning kind of data science people that are not in the class, but it was a fun opportunity, and for those of you who are professors to do sort of interdisciplinary work together, these kinds of opportunities are very welcome. And a number of these folks have deep experience in prosecution and doing work.

We also got a lot of help from open data from the courts and the PTO, but that was supplemented by sources. So there was already reference to Lex Machina and Unified Patents. We also were able to work with Harrity, LLP for access to a tool for analyzing patent traits; TurboPatents and AskAlice. TurboPatents actually is created by a Santa Clara alum as well. They’re AI-based systems. We didn't have

time to integrate those results, but we'll seek to release those later.

So, again, my focus since I was looking particularly -- our focus since we were looking particularly at applications, patent applications submitted to the Patent Office as well as complaints, we were less, I think, focused on things like joinder or TC Heartland. We were looking at really what's getting impact, what's getting filed, the bread and butter of what's being put together by litigators, by prosecutors all over the country as they're writing now their documents and thinking about the changes in the law.

So most of these changes are clustered in the 2014 to 2016 period. So even IPR, even though it was introduced earlier, it didn't really reach steady state until 2014. We had the Octane Fitness fee-shifting cases, cases in 2014. Alice was decided in 2014. We had Teva, Williamson, and also the Form 18 change happen in 2015. So we thought, well, we can kind of look at this period of time and try to concentrate on what happened before and after it.

And as was I think sort of maybe the methodology that Shawn and his team were working sort of on as well, we were a little more explicit here and

wanted to talk about using a differences-in-differences approach to looking at whether or not the policy changes did bring about causally changes in the environment. Now, that analysis is always very challenging and it's hard to do it. So we're going to just show you our results.

But the idea is, if you have a child who's sick and you give them some cough medicine and they get better, you might say, well, yeah, well, the cough medicine made them better. But you can't really be sure unless you actually give their twin who also has the same illness and is in other ways completely similar to that kid that had the treatment, and you also don't treat that kid and you see how they do themselves.

If they both get better, then it wasn't really the cough syrup that made that first child get better. It's just something else. Maybe they were on their way up, the weather got better, et cetera. So we want to look for control groups that don't have a treatment or that were not targeted by the policy intervention and just see how they're doing in comparison. And, again, Shawn's team already referred to that, and we have very similar priors in terms of what ways to control.

So we do look at these periods pre and post, before 2014 and then after 2016. And we try to use our control by thinking about, well, what were the reforms about. They were really about trying to target abusive litigation, so litigation that was sort of based on the economies of scale and the cost of defense by MPs based on software patents in particular.

So we looked and tried to then say, well, if those are the target of some of the reforms, how do we then try to develop controls. So we control by technology looking at peer software versus a random sample of patents that weren't peer software. And chemistry patents were the most stable in there. We also controlled by plaintiff. And here we mostly relied on Unified Patents codings, but those only start in 2015.

So we developed another kind of coding, which is high-impact patent, which is a patent that's been asserted more than ten times, and that's just a small cluster of patents, kind of in terms of proportion of overall patents, but they correlate highly with PAEs, and you can think about the economics as being what's important anyway, even if there is a entity that may be practicing but then

asserting and asserting, asserting one patent. They're more likely to tap into the cost of defense and the economies that come from economies of scale.

So we looked at two types of inputs or I guess products in our patent system -- complaints, as I mentioned before. And here we wanted to look for quality primarily by looking at are they more detailed? Are they conveying more information so that the parties can get to a meeting of the minds more quickly? And we had certainly in mind Form 18 change, and so we looked for the presence of claim charts and we also looked for specific product details like screenshots and accused product descriptions.

And the first one, we could look at the entire set of complaints, all of the complaints filed. For the second one, we had to do hand-coding, so we had a smaller sample. For patent applications, we then also wanted to see are there more details there? Is there more technical information? Is there more narrowness in what's being applied for post-Alice and post-Williamson, et cetera.

So we looked the total words in an application. You know, there could be a lot of boilerplate in that, though, so we wanted to also look at unique words, and so we looked at unique words in

claim 1. Again, not perfect measures. We used a lot machine-based techniques here, so it did allow us to get a large volume. Hand coding might result in more fine-grained analysis.

So let's just first go to this kind of first assertion about a flight from quantity, and again, Shawn's team nicely cued up this -- and has already reported findings on this already. So I want to just kind of show a very high level, though, if we take away sort of this idea of patent assertion and MPE, if we just look at, again, the economics of who is a high-impact patent asserter, who's serving a patent that's being litigated many times, we do see that there was a rise and then a fall among those patentees in the red as compared to the non-high-impact patent on the bottom. So, those have been down since their peak in about 2012 or so.

One thing that wasn't addressed by Shawn's presentation, he focused on PAEs, is what about non-PAE NPEs? What about individuals? What about small businesses who are not practicing the patent but are asserting it? How are they doing? I thought it was really important to look at their impact as well because I don't think that the reforms were as targeted towards individuals or small entities or

small businesses but really focused on the PAES.

So here again because the data is from Unified Patents, it doesn't show a really good pre/post. I only have it from 2015 on. But what I think is interesting is to contrast in the red the PAE share which has declined and the orange kind of NPE non PAE share. So they both kind of convert -- they were both at a similar point in 2015, but they take a similar trajectory downwards, which suggests that even if you're a non PAE NPE, you have also been affected in a way that's different than operating companies.

And, again, this is data that I think we can probably look at Shawn's data to kind of confirm whether or not he sees the same trends, since he has all the granular breakouts, but I think it's an important thing to consider as well.

So focusing, though, on the kind of newer findings here about the flight to quality, again we looked to complaints first. And we tried to look at their length. Again this was a hand-code. I think we can actually do this with machine work, but so it's about 526. We don't have a great huge set here, but we did see that there was the change in the law in 2015, the end of the year that Form 18 was abolished, and you did see at that point in coincidence an

increase in the number of pages in complaints.

We found this to be the case across all groups we looked at, but, again, because our end was only 520 or so, you know, it was hard for us to do a lot of meaningful, fine-grained analyses.

Now, we were able to do the claim chart analysis across all complaints. And, interestingly, we saw that claim charts also became much more common. And that's partly because we had such a low baseline to start with, almost -- like 1 percent or less than that was being filed in the 2010 to 2015 period or 2014. And then you start to see an increase, and it’s dramatic, right? In 2018, if we look at the complaints filed this year, we see a rate that’s closer to 15 percent. That means that if you are on the receiving end of a lawsuit or you are initiating a lawsuit, you’re going to have to do -- you have much more information at the outset of the suit than you're used to.

So I can’t tell you how many people I’ve talked to who said, you know, I got this complaint, and I really have no idea what exactly they're accusing me of and which products are at risk. And that makes it hard for me as a business because I don't know what I can manage, what I might be able to

kind of change the product or negotiate on because I don't know how much my revenue is exposed by this.

So when you have a litigation and a complaint that's filed that's vague and very high level, that can put an entire company at jeopardy unnecessarily because it really implicates, you know, potentially the whole amount of product and revenue stream. So when you have this detail, which we're now seeing in these claim charts, where it shows exactly the language of the claim and exactly which elements of a product are being implicated, that provides a lot more certainty to the market about what's actually at stake. So I think this is a good development.

We also saw that product details were much more common. So we looked here particularly for screen shots, for claim charts that were embedded inside the complaint. Also for actual product descriptions and links to an actual product, so you can see here on the right, for example, this was an AR technology, and they actually put in Pokemon Go, and, you know, showed exactly what they were talking about and kind of mapped those two things together.

So, again, going back to the claim chart, the greater increase in claim charts, I wanted to also look briefly at whether there were effects by

district. And we saw that there were, you know, again, if you look at all and non-EDTex -- or it's probably just most important just to look at non-EDTex and EDTex. In 2015, you see this increase, but then you see a decrease in the Eastern District of Texas with respect to claim charts.

Now that could be technology-related or something else. We do need to try to do more work here. Again, this is a complete set, so we can probably do some additional controls here. But it is interesting and notable that EDTex kind of takes a different direction with respect to claim chart detail and whether that is needed or at least the complainants perceive that they need to provide that up front.

The same is true, and here we see, sorry, a variation with respect to the PAEs and also the non-PAE NPEs. So, again, looking at -- and, again, this is a truncated data set, only 2015 on -- but if you look in particular at NPEs which are in blue and you look at PAEs which are in orange, you see that PAEs -- they're both filing less than OpCos in terms of claim charts. They're not filing as many. And, again, this could be a technology -- there could be a technology explanation, but you do see that non PAE NPEs are --

you know, sort of have continued to have a higher rate than the PAEs. But, you know, again, there's not a lot of -- there still needs to be some control work, so this is more suggestive, I think, than conclusive of anything.

Briefly, let's just talk about patent applications because we are considering Alice and some of the other decisions that took place. Here, we could see -- again, we were able to look at all the applications filed in these particular art units, which are defined in the appendix. And, you know, don't kind of -- I think the scale here goes from 60 to 90. So if it were actually spread, you would see that there's not a huge change. But you can see that, again kind of the pre and post-idea that there has been a change in pure software patents, that the unique words are being added to a larger degree than they were for pure software, and this happened around the Alice decision. It's about a 14 percent difference in terms of the initial claims that are submitted.

Specifications are also becoming longer, and here we looked at software versus non-pure software. So red, pure software; blue is non-pure software. And we looked at chemistry again as the control, and we

saw a difference of about a thousand words. So, again here is where you could see that the software specifications -- software prosecutors are working harder, they're writing longer specifications, they're putting in more unique concepts and ideas, using longer ideas. And so, again, I think I would argue that that is a good thing for the patent system, to have more detail in patents. If the problem was low-quality patents, flimsy patents, that you couldn't tell what they actually covered, now we are seeing more quality there.

So in conclusion, what we're seeing, then, overall in terms of a flight from quantity that there are fewer scale assertions, right, of the ten-plus variety. There are also fewer PAE as well as non-NPE assertions. That's the suggestion from the data. We also are seeing more detail in complaints, particularly claim charts, and also more unique words in claims and in the specs. Thank you.

MR. DUBIANSKY: Thank you for that presentation. I think now we'll move on and invite our other panelists to give brief opening remarks of about five or six minutes. I invite them to both react to the presentations we've seen earlier this hour, as well as to offer their views in particular on

if there's anything, any changes in the patent landscape, particularly beginning with the AIA and subsequent Supreme Court decisions, that have influenced litigation today.

So with that, John, if you would begin. Thank you.

MR. GOLDEN: Okay. So I think as you've seen partly through Colleen and Shawn and Joshua and Rebecca's presentations, there have been a multiplicity of changes that have tended to kind of raise costs of litigation in some ways, lower expected rewards from patent assertion, partly through greater opportunities to challenge patents, say, through PTAB proceedings.

And we might expect these changes to have been particularly important for assertions that are or were likely to be recognized as having been relatively ill prepared or relatively low quality. And it’s reassuring to see that there’s some data indicating that when you make legal changes like this, they can actually have some sort of effect, so it’s a sort of good story for policymakers that they’re not totally helpless in the face of a litigation system that might have some problems.

But, you know, I do think overall, it can be

difficult to evaluate where we are and what we've accomplished with regard to the ultimate aims of the patent system, which are looking to promote innovation in the spirit of the title for this hearing, perhaps to sort of promote healthy competitive and diverse environment for technological innovation. And you might even say partly to help support the foundations of a healthy democratic culture.

So for that, we probably, and it should be sort of a next step maybe, to try see if we can drill down further to see how these impacts might have differed across different types of actors in the system. To what extent have, say, mid-size or smaller firms had different experiences or similar experiences in comparison to large firms? What had been the impacts on any individual inventors who remain out there or university innovators and their licensing programs?

So it's always easy to ask for more, but I do think that might be the next step to see to what extent at least we're supporting kind of a diverse environment and ecosystem for innovation, which I tend to think is the healthiest sort of environment for innovation. And of course, ultimately, you'd like to connect this to the kind of fundamental goals of the

patent system of promoting technological progress. So with that I'll turn it over to Dave.

MR. SCHWARTZ: So I appreciate the opportunity to provide my views here today on patent litigation. I wanted to make kind of two brief comments about the data and then one more broader institutional comment. First, I want to just second something that Colleen said, like, it's useful. I thought that the presentation that Shawn and Rebecca and Josh did was really interesting and really useful.

I think that an enhancement would be to try to separate PAEs into some other more finely granular definitions. And so one thing that, like, I've done in my work is you could separate -- and to stop for a minute, Colleen used, like, NPE and sometimes used -- and I think Shawn used PAE. I think sometimes those are a little confusing on what people mean. And so just to be explicit, I would say that you could separate out patents that are enforced by the original owner, which include individual inventors and failed businesses and maybe universities and some other folks on the one hand. And on the other hand, kind of what I call speculators, people are buying patents from others, and I just would be interested in, like, if there's any differences if we did that.

The second data point I want to talk about is the limits of the available data about patent litigation. And that's partially due to selection concerns, but I think it's a little deeper than that. So as we all know, most patent lawsuits settle. Most of the settlements are confidential. And so the win rates on the cases that go to trial are important, and they tell us something, but they might not tell us the whole story. And so I've heard anecdotal stories, not data-driven stories, that accused infringers like more recently are less willing to offer meaningful settlement offers out of the belief that the law is very favorable and that they're likely going to win or that the delay in the case is going to be substantial, such that the plaintiff will eventually give up.

And it may be that the underlying negotiating position between the parties has changed such that like the filing rates and the win rates and the summary judgment rates don't tell the full story. And there's very little known about these settlement dollars because they're all confidential.

Separately, but relatedly, we know very little about pre-litigation activity, demand letters and licensing, outside of litigation. I commend the FTC who did a 6(b) study a few years ago on PAE

activity, looking at these kind of confidential -- or at least confidential to the public -- information. And I raise this really just to encourage others to research this, where I understand it's hard to find data, but I just think we should be cautious in extrapolating too much from the available data that we have.

So, finally, I want to just note some of the institutional issues that are going on with patent law. And so we've had a large number of changes to the patent laws. I think that John pointed them out, Colleen pointed them out, the Stanford presentation pointed them out. That includes the AIA which brought us IPRs, Supreme Court decisions on Alice, fee-shifting, venue, willful infringement, Federal Circuit decisions on damages, changes in the rules of civil procedure, as well as PTAB changes, including notably that the claim construction standard will be changing in the PTAB.

Those changes, for the most part, and John noted this, have made it more difficult and more costly to enforce patents, but that's not why I'm mentioning them. I'm mentioning them to highlight all the different institutional players involved in those changes. So we have Congress, the Supreme Court, the

Federal Circuit, the Patent Office. That's a lot of cooks in the kitchen, in a small period of time, adding a lot of different ingredients.

The patent system is complex. And, you know, maybe to mix metaphors a little bit, it's more like a boat than a car. And I mean it takes a while for things to turn. And so we have so many changes in such a short amount of time. There's a concern that there's going to be both unexpected and unintended consequences and that we're not at steady state and you need to let things settle.

And so as I think about those different actors that are involved in making these changes. The Federal Circuit, you know, has the difficulty of only hearing the cases that the parties bring to it. And really, you know, the parties have very personal reasons for advocating different positions. And it's hard for it to be in like a kind of a policy mindset.

Congress is different, right? Congress can take testimony from others. The Supreme Court gets amicus briefs, and the Patent Office has the opportunity to, like, take testimony and hear from both patent owners and others affected by the system. And so I just, you know, want to note all of the changes that have happened and think that we want to

get to steady state or, like, think about things carefully as we're thinking about exchanges going forward.

MR. DUBIANSKY: Thank you

Neel.

MR. SUKHATME: Great, thanks. Thanks for inviting me here. So my background is I'm an economist by training and also a patent attorney. And so, you know, as an empiricist, I really want to thank Shawn and Mark Lemley and the students at Stanford for the Stanford MPE data set. It's really very useful. It's something that I've used in my research. And I'll, you know, talk a little bit about that right now, and I think probably later on I'll sort of go into maybe the details.

But I've recently written an empirical analysis of the effect of TC Heartland. And, well, first, a few things to note, right? So the question is what's the long-term impact of TC Heartland going to be. And so what we do in the paper is we use something called an event study methodology around the date of TC Heartland to see how investors responded to the change in patent term rules, right -- oh, sorry, the change in venue rules.

And so what we find is that folks, firms

that are incorporated in Delaware in particular were quite happy about this change. And, again, I'll go into the details of that. But what I want to sort of cover is venue clearly mattered to patent litigants. It seems like the TC Heartland decision is going to have an enduring impact in terms of where suits are filed, right? They were filed largely in the Eastern District of Texas. We see them moving en masse to the District of Delaware, as Shawn pointed out.

And I just wanted to sort of highlight and sort of -- you know, what was actually going on there in Texas beforehand was this notion of form-selling right? Texas had sort of -- had these rules in place, discovery rules, rules that made it difficult to transfer cases, made it less likely to grant summary judgment, which encouraged the filings there in the first place.

And the reason why Texas was able -- the Eastern District of Texas was able to track these suits in the first place is because plaintiffs had complete choice of where they could file suit. Really what the defendant's preferences were were not really part of the equation at all. And I think a way of thinking about TC Heartland is that it changed the dynamic. Now, where a defendant is incorporated or

where it does business is highly relevant in terms of where it can be sued.

And so a broader point to take away from TC Heartland, right, and this applies outside, even outside of patent law, is that by giving defendants some choice of -- some choice of -- over where venue occurs, right, essentially allowing both parties to have a say over where lawsuits occur, we can end up with better results. And I say better because, as I'll probably mention later on, my empirical results suggest that firms are quite happy, especially Delaware firms, about this shift to Delaware that's occurring. And to the extent that the interested firms are opposing to those of patent assertion entities, that suggests that TC Heartland will have an enduring impact on patent assertion entities going forward.

MR. DUBIANSKY: Great. Well, thank you, and I thank all of our panelists for those statements. Now we're going to move into questions. And, again, I invite the audience as well to submit any questions that you have on the cards being distributed by my colleagues.

So with that, I think Elizabeth will ask the first question.

MS. GILLEN: So both Shawn and Neel have talked about TC Heartland, and we've seen some data on the number of lawsuits that have been filed after the decision and where. And Neel has another perspective on it, but I'm wondering if the other panelists have any thoughts on how TC Heartland has influenced litigation behavior, perhaps in a more qualitative way.

MS. CHIEN: I actually have a question, and this would be more, you know, to ask if there's unreported research or you are -- this is ongoing, but I think in particular I'm really interested in the question of the non PAE NPEs, so thinking about small businesses and individuals, and I'm just wondering if some of these shifts mean that they're not bringing as many suits or they're also moving to Delaware as asserters.

So I just didn't know if you had unreported data or looked into those issues, either of you. I think you have the data, but I don't know if you looked at it yet.

MR. SUKHATME: So I'm sorry, what particular kinds of suits are you --

MR. MILLER: Small entities that aren't PAEs.

MS. CHIEN: Yeah, non -- so, you know, thinking about folks who could bring a suit in -- not even in Texas but in New York because that's where they're based, instead of having to go to the defendant's home turf in California, which is a lot more of a burden to them. So if you think of a small business which has a patent that they want to assert, that's a lot harder now potentially to have to go to the defendant's venue.

And I'm just wondering if that is reducing the number of suits by these entities. We saw that those were going down on overall, at least as expressed by the Unified Patents data, and I wondered if TC Heartland was part of that story. Again, in the data that I showed, it didn't look like there was a particular steeper decline or anything, but I just didn't know.

MR. MILLER: Nothing directly on point. So my TC Heartland project that I'm working on right now is actually not really a TC Heartland project. It's looking at the importance of home court advantage for choice of patent venue, and so ideas of whether or not parties think that there might bias towards local parties, and also, cost of convenience concerns.

And one thing that I'm seeing, so I've

broken it down again by PAEs like I did here, which combined both those categories of PAEs that Dave talked about, the ones that are started by the inventors of patents and those that acquire patents and then also practicing entities. And the one thing you're seeing is so before TC Heartland, and this might be a surprise, it might not be, but a very large percentage of the cases were filed in the plaintiff's home court where their principal office is. And the big change that I've observed so far is after TC Heartland there's not an increase in filing in the defendant's -- where a defendant's principal offices are, but there is, of course, a decrease in filings in the plaintiff's home court. But so what they're doing is they're moving to neutral sites, right? Primarily Delaware.

And I've thought about that. I think that's an important extension is to think about, you know, so my results are suggesting that parties do care about being close to home. And you would expect that smaller entities would probably care more insofar as cost is an issue.

MS. CHIEN: I will comment that when Michael Risch and I did our study before TC Heartland to look at the dynamic impact potentially projected, we did

not think that small entities would be hurt that much because they weren't necessarily filing opportunistically in Eastern District because that's too far themselves. They were filing closer to home. And so it depends again if they're located mostly closer to Delaware or Northern California, then, you know, it depends a lot on the relative position of them to those locations of interest.

MR. MILLER: There could also -- I would just add real quick, there could also be correlations between small entities tending to be from different industries, right, where it's possible that small entities, typically you're seeing some types of practice entities, while -- they tend to sue their neighbors, right? So if you're a machine shop or some sort of -- I'm trying to think like a -- an importer of some good, you're suing another importer of a similar good that also happens to be in LA, right? So maybe then there's not as big of an impact on cost for those smaller entities.

MR. SUKHATME: Yeah, I wouldn't expect a huge effect on those entities because the folks who really were taking advantage of the Eastern District of Texas were the patent assertion entities. And also another important thing to keep in mind here is that

TC Heartland, you know, the venue statute has got these two prongs, right? So the Supreme Court interpreted where a corporation resides is no longer where it's subject to personal jurisdiction, right? It's not just you committed an act of infringement. What they said -- "resides" means where you're incorporated. However you can still be sued anyplace you commit acts of infringement, and if you have a regular and a -- quote, regular and established place of business, right? So we've seen some litigation since then in the Federal Circuit to try and interpret what that means.

But it's important to know that TC Heartland doesn't sort of limit you if you're a Delaware corporation to suit in Delaware, but it certainly makes it impossible essentially for you to be sued everywhere unless you have facilities everywhere. And that's what I was sort of referring to earlier in the sense that now under the current -- the new system, right, both plaintiffs and defendants essentially have control -- some control over where lawsuits can be filed, right? Because defendants, where they decide to actually establish their regular and established place of business and where they're incorporated, those are essentially the choice set

from which plaintiffs can pick where they're going to file suit.

MR. GOLDEN: I just want to jump in just to sort of reinforce Colleen's question. I guess we're both sort of concerned about this. I mean, I think if partly part of the concern is these sort of gross statistics may not reflect what might be a relatively small percentage of litigation overall that's filed by, say, these small or mid-sized companies but might be very significant to those companies with their business model.

And this relates to some work that I did years ago looking at patent infringement injunctions where it turned out if you looked at who’s getting these patent infringement injunctions, they’re these kind of niche companies with technologies that wouldn't be so prominent or high-tech, or you wouldn't think necessarily were so valuable, like a sort of tub for a veterinarian to use for a dog or something as being -- or there's, you know, a coffin design which I'm not sure that patent should have been issued. But it was very important for this company that apparently sells something like 50 percent of the coffins in the United States, at least at that time.

And so I think this is part of our concern,

that the concern that Colleen raised and was something that I referred to in my initial remarks is that you might need to look at things more -- in a more granular way, to get at what might be kind of middle-level companies for which patents are disproportionately important.

MR. SCHWARTZ: Yeah, and just to reiterate, I mean, I guess I have the same reaction Colleen and John have that it just seems like a fairness issue when it's a small plaintiff suing a large defendant to have to litigate in the defendant's home court. There was also a fairness issue when large plaintiffs were suing small defendants and they were suing them in the plaintiff's home court. That also seemed to be a fairness issue.

MR. DUBIANSKY: Great. Well, thank you. I think we'll move on to another subject, which is the PTAB. In our previous panel this morning, we've heard a lot of discussion regarding the implementation of the PTAB. And I would like to ask this panel as well, I guess from a litigation perspective, how has the creation of the new proceedings at the PTAB influenced the litigation practice?

Perhaps, Dave, if you could speak to this.

MR. SCHWARTZ: Okay, great. So I want to

make two points. One has to do with the delays and the kind of effects on small business owners that are patent owners; and then the second has to do with this kind of oncoming post-grant review PGRs. But before I do that, I just want to say that I do think that a fair and balanced post-grant proceeding to effectively remove invalid patents is both appropriate and necessary because patent litigation is very expensive. It's expensive for plaintiffs; it's expensive for defendants. And there are practical limits to the thoroughness that the PTO can conduct its initial examination.

But one thing to keep in mind is the delay caused by an IPR. And so the Stanford folks had some data that there is a delay in cases that have a patent IPR, you know, it makes sense because the process takes time. It generally takes about 18 months from petition to decision. And if you had a Federal Circuit appeal, that might take another year.

And there was also some data I think Saurabh was talking about on the last panel about stays. And so stays are somewhat common, although not guaranteed, when there is an IPR. Stays and delays in litigation are not neutral, and so the kind of conventional wisdom in civil litigation, it's not a patent

litigation issue, is that delays harm the plaintiff, and especially smaller plaintiffs, and benefit larger defendants.

And it's especially true, where the plaintiff -- a smaller plaintiff needs either the recoveries for some business reason, or in order to obtain financing through alternative litigation financing or trying to entice an attorney to accept the representation on a contingent fee representation. And so making the litigation substantially slower and riskier, but really slower is enough, it just makes it harder for those smaller patent owners to enforce their rights. And for sure this had an effect and maybe an intended effect on the kind of PAEs that are speculators, but it also has a similar effect on smaller businesses that aren't, you know, speculators but they're actually just small businesses.

And so I just would balance this against, you know, the concern that speedier resolutions increase the risk that there's settlements in cases that are actually weak or very -- very questionable on the merits. And so this is all like a very delicate balance.

The second point I want to talk about is on post-grant reviews. And so there aren't very many --

there haven't been that many post-grant reviews conducted. Those are limited to patents that are filed under the first file provisions of the America Invents Act. But over time, we expect there's going to be more patents that are eligible for post-grant review, and, therefore, there will be most -- there will be more post-grant reviews. And we don't know whether in the future those will substitute for the roles that IPR plays today.

We can look at trademark oppositions, which is, actually, I think, relatively well used, although trademarks have kind of different characteristics where it's easier for companies to identify marks that might be potentially problematic in the future. I don't know if the same would hold true for patents. We could look at European patent oppositions, but the truth is we don't know yet how extensive the use of PRGs will be and whether that will reduce the use of IPRs in the future.

And so I raise this point merely to say that we have some changes that are already kind of in the works that haven't gone fully into effect, and so we might not be at steady state yet with the system.

MR. DUBIANSKY: Thank you. Anybody else

care to weigh in?

MS. CHIEN: I think from talking to people there's kind of two different opinions about IPR. One is, oh, IPR is awesome, we are able to challenge patents that are weak, and we can get a settlement that's a fraction of what we used to have to pay for a claim that we don't think is very strong. So and that's going to be on the defendant's side.

And then I hear something litigators and more people who are with plaintiffs say it hasn't changed really anything because now all that's happening is people are adapting. They're asserting more patents in every litigation because you can't file an IPR in all of them, you're complicating things because even if you're giving an initial decision determination and you're also giving more data in terms of the court's outcome, I'm sorry, the PTAB's outcome, the PTAB is not knocking out the patent which would be a disposition that would be, in theory, earlier potentially than a court.

You've just made the parties not actually have more of a meeting of the minds. They're just going to sort of get more entrenched in their own position. The patentee is saying, look, you know, my patent withstood the PTO, let's settle now; and the

challenger saying, well, no, I'm just going to, you know, take another gamble at trial, like we're not going to accord that any deference, and, plus, you know, there are other defenses we have.

So I've heard -- and what I thought was really interesting about Shawn's data is that he showed that again in this very small selected tip of the iceberg, right, people who have patents that are both worthy of an IPR assertion and a court assertion and I think it was also those who had gotten pretty far along with both of them, I wasn't sure what was represented. It was only filed in those two?

MR. MILLER: Only --

MS. CHIEN: You were looking at the resolution rates?

MR. MILLER: Yeah, so no.

MS. CHIEN: Yeah, looking at the time to resolution. But -- and you had to get to a resolution, right?

MR. MILLER: So it was comparing ANDA -- so ANDA, well, and it's ones that had a concurrent IPR, ones that did not.

MS. CHIEN: Okay.

MR. MILLER: And then the third group was actually looking at earlier lawsuits, looking at the

time determination for earlier lawsuits before IPRs came online.

MS. CHIEN: Okay, and I think it was -- you were cautious, but I wanted to ask you again, like, do you think those two narratives, IPRs just made things more expensive and complicated versus IPRs really allowing us to get to a quick -- a cheaper way of getting to a merits-based resolution? Do you think your data conclusively points to one or the other, or do you think it's just too selective?

MR. MILLER: Yeah, no, I don't think it -- I wouldn't want to conclude anything on that right now, no.

MS. CHIEN: I think that's an open question, right?

MR. MILLER: Yeah.

MS. CHIEN: You hear both stories. I mean, I don't think IPR is going away, but these are -- I think that's the important question, of like do we think IPR's a good thing, or has it gotten us, you know, the efficient process that we think we want, or is it really just making things more expensive and complicated?

MR. SUKHATME: Yeah, I think the IPR -- I mean, I think overall, you know, it makes sense, it's

a good development to remove bad patents. You don't want to do all of this ex ante. You can't expect probably the Patent Office to be able to catch it all, and it makes sense to have this review process after the fact.

What strikes me, though, it seems to me kind of inefficient because you're allowing these multiple petitions -- like, what's the point of litigating the validity of the patent so many different times, right? Multiple petitioners can sort of come and challenge the same thing. You can have the same thing going on in federal court. I don't understand exactly what this redundancy buys us.

And, you know, that's never -- that's something which I really have never quite understood about the system. I mean, I know why it's there legally, but to me, it seems that that is an easy away in order to improve the IPR process, because the one thing is if you have property rights and you don't know, you know, property rights or pseudo-property rights, whatever you want to think patents are, if you don't know whether they're going to be valid and there's no finality in it, that's hard for businesses to rely on this. You know, how are you going to know whether this patent actually protects your business?

And, ironically, it's going to be harder for firms that really actually need that underlying invention, for whom the patent is actually valuable. For the ones who are just sort of, you know, doing an arms race and getting patents for reasons that are more strategic, maybe they don't care. So you're actually hurting the ones that actually need the patent protection the most. And that, to me, seems potentially problematic.

MR. GOLDEN: So on IPRs, I think -- I also think that the basic idea makes sense. There are obviously some aspects of the design, particularly, I think, the interaction with ANDA litigation, which Congress probably didn't anticipate quite how it's worked out, that that's going to require some tweaking or adjustment by Congress, hopefully sometime.

I do think related to this idea of expense, I do think it's disappointing that the IPRs have ended up being, I think, as expensive as they have been, although that's probably predictable if you think through their substantive nature. But they haven't been a truly extremely low-cost option where spending, you know, typically people are spending, I think, $100,000 or more just in the early stages, relatively early stages of the IPR process.

So it's not a truly cheap alternative to litigation, which can be frustrating for presumably some challengers, also for some patentholders who feel they're being dragged into this proceeding and potentially if they do want to actually enforce their patent rights, then, of course, they're going to have to go back to District Court.

And so, you know, it could be something where you do want to consider some other options, perhaps relating to David's remarks, if you had a patentholder who really wanted quick action and was willing to kind of give up some potential forms of remedies as a result, maybe you could have something like a small claims patent court. You'd have to get the defendant to also acquiesce to that as well, but in some cases, maybe a defendant seeing how much they'll save on litigation costs might accept that.

Some coauthors and I have another proposal, which is for it to sort of layer on the front end of patent litigation, a kind of quick look administrative review process which could help both patentees as well as defendants by identifying some areas, say, where the patentee is most likely going to win and there doesn't seem much of a case for the defendant. So there might be some alternatives to help add even

cheaper front-end or alternative path for patent dispute resolution.

MS. CHIEN: I just will mention two ideas that I think are interesting to consider when we look at European opposition, which is more like PGR in terms of the time frame, but, you know, it's been in process, I think, it's trusted and well understood. And I have a forthcoming paper with Christian Helmers and Alfred Spigarelli who used to be at the EPO about how to sort of look at the European experience, both with respect to opposition as well as German nullification proceedings, and what those can teach IPR, just because they've been around longer.

And so two ideas that we came up with were, one, allowing patentees to amend their claims is something that is done routinely in opposition and allows the patentee just to keep a little more certainty and control over what happens in the post-grant proceeding. And it’s paced well in Europe, and it’s done and it’s -- you know, the parties seem to be okay with how it proceeds, so that's one thing to consider. The mechanics, I'm sure, are complicated and have to be executed correctly, but that's one thing to consider with respect to IPR.

And another is consolidation of the suit, so

kind of going back to Neel's point. You know, it's a little different obviously because opposition is a nine-month window, so all the challenges come in at once or they have to come in through that window and then they get taken together. But if there are some incentives for those who might have existing challenges or instead of -- incentivize them to join a current IPR rather than to file their own in a serial manner, those are things to consider as well.

MS. GILLEN: So I want to, in the interest of time, switch gears just a bit and go back to Colleen's presentation, which touched a little bit on the recent changes we've seen in complaint length. And I'd be curious to hear if there are other ways that the amendment of rule -- of Form 18 have influenced litigation behavior and whether there are other procedural changes, such as the amendments to discovery rules, that have had an effect.

Colleen, do you have any --

MS. CHIEN: Oh, yes. So I haven't had -- I haven't been able to look into discovery changes as such. Again, I think the bigger question from a quality perspective is, and that's something we didn't just -- we just ran out of time -- is we were looking at whether or not having the complaint data be more

robust in terms of having a claim chart whether that led to a faster merits-based resolution as well. So the parties might have settled faster, or the resolution rate was more -- you know, there was more meeting of the minds, because, again, the kind of dynamic you hear is like they put this vague patent complaint out, I have no idea what it involves, so we have to go through back and forth, and there's a lot of kind of noncommunication that then culminates in a lot of extra expense.

But if you have the claim charts up front, it's not clear to me whether it just makes it shorter or it actually makes it more efficient because you have, you know, like ITC, where you get clarity much more quickly, but it's still quite expensive. So I think the overall question for me on the complaint side -- maybe on the discovery side as well -- is, again, does the quality translate into a cheaper merits-based resolution. And to me, that's the right metric.

MR. GOLDEN: I'll kind of -- maybe this is getting ahead to what I was partly going to say later in relation to Octane Fitness and attorney fees, but, you know, some of the changes that Colleen is seeing could also reflect the move toward a somewhat more

robust, although still exceptional, on a space, attorney fee-shifting system, because certainly -- certain attorneys, you know, looking through cases, have gotten the impression that courts are more likely to shift fees against you because you -- require you to pay the other party's fees if it looks like you didn't have your case kind of together up front and you're presenting new theories later on.

Whereas if you do have something more in the nature of what Colleen is describing, with your claim charts in order, specification of products you're looking after, a description -- going after a description of them, then my guess is the attorneys will feel the perception is you're less likely to have that kind of sanction or remedy at the end of the day.

So this is another example of the situation where you have reforms, going to David's point, reforms going along different tracks, and it can make it a little difficult to disentangle whether a particular effect is reflecting one reform or some combination of them and to what extent, which of the reforms has been most influential.

MR. SCHWARTZ: So to chime in a little bit on this Form 18 complaint change, and let me actually just kind of to keep it all in perspective, before I

tell what you the comment is, I think that Form 18 is not a big deal, especially relative to, like, IPRs, which I think are a big deal. And I think Alice in many fields is a really big deal. I think that Form 18 is just not going to be of the same order of magnitude.

The thing that I've heard, and I've heard this from a federal judge, is that she now sees a lot more motions to dismiss and complaints about the pleadings that she didn't see before in patent cases. And she sees these in other areas of law, she just used to not see them in patent cases and now she sees them in patent cases. And these require amendments that just kind of add more detail.

None of that's really related to the merits of the case, so it adds more money, it makes patent litigation more expensive, but it doesn't get quicker, at least it doesn't seem to get quicker at the underlying resolution of the validity issues or the infringement issues.

MR. DUBIANSKY: Great. Well, I'll actually build on some of John's comments, which are regarding fee-shifting and, in particular, the Octane Fitness decision.

My next question is what has been the impact

of Octane Fitness in practice, and I guess more broadly, do you have any views on the merits of a shift to a “loser pays” approach in the U.S.? And perhaps, John, you might want to follow up on that.

MR. GOLDEN: Okay. So, right. So I have to say, I haven't compiled data on this myself. But, you know, looking at data compiled by others, including partly some of the data presented by Colleen earlier, we do have some evidence that the Octane Fitness decision, which moved us away from the prior Federal Circuit quite structured approach to when attorney fees would shift to a more open, although on its face still limited, exceptional circumstances approach. This shift has resulted, as you might expect, in sort of some more success in motions for fees, and particularly in motions by successful defendants who have been defending against charges of patent infringement.

And as I indicated in my earlier remarks, it’s possible that this change is also correlated with some of what -- well, it’s probably correlated, it might actually help explain some of what Colleen is seeing in terms of the greater preparation being put up front into litigation, whereas when I was in practice many years ago, of course, you are preparing

up front because you were worried maybe about a Rule 11 motion and now maybe an additional thing attorneys are thinking of, well, if we don't prepare as much up front, there may be a greater likelihood of attorney fees being awarded against our client.

So, now, what's most difficult perhaps to disentangle from the data we've seen so far is, well, to what extent has this attorney fee-shifting actually discouraged some weaker suits, because going back to David's remarks and mine to some degree, we've seen so many changes it's hard to tell, and so many changes within a short period of time, it can be hard to tell which has, you know, which has been most -- has contributed to this decline, particularly when you have some other changes like Alice or whatnot, on subject matter eligibility, that seemed likely to have had a very substantial role in declines.

Okay, then going to the second part of John's question, should we go further, well, this is something we've seen people push for a long time and push far outside of patent law. It's been a favorite of tort reform proponents in this country for many years to argue that we should move to a more European-style rule with regard to attorney fees where you could have a general rule that at least some of the

fees are going to be shifted in every case and have a basic “loser pays” principle in place.

That's -- many theoretical studies have suggested that would tend to promote higher quality litigation. It's commonly been resistant in this country because of a concern that it really raises very substantially the risk for many plaintiffs who may be pursuing sort of meritorious and, you know, other areas of litigation like civil rights litigation, maybe somewhat new forms of arguments, trying to push the envelope.

So in this context, we might not be so concerned about people pushing the envelope, but we might be concerned about patentholders who are relatively less well capitalized and are risk-averse. And I recall, it's now probably about a decade ago or so, but once I was trying to look into sort of patent litigation insurance. And I was thinking of patent litigation insurance for defendants, so I started doing these searches for this. I found what I thought was going to be a great European report on patent litigation insurance, and it was actually about patent litigation insurance for plaintiffs because there was actually a concern that they weren't getting enough patent assertion by people who had meritorious patent

claims because they were scared about the prospect of having to pay these -- the attorney fees for the other side.

And so that's a potential warning about one of the dangers of making a very large shift to a true "loser pay" system, and it's one reason I myself have tended to feel more comfortable with incremental change in this area.

MR. SUKHATME: So just one small point. I think a lot of the changes that we're talking about might sort of interrelate with one another, right? So I kind of view Octane Fitness as kind of a delegation of authority to District Court judges. Essentially instead of saying you have this rigid test, you have more sort of ability to award attorney's fees to shift fees when appropriate. And you have to think about that as compared -- you know, bringing back to TC Heartland, right? So to the extent that which now it's -- you know, pre-TC Heartland, you actually could kind of know which judge you were going to get, depending on where you filed. I think Greg Reilly and Jonas Anderson and others have really written about this.

And that kind of makes it -- to the extent judges have predictable practices in terms of how they

would be likely to award attorneys' fees, you know, then the Octane Fitness in that realm would be very different than in the realm now that we have where it's not as clear which judge -- there's not going to be as much of a concentration of patent suits in one particular court or another.

And so the unpredictability of that, I think, it magnifies in a way the effect of Octane Fitness. So I think it's important to think about all of these developments as they relate together. And it's also important when we're doing empirical analysis because what when we think we're measuring the effect of one event is really actually many times building on a lot of interrelated events that are occurring approximately contemporaneously.

MR. SCHWARTZ: To build upon, like, the complexity of patent litigation, when I think of the days before Octane Fitness, the kind of perception was that the main or primary way that an accused infringer could recover its attorneys' fees was via proving that there had been inequitable conduct in obtaining the patent. And so that put a lot of pressure on accused infringers to assert and allege inequitable conduct, so much so that the Federal Circuit said a few times that it was a plague on the

system, and then that spilled over into prosecution practice. And I think that the Octane Fitness rule, which seemed sensible to me, that if a judge who knows something about patent cases thinks it's, like, far out of the ordinary or out of the ordinary, that seems like a candidate for fee-shifting. That seems like a sensible rule.

We don't have as much pressure on inequitable conduct if it's really weak on the merits on infringement or on validity, then that seems like a candidate for fee-shifting. And so there's maybe a relationship between, you know, changes in doctrine on fee shifting and other litigation defenses.

MR. DUBIANSKY: Great. Well, looking at the time, I think we've just got about enough time to have everybody provide a brief closing statement. And I'd ask if you speak for probably two or three minutes, and we'll just go down the line, so we'll start with Shawn. Thank you.

MR. MILLER: Thank you. Thanks again for having me, John and Elizabeth and Suzanne. So I really liked Dave's -- his metaphor of too many -- maybe too many cooks in the kitchen with patent reform over the last eight years. And I think -- so my research, a lot of my research for the last eight, ten

years really has been looking at patent trolls and software patents. And I think we had issues with software patents that we had these uncertain property boundaries, providing opportunity for people to claim more than they had actually invented. And I do think there have been issues with patent assertion entities, you know, using, taking advantage of the cost of litigations in order to gain nuisance value settlements and these things.

Awful lot of these changes that we've had the last eight years have been targeted directly towards these types of patents and these types of plaintiffs. And so I think I agree with all of my copanelists. I think that the idea that a lot of these things are going to be interacting with each other, a lot of these changes, and I think at this point we really, you know, we do want to see how things play out for a little bit and see if we haven't -- there haven't been unintended consequences that have severely impacted maybe good patents and the types of assertions that we actually want to encourage.

And then I think, you know, part of what we need to do is those up here and then also the FTC hopefully help with additional research efforts, to

try to really tease the hard problem of teasing out impacts of individual reforms on some of these metrics like who's able to sue and outcomes. So I think a lot of these changes have been positive and I'm looking forward to studying whether or not I'm wrong about that in the coming years.

MS. CHIEN: I think I'm probably a lot more sanguine about the impact of the reforms. The reforms were targeted at dealing with abuse of patent litigation, and I think by a lot of metrics that we didn't talk about, I think there have been a success. So if I consider an article I wrote in Patently-O about patent assertion entities by the numbers, you know, it was a question of how many public companies, how many public PAEs are there, public companies, if you look at how those companies are doing, like, there are a lot fewer of them, they may mostly be -- no longer that being an important business model as it had been.

I went back to a number of venture capitalists that I talked to before who were really upset about the patent system and really felt like it needed drastic reform at the time. And they've said no, our companies are much more able to deal with issues that come up, and we don't see sort of the

negative challenges that we had dealt with before on acquisition, with having to change business models.

Now, I still actually am hearing from some folks who are getting sort of the very meritless or that consider themselves -- right, these are people who are users of technology, I'm still getting calls from people who are getting hit with suits, so it's not to say that behavior does not exist, but it's a much smaller footprint, I think, on our innovation ecosystem. And I frankly think those assertions were really giving the patent system a very bad name nationally, and there's just not as much attention paid to the patent system. And I think the attention before was negative attention, so I think that's a good thing.

Now, again, still dealing with and calibrating the changes that have happened, to ensure that we're striking the right balance remains a challenge, and we have to continue to use different levers. What I think is really interesting about the Form 18 findings, which really surprised me, that there was so much more use of claim charts, much more detail.

I disagree with David that those are minor. Even though they don't make headlines, they are

increasing the quality of what's being discussed at the front end. Again, it's a lot of stuff you cannot see that there's more certainty, there's less risk to companies because they have a sense of what it is -- what they're dealing with early on. I think that's hugely important. That goes across the entire system and not just looking at IPR.

You know, most of the litigations do not have a parallel IPR. They just happen day-to-day. They're challenges that companies bring and they fight it out. And so that's an impact across the system. And so I think that these are positive changes and that they, you know, need to be -- again, we need to think about IPR and how to kind of calibrate and deal with it.

But, overall, I would say that if the problem was really dealing with -- patent reform was really targeted at abuse of litigation, that there has been positive reform. Now, the one thing I will say at the end is that, you know, we think about what Congress and what the courts do. Where there has been, I think, what we've talked about today on this panel, there has been a lot of significant impact from sort of design decisions.

So little changes that or little sort of

implementation decisions that the PTO has made, they've done a great job of coordinating with district courts so the district courts will stay the litigation and we don't have duplicative, you know, IPR and district court in most case. We have stays happening.

That's not the case in Germany, for example, where if you have a nullification, the court still does its thing, you have two cases going on full bore, often you'll have an invalid but infringed finding at the end of the day, because the injunction is issued before the patent is even litigated. We have a more coordinated system here. That's a good thing, and that's a decision that's an implementation outcome -- that's an outcome that comes from a good implementation.

The same thing with Form 18. It seems like a trivial change, but in my mind it's improved the quality of patent litigation across the board. It didn't take Congress to do that; it didn't take the Supreme Court to do it. It's administrative actors taking sensible steps. And so, again, I think these design choices can have a big impact and potentially bigger than those of the high court.

MR. GOLDEN: Okay. So, yeah, I mean, I think -- I mean, I may not be as enthusiastic as

Colleen about the changes, but I think we have seen a number of sensible changes and tweaks to the system. I remember once presenting a paper to my faculty at the University of Texas. And one of my colleagues, when he was hearing about the percentage of cases being brought in the Eastern District of Texas and before just a single judge, Judge Gilstrap, was like, well, clearly there's something wrong with this, you don't really need to know anything more about this.

So there have been certainly some idiosyncratic aspects of the way the system was working and bad practices, which a number of these reforms have helped address. I do feel that there are fundamental aspects of the system, that it doesn't seem these reforms are addressing and that are problematic or at least present great challenges for the system, are going to be great challenges for the system over the next few decades.

One is just the interaction between the numerocity of patents and patent applications -- of issued patents and patent applications, in combination with the limited resources that almost all the relevant actors have to deal with, whether it's the PTO, whether it’s sort of private parties looking to try to obtain a valuable patent and then be able to

enforce their patent rights, or, you know, potential or alleged infringers or people who may be worried about being alleged infringers who have difficulties sort of navigating the sea of patents in a way that gives them security and a feeling that they've achieved patent clearance.

So it's not clear that the sum of these changes is helping really to address that sort of fundamental challenge which is going to remain with the system over the next couple of decades. And then still there's, as I said, sort of high litigation cost and the fact that IPRs, although I think they have been a very positive reform from my perspective for the system overall, although they've had negative impacts for some players, have ended up being somewhat more costly than we might have hoped, and what can we do still to try to make litigation sort of less expensive, so that we can reduce the incentive for abusive use of those costs by patentholders and at the same time allow, to the extent we think the patent system is serving any good, you know, patentholders who do have valid patents that are being infringed more effective access to the courts.

MR. SCHWARTZ: So thanks again to Suzanne and Elizabeth and John for the invitation. I want to

talk just really briefly about predictability. Companies and lawyers value predictability in the patent system, and while bad rules can be problematic, there's also just a cost in switching rules, especially if it's done frequently. Unpredictability makes it harder for lawyers to advise clients on the proper course of action. It makes it harder for companies to plan ahead in terms of their long-term plans such as commitments to R&D.

And so I place a high premium on predictability in the patent system, and for that reason, as well as the point I raised at the beginning about the maybe too many cooks in the kitchen, I just suggest some caution among, like, the institutional actors before making more large-scale changes to the system. The patent system is complicated, and I'm not sure if it's yet at equilibrium or steady state.

MR. SUKHATME: So it's convenient that my notes here say stability and predictability is what I wanted to talk about, and we only have a minute left here. I think that the issue of patent assertion entities, right, I think it gets -- it's sort of a flashy issue, it's gotten a lot of press. I think it's going to fade. I think it already is fading over time. I don't think it's going to be as much of an

issue going forward. I think the changes that we've talked about here are going to -- you know, it might be a death by a thousand paper cuts, but I think it's going to become less salient over time.

I'm echoing what Dave says here because I think stability and predictability is something which I don't think has really improved over this time period. And a lot of it relates to something we haven't really talked about much, which is patentable subject matter. I think it's -- you know, Alice and Mayo, you can decide whether something is going to be patentable or not. But it seems kind of crazy to me that one day something is patentable, the next day it's not, the next day it might be, right?

So it seems to me if there's going to be stability and predictability, we need to kind of come up with a rule, whatever that rule might be. And in order to get it, I wouldn't even say right, just get a rule that's sort of clear and sort of stays stable, it might be necessary for Congress to step in to do this because it seems like right now that issue is just bouncing around so much that it's very hard for businesses to plan and figure out what to do.

MR. DUBIANSKY: Great, well, thank you. I'd like to thank all of our panelists, as well as their

colleagues that joined them today, and if you would join me in doing so, and then we'll take a break and return after lunch at 1:30.

(Applause.)

(End of Panel 2.)

(Lunch recess.)

PANEL 3: INDUSTRY PERSPECTIVES ON INNOVATION AND IP POLICY

MS. MUNCK: We're going to get started here. And, you know, speaking only for myself, I am just so thrilled with the quality of presentation by our panelists. Yesterday, we started with an academic panel looking at broadly innovation in intellectual property issues. Then we had a panel of VCs who focus primarily, I would say, on startups, but I don't want to miscategorize that to the extent that they have broader views, but we were really sort of talking about what's the role of IP in sort of early stage investment.

As you saw this morning, we pivoted to quality and litigation, and we actually also had the copyright panel yesterday. Now, we are sort of coming back to an industry panel to a, I think it's fair to say, with a slightly broader perspective because you're not all, you know, only focused in one particular industry. You're not all focused in one particular stage of development. And I'm really looking forward to collecting your feedback on what you've heard this morning and your views of innovation and intellectual property within your various industries.

So with that, I would like to introduce Tahir Amin, who is with the Initiative for Medicines, Access, and Knowledge; Patrick Kilbride, who joins us from the U.S. Chamber of Commerce; Barbara Fiacco, who joins us from AIPLA, the American Intellectual Property Law Association; Hans Sauer from Bio. And I also am getting a flashback to about ten years ago when Hans and I were on a similar panel looking at biologics issues. And Matthew Schruers from the Computer and Communication Industry Association.

So thank you all for your time today. And I'd like to begin with a presentation by Tahir. Thank you.

MR. AMIN: Thank you. I'm going to speak today with respect to the pharmaceutical sector. So I've just been following some of the panels earlier today and yesterday, and we've heard a lot about -- and I'm sure we'll continue to -- what I would call innovation welfare or the welfare of innovation, but I want to address it from what about the consumer welfare when it comes to intellectual property and how we can have competition which is not entirely focused on just IP.

So I'm going to look at the role of patents, or patents -- I'm from the U.K., so we say patents --

and the problem that we have in respect of what I call overpatenting. So what we have done is looked at the top 12 drugs sold in the United States, and we looked at the data in terms of number of applications filed and the numbers granted, but we also looked at the prices that have happened over the last six years with respect to those patenting trends.

But just to give you some context, and as I said, I'm going to come from a more consumer welfare perspective because that's also the FTC's role in this conversation, one in four Americans are having difficulty filling their prescriptions in the United States. The drug pricing issue is the number one issue for the electorate, and that's not usually the case; it's usually the economy. And this has been going on for the last year. So that's just to give you some context to the data and the issues that I'm going to address.

So as you see with these slides, the drug pricing is set to double by 2025, so this is going to be an ongoing problem. Now, of course, we need innovation, and we need new inventions to bring new medicines to the market, but at the same time, with this balance, this delicate balance that we try to achieve with IP, we need competition. And it's self-

evident that with more competition you bring prices down.

Now, what we did was to look at the top 12 drugs in the United States, the top 12 drugs that are being sold. And what we found was an enormous amount of patenting activity that is going on in the name of innovation. And many of these patents are well beyond the 20 years, or many of these products are providing potential exclusivities up to nearly 40 years. Now, after these drugs are on the market, I believe only three actually have competition, to date.

So, we've seen a 68 percent price hike over this period, and many of these drugs have been on the market for 15 years and more, and yet we've seen over 100 attempted efforts at getting a patent.

Now, particularly, I'm going to drill down on Humira because a lot of people have been asking us, well, you know, what does this data mean and more specifically, more granularly. And we looked at Humira, and one of the arguments that is often made by industry is that many of these patents are filed before the product is approved. So we thought, okay, well, let’s have a look at that.

And what it shows is 89 percent of the patents are filed after the first approval. And then

with the case of Humira, which is a real poster child for the kind of behavior that's going on, we have 49 percent which are filed even after the first expiring of the first patent. Now, it would be coincidence to say that this is not some kind of strategic behavior that is going on by companies in order to preserve their franchises and their life cycle management of products. When we compare it to what's happening in the United States with Humira as to Europe and Japan, we see a far fewer number of patents being issued.

Now, is Europe more stringent than the United States when it comes to patents and innovation? That's a debate to be had. But what we're seeing is some of the patenting practices and the procedures that are available at the USPTO seems to encourage this excessive behavior of patenting, all in the name of innovation.

Now, there’s been a lot of debate about the PTAB, and I just want to touch on a few points here. The PTAB, when it started, did show that there was some correction that was going on. And you see this is slightly out of date in terms of the periods, but initially, there were -- and with respect to Orange Book patents, you had 64 percent of petitions being instituted.

Between February and August, we've seen that drop significantly to 27 percent. And the same trends show also in terms of getting claims removed. Now, whether you agree with the PTAB or not, I think it's fair to say there's been a chilling effect around the PTAB, particularly following Oil States, the case that was taken to the Supreme Court, for any of you that weren't following that. And, really, with a number of the industries who, what you might say, were from the pro-patenting side or the pro-innovation side, really lobbied hard to make the PTAB corrected. And this is the effect that we're seeing with this correction. In fact, the PTAB, in my opinion, and we can talk about this later, hasn't had the chance to settle.

So in view of all these trends, we believe that there needs to be some reform. We believe that we really need to revisit what is inventive. I think the language of innovation is important, but I think invention and innovation are two different concepts. I'm not going to get into that abstract debate now, but it's something we can talk about.

We need to really reduce and, I think, eliminate continuation application because many of the patents we're seeing stockpiled are because of these continuations, and these are strategic measures that

companies use to keep competition at bay. We need to improve the existing IPO system. Unfortunately, as I said, forces have whittled it down, and we are seeing it being narrowed more and more.

And we've seen the success of pre-grant oppositions in other countries. I think this can actually encourage competitors to come to market earlier and let the problem solve itself afterwards, rather than the other way around, where we have litigation to solve these issues and people are not getting the medicines that they need.

And then, finally, specific to the Orange Book, I think there could be some tailoring there. Companies are well known to be listing patents on the Orange Book just to extend litigation. And I think we need to have a bit more of a transparency around this patent dance that happens with biosymbolism and biologics. Thank you.

MS. MUNCK: Thank you very much.

I think next we'll hear from Hans Sauer.

MR. SAUER: Good afternoon. On behalf of Bio, I want to thank the FTC and its staff for the opportunity to participate in this hearing. Bio is the nation's largest trade association for the biotech industry. Our industry is largely an industry of

small and mid-sized development stage companies, and much of it is not visible to consumers. The vast majority of our members have fewer than 50 employees and no marketed products yet, and most never will because product development failures are frequent, they're almost the rule, and the path to market is long.

Emerging companies hold more than 70 percent of the clinical development pipeline for future drugs. Roughly 43 percent of emerging company clinical programs are partnered with larger pharmaceutical companies, and that demonstrates, I think to us daily, the importance of licensing and the importance of relatively clear IP rights for the transfer and orderly dissemination of intellectual property as is relevant to our industry. This is really like a hallmark of how we develop products, like we do it very much in our industry through partnering and licensing and tech transfer.

And this, in fact, is the predominant way in which patents and IP instruments are being used in our industry. It is not to litigate against people, but it is at the early stage of drug development to be able to attract capital and disseminate technology among different entities in the value chain that are

best able to share the burden of cost and risk in product development.

Between one-half and two-thirds of new drug applications and biologics license applications submitted to the FDA have small company involvement. The cumulative likelihood -- I told you about the risk of failure. The cumulative likelihood that a new clinical development candidate will eventually receive FDA approval is less than 10 percent. Clinical testing and regulatory review consume close to ten years on average, and out-of-pocket expenditures exceeding $1.3 billion.

So despite unfavorable odds and long investment horizons, the U.S. biopharmaceutical industry, however, is highly productive on an international comparison. This is shown in the pie chart by one measure -- more new medicines originate in the United States than in the rest of the world combined over the last decade and a half.

Although projected returns on R&D investment in the biopharmaceutical industry have been on the decline -- they're currently measured at around 4 percent per annum -- the U.S. biopharmaceutical industry is -- this is my proposition to you, by and large, doing an effective job at creating new

medicines and treatments. We believe this to be attributable to at least a number of factors such as these listed here.

Competition in the industry takes many forms. Emerging companies, long before a drug is approved, compete for access to capital and for the attention of development partners. That, too, is competition. Experimental drugs that undergo clinical development compete with each other for scarce clinical resources, for the ability of clinical trial sites, or patients who could be recruited into trials. That, too, is competition.

And marketed original drugs compete with each other both on value and on price. Many of the products that Mr. Amin showed you earlier actually compete against each other, and at least one had already two biosimilar competitors in the market. So there's a lot of competition going on that takes different forms.

It is often actually competition with other branded products that drives innovators to add additional features, indications, and clinical studies to their own brand products in an effort to distinguish these products in the marketplace and compete and provide more clinical value to patients

and providers and have a distinguishable product in the market.

Branded products also compete with each other on price, discounts, and rebates, but to be clear, that kind of competition is between different innovative products that have their own IP portfolios and that have their own patents and that have distinguishable values in the marketplace. It's not competition between ever cheaper copies of the same product.

That kind of competition is a special feature of the Hatch-Waxman Act, which regulates the approval and market entry of generic drugs. When generic drugs enter the market -- you see this on the left-hand diagram, this has been studied -- the impact on the original product is profound. Today -- and this is the lowest line you see on the left -- innovator market share erosion of 80 percent or more within three months are the norm, with eight, ten, or more generic entrants vying for a share of the market.

Ninety percent of prescriptions in the United States today are generic. This is the highest generic market penetration rate in the industrialized world. And U.S. payors pay among the lowest generic drug prices anywhere. This form of competition works

incredibly well for consumers and payors, so complaints are not that there isn't enough of this kind of competition or that it doesn't work. Complaints are usually about when that competition comes, right? It's the timing and when it occurs.

That, too, has been studied. Over the past 20 years, innovator drugs that experience generic entry -- this is kind of funky to read, but if you focus on the black line, for example, you will see the black line is the number of innovator drugs that experience generic entry in any given year. And the percentage it shows is how many of these innovator drugs that have generic entry actually had an affirmative patent challenge and patent litigation, a challenge to their patents before there was generic entry, a so-called Paragraph 4 challenge, which is unique form of patent validity litigation in the pharmaceutical space.

So these patent challenges, as you see from that line, have become increasingly more frequent and come earlier in the market life of the innovator drug over the past 20 years. We've gone from about 10 percent of innovator drugs who experience generic entry after an affirmative patent challenge in District Court, this litigation, and we've gone to

about 80 percent in 2014. Right, so the number of patent challenges has gone up, and these challenges come -- and that's the other line -- much earlier in the life of the innovator drug. So generics are challenging patents much more often and much earlier.

What this diagram doesn't tell you -- though it tells you something about litigation behavior, it doesn't tell you about when these generics actually come on the market, just like patent numbers don't tell you about how long they stay off the market. That, too, has been studied.

The empirical time to generic entry actually has been investigated by several different groups. In this 2015 study, the innovators looked at originator drugs that experienced generic entry over a 12-year period. And consistent with other studies, they report an effective period of market exclusivity of 12.5 years for all agents. The time is somewhat longer for pioneering drugs and tends to be shorter for other kinds of products like second or third-in-class molecules or drugs that are merely, if you will, new formulations.

Again, these types of studies are limited in that they don't tell you about the mechanisms that are in play. So, for example, from these numbers, we

don't know if it's attributable to patents or regulatory exclusivity or technical or market factors. The only thing this counts is the day when a new innovator drug enters the market, and then it counts the days until it experiences generic competition. That's how you get to 12.5 years.

MS. MUNCK: Hans, if I could just say --

MR. SAUER: Yes?

MS. MUNCK: -- two things. One, I think we know you have two more slides, so we want to let you keep going, but the second is when we're talking about the past few slides, we're talking about small-molecule drugs, right? Just a point of clarification.

MR. SAUER: Yes, and I need to make that clear, right, because this is the area where it's been best studied and where behavior is best understood. And I hope to get to that maybe later. It's not about biosimilars. I think those deserve a different conversation. But you're right in pointing that out.

MS. MUNCK: Okay, thank you.

MR. SAUER: Good. Okay, let me move on and say a few things about patents. On the topic of patents -- now, where was I? The number of patents are best understood for small molecules where they're listed in the Orange Book. The number of patents that

innovators use to shield generic competition also has changed over time, just like you saw the patent challenge behavior changing over time in the earlier slide.

We know that today pharmaceutical innovators do list more patents in the Orange Book. That's a listing of, like, the relevant patents that cover the drug or methods of using it. I think they list more than twice as much as they did in the 1980s, but the absolute numbers are still small. The reported number, the median number of patents that are listed in the Orange Book for new chemical entities is four, but the average number is about five, five and a half.

It used to be only one to two drugs -- to two patents in the 1980s, so that has increased, but the absolute numbers are still small, and it’s not hundreds of patents. And while the Orange Book captures different kinds of patents than what I-MAK may have captured, the big difference in numbers is still perplexing and we're still trying to understand how these stark differences could arise.

For us, it's been difficult to understand. I think some of the data that have been put out, knowing that patent numbers are what they are, at least in the small-molecule space in the five to six

patents per drug range.

Okay, finally, time to generic entry. This is another study. It looks not just at average numbers over a 12-year period. This actually measures over time drugs that receive generic entry or experience first generic entry over different time cohorts. You see this on the X axis. And so what the system produces, the Hatch-Waxman system, has been over the past 20 years -- ever since people started measuring, there's a very actually surprisingly consistent period of 13.5 years for new chemical entity drugs from the time they first enter the market to the time when they experience generic competition.

And interestingly and perhaps surprisingly, the time has been stable, despite so many other changes in corporate and litigation behavior. What I told you about the fact that there are more patent challenges now than there were 20 years ago, that the challenges come earlier. I told you that innovators list more patents than they did in the past, but what the system produces in terms of market exclusivity has been surprisingly stable and hasn't been subject to a lot of change.

It's 13.5 years for small molecule drugs. That's what it's been. It hasn't changed. It's not

48 years. It is what it is. We could have a policy debate over whether that time is still appropriate or not, but I want to ground all of us, I think, in this kind of horizon of competition and periods of market exclusivity that the system seems to have produced.

On the topic of biosimilars, I think it's very different and too early to say, and I'm going to finish that because I'm not going to go into it. I just want to leave you actually with a reminder that this doesn't tell you much about competition in the biologic space, but it's the best data set we have on small molecule drugs and the behavior of medical innovators.

So thanks for that, and we're going to do the rest in discussion.

MS. MUNCK: Terrific. Well, thank you very much and, again, sorry to interrupt, but we want to make sure we have enough time for everyone.

So next we'll turn to Matthew Schruers.

MR. SCHRUERS: Thanks. No slides for me, so I'll just present from here. Thanks. I want to say thank you to our host. We appreciate the FTC bringing folks together today to talk about these critical issues. Happy to have the opportunity to explore them.

CCIA represents companies that are some of the largest users of the intellectual property system. Worldwide rankings of research and development show U.S. ICT firms having five of the top five slots for R&D spending. It's on the order of $70 to $80 billion a year, depending on when you account, and a considerable amount of that R&D yields patents, making our constituents some of the biggest users of the patent system. They're also some of the most recognized brands in the world, some of the most trusted institutions among Americans, in fact.

And that, of course, has great impact on the brand value, so our constituents also care greatly about trademark. And as many of us probably consume content that's produced or distributed at least by some of the firms we represent, and so I'm happy to say that our constituents care greatly about copyright as well.

In short, ICT firms are rightsholders. They are economically significant rightsholders, and they want an IP system that encourages and promotes innovation. So with that in mind, I've got three, I think, pretty brief points that I'll try and stick to here and explore the rest in discussion.

The first is that the legislative and

judicial changes that have happened in the patent system in recent years have improved the innovation landscape. They have not solved problems, but they have improved conditions. Objections to these reforms are not particularly well founded. And, three, more needs to be done to promote IP certainty, both in the context of patent and copyright.

So, on the first one, the first item, these reforms have made differences. The availability of IPRs under the AIA and recent federal court jurisprudence, primarily Alice, were both warranted and actually overdue. The Supreme Court reining things in via Alice had a very positive impact on research and development in the software and internet sectors. We saw it grow at 27 percent, which was greater than the growth of all other industries. That's research and development spending for software and internet in the year after Alice.

And the suggestion that Alice had any negative impact at least with respect to the software industry is difficult to reconcile with the stats on so-called unicorn IPOs. These are firms that -- startups that IPO for greater than a billion dollars. That number exploded in 2014 and then doubled the subsequent year in 2015.

There's also data that supports the impact of IPR. Since both the AIA and Alice, the AIPLA economic survey shows that the cost of patent litigation has declined substantially. And if you look at copyright and trademark litigation as not a perfect control, but a control, that does tick down slightly, but not nearly at the rate that we saw the cost of patent litigation fall.

And if you compare the amount of work that's being done in IPRs relative to patent litigation, some rough math could lead to estimates that we've made that over $2 billion in litigation savings have occurred by adjudicating issues in the IPR format. And so based on that data, I think we can clearly say the reversing course on these reforms would negatively affect the industries that depend on this regulatory regime and that have seen the benefits from these recent reforms.

So my second point that the critics' arguments are not particularly well founded, there's a narrative that the courts have gone after the patent system. And it is true that particularly in the area of 101, the Supreme Court has cut back on excesses that have originated largely with the Federal Circuit, but for every case, you can find where there have been

judicial reforms of the patent system. You can point to cases like SCA Hygiene on laches or Halo on willfulness as to Berkheimer, where wins for plaintiffs have strongly given an advantage in the litigation context.

And so it's not accurate to paint the recent developments in case law as painting -- narrowing patents. Like any area of the law, we see wins and losses that benefit both defendants and plaintiffs. And that's totally appropriate.

There is independent research that shows that patent valuations and secondary markets have remained largely unchanged after Alice. I know we have a representative here from the Chamber so that they can respond to my -- Patrick can respond to my criticism here. But the Chamber has a study which ranks the U.S. patent system as 13th in the world now, behind Italy, which appears to be largely based on the assessment that having a meaningful 101 and the institution of IPR under the AIA was a bad idea.

It cites high volumes of IPRs. As some of the scholars on the first panel this morning noted, that's misstating the frequency at which patents are invalidated by the PTAB. And, in fact, several EU countries, which outrank the U.S. in the Chamber

study, invalidate or modify patents at a higher rate than the PTAB does. So, the notion of a regulatory system that's going after patents without cause is highly overstated.

In short, I'd say the impact of the reforms we've seen is overstated and, in fact, more needs to be done. Suzanne asked about what we might have taken away from this morning, and I think a lot of the data we saw shows that while there's been some improvement in a number of metrics and indicators that we can look at, these problems have not gone away. They have in many cases simply leveled out. Perhaps we have stopped the bleeding but not treated the underlying wound.

So and more -- I think more can be done to achieve certainty for innovators in the patent system. And some of these issues, I think, actually carry over to the copyright system as well, and the recent Music Modernization Act is a recognition that uncertainty can impede licensing, and Congress stepped forward to try and address that area. I think some parallels could be drawn here, but seeing as how I've exceeded the time I've been given, I'll stop here and we can cover it more in discussion. Thanks.

MS. MUNCK: Thank you very much.

Next I'd like to turn to Barbara Fiacco.

MS. FIACCO: Thank you. Thanks very much for hosting this discussion today. I need to give the obligatory disclaimer. I think I'm the only one on the panel today that needs to do so. But AIPLA is not my full-time employer. I am here speaking on behalf of them today as the first vice president, but my full-time employer is my firm, and I'm not speaking on behalf of my firm nor my firm's clients.

So with that, let me introduce you a little bit more to AIPLA. We're a national bar association. We have approximately 13,500 members. We're primarily lawyers engaged in private or corporate practice in government service or in academia. We represent a wide and diverse spectrum of individuals, companies, and institutions who are both owners and users of intellectual property, big and small, across all sectors.

Our mission includes helping establish and maintain fair, balanced, and effective laws and policies that will stimulate and reward innovation while balancing the public's interests in healthy competition, reasonable costs, and basic fairness.

So at the outset, I do want to address the data point that Matt brought up, which is the U.S.

Chamber's index, and I won't steal Patrick's thunder, but suffice it to say that AIPLA is concerned with the drop in the U.S.'s ranking in the IP index. It's a disappointing turn of events for a country that's traditionally led the world in this area and has championed intellectual property rights.

So in my opening remarks, I want to touch on two things. First on the importance of IP to U.S. competitiveness and leadership, and then I'll underscore some of the legislative and regulatory changes to the IP landscape, as well as judicial that we've talked about this morning and I'm sure this panel will continue.

So with respect to intellectual property and the U.S. market and technology leadership and competitiveness, AIPLA firmly believes that in order for the U.S. to maintain competitiveness and leadership in the global marketplace, it's important to support innovation by having a very strong patent system that enables a sustainable return on investment in R&D. Innovators in high-tech industries spend many billions of dollars on high-risk R&D. These innovators face substantial risks that their R&D won't succeed and that their R&D expenses will not be rewarded.

Ensuring that we have a strong patent system allows innovators to be confident that they'll be able to obtain a return on their investment, if and when they successfully develop those new technologies. And without this promise of a return, there's no incentive to continue investing in R&D and create these technologies.

So let me shift now to the current and shifting landscape of U.S. IP law and practice. And I want to touch on a couple of things. First, Section 101 case law. The landscape has clearly changed here, or perhaps I should refer to it as a sea change. In three Supreme Court decisions issued between 2010 and 2014, the Court distorted patent eligibility determinations under Section 101.

Section 101 was really intended to be an enabling provision, identifying particular categories of subject matter that qualified for patent protection. It wasn't intended as a standard to decide whether a particular technological advance should receive patent protection. That's what the remainder of the Patent Act is for. Sections 102, 103, and 112, they were intended to provide the yardstick that judges novelty, nonobviousness, and the sufficiency of the disclosure in the spec and in the

claims.

The Supreme Court's decisions have blurred theses statutory functions and they've caused significant uncertainty, as we have heard today, and are potentially driving innovation investments abroad. The present uncertainty has weakened our system and it's discouraged investments in areas ranging from software to life-saving diagnostic tools to therapeutic medicines.

The Federal Circuit, the district courts, the PTO, and our members are all struggling to find a principled formula to guide their decision-making. So AIPLA, along with other organizations and businesses, have recognized the significant problem and we've called for a solution. Over the past year, we were able to reach an agreement with the Intellectual Property Owners Association on a proposed legislative solution to the 101 subject matter eligibility problem.

Our proposal provides a clear and objective test that will result in appropriately broad eligibility, including expressly removing considerations of inventiveness from the eligibility determination. We hope that the FTC will take this significant uncertainty into consideration when

evaluating the market power or effect associated with patents going forward.

Second, I'd also like to address the IPR proceedings by the PTAB, which has also been the subject of discussion by many of today's panelists. It also represents a very significant change in the landscape. Since introduction about six years ago, IPR proceedings have been very broadly used, perhaps far more frequently than had been envisioned at the time that the AIA was enacted in order to challenge patent validity.

Some, including some here today, have expressed concern about the balance and the fairness of that procedure. The emergence of the proceedings has dramatically changed U.S. patent enforcement by adding in effect a second prong to litigation in many cases. Rather than taking the place of district court litigation as originally intended, it also now allows for serial challenges to the same patents, both in the PTAB and the courts.

So the IPR process has fundamentally changed the calculus of considerations that a patent owner has to consider before pursuing enforcement in the courts. Moreover, as you've heard, in IPRs, the PTAB doesn't assume that a patent is valid. So the presumption of

validity that characterized U.S. patent law for decades is significantly limited and weaker today.

Other concerns have been expressed about IPRs such as the difficulty of amending claims during the proceedings and the possibility of serial challenges with no standing requirement. These factors have created a landscape which can place a cloud over a patent for its entire life, leading to the devaluation of patents generally.

Third, patent litigation has changed. Over the years, few would dispute that the legal framework for enforcing IP rights has changed dramatically. It's led to some uncertainties and a lack of clarity, as well as some positive outcomes. Examples of that include in the context of injunctive relief. The 2006 eBay decision changed perceptions about the ability of patents to exclude others, changing the calculus, sharply limiting the ability of patent owners to obtain injunctions, and that's impacted enforcement strategy and also some licensing behavior.

In light of that case law, the portrayal in the 2017 FTC/DOJ licensing guidelines of IP rights as conferring an unbridled power to exclude may no longer be completely accurate.

As was also noted this morning, other

developments in patent law have changed, negatively impacting the ability of the patent owner to enforce her rights and recuperate investment costs, including the change in venue law, divided infringement law, heightened pleading requirements, and patent exhaustion to name a few.

So in conclusion, over the past seven years, we've seen legislative, administrative, and judicial trends that have produced some inconsistencies and uncertainties about patent rights and their enforceability. While there have been some positive developments, AIPLA is concerned that the balance of U.S. patent policy is tilting in the direction of limiting enforcement rights, which may lead to a negative impact on R&D investment and reduce the innovation that produces such dynamic competition in U.S. markets.

Governments through agencies like the FTC have the power to promote or discourage innovation through policy. AIPLA believes that IP protections are important to accelerate technological progress and economic growth, and we submit that careful consideration of the impact of these changes is warranted, and we thank the FTC for doing so through these hearings today.

MS. MUNCK: Thank you, Barbara.

And, finally, we'll hear from Patrick Kilbride in opening.

MR. KILBRIDE: Thank you, Suzanne, and thank you, John, and to all the Commissioners for hosting this opportunity. Again, I'm Patrick Kilbride. I'm the Senior Vice President for the Global Innovation Policy Center at the U.S. Chamber of Commerce. The GIPC is the dedicated voice of the Chamber on issues of intellectual property-driven innovation and creativity.

And I want to share up front three principles that really form the premise for my comments today. You know, number one, that labor and capital invested in the creation of intangible assets deserve no less property right protection than laboring capital invested in the creation of physical assets. So in today's economy, we see that intangible assets like R&D capabilities, workforce training, business processes form much greater share of market value than physical assets like plant and equipment and real estate.

So it's appropriate that the U.S. is a leader in protecting intellectual property rights, which is a critical subset and a pivotal subset of

that broader class of intangible assets. Number two, that exclusivity, exclusive rights to a discrete work should in no way be conflated with a monopoly. And number three, that the brilliance of the U.S. system is that it has recognized that strong property rights in both physical and intangible assets yields more productivity in the intangible space and innovation and creativity and more competition.

So this was explicitly recognized with a great deal of foresight in the U.S. Constitution. And as a result, the principle that authors and investors should own property rights in their work, no less than in physical assets, has underpinned the dynamism of the U.S. economy from its outset. Intellectual property was not an invention of the American founders, but America did democratize it in a very meaningful way, making it available and broadly accessible to inventors of every class. And that changed the system, making it the envy of all the world.

Periodically, there are attempts to diminish the founders' vision by conflating that exclusive property right with a monopoly, but common sense tells us that Walt Disney's exclusive right to the reproduction and distribution of Pirates of the

Caribbean, for instance, is no more a monopoly in the movies than your title to your car is a monopoly on automobiles or transportation.

And, in fact, the FTC and the DOJ in licensing guidelines have long held that they do not presume a patent, copyright, or trade secret confers market power upon its owner. And this basic premise, though correct, I think actually improperly suggests a correlation between the two. And we think the FTC should consider going further to clarify that in general intellectual property rights in and of themselves do not confer market power.

I think there should be no doubt in the minds of the Commissioners that intellectual property rights are procompetitive, that they protect against unfair competition and free riders, and that the existence of exclusive rights has long been considered and understood to be distinct from market power. And that's because the power of that property right to stimulate innovative and creative activity really hinges on the ability to invest at very early stages in those -- in that intellectual capital formation that provides a pathway to development testing and ultimately commercialization of a new and useful product.

And in an environment where those property rights are protected, we consistently see more innovation, more creativity. Where they are less protected, we don't see as much. That scenario, unfortunately, is the reality in much of the world today where intellectual property standards are very low. And such a routine infringement is a form of market failure for the innovative and creative sectors and could even be considered an unfair method of competition.

What does this mean for the United States? You know, throughout a period of intense globalization of international markets, the absolute and relative strength of its intellectual property laws gave the United States a competitive advantage and made it the world's economic engine. Now, following decades of globalization, the productivity edge in those sectors has been dulled, especially because our trading partners do not respect property rights at the same standard that we do, creating an unfair playing field for U.S. innovators and creators.

So we've sought at GIBC and the Chamber a global commitment to enact and enforce intellectual property rights at a higher standard, one that empowers the creative capacity of all the world

citizens. That's why for the last six years the GIBC has published its International IP Index, which is a comparative law analysis, allowing like-for-like comparisons among, at this point, 50 economies across a range of categories of different intellectual property rights.

And the data accumulated in the index provides clear evidence of a strong correlation between, number one, the standards of a country's intellectual property system, the strength of their standards, that is, and its innovative creative output, its access to innovation and creativity, and a whole host of other socioeconomic benefits, including job creation in knowledge-intensive industries and many others.

However, on the global stage, we continue to see efforts to reduce intellectual property rights to the lowest common denominator, and among them, competition policy principles are being misrepresented and abused in order to deny U.S. innovators and creators the rights they deserve.

What happens at home matters abroad. The U.S. is watched very closely by its counterparts around the world, and we need to be careful about the signals that we send. You know, we're here looking at

the period from now since 2011, and naturally, the 2011 report of the Commission forms a focal point for that discussion. And whether or not you think that the 2011 report got it just right, the fact is that it was picked up and used by other actors in global markets in ways that have disadvantaged U.S. innovators and creators.

So where it's very possible in the U.S. with our judicial tradition, our legal context, to take a nuanced and complex approach to these issues, we have to be very careful about the message that we're sending to the rest of the world.

In similar fashion, seven years ago, the U.S. Chamber supported enactment of the 2011 America Invents Act, creating the Patent Trial and Appeals Board. Concerns related to patent enforcement abuses were at a peak, and it was important to a well-functioning system that those be addressed. In its implementation, however, we see some over-correction. While the U.S. maintains the highest rated overall IP system in the world, including on our index where the U.S. scored 37.98 points out of a possible 40, there have been concerns in some industry sectors regarding restrictive patentability standards, the threat of patent litigation abuse, and legal uncertainty

regarding the durability of patent rights.

We think that this does a disservice to our innovative and creative economy because it dampens enthusiasm for that initial investment. In a similar fashion -- actually, you know, the good news is that recent steps by the U.S. Patent and Trademark Office have taken important steps to address some of these concerns, and we look forward to continuing to work with the FTC, with the USPTO, and other stakeholders to make further progress.

Similar attention is due to the modernization of Copyright Office operations, as well as to addressing the global scourge of counterfeit and online piracy that threatens both U.S. consumers and its jobs. In all of these activities, the Commission has a critical role to play in upholding the constitutional promise of intellectual property-driven innovation and creativity that has served the United States so well. And we believe that a nuanced and sophisticated approach to regulation is not exclusive of a strong, clear, unequivocal political commitment to property rights. A fair and competitive marketplace demands no less. Thank you.

MR. DUBIANSKY: Thank you. We're just going to move into questions now, and the first question

built upon the remarks of several of the panelists, which is, what, in your experience, is the role of the patent system in promoting innovation today?

Perhaps, Patrick, if you'd like to begin, and then we can invite others to join as well.

MR. KILBRIDE: Thank you very much. So, you know, the fact is that, you know, as I just sort of reviewed, we believe the ability of the patent system to stimulate innovative work is only as strong as the system is -- produces rights that are reliable and durable on the back end. So that means that we need to do everything in our power not to address symptoms, when we see those in the system, but root causes.

So, you know, when you hear about claims of overpatenting, claims of poor-quality patents, the answer is not to make it easier to invalidate all patents; the answer is to spend the resources necessary and the attention necessary to address those problems on the front end.

So I know we heard this morning, for instance, from Georgia Tech. There have been some very interesting ideas about the application of machine learning and AI to patent examination, but the point is we cannot afford to just make it easier to invalidate a property right. We have to get

examination right on the front end, as Barbara said, to restore that presumption of validity so that innovators can rely on the patent as a holder of value as they make long-term, high-risk, capital-intensive investment decisions.

MR. DUBIANSKY: Thank you.

Would anybody else like to join in? Tahir.

MR. AMIN: I mean, I would say that the whole patent system and the idea of innovation has become so muddied that we need to really understand what do we mean, first, by innovation. I think when we look at the patent system, it started off about invention. And I think in the '60s, the language of innovation came about. And you can probably check the text for that if you look historically.

And innovation is a great driver of economic growth, but that does not mean that it's deserved of a patent. Innovation encompasses so many different things -- marketing, design. It doesn't necessarily mean inventiveness. Now, if you want to call the label what it is, if you want to say the patent system is not just about invention and it should be about all these other things, then perhaps we need to really start speaking what the value we put on these items because the cost of society is far greater when we

give these -- if you want to call them exclusivities, but when you see the strategies at play, they become monopolies.

So I do believe that the patent system is in need of correction, and the definitions that we use are important in the narratives that we frame.

MR. SAUER: I have a more pedestrian observation just real quick. From the perspective of our kinds of companies, when you ask, like, how do we use patents and why they are important, I would say there are really three simple answers. First, to us, they're important for licensing, partnering, and for transferring business assets and intellectual assets, right? So you use the patent instrument for orderly dissemination of technology and getting partners.

Second, they're important, of course, for investment and access to capital. And, third, this is an observation I very often hear from our member companies, that with all the other uncertainties that are baked into the business model, you know, when you develop products that more often fail than not and where you have to sustain investments of hundreds of millions of dollars or billions of dollars over a decade or longer, there are so many other uncertainties already built into that decision that

adding additional IP certainty by changing laws or by court decisions actually become very highly leveraged in business decisions.

You might say, really, our business is going to change their behavior just because there's a 10 or 15 percent increased uncertainty on the patent assets? Is that really going to, like, change the course of the tanker? And it might, right, because you have to think of it as being leveraged and layered on top of all the other business uncertainties that exist until a tipping point is reached and companies have -- I've heard myself from colleagues in the industry who've said, you know, we make our business decisions. When IP changes, you know, we might as well go the other way on a development program, and we might not go with a high risk, maybe highly innovative program, but we're going to invest and go and take forward another development candidate that is perhaps less innovative but promises less risk as well.

So that, I think, is often what I hear about the role of the IP risk in the industry and how leveraged it can become in corporate decision-making.

MR. DUBIANSKY: Matt?

MR. SCHRUERS: I'll add something which sadly, I think, echoes statements that were made in

the hearings in advance of the 2003 FTC report "To Promote Innovation." So in that sense, you know, it seems some things haven't changed, but in recent years, surveys and empirical data on venture capitalists have indicated that overpatenting or uncertainty around patent rights has a substantial negative impact on the willingness of VCs to put investment in a particular sector. And that's particularly the case in tech. And the availability of patents by contrast to a particular startup has relatively minimal positive improvement, and so it's regrettable that we appear to be in the same place we were back then.

So in that sense, I think it's similar to what Hans was saying, is that the IP system does impact investment decisions, and clearly it affects different industries in different ways.

MS. FIACCO: I'll just add a little bit to that. You know, we have members who are entrepreneurs or who are representing entrepreneurs who need to raise venture capital, and what we hear from them is they need patents in order to get the venture capitalists' attention. You can't take a trade secret on a road show. You need to have at least your patent applications on file, if not at least one issued

patent to obtain the investment, to take the technology through to commercialization.

MS. MUNCK: Excellent. Well, in many ways, I wish we could kind of meld this panel with the venture panel that we had yesterday because I think there's some interesting parallels and some interesting sort of maybe change points. But one other thing that we talked about so far on this panel is the IP licensing guidelines and in a little bit the 2011 report.

And since our focus here is with innovation, I'm going to paraphrase the beginning of the 2011 report, which says that innovation is key to meeting society's unmet needs. It is risky and complex and includes a number of steps from sort of idea to development. And we talk about the role that intellectual property plays in promoting innovation because it protects investment and protects the ideas from copying, but we also talk about the role that competition plays in promoting innovation because it drives others to enter into the market.

And so I say that because my next question is really in looking at the years that have passed since we issued the evolving IP marketplace report in 2011, how has substantive patent law changed in ways

that are relevant to your members and how is this influencing incentives to innovate and invest in commercializing technologies?

And, if possible, I'm interested sort of in how you are striking the balance between patent protection and competition and the roles that those play in promoting innovation. So I think we'll start with Barbara.

MS. FIACCO: Okay. Thank you. First, I want to say that I think by the time the AIA was enacted, you know, the dialogue definitely surrounding the need for increased certainty in the patent system had all come together and aligned. I mean, I think one of the purposes of the AIA was to eliminate some of the uncertainties that we were seeing in the patent system and to improve it. And the switch to the first-inventor-to file system really represents, I think, the culmination of that consensus about the need for additional certainty. So, you know, that's definitely a positive.

Unfortunately, I think we've seen some other developments that have led to more uncertainties in the patent system. Certainly, some of those uncertainties surround the PTAB, which I discussed in my opening comments. It's caused, I think -- the

uncertainties around the PTAB have led to significant costs and inefficiencies as patent owners and other stakeholders figure out kind of the lay of the land with the PTAB. I think it is stabilizing a bit. We are seeing some improvements with the clean construction rulemaking in particular, so that's going to eliminate some of the uncertainty and some of the inconsistency between district court litigation and the PTAB, which is very good news.

The concern about serial challenges I think is still very real and how to manage the situation around, you know, a potential standing requirement, particularly to the extent there's any uncertainty surrounding, you know, what happens when a decision from the PTAB is appealed and is there standing to continue the appeal or are we in a place where there's no appeal from particular PTAB decisions because of the identities of the parties.

So there have also been a number of judicial decisions that I alluded to in my opening statement. TC Heartland on venue has upended some things in the Lexmark decision on international patent exhaustion, Akamai on undivided infringements. But by far the most significant one for our members is the 101 issue. There's no question that our members are

extraordinarily concerned about that. It's very difficult to advise one's client about whether to file a patent application, what the outcome of that patent application would be.

And in some ways, the 101 situation is an interesting kind of case study for some of the other places where substantive law has changed, right. So we're in a place where we have a patent system where you file a patent application, you disclose publicly what you believe your invention to be, and the quid pro quo is that you, based on what you understand the law to be, will obtain some patent protection that may be the scope that you had originally hoped for but you get some patent protection.

That's the quid pro quo that our system has been based on for many years. And we've seen the benefits of that. We've seen the disclosures that are out there encourage other entities in the marketplace, including sometimes one's primary competitor to design around. And some of the big technological innovations that we've seen over the years are, in fact, the result of the design-around of the first patented invention that's out there.

And so that's very concerning, and the Section 101 law situation has certainly exacerbated

that problem and led our members to be concerned about whether patent filings will continue or whether we'll start to see companies maintaining more trade secrets. And, of course, if something's maintained as a trade secret, it's very difficult for innovation to build on itself in that way. And so we have seen and heard expressed from our members that this 101 situation is really discouraging investment and innovation in certain areas, especially those involving artificial intelligence, healthcare diagnostics, and personalized medicine.

And there's a real concern that this is going to shift innovation and the innovation activities outside of the United States to other countries. And I'll leave others on the panel, I think, to discuss maybe the details and the data around the filings that we've seen around the world, but there are some studies out there, including those that we've cited in our 101 report, that suggest that applicants aren't able to get past the patent subject matter eligibility threshold in the United States but are obtaining patents around the world on the very same invention.

MS. MUNCK: Well, thank you. And I want to open this up to the rest of the panel, and just sort

of noting the time, one thing I want to sort of flag for people going forward is I hear a lot that, you know, if we don't have patent protection we're going to move to trade secrets on the one hand, but then I talk to others who say, well, actually, they cover very different rights and they're very complementary. So I think I probably can't ask you that followup question right now, but I'd like to sort of raise that for people who are commenting on this because I think it's a very big question, unless there's something you want to say quickly because I don't want to prevent you from talking about that.

MS. FIACCO: No, thanks.

MS. MUNCK: So I'll open it up to the rest of the panel.

MR. SCHRUERS: So let me jump in there. You mentioned the intersection. I think it's very appropriate for the FTC to be contemplating is the impact of IP versus competition, as a vehicle, a mechanism for promoting the public welfare. I think they're both appropriately regarded as critical tools in the innovation promotion toolbox. All those tools should have clear substantive boundaries around them. And you don't use a hammer to drive a screw.

And we see these kinds of fights happening

outside the IP space, right, and there's a lot of discussion now about using competition law to solve noncompetition issues because the noncompetition issues are regarded as subjectively important, and competition law looks like a pretty powerful hammer to use. So we need to make sure that areas of the law stay in their lane for design purposes. And in many ways, I think our recent 101 jurisprudence is doing precisely that.

I would note on the matter of serial challenges which comes up rather frequently, the PTO does have complete discretion over whether or not to institute these, and so to suggest that this is a huge problem implicitly suggests that the PTO doesn't have the capacity to exercise that filtering function, which I think is a hard argument to justify. And, secondly, it's my understanding that only about 15 percent of patents are subjected to IPRs, and -- I'm sorry, more than one IPR. I think that’s right. And the majority of those, it's only two. So I submit that that may be overstating the problem.

Particularly one, as I mentioned in my preliminary statement, our European counterparts actually appear to invalidate or modify at a higher rate in their opposition proceedings than we do.

Overall, I think the way the system has changed I mentioned previously IPRs and the subject matter reforms, the ways that the patent system has stayed the same are equally important. And some of the data that we saw earlier today has shown that many of the problems that are regarded around patent assertion entities have stabilized. They have not gone away, they have stabilized. And insofar as we regarded that as a problem ten years ago when we started talking about the patent system and the data points are where they were ten years ago, I submit we have more work to do.

MR. KILBRIDE: Suzanne, maybe I could jump in on the question you raised about patents and trade secrets, just to, you know, share some observations from someone who works with a really diverse set of businesses and industries. I've seen a bit of a breakdown on two levels.

You know, one, you talk about inventors, and there's obviously a huge difference between an inventor who’s housed in a large multinational corporation with, you know, incumbent market power and a small inventor working out of their garage, you know, investing their time and their money in a startup. And to one, a patent might be a little more

than bragging rights, but to the other it's a business model. So that's one thing.

And the other level that we have to consider is the way companies use their intellectual property. And I've seen a breakdown in the companies that we work with between the industries where intellectual property is part of the platform and really does stay within the company and those where the intellectual property is necessarily housed in their end product. So that leads to some different commercial decisions.

What I think we want to avoid in terms of promoting the national welfare is making decisions based on commercial considerations versus those fundamental economic principles, and so that's where some of our arguments are based.

MR. SAUER: Just real quick because you asked about changes in substantive patent law that affect our members, of course, Section 101, that's the one we hear about most and most consistently, but it's not the only one. There are other areas. Written description for antibodies under Section 112 is kind of peculiar to our industry. Nonstatutory double patenting.

So a list can be compiled of legal changes that over time I think now implement different roles

from the ones that existed before. The reason why I bring this up, and I don't want to let it go unsaid, is that people consider these changes and these Supreme Court decisions and court decisions mostly in the context of what it means for procuring more patents in the future, what does it mean for the patentability of new innovations, and what sometimes is forgotten is their impact on issued patents that have been around for a long time and on which people have relied to build their businesses.

The proposition is really if you, like, flip the time line is you could tell an entrepreneur today that, congratulations, you have just applied for a patent and been granted one. You have complied with all the rules, we all did a good job. And with the expenditure of much effort, you can be pretty confident that you have a good patent today. Go and build your business.

In ten years, when it matters, and when that patent might be reviewed in the context of litigation, we may apply different standards to assess its validity than the ones we just applied when it was granted. You will not know what these standards are, but go ahead and invest and build your business. You know, we'll see, maybe you can hang onto your patent

in ten years, or maybe it will be declared bad because the law changed along the way. Nothing could be worse for investment and innovation in that.

And Section 101, as Barbara said, is only one example. I think we've had a range of those, and we really have to, like, consider the impact on granted patents and the speed at which businesses learn their lessen because when this happens two or three times and when it happens to them, I think they will go back to their patent counsel and other people and ask, patent, fine, is there something else I can rely on that will give me the certainty that I need because this is a crapshoot, and if they are going to keep changing rules on us, we need to find something outside the patent system that will give us that assurance or change our investments in a different direction.

MS. MUNCK: We're just checking our time here.

MR. DUBIANSKY: Well, earlier today and also in our discussion right now, we've heard a lot of mention of both the PTAB and the new IPR proceedings. So my next question is in your experience, what has been the impact of the AIA's creation of the new IPR proceedings administered by the PTAB. I'll start with

you, Hans.

MR. SAUER: I want to make reference to things I heard in the earlier panels this morning which talked a lot about the PTAB. So one observation that I get very much from our members is, yeah, the PTAB was created, you know, its stated purpose was to serve as a more cost-efficient and quicker alternative, a substitute, if you will, for district court litigation. And manifestly this is not the experience we have in our membership. I talked about Hatch-Waxman litigation earlier, that is the largest proportion of IPR-related litigation that we have in our industry.

And in those cases, in drug cases, we know empirically that they are virtually never stayed when there's an IPR. So district court litigation is nothing, that we're aware of two, maybe three pharmaceutical cases that actually received a stay when an IPR was instituted. Overwhelmingly, what we do see is that they operate as parallel adjudication. A typical scenario is that a generic company -- drug pharmaceutical company might -- so this is only small markets -- the picture is different for biosimilars, but for ANDA litigation, generic drug companies file their Paragraph 4 certification with the FDA, which

means they have a time point at which they have a pretty good idea of what's wrong with the patent or what they think is wrong with the patent.

Then the patent is litigated for about a year. Then the IPR challenge comes, and if it's timed right, because the Hatch-Waxman litigation is not stayed and is supposed to be under a 30-month time frame, around the same time period, at the end of the IPR, the district court litigation likewise will come to a conclusion. And so the effect is that there's an opportunity to hedge against the result of the district court litigation. And if the district court upholds the patent maybe the PTAB will strike it down, even if they both agree that the patent is not invalid, there is an opportunity for not one but two appeals.

Right, so there's a lot of duplication built into the system, baked into the system as it pertains to pharmaceuticals that wasn't contemplated when the AIA was negotiated. And without opining on other experiences with the PTAB system and other industries, I think in our industry, given the duplication of adjudication that it produces, IPRs have served some kind of function that wasn't contemplated when the AIA was negotiated. It certainly doesn't unburden the

district courts.

MS. MUNCK: Hans, I just had a clarification question. When you're seeing PTAB and district court proceedings that are not stayed pending PTAB review, is that localized within certain districts, or what's the reasoning for that?

MR. SAUER: Oh, there's always, I think, concentration in certain districts because if it's Hatch-Waxman litigation, this is the one we understand best that unfolds in maybe three districts in the country. It's mostly Delaware, some New Jersey, and a few other places. It's not the courts. I think it's an expectation that these litigations by statute are supposed to proceed under a 30-month time line. So I do think that judges who handle these Hatch-Waxman cases feel that they ought to proceed because everybody is waiting for a result. The FDA might want to approve the generic drug but can't do so until after the expiration of 30 months or resolution of the litigation.

So there is a sense that there's benefit to resolving these disputes at least promptly without sitting around for a year and a half and waiting for the result of an IPR. And, now, keep in mind, right, the kill rates in IPR aren't what they used to be at

the very beginning, so there's a pretty good prospect that if a pharmaceutical patent or a biologics patent undergoes an IPR, it might emerge with claims intact at the very end, and then we're just back in district court because invariably the defendants have other defenses that they couldn't have brought in IPR and that they reserve for a second round of litigation in district court.

Right, so I do believe that judges often feel there's a risk that the IPR is going to lead to more delay than expedient resolution and it's going to cause duplication of effort rather than unburdening the district courts.

MS. MUNCK: Thank you.

MR. DUBIANSKY: Well, keeping an eye on the time, I'd like to give some of our other panelists an opportunity to respond prior to the conclusion of our hour. So perhaps, Tahir, would you have anything to say in response?

MR. AMIN: Yes. I just want to take a step back a little bit just looking at the broader system. It's kind of ironic that we hear the complaints of serial challenges, yet we have serial continuation applications to get a patent in the first place. So if we talk about front-end problems, there you have a

front-end problem straightaway. We might not end up in litigation or these investment issues if we solve these matters earlier.

The other thing that I find interesting is there was an FT article that talked about how the branded pharmaceutical industry uses the PTAB quite a lot. So on the one hand, the branded industry pharmaceutical industry is complaining about the PTAB, but then on the other hand, it uses it itself. It seems to me to be kind of hypocritical to not want the PTAB or try and diminish it but on the other hand to try and use it as much as possible when they need it. And I think this is where having the PTAB and having a strong IPR system is important for a democratic patent system.

And we've heard the issue of standing being a problem. I think there's a lack of standing in courts when you think of who can actually bring a patent invalidation in court. Consumer people, groups, public interest people are not allowed to have standing in courts unless you're infringing the patent. What kind of patent system is that? I don't believe that exists anywhere in other Western developed countries where you can't actually have the right to stand and bring an action.

So when we talk about these issues, let's look at it in the broader sense. We hear a lot of these complaints about what the industry needs, but I feel we're gearing towards where the term "innovation" has become a monopoly power. It's anytime you use the word "innovation" it should be overprotected. And personally I think the IPR and the PTAB system is a minuscule check on some of that, and it's actually being whittled away, particularly because the industry -- the pharmaceutical industry tried to extract pharmaceutical patents in 2015 from the IPR system.

So it already showed that it didn't want it, so hasn't really allowed it to work. And we've seen it scaled back, and even Director Iancu in his speech the other day, where he's calling it balanced, but he's really saying anybody who's talking about patent abuse is really anti-innovation So I think there's a lot of work to be done.

MR. DUBIANSKY: Thank you.

Would anybody else like to speak to this?

MR. SCHRUERS: Let me say a word about IPR. And while I can't comment on the Hatch-Waxman issues that Hans was referring to, I know from our perspective, IPR has provided a very cost-efficient procedure for determining validity before an expert

tribunal as opposed to the alternative where ultimately you're winding up -- you can wind up determining validity before, at best, an inexpert federal judge who is skilled but a generalist. And having the opportunity to move these validity questions to an expert agency of judges trained in the law and the technology has provided extraordinary cost savings over the alternative of doing that through civil litigation, which isn't to say it's free.

The IPR processes are expensive, but our back-of-the-envelope calculations is that billions of dollars literally in litigation costs have been avoided due to the PTAB's processes. And that's critical and due exclusively to the availability of a mechanism for assessing validity that's not in federal district court.

MR. KILBRIDE: Maybe I could just add that -- you know, again repeat that the U.S. Chamber supported the act that created the PTAB, that we see value in a mechanism that provides a time-effective, cost-effective alternative to the courts. However, it's important that in its operation it doesn't undermine the reliability of patents as a store of value such that businesses are able to make long-term investment decisions. And in its operation over the

last six years I think a number of problems that have been raised today are significant -- the serial nature of challenges, which does exist; the differing standards from the courts; and the reality that unless a patentholder gets a final written decision affirming their claims that they have no certainty throughout the life of the patent.

And that's a problem for our system. USPTO Director Iancu has taken some steps to make this work better. We're interested to see how they work and want to work with all industries to make it as useful and effective as possible while retaining that strong store of value in the U.S. patent.

MR. DUBIANSKY: Thank you.

Barbara.

MS. FIACCO: So I just want to add a couple things, and this is really more my own perspective as a patent litigator rather than speaking on behalf of the association. But, you know, we can talk a lot about the data and how many serial challenges there have been or not. The threat of redundancy, however, is one that I have to address with every client I speak with who's considering enforcing their patent rights.

And that's changing the calculus of the

decisions that patent owners are making about whether and when potentially to bring a district court litigation, knowing that even if they assert one patent, they could face several petitions directed to the same patent in addition to the district court litigation. And if those petitions are filed just before the one year bar, it's highly unlikely that the district court's going to stay the litigation and the defendants actually may choose not to because it's part of their litigation strategy to run up costs, so something to be aware of.

And I'll just throw out with my AIPLA hat back on that according to our economic survey, the average cost through trial for a single PTAB proceeding is not cheap. It s $324,000, which is something else to think about.

MR. DUBIANSKY: Well, thank you. And given the time, I think we'd like to shift into giving everybody the opportunity to make probably two minutes of closing remarks. But as we do so, we received a number of questions from the audience, and there's one in particular I think is rather good and perhaps you can think about it as you make your closing statement. And that is, what is on your patent policy wish list as we gear up for the next congress. So I invite you

to respond to that or make any other statement you like, perhaps going down the line and beginning with you, Barbara.

MS. FIACCO: Well, I think I've already shared a piece of that. I think the Section 101 legislative reform is something the AIPLA has been speaking about with IPO, with other bar associations, and others in the industry. I think that that's a particularly important reform effort for us. That's the one that's kind of at the top of our radar screen at the moment.

And let me just close really by thanking you all again for the opportunity to have this discussion. I think that all of us here have benefitted from it. And there are a lot of cooks in the kitchen, as someone said this morning. There's a lot of pieces to this puzzle about the changes in the patent landscape, and we just encourage you to be comprehensive in your studies, incorporate a range of perspectives from the various stakeholders, and collect data on all the trends across all the sectors in order to really assess the legal landscape. And we thank you for your efforts in that regard.

MR. DUBIANSKY: Great. Thank you.

Matthew.

MR. SCHRUERS: So let me try and answer the question and sum up at the same time. I think for the reasons I've mentioned before, the most, the highest value that can come out of patent policy right now is I think everyone would agree increasing the certainty for all the stakeholders in the system. We view one particular way of doing that is to improve the output and quality of PTO's work. You know, obviously the PTAB is one mechanism by which that is done. Having greater certainty around subject matter is another vehicle. And whether those are legislative wish items or just generic wishes, I think, you know, I'll leave open. But those are something that I think we can all agree is a shared objective, and I hope we can find ways to pursue that next year.

MR. DUBIANSKY: Thank you.

Hans.

MR. SAUER: So my wish for next year, I think there's been too much patent reform too quickly. And so I think what we should have over the next couple years is that we take a breather to work through the substantive implementation of the AIA. I hope that the scope of patent-eligible subject matter is going to settle, but I'm just going to second Barbara there. I'm not optimistic that this is an

area of the law that the courts can develop and that's amenable to, like, good judicial development.

On the PTAB side, a wish for harmonization of legal standards with those that apply in district court. I think adjudicators of issued patents should use the same legal standards. A patent should mean the same thing to different adjudicators, and it should be upheld or struck down on the same quantum of proof. I think that's only good policy. I would hope that we can take steps towards that. But overall, I think I'm hoping for a breather and for the system to recalibrate and kind of calm down. We don't need more patent reform too soon.

I think we need incremental change, and I think we're taking good steps. I think this current Administration and Patent Office leadership is working in the right direction, and we were encouraged to see the level of public support that Director Iancu and Patent Office leadership seems to be gaining and gathering for their current initiatives. We hope this will continue.

MR. DUBIANSKY: Thank you.

Tahir?

MR. AMIN: Just to piggyback on what Matt was saying, I think we need more equality coming from

the USPTO, and I think one of the ways to do that -- my wish at least -- is that we really start looking at the obviousness standard. I think post-KSR, despite that providing a little bit more clarity, the courts have never really applied it in any real way, and I think we barely have an obviousness standard. It's just marginally -- slightly more than a novelty standard, and I think more patents are being granted just on the basis of utility and meeting an unmet need than actually having real inventiveness.

So I would like to see a stronger inventiveness standard that would actually eliminate many of these arguments that are going on in terms of litigation and fluctuation and investments and so on. I think there isn't actually enough patent reform. I think we need more. It hasn't gone fast enough, and that's why we're in the predicament we're in where we're having more monopolies today than we've ever had since the Gilded Age. And that is a fundamental problem for society, and it's also a problem for innovation as well.

MR. DUBIANSKY: Thank you.

Patrick.

MR. KILBRIDE: Yeah, thanks. I guess topping my wish list I would have to look externally

to the role that the U.S. plays in the global economy. And I think it's incredibly important that the U.S. really step out and lead the creation of a global system that empowers innovators and creators everywhere to develop their latent capacity.

You know, 25 years after the WTO TRIPS agreement was created, we still see vastly different standards of intellectual property treatment around the world. Only a handful of countries protect intellectual property at the standard that the U.S., the U.K., and a handful of other countries do. And those countries are disadvantaging themselves both in terms of their innovative output and their access to the innovative product services and technology of the U.S. and others. It's absolutely critical that the U.S. speak with a clear voice, that it be a champion for certainty, and that we not send mixed signals.

So I'd really like to see everyone rally around the system that has gotten us to where we are at today. We're better off than at any time in history across all sorts of different metrics, and we can't forget how we got here. Thank you.

MR. DUBIANSKY: Thank you.

Great. Well, thank you, and I'd like to thank our panelists. We're now going to take a short

break and resume at 3:15.

(Applause.)

(End of Panel 3.)

PANEL 4: ECONOMIC PERSPECTIVES ON INNOVATION AND IP POLICY

MR. EZRIELEV: Good afternoon. Welcome to the Economic Perspectives on Innovation and IP policy Panel. This is the last panel of the day. I am Jay Ezrielev from the FTC. I'm an economic advisor to Chairman Simons.

MS. CARLSON: Hello, I'm Julie Carlson. I'm an economist in our Bureau of Economics here at the FTC.

MR. EZRIELEV: We'll be your moderators for this panel. And before we begin, we want to give the standard disclaimer. To the extent that we as moderators express any views, those views are our own and not that of the Commission.

We'd like to welcome people who are just tuning in to this panel or just coming in to watch this panel. And a special thank you to those of you who have stuck around all day and watched a full day of hearings. Your reward for sticking around is hearing six economists have a very thoughtful discussion on the economics of innovation.

We have a very distinguished panel of economists today to discuss the economics of innovation and IP. I'm going to give very brief

introductions. Rich Gilbert is Emeritus Professor of Economics at the University of Berkeley and my former colleague at Compass Lexecon.

Jim Bessen is Executive Director of the Technology and Policy Research Initiative and a lecturer at Boston University School of Law.

Michael Frakes is Professor of Law and Economics at Duke University School of Law.

And Anne Layne-Farrar is Vice President at Charles River Associates and also my former colleague at Compass Lexecon.

So we're going to have a discussion on lots of topics today, but we will kick off the discussion where each panelist will give an opening five-minute presentation, and after that we'll have a panel discussion.

Our colleagues from the FTC will be coming around and collecting audience questions, so please write down your best questions, and we hope to have time to cover these questions at the end of the panel.

So we're going to kick things off with Rich Gilbert who will be speaking about antitrust and innovation.

MR. GILBERT: Well, thanks, Jay. I'm happy to be able to address these hearings, and also kudos

to the Commission for continuing to have hearings and collect information and input that's relevant to your enforcement mission.

So, now, our topic is innovation and intellectual property today. It goes well with the 21st Century theme of the conference. And a common perception is that antitrust enforcement is up to the task of promoting competition in innovative industries. That was the conclusion, for example, of the Antitrust Modernization Commission. Most people -- when I ask most people, you know, are the antitrust laws adequate for addressing innovation issues, does anything need to be changed, most people say, no, they're fine, just leave them as is.

And it's true that the antitrust laws are very flexible. The Sherman Act doesn't say much about either Section 1 or Section 2 standards. The Clayton Act doesn't say a whole lot more. But I think the view that nothing really needs to change is actually not correct. And there are many obstacles to effective antitrust enforcement for innovation.

First of all is the obvious point that antitrust policy has evolved over the past hundred years with a focus on short-term consumer welfare. In many respects, this is sort of a victory for

economists who have been saying, you know, it's all about consumer welfare and allocative efficiency. But at the same time, a focus on allocative efficiency, which is really price-cost margins, is not necessarily the right objective if the purpose is to provide incentives for dynamic competition.

And it's also curious, anyone who has looked at the history of the antitrust laws, there's nothing about consumer welfare and allocative efficiency in the history of the Sherman Act. If anything, the Sherman Act was about promoting the ability of lots of firms to compete in a context where there were large trusts, not terribly unlike the situation we face today.

Now, there are other challenges, somewhat technical, that are nonetheless very important. One is the strong emphasis in antitrust enforcement on market definition. And, again, market definition was not written into the Sherman Act, but it quickly got included in there. Many economists -- I would say almost all economists these days, if I can speak for the profession -- and even many lawyers have been pushing back against market definition as a necessary predicate for antitrust enforcement.

Even the latest version of the Horizontal

Merger Guidelines kind of subtly takes this view by inverting the positions of competitive analysis and market definition. It used to be market definition first, followed by competitive analysis, and now it's switched. And that's a real problem for innovation. Why, first of all, with a few narrow exceptions of contract research and development, R&D is not traded in a market.

So if you want to talk, even though the IP guidelines talk about a research and development market, we know it's not a market in the usual sense of trade. And that's a problem if you follow the precedent in the law.

The other problem is that innovation effects, whether you're talking about actually promoting R&D or whether you're talking about promoting future competition in product markets, it's just very hard to define these markets, particularly in a world where there's a high standard for proof. Increasingly in merger cases, we want to see things like difference-in-difference analysis and really getting down to very precise effects.

Well, those are hard to do when you're talking about markets that may not even exist yet. Or if they do exist, you don't know what the

competition is going to be a few years from now. And, you know, that doesn't mean that these things aren't important. You know, another problem is that you might have a situation where the effects are to advance or retard, delay competition. And that's a big issue as well.

Well, I'm getting the hook here on having to finish up. I think we'll be able to talk about a lot of these other issues. But my own point, and I really want to get to divestitures and innovation remedies at some point, but my own point is that we've been just a little bit too optimistic about antitrust and innovation and our ability to use antitrust policy to stop innovation concerns.

MR. EZRIELEV: Thank you, Rich.

Next we have Jim Bessen.

MR. BESSEN: Thanks for having me. As many of you I assume know, industry concentration has been rising in the U.S. This is a graph for the manufacturing sector of the top -- the market share of the top four firms since the 1980s. It's gone up about 5 percent. And similar graphs could be seen in every major sector of the economy -- services, wholesale, retail.

Many people look at a graph like this and

assume it means that competition is declining and that this is a real challenge for antitrust policy. I'm going to suggest that it's actually something different. It's not about competition declining, but it poses a major challenge for IP policy. I have an analysis, and I can go into it in detail later if there's interest, but what's actually causing most of the increase in U.S. industries outside of big tech are major investments in proprietary information technology.

Think about Walmart's investments in its logistics and information systems that allow it to be highly efficient and as a result have allowed it to grow much faster than its rivals and come to dominate the general merchandise market. We're seeing similar investments in all areas of the economy by top firms to the tune of $250 billion a year. That's almost as much as firms invest in tangible capital, net of depreciation, so it's a very large investment being made, and it's paying off in terms of increased productivity.

Well, that sounds like good news. Why would that be a problem? So the problem is that the productivity is growing for the top firms in the economy but not for everybody else. So this graph

shows -- the red line shows the productivity of the top 50 public firms, and it's continued to go up at a good rate after 2000, much faster than the productivity of all of the rest of the firms.

And you have to ask, well, what's going on there. In a sense, there is a diffusion gap that the new technologies are being developed, but in contrast to the way things worked in the past, they are spreading to the rest of the economy more slowly. The rest of the firms are being left behind. And this has significant economic consequences in terms of things like average productivity.

This is true not just in the U.S. but in the OECD nations generally. The OECD has a report showing a productivity graph growing across developed nations. So it's not just an issue of U.S. antitrust policy that's causing these changes.

So why is this significant? And the significance has to do with the importance of sequential innovation. We tend to focus when we think about innovation about the big inventions, the first inventions. So the power loom, for instance, was a great invention which powered the industrial revolution. From the hand loom to the first power loom in the U.S., it increased the output per worker

over two times. That was tremendously important and, like I said, it helped spur the industrial revolution.

But that was really only a small part of the productivity growth that came related to the power loom. So if you look over a hundred-year period that initial doubling is really very small compared to what happened in the century that followed. There was this sequential innovation, and it consisted of two main things. One was the development of a skilled labor force who knew how to use these technologies such as the power loom and in a more and more efficient way. And many of those people also became tinkerers and relating to the second cause, which was the series of incremental improvements, incremental inventions, which are sequential in innovations, which allowed productivity to continue to improve.

So when we have a situation where technologies are not diffusing or not spreading, we are cutting short this pattern of important sequential innovation. So what does this say about policy? In general, IP policy needs to balance the incentives that we provide for providing the initial innovations with the incentives we provide for diffusing those inventions and sharing them and the associated knowledge.

And what that growing productivity gaps suggest is that we have a less optimal balance today than we had in the year 2000 because things seemed not to be spreading as rapidly. Policy is not the only factor. I should emphasize, a lot of this may be simply the technology. We're dealing with new sorts of information technologies. These are complex systems. They may be more difficult to spread in a way. But there are -- there is a body of evidence suggesting there are policy areas that do affect the rate of diffusion. In patents, we're talking largely here in information technology, so software patents. We have some evidence that software patents reduce the rate of sequential innovation from Galasso and Schankerman.

We have several studies now that have looked at the impact of patent assertion entities, or popularly patent trolls, and their litigation and that these reduce R&D, particularly for smaller firms.

Another policy is employee noncompete agreements. We've seen a tremendous spread of these. We have good evidence now that they reduce labor mobility, they reduce entrepreneurship. Another area closely related is the inevitable disclosure doctrine and trade secret law. And, again, we have some good

economic studies which are now showing that these reduce labor mobility and reduce innovation.

So these are some policy areas where policy in some cases seems to be going against diffusion, making it more difficult or slowing the spread of new ideas. These are some things we need to think about in the bigger picture of innovation. Thank you.

MR. EZRIELEV: Thank you, Jim.

Next up we have Michael Frakes.

MR. FRAKES: Thank you for having me here today. I'm going to speak in somewhat broad terms regarding what we've learned from the economics literature on the fundamental question of whether patent systems incentivize innovation. To begin, as many of us are aware, you know, we may be concerned that new ideas may be under-incentivized, given that ideas take on characteristics of public goods.

One of the chief promises of patent system is that by allowing innovators to earn rents through exclusion rights, people and firms may be willing to innovate and overcome free-riding concerns, but have we actually seen this promise met in practice? At the outset, I should say any attempt to empirically approach this question with confidence encounters notable obstacles, arguably the most challenging of

which is the construction of the necessary counterfactual that is to be able to effectively compare the extent and type of innovation we would see in a system without patent rights if we could also observe that same system with such rights.

One line of research produced by the Economics Academy that I perhaps turn to most when thinking about this question is that from Professor Petra Moser. For these purposes, Petra looked at sort of mid/late 19th Century Northern Europe, a time where this region was characterized by notable heterogeneity across countries and the strength and existence of their patent systems, but where this heterogeneity is what economists would call plausibly exogenous, as it was perhaps driven by various political traditions rather than by characteristics of the innovation environment. This provided Professor Moser with the means to sort of make comparisons across different IP regimes. And in a very clever fashion, she acquired data on innovative activity by turning to records of innovation exhibits at two of the major world's fairs at the time.

So the following is just a brief summary of her findings from this really interesting work. First, countries without patent protection at that

time still had very high rates of innovative activity. Second, across all innovations at the fairs, only a small portion were reported to be patented. That being said, there was a relationship between whether an innovation was patented and whether the innovation won a prize based on its level of usefulness and quality. So while patent systems may not have been major drivers of innovation levels, patents may have led to higher quality inventions.

But it is her next set of findings that I actually find most interesting from her work. In countries without patents, we see a greater focus on innovation and industries where secrecy operates as an effective alternative to patents, mainly in industries with innovations that are harder to reverse engineer, or as in countries with patent protection, we saw a greater amount of innovative activity in industries where secrecy was arguably less effective. So I'd say that the bottom line from this analysis is that patents do seem to play a role at least in shaping the direction of technological growth.

Now, I perhaps have two concerns with this discussion thus far. You know, first we're talking about innovative activity from a very long time ago. And as Jim mentioned, you know, we're also speaking --

to get to the idea of sequential innovation -- so far I've just been speaking about innovation in rather broad terms, perhaps, you know, combining both notions of isolated, stand-alone innovation and follow-on cumulative innovation, when the reality is when we sort of look at innovative activity today perhaps much of it is truly cumulative in nature in the sense that existing technologies may be inputs into newer technologies, which raises a more specific question for our literature, you know, what effect do patents have on follow-on innovation.

And this question has been the subject of much theoretical literature, which I won't discuss in the interest of time, but from what I gather from this theoretical work, there really is a lot of ambiguity surrounding this question, so I think at the end of the day, it really is, you know, quite an empirical question.

And so what have we learned from the empirical literature? Well, let me just turn briefly to two very nicely done recent studies, one of which Jim had just alluded to. But first is a forthcoming study by Heidi Williams and Bhaven Sampat that look at the effect of whether a patent is granted on human genes on follow-on scientific research and follow-on

commercial research investments.

Williams and Sampat are also very mindful of the need I raised above to sort of develop a convincing counterfactual environment. And the quasi-experimental framework that they take is really quite clever. They rely on what is effectively random assignment of patent application to examiners, combined with heterogeneity and the leniency of examiners to really produce what is in effect, you know, randomization and whether applications are granted or not.

So taking this approach, Professors Williams and Sampat essentially find really no meaningful effect of patents on follow-on innovation, at least in this gene context. And that raises the question about what about other contexts. And, here, I think it's perhaps helpful to turn to recent research by Professors Alberto Galasso and Mark Schankerman, which Jim had just mentioned.

And, in fact, they’re actually taking a very similar methodological approach to that taken by Williams and Sampat, but instead they're looking at what happens when courts invalidate patents, creating the necessary counterfactual by drawing on random assignment of judges and judge heterogeneity and

patent invalidation rates.

Their findings are interesting but need a little bit more explanation. They find that patents impede follow-on innovation but only in very specific scenarios. For instance, they find that patent invalidations have a significant impact on cumulative innovation in the fields of computers and communications, electronics, and medical instruments, but they find no effect for drugs, chemical, or mechanical technologies.

Additionally, they show that their entire findings are actually driven by one specific scenario, the amount of innovative activity by small innovators increases when patents by larger firms are invalidated. So the bottom line is, is there perhaps some evidence that patents may, in fact, impede follow-on innovation but only in select circumstances. I'm going to stop there for now.

MR. EZRIELEV: Thank you, Michael.

Next up we have Anne Layne-Farrar.

MS. LAYNE-FARRAR: Thank you. I'm going to switch gears a little bit and talk about a very particular kind of player in the marketplace, and that is a form of PAE, patent assertion entity. There's one aspect of a PAE that's referred to as a privateer

or, less pejoratively, a hybrid PAE. And these are patent assertion entities that maintain a financial back end with the patent assigner. These were not covered in the FTC's case study that was released in 2016. It's a narrower subset of the PAEs.

And the claim in the theoretical literature is that these entities impose an innovation tax on whatever industry they're operating in. The arguments are similar to those made for PAEs in general but with some specifics added. For example, that in addition to acquiring and asserting low-quality patents for nuisance value settlements, they also target the practicing entity from whom they received the patent as a means of raising rivals' cost, which is an antitrust issue.

Until now, however, there hasn't been any empirical work. It's all been legal and theoretical. My coauthors and I have the first round of our research on quantitatively testing some of these implications coming out in the next few months in The Journal of Empirical Legal Studies.

So very briefly, just a thumbnail sketch of what we found in this first round of research, and that is at least from the quality -- patent quality perspective of the theory, we are not finding support

for the claim that these entities are acquiring low-quality patents to assert for nuisance value. Instead, an objective patent measures, patent quality measures that are accepted in the economics literature, we find that the privateers are acquiring patents that look like other litigated patents, in some technology areas, even higher quality than other litigated patents or other PAE-held patents.

Certainly, the odds of a patent being held by a privateer increase with both the scope of the patent and certain quality measures. And not surprisingly, not differentiating this theory or any other theory, the odds of a patent being litigated are higher when they're in the hands of a privateer. That's consistent both with this antitrust tax on innovation theory, as well as other theories such as these are just profit-maximizing entities who create an intermediary or liquidity within the marketplace so it's not a differentiating factor.

And, lastly, we've just begun to look at litigation timing, and we found thus far that privateers -- patents held by a privateer experience their first litigation event later than patents held by others. Now, that could either be because the privateer is holding on to a patent longer as a means

of raising the damages over time, which would be consistent with an innovation tax theory, or it could be simply that the reassignment process takes a while to work out, and that once in the hands of the hybrid PAE, assertion is relatively quick after that. That's something we're investigating now.

But thus far, at least one aspect of the innovation tax theory is not confirmed with an empirical look, and that is the quality piece. Thank you.

MR. EZRIELEV: Thank you, Anne.

So next we'll kick off the panel discussion, and the first question is for Rich. Rich, you spoke about the need to look at incentives to innovate in antitrust analysis. But here the big challenge is how do you identify the incentives to innovate in the context of antitrust in reviewing mergers. Is there a reliable set of tools that policymakers could use to identify mergers that may impede innovation or alternatively incentivize innovation? And, if not, what are we to do?

MR. GILBERT: Well, in terms of, you know, what signals do we look for, you can look for basically three classes of evidence. There's the corporate documents. You can look at theoretical

analysis. You can look at empirical analysis. An interesting issue is that there's been a great deal of work that's been done on the economics of competition and innovation, both on the empirical side and on the theoretical side.

Some people say it's the second most tested relationship after the price-structure relationship in economics. But there's not been a whole lot of work that's been done that is relevant to the types of enforcement levers that the antitrust agencies have. So in other words, competition and innovation is different from mergers and innovation, certainly different from what you might encounter in a Section 2 case. And so you need to tailor the evidence to what solutions that you have or the enforcement instruments that you have.

Now, there is another way of thinking about a whole class of innovation cases, which is potential competition theory. There are many cases and many traditional innovation cases, none of which, by the way, have ever been tested in court, which is an important caveat. There are many potential competition cases. The problem is that the agency's record on potential competition cases has not been very good, but I would argue that innovation cases are

different, and if they did go to court, assuming that the courts are not stuck in their old ways, which is a big assumption, these cases should succeed.

I'll give you an example. The FTC's challenge of the Thoratech-HeartWare merger where I was involved as a consultant to the FTC was, in my opinion, a very successful challenge. Now, I think you gave me the opening to also talk about solutions. Many innovation cases are settled with remedies, and particularly merger cases. And even though the FTC and other enforcement agencies have conducted a lot of retrospective analyses of merger remedies, they've been almost entirely focused on price effects. There's been very little sort of historical studies of innovation, the success of innovation remedies.

I've done some work on this question. And the preliminary results are not at all encouraging. There have been a lot of remedies in merger cases that were supposed to address innovation concerns that turned out to be really unsuccessful. The assets went to someone who then either did not pursue a desire to R&D at all or the company went bankrupt and was bought by another company that also did not pursue the desired R&D direction.

This is a big problem, and what does it mean

for merger policy? Well, it doesn't mean -- one lesson might be to be more aggressive and not accept these consent decrees. That actually doesn't work because if you adopt a more aggressive stance in merger enforcement, what people are going to do if they have overlapping activities that they can divorce from the deal and are not critical, essential for the deal, they'll fix the transaction first. And they'll do it with effectively a spinoff that has no reason why it would be more effective as an enforcement remedy than what the agency would have done. So it's really quite a dilemma.

I do think that one area that is promising and is actually related to the comments of other people on the panel is a number of compulsory licensing obligations have been pursued, and those in my analysis seem to have generally positive effects as a remedy.

MR. EZRIELEV: Thank you.

Anybody have a response, panel?

Okay. So next question for Anne. So Rich spoke about the focus or the obsession with market definition in IP. The question, of course, is with market definition and in IP cases, merger cases that focus on innovation, is there even an implication of

Section 7 of the Clayton Act? If firms don't compete, can antitrust enforcement agencies do anything about incentives to innovate?

And in terms of competition, competition may happen 10 years from now, 20 years from now. You're investing in something that where alternative technologies may or may not compete. So how do you apply this analysis in merger cases if you don't know if Section 7 is even applicable?

MS. LAYNE-FARRAR: Well, I think that's one of the risks that you run in trying to regulate or oversee innovation, that whenever you try to do so, it involves some manner of industrial policy. So you said what laws apply if the firms don't compete. Well, I think you have to think about your definition of competing. What exactly do you mean? Do you mean do they not compete in downstream product markets? Do you mean that they don't have competing strands of R&D, that they aren't at least attempting to reach the same customers, even if they're with very different approaches or different products and services?

And I would say the answer to those questions inform, then, what policy can and cannot do, but nobody's going to have a crystal ball on how things are going to play out over time. And when it

comes to potential competition, I think it's a very risky proposition for any agency to try and step in to prevent activities that aren't even clear that they're going to come to pass.

MR. EZRIELEV: Okay, Rich.

MR. GILBERT: You know, William Baxter once wrote that competition and mergers in particular can affect competition in today's markets, tomorrow's markets or in research and development to get from today to tomorrow. You know, all of these three, they're all three possible effects. Antitrust policy has been overwhelmingly focused on today's markets, but the fact is there can be significant consequences in the other two, at least as important as the consequences in today's markets. But we need to be able to take some more risks in antitrust enforcement.

Right now, I would characterize antitrust enforcement today as saying you have to be absolutely right because we are -- we don't want to have any -- make mistakes about overenforcement of the antitrust laws. Well, what about underenforcement about the antitrust laws? That's a risk, too.

Now, I'm not saying that we should abandon standards of proof and just assume that every

transaction raises a concern. That, of course, would be absurd. And particularly when you go farther and farther out into transactions that are many years off, which has happened with, for example, and the European Commission has been doing some of these interventions, it gets very uncertain, and then you really are in the crystal ball world.

But we do need to take a few more risks, and I'll give you an example. There was a not too distant case, the Nielsen-Arbitron transaction, which was challenged on effects in a new market and, you know, whether or not that was a good transaction or not, a good enforcement action, it was a bit complicated.

I don't want to get into the details. But what I do want to say is Commissioner Wright wrote an interesting dissent in that transaction about the difficulties of challenging conduct or a merger that was going to have future effects. And I would agree with everything that Commissioner Wright wrote in that dissent. But if you take it literally, you can't block any merger that would have a future effect because there's always going to be uncertainties. And that would not be good policy in my opinion.

MS. CARLSON: Great, thank you.

Anyone else on that topic before we shift gears a little bit?

No, okay. I'm going to pick on Anne a little bit more since she raised the issue of PAEs. In our 2016 report, one of our findings was that litigation PAEs engage in conduct that's consistent with nuisance litigation. And so I wonder if you could speak to what evidence we might have that nuisance litigation by PAEs -- what effect that might have on innovation and follow-on innovation in particular.

MS. LAYNE-FARRAR: So I don't think there's been any empirical work on this yet, aside from the case study, the FTC case study you're mentioning. And we were discussing this over lunch actually. I am frankly a little skeptical. I understand that the nuisance value, the costs and the time and the distraction involved in litigation are a price that you have to pay for any IPR, any patent. Because it's valueless unless you can enforce it or have a threat of enforcement.

So there's going to be some -- in any but-for world -- some baseline level of transaction costs related to getting sued, defending yourself, having to sue, having to pay for your arguments in court. The

question I have in terms of the nuisance litigation and the nuisance PAEs is how prevalent they are within the economy. I know we can all probably come up with anecdotal evidence of an example here, an example there, but I think that's true for almost any kind of antitrust or policy issue that you can think of that you're going to find one or two.

And the question is, are those one or two representative of a large group or are they just exceptions? And if we're going to pursue policy that targets particular business models or makes it harder to litigate, those have -- those kinds of policies have far-reaching repercussions across the ecosystem and affect people's incentives even in different business models.

So I would want to see some solid empirical evidence that this is a widespread or at least a common problem that the nuisance lawsuits are dragging down small firms, preventing R&D investments or preventing the ability to obtain financing, for example, in a fairly regular basis before I saw any policy simply because I think the unforeseeing circumstances could be quite detrimental, especially in areas of innovation where we know that innovation is -- incentives are created from all different kinds

of areas of the economy. And you just don't know how you're going to muck things up by clamping down here when maybe you kill innovation over here.

MS. CARLSON: Any others? Go ahead, Jim.

MR. BESSEN: So there is empirical evidence about the effect of PAE litigation, and it's the specific question of whether there's a detrimental effect from nuisance PAE litigation. It's hard because it's hard to define which any particular lawsuit is a nuisance case. So we should put it, I think, in the context of the broader literature. There are several papers now that have used quasi-experimental methods. Mezzanotti has a paper based on the eBay decision, where he finds a reduction in R&D. Mezzanotti and Simcoe have another paper on the eBay decision and find no negative effects from the eBay decision.

Conan, et al., have a paper where they look -- they compare companies that lost to a PAE or settled with a PA, compared to companies that won after they've been -- had a PAE demand, finding a loss in R&D. So there do seem to be some evidence, and I don't think it's conclusive or overwhelming, but there's some very significant evidence that PAE litigation has negative effects on innovation, at

least R&D spending and patenting, particularly by small firms.

MS. LAYNE-FARRAR: If I could follow up a little bit on that. Those papers are -- they are very good papers, they're solid empirical papers, but they are also very clear about what their limitations are and what assumptions they're making. And, so, for example, the Mezzanotti paper looks specifically at the eBay ruling and the removal of an automatic injunction. So that's a shift from a very extreme, strong IPR system to a more moderate one, and so I think you have to interpret those results in the context of the research that he was doing.

It is what is the impact of removing automatic injunctions. It's not necessarily that all PAE litigation is bad. And likewise with the other PAE studies. I think, you know, they're very careful in circumscribing what exactly the question they're asking is. And so you need to look at the assumptions, you need to look at the model they're running, rather than just lumping them all together and saying, yeah, there's this body of evidence.

MR. BESSEN: Mezzanotti went beyond that. He compared specifically companies that were prone to PAE litigation and not. And he found that PAE

litigation was significantly affected by the eBay decision. So he has an instrument.

MS. LAYNE-FARRAR: Yeah, and I agree with it, but it's all about the injunction question.

MR. GILBERT: So this is not really on the nuisance issue, but I can't resist saying in the context of the earlier session which made some rather strong claims about how the world would fall apart if we don't have strong intellectual property rights. The Mezzanotti and Simcoe paper did look at, as Anne said, about injunctions and removing automatic injunctions.

And that's a pretty strong change in intellectual property rights, a weakening of intellectual property rights. And, well, it's hard to get conclusive empirical results because you don't really have any natural experiments. A lot of things are going on. But they couldn't find any evidence of any reduction in innovation, productivity, R&D effort following the eBay decision.

MS. LAYNE-FARRAR: If I could just add one more quick thing. I think there's not been enough, probably because it's too difficult, empirical work examining what happens when you start from a Western, well-developed country with a strong system of IPR and

you reduce those rights. The Mezzanotti paper looks at that -- at one aspect of that because eBay gave us this natural experiment: What happens when you go from automatic injunction to having to fulfill the four eBay factors?

But the trickier question is what if you take a system like the U.S. and you start systematically weakening patent rights. And we don't know the answer to that question just because it's not been done and we don't have the empirical data for it. And empirical studies in other parts of the world look at the other side of the question: What happens when you start really low and you add?

And so taken as a whole over a span of multiple decades, the empirical literature, I think, suggests that there's sort of this inverted U relationship between property rights and innovation, that if you have too little, improving them strengthening them, increases your innovation. Once you get past that sweet spot, you're on the downward slope, automatic injunctions were probably on the right side of that curve, and so moving back took us back up towards the peak. But there's not very much empirical work on that other side of the question as opposed to the one on the left.

MR. BESSEN: And the work that is done, I mean, you have to be really careful about the fact that everything is simultaneously determined. I always cringe when someone says, you know, we have strong intellectual property rights and we have an innovative economy and, you know, you look at these poor developing countries, they have weak intellectual property rights, and they have -- you know, they don't have innovation like we do.

Well, now, if you're a country that's mostly using innovations and not really entrepreneurial to begin with, you probably don't want a strong intellectual property right system. It makes more sense to be biased towards users rather than towards the IP creators. And that doesn't mean that if you strengthen intellectual property rights all of a sudden these countries would just have millions of flowers blooming. There are a lot of determinants.

MS. CARLSON: Great. Thank you.

MR. EZRIELEV: On that note, very interesting exchange, we should move on to the next topic.

MS. CARLSON: Yeah. I was going to do the patent quality.

MR. EZRIELEV: Okay.

MS. CARLSON: So we had a pretty extensive discussion this morning about patent quality from a legal perspective, or I should say from the perspective of an economist who was very much in the legal weeds about patent quality, but one of the themes that I heard this morning was about devoting more resources to patent examiners to improve examination.

And what struck me about that conversation is, you know, there's two ways that you can deal with patent quality, right? You could deal with it ex ante by devoting more resources to examiners, or you can deal with it ex post by weeding out the poor-quality patents.

So, I don't know, Jim, if you can maybe talk about that balance and is sort of a zero error rate ex ante really the most efficient way to think about this or, you know, whatever thoughts you might have on that.

MR. BESSEN: Okay, hmm. So it's more complicated than that I think. It's not -- we can talk about patent quality about certain things, like novelty, 102. And the question is did the examiner do a good enough search? Was there something out there that would invalidate that patent? And in that area,

more resources or perhaps more technically astute resources or crowdsourcing, I mean, there's this new movement where the MIT media lab and some other sources have gotten together and are creating a prior art database for software patents.

You know, those are encouraging things. But a lot of the problems with patent quality aren't so simple. They have to do with 103, they have to -- which is -- or with issues I think of vagueness of what the definitions are, of what the patent actually is, which, by the way, relates to even simple novelty searches so that if we're not clear what the boundaries are, we can't be very clear on what the relevant prior art is.

So I always find -- this is sort of the Lemley discussion of rational ignorance. Do we want to put the resources up front or later? And I find it difficult because to a great degree, we need to change how we're doing things in a more fundamental way, I think, to really solve some of the patent quality problems.

Now, that said, we are -- when we get into the world where we see a whole business model based on -- well, arguably based on poor-quality or at least poorly defined patents, I think that may be a better

description, patents which have vague boundaries or unclear boundaries, that's probably a sign that we need to put more resources into finding things early. But, as I said, it's not just a matter of resources. I think it may be much more about what we're doing rather than how much we're doing it.

MS. CARLSON: Any others?

MR. FRAKES: Yeah, I'll jump in on this because I've been thinking about it quite a bit lately, and it raises a classic question that we confront, and I'll put my lawyer hat on, and from the law professor perspective we think about this all the time. If we're going to, you know, regulate, regulate in a loose sense, so do we want to do it ex ante, do we want to do it ex post, sort of you know, more agency approach, do we want to do -- sort of rely more on, you know, the courts after the fact?

That's not a unique question to the patent system. We confront it in the patent system. And I think the starting point is, you know, if we think that sort of -- you know, the patent system is relevant for innovation incentives, then, you know, we have these patentability standards that are meant to sort of reflect the balances that we sort of want to get right.

And so -- and hopefully, the patentability standards are set in a way to sort of properly reflect these balances, and then the question is, well, who's going to apply the patentability standards? So this rational ignorance idea is essentially, you know, maybe it's just more cost-effective for society to sort of reserve more of those efforts for the courts and less up front.

I think it's ultimately a cost-benefit exercise. And Professor Lemley nicely got this conversation started in a Law Review article that he wrote in 2001, and I think it was a great discussion. And I think it's certainly time to revisit the discussion because there was really a lot that he was kind of assuming the answer on many things and actually said, you know, now, we have sort of better data and better methods, we could actually try to estimate some of the parameters that he was simply assuming.

And so Professor Wasserman, who was here this morning in the first panel, and I, we have a new paper where essentially we're revisiting this cost-benefit exercise. And so the analysis, you know, it's rich. We have to sort of think, well, if it's sort of a question of do we -- it almost sort of starts with

the question, do we invest more in resources at the Patent Office right now to allow them to sort of do a better job in applying the patentability standards. And those resources are going to cost money so, like, what are the costs of it?

I mean, that's -- you know, our simulation analysis, we're really focusing on giving examiners more time because without getting into the details, we have an empirical sort of framework to be able to sort of estimate what's the effect of time that examiners are allocated on some of the outcomes that are relevant for this cost-benefit analysis.

What was nice about the conversation this morning is not just thinking about resources in terms of time, but also on resources in terms of technologies available to do prior art searching and AI and related as well, so that could be part of it as well, but whether we invest in more time, and that would be more personnel expenses, these are the types of costs that we're really going to have in the equation. You know, what are the savings that could come from sort of giving examiners more time?

So and the idea is that if you've got this sort of tradeoff between -- you know, if we do more of a good job weeding up front at the Patent Office,

well, one of the savings could be, well, we have less need for litigation later on to the extent that litigation would otherwise be filling this residual role of weeding out legally invalid patents.

And so then it raises the question, well, what are the litigation savings, and without getting into the weeds, we have our empirical framework to be able to put some estimates now into that. And then there's other savings as well. To the extent that if we think we take the work by Galasso and Schankerman, we think that there might be some consequences of if there are legally invalid patents that are issued and might have effects on follow-on innovation, then the period of time between otherwise when the Patent Office would have knocked out this invalid patent before the courts getting around to it, there could be some social welfare costs there imposed in the meantime. Those are much harder to quantify, so we left them kind of unquantifiable in our analysis.

But even with what ultimately we could quantify on the cost side and what we could quantify on the savings side, we actually sort of -- we think, could come out suggesting that it would be beneficial to invest more on the margin in the Patent Office as opposed to sort of relying ex post on litigation, so

we kind of come out counter to what Professor Lemley did. And much of what we can't quantify we think only sort of reinforces that. I'll stop there.

MR. BESSEN: Yeah, I should add, I mean, since 2001, litigation costs have soared. So many of the things that he was considering then are different now.

MS. LAYNE-FARRAR: Well, that's why the cost-benefit framework is such a nice one, right, because the costs are going to change over time, the benefits are going to change over time, and you can decide, I'm going to reassess this every few years.

But just one other point on this particular question, I think there's a third avenue that since we've mentioned them three times today let's make it four, Galasso and Schankerman, they conclude on the basis of their empirical work that because of these areas of blockage that the freeing up of R&E only after a patent is invalidated only emerges in very specific circumstances, they conclude that it's not a problem with the patent, per se, but that it is contracting, that there are blockages between the ability of small firms to negotiate properly with the large firms who are holding these rights to come to societally beneficial outcomes.

So, you know, let's not forget that that's a really valid avenue that should be explored, and is there any role for policy in making those kinds of transactions easier? Clearly, they're happening in lots of parts of the economy, and it's only in these narrow areas that Galasso and Schankerman find the problems.

MR. FRAKES: Right, and I definitely agree with that, and so you would take, like, what we did with our analysis, take as given sort of what's there right now, but not to say that's not in the tool set of maybe also sort of trying to solve some of the contracting problems. I definitely completely agree.

MR. EZRIELEV: Okay.

MR. BESSEN: Also, I mean, people have said narrow region a couple of times here, and we're talking about computers, telecommunications, software, which is --

MS. LAYNE-FRAKES: But from large firm to small firms, it's not all of ICT.

MR. BESSEN: Right, right.

MR. FRAKES: It's narrow, but they actually still had an average effect, as well. So there's still the average effect, but it's narrower when they broke it down, so -- but it's a fair point.

MR. EZRIELEV: Okay, we're going to shift gears once again. The next question is for Jim. You spoke about the importance of technology diffusion and presented some very compelling evidence. So the question is, is there a tradeoff between technology diffusion and retaining sufficient incentives for original innovation?

MR. BESSEN: That's one of the basic -- did you have more?

MR. EZRIELEV: Yeah.

(Laughter.)

MR. EZRIELEV: So and truly every invention is a follow-on innovation. So are we on the right side of the balance in the straight-off? And another question is whether we should have different policies for sequential innovation. That’s a lot of question, but...

MR. BESSEN: I was better off interrupting you.

(Laughter.)

MR. BESSEN: So, yeah, so one of the key theoretical things is yes, there's very much a tradeoff that you can -- in many cases, you know, you can give a greater right to an initial inventor who can then license it to somebody downstream, who -- and

can -- the initial inventor can extract some rents from the downstream inventor and you want to play with that so both have optimal incentives.

And you're also right, this is complex because basically every invention, even the power loom was an improvement of earlier things, people had been playing with it for over a century. And knowledge tends to be cumulative inherently in so many technical fields that there is this balance we have to achieve. And I think this has been a very difficult area to get at. I think one of the insights I have here, which is I think I can say with some credibility that since the year 2000, when we see these gaps, what appear to be gaps in diffusion of technology, we're seeing a change for the worse, because what we're seeing, on the one hand, the top firms are innovating as fast or actually faster than they were prior to 2000, so there's no shortage of innovation incentives for them. They have the incentives and they are innovating and their productivity is going up.

What we're seeing that's worse is everybody else is so much behind. Now, how we solve that and what exactly is causing it, and what the choke points are and what any policy would look like, those are complicated questions I can't answer, but I think I

can say enough to say that things have gotten worse in the last 15 years or so.

MR. EZRIELEV: Rich?

MR. GILBERT: So in terms of what can be done in this area, what should be done, I want to look to history a little bit. There's a very nice paper by Will Tom who spent many years at the Federal Trade Commission, also at the Antitrust Division, and the paper is on the 1975 Xerox consent degree negotiated by the Federal Trade Commission.

And his premise was a very interesting one, which was that this was a consent decree that had very little legal basis, that is, you could criticize it and say what was the basis for this intervention. On the other hand, it seemed spectacularly successful. It opened up the market for xerography, led to all kinds of new competitors, small firms becoming larger firms, increased productivity by every dimension.

We also have other examples. The 1959 IBM consent decree, the 1959 -- or it might have been '56 AT&T consent decree. You know, most people who have looked at this consent decrees say that they have really done pretty positive things for the industry. And it suggests to me that we really do have this problem of sequential innovation that protecting the

original innovator to the maximum extent, that's fine for the original innovator, but what about all the follow-on innovations that often account for at least as much or, as Jim said, many times as much in terms of economic output as the original innovator did? And there are things we can do. It's just we haven't done anything like this really since 1975.

MR. EZRIELEV: Anybody else?

MS. LAYNE-FARRAR: Well, if you did things like that on a regular basis and it was semi-predictable, then we'd have to do another round of empirical research because if you're anticipating that, would you have had the Xerox and the AT&T? It's an interesting question. And I agree with you about you can't have maximum power, that then you're on the wrong side of the curve.

MR. GILBERT: Exactly. You're on the wrong side of the curve. But in terms of the predictability issue, yeah, sure. You know, if everybody has succeeded, then how to license all the intellectual property? But I just don't think many people would really be deterred from innovating if they said when you become the next AT&T, you might have an antitrust problem --

MS. LAYNE-FARRAR: If I get a decade of

those returns first, I would probably still do it.

MR. GILBERT: Yeah, exactly.

MR. BESSEN: So, I mean, these are interesting historical examples. In the AT&T case, there's an AT&T executive at the time who wrote about how, you know, this was like -- I think the phrase was spreading bread on the water, that it produced all sorts of innovations that AT&T would have never thought of and they thought -- he actually thought it was a good thing.

And, similarly, some people have argued that the IBM unbundling that came about in part because of the consent decree was something that IBM probably would have done anyway given enough time but that the consent decree hastened. So we're not necessarily talking about giving away the crown jewels in a sense that it's often portrayed.

MR. GILBERT: Yeah, and I think it was Noyce at Intel said the AT&T consent decree was the best thing that ever happened to the industry. And then the CEO of Xerox said that the Xerox consent decree ultimately was a good thing for the industry.

MR. EZRIELEV: So a speaker on the last panel suggested that innovation in the computer industry actually increased after the Alice decision.

Is there any economic support for this claim? And, if so, what does that tell you about the role of patents in promoting innovation, technology diffusion, and do patents actually play a positive or a negative role in technology diffusion? Question for Jim and others.

MR. BESSEN: So I didn't hear the first part. The Alice decision had an effect on what?

MR. EZRIELEV: So the speaker at the previous panel suggested that the Alice decision had a positive effect on innovation in the computer industry.

MR. BESSEN: So, I mean, I think it's conceivable to the extent that it -- from my point of view -- sorry about that. From my point of view, the Alice decision was not related to any real innovations. Most of the things that were wiped out by Alice could have also been wiped out by a strict 103 nonobviousness determination. These were -- do it on a computer basically, something we already know how to do, let's do it on a computer.

So it's hard to see how it would have affected innovation adversely. To the extent that Alice patents were being used by PAEs and these were burdening small innovative firms, I could see that would have a positive -- possibly have a positive

effect.

MS. LAYNE-FARRAR: I haven't seen any empirical work on that question, but anecdotally, I have heard that Alice actually increased uncertainty because there was a lot of confusion over how it was going to be applied and where it was going to be applied. And I heard some examples of if you looked at Patent X, which has been hugely successful commercially and spurred all kinds of follow-on innovation, if you evaluated it under the new Alice rule, you wouldn't know if you would be able to get that patent and whether it would be valid today.

So I think from what I've heard -- again, anecdotally, not statistically valid -- but that it increased uncertainty, and that could have a detrimental impact on innovation.

MR. EZRIELEV: So and on the question of whether patents actually have a positive or negative effect on technology diffusion, anybody have any thoughts?

MS. LAYNE FARRAR: Go ahead.

MR. GILBERT: Again, it relates to this issue of sequential innovation. If you're a strong believer in sequential innovation, then the desirability of creating an ecosystem for innovation

and lowering barriers to entry into that ecosystem is desirable. So I mentioned, you know, in the context of the AT&T consent decree, it was actually Gordon Moore who said it was the best thing that happened to semiconductors, but, you know, clearly no one wants to do away with intellectual property -- well, some people do, but I don't think it's really a credible proposal to say that we're going to do away with intellectual property completely.

But at the same time, we have these -- it's almost these two religious extremes. One is we don't need any intellectual property rights. That's wrong clearly. But then this other extreme, which is innovation is maximized as long as an increasing function of the strength of intellectual property rights, that's wrong, as well. The optimal balance is somewhere in the middle.

MR. BESSEN: A lot of it has to do with quality issues or really scope or vagueness issues. So the ability of the original inventor to extract too much from the follow-on inventors is increased when patents are interpreted very broadly, which will happen when they're very vague. So when we have a regime where we're issuing far too many vague patents in certain areas like software, we may very well be

giving too much power to the upstream inventor and too little leeway to the downstream inventor.

MS. LAYNE-FARRAR: There is some empirical evidence on historical data from Petra Moser who looks at the change in the 1870s in the ability to reverse-engineer chemical inventions so there were certain technological advances like the periodic table and some other things I can't remember that made it far easier to reverse-engineer chemical innovations and inventions. And what she found was then a shift towards patenting, away from trade secrets in that industry, and she confirmed that there was a broadening of diffusion of technology as measured by the geographic localization of innovative activity around the focal point of the patent.

So that's at least a historical example of patents increasing diffusion over the alternative of trade secrets. Of course, it always depends on what else you were going to use, whether it's trade secrets or something else.

MR. GILBERT: But that's also an example of being at one end of the spectrum.

MS. LAYNE-FARRAR: Right.

MR. GILBERT: No patent protection.

MS. LAYNE-FARRAR: Right, trade secrecy with

no disclosure whatsoever moving to patents with disclosure.

MR. BESSEN: And I think also critically the periodic table and the other developments Petra talks about helped produce very sharply defined patents that were not excessively broad or excessively vague.

MS. CARLSON: So I want to pick up a little bit on the work that Petra Moser did, and also we've mentioned quite a bit already the work by Galasso and Schankerman on sequential innovation. So I think the two combined tell a pretty interesting story. So we have the work of Galasso and Schankerman saying that patents have some potentially negative effect on follow-on innovation but that this varies by industry. And then we have Petra Moser's work saying, well, patent protection is important, but it varies by industry, right?

And even if you sort of tie that back to Galasso and Schankerman, right, that the patents affecting follow-on innovation weren't really an issue for something like chemicals where we can really easily define the patent or the boundaries of the patent and that there aren't really a lot of alternatives for protecting that innovation relative to software where maybe the boundaries are a little

bit more vague and there may be alternatives to protecting that innovation, like copyrights, for example.

And so, I don't know, maybe, Michael, you want to take this. Does this sort of literature then suggest that maybe really in the -- in the patent system we ought to be thinking of designing IP rights in such a way that they vary by industry? That maybe, you know, this sort of one-size-fits-all IPR policy is not really the most efficient?

MR. FRAKES: Right, and, I mean, there's, I guess, a ton with that question. I mean.

MS. CARLSON: Sorry, that was a big lead-in.

MR. FRAKES: Yeah, I mean, to some extent, too, to the extent that also you don't have to be all or nothing with what type of IPR system, you have to the extent that you've got, you know, a patent system alongside the ability to have trade secrecy as well that you might just get kind of sorting by industry into maybe sort of the desired protection regime.

And then -- and we ask this question sometimes in the patent context a lot, should the patent policy be industry-specific, focusing specifically on the patent side. And I'll just say that I've just been kind of a casual consumer of these

topics and I'm not remotely an expert in this and I also defer to my more “patent law” colleagues on this, but sometimes my patent law colleagues would even tell me, yeah, we have sort of like a unitary patent system. And when you look in the doctrines they may not speak so specifically to industries, but I think that the realities in practice, they have still, like, taken on industry-specific treatments.

And I would sort of defer the Commission to sort of look to work by Mark Lemley and Dan Burk, who I think have sort of written a lot on this point and just, you know, there are certain doctrines that have just -- they play out in practice differently in some -- you know, a written description may play out differently in some industries relative to others, and I think they may also sort of tell us that even the notion of a PHOSITA, you know, a person having ordinary skill in the art, already inherently sort of builds in flexibility that is in part sort of industry-specific as it relates to sort of how we apply nonobviousness.

And so I think, you know, one answer might be in part it's already even -- by its face, it might seem so unitary, but when you uncover a little bit, there's some more industry-specific patterns that are

actually playing out. That might still not be sufficient to those who think it ought to be more industry-specific. Some people often point to the fact that patent terms are -- we're kind of unitary in patent terms, and that might seem nonsensical for a number of reasons.

Professor Sukhatme, he was over there and he's gone now, but he was a panelist earlier in the day. He's done some interesting work showing differential sensitivities across industries to patent terms. Ben Rowe at MIT has written quite a bit about this, and then did some follow-on empirical work with Heidi Williams and I think Ben Rudush (phonetic), looking even within pharma, even looking within one industry, you can get some distortions in behavior to the extent we have sort of a unitary patent term.

So I think that there could be -- I mean, we have these discussions about there could still be sort of a lot of potential social welfare improvements from kind of, you know, more sufficiently tailoring our patent system, but my one comment is, you know, there's probably more of it going on than might sort of, you know, initially be perceived. And then we as economists, we could talk about we can do a lot more.

I wish there was -- you know, the lawyers

could sort of also correct -- and we also run into some various constraints on sort of how much we can do in this. I think trips might be sort of a constraint in sort of how much you can do on varying across industries. And I'm not remotely an expert on that particular question. I'll stop there and kick it off to anybody else.

MS. LAYNE-FARRAR: I just want to add a caveat. Do not underestimate the creativity of patent drafters. So you may try to make things industry-specific. They will be creative. They will figure out ways to make this thing in this industry sound like that thing in that industry if the protection is better over there. So it's just a risky proposition.

MR. FRAKES: Right, and I'll even add to that. It's really probably the PTO experts in the room could speak better to this. I think that there had been some PTO practices that try to target specific art units, like I think a second-pair-of-eye review might be sort of one particular example in what you say, or sometimes I think applicants -- and it might be -- and I think that John Allison and Mark Lemley had a paper on this, and that might be totally wrong in my recollection of that, but seeing applicants like try to actually sort of -- would

otherwise sort of like, you know, kind of respond in a way to sort of -- you know, to move where they think ultimately -- or, you know, an art unit to the extent that it might be difficult for them to sort of control that.

But there might have been a behavioral response, you know, in an attempt to try to affect essentially sort of, you know, what art unit is really going to be reviewing their application. And so I definitely agree with don't rule out sort of the craft of the applicants.

MS. LAYNE-FARRAR: It is a game. You have to use game theory, and I think you can look at history for examples, right? Back when software patents had to have some physical embodiment, then you see software patents that were disguised as pizza ovens. So people are creative.

MS. CARLSON: Anyone else?

So a number of commentators have suggested that using alternative mechanisms, such as prizes or contests or crowdsourcing, to incentivize innovation, so is there any support in the economics literature to suggest that these alternative mechanisms might actually be effective in inducing innovation, perhaps relative to patents or other ways of protecting

innovation? I don't know who wants to start with that. Jim, do you want to take the one?

MR. GILBERT: Well, here have been some nice things, done both historical and some more recent ones, finding yes, these can be effective innovation mechanisms. It's not clear that they're necessarily alternatives to the patent system. They may be complements to it. And that's part of I think the design, but it's very clear there's some areas where the current regime does not address innovation well, and prizes and some of these other mechanisms may be very important.

Trade secrecy, of course, is huge, and we always kind of forget about that. But probably the majority of innovations are protected by trade secrecy rather than anything else.

MS. LAYNE-FARRAR: Zorina Kahn has some really nice papers on historical data on prizes and medals and contests, and she points out the rent-seeking behavior that those kinds of incentive mechanisms can create -- both the rent-seeking to get on the committee to name who wins these things and the rent-seeking to obtain the awards.

And in some instances what she found was that the really highly valuable most pioneering

inventions were getting patents and it was the “me, too’s” or the less incentive ones that got the awards because they didn't have the incentives to get the patents, whereas the ones who wanted the market value did because there's very little correlation between what the prize value is versus what the societal value of the innovation may be. Or that the prizes were given to people who were gaming the system and getting patents, too, and maybe getting prizes in multiple countries and from multiple entities in addition to their patents. So it's not clear that those kinds of mechanisms are a silver bullet.

I would agree with Jim that you might want to think about them, if at all, as complementary to the IPR protection system that you already have, but be very careful in how you define those prizes and medals and think about how you're creating incentives.

MR. FRAKES: And I’ll just add, I think on some of this empirical literature I think they've supported this complementary idea to the extent that they've found -- I just remember -- actually, I kind of forget the authors, but some studies looking at the Royal Agricultural Society of England and some prizes that they were giving out from sort of mid 19th Century to the early 20th Century. It was, like, a

long period of many decades of prizes they were giving out, and some of the punch lines of their analysis was there does seem to be sort of, you know, entry into innovation resulting from the prizes, but then ultimately sort of kind of fed over into sort of the patent system subsequently. And so I do think there's some empirical support to the idea that they can sort of work as complements to each other.

MR. BESSEN: Also, in the sense of sequential innovation, we need to distinguish between the big inventions and the incremental inventions. And so often -- you know, Zorina focused on the major inventions, but that doesn't mean the minor inventions were to be ignored. And, in fact, if you look at the power loom, the big invention was really a very small part of the total productivity gain. It was mostly from those minor improvements, many of which were probably unpatentable, many of which -- some of which were patented, some of which were not patented, and some of which were, you know -- may well have been enhanced by a prize.

MR. EZRIELEV: Okay. So we had a number of questions from the audience. We only have time for one. Time is running short. This question is for Rich, and others can weigh in. Seventeen years ago,

Rich, you and Will Tom asked if innovation is king at antitrust agencies. And do you think we've made progress since then?

MR. GILBERT: Interesting question. It's progress in the sense that innovation concerns are very commonly raised in antitrust cases in high-technology industries. And, in fact, since about I don't know, since the turn of the century, it's really been almost 100 percent in terms of complaints. If there's a complaint in a merger case alleging harm to innovation in a high-tech industry, it's also going to include an allegation of harm to innovation.

So it certainly has -- the innovation's concerns are more prominent, but they have not been really pivotal yet with a couple of very -- only a few exceptions at most. And the question is, you know, when are we going to really step up and say this is a concern in this case. It's not just a price concern. It really is an innovation concern and be prepared to litigate.

I think we're getting there. I think we're getting there. And we are making progress, but we haven't yet seen an agency actually take it to court on a fundamentally innovation-based theory.

MR. EZRIELEV: Anybody else?

Okay, so let's take a little bit of time where each person, each panelist will give a short statement of policy recommendations, your overall conclusions, takeaways. We'll start with Rich.

MR. GILBERT: Okay. If I may I would like -- we've had sort of two main themes. One is the innovation theme, but the other is intellectual property and protection and sequential innovation. On the latter, I just want to briefly repeat my concern that you can't equate intellectual property strength to innovation. It's much more complicated than that. You know, we don't know if people innovate because there are strong intellectual property rights or if there are strong intellectual property rights because people innovate. You know, both are factors. And some of the work that's been discussed here I think provides nuances on that that are important to appreciate.

On the innovation area, you know, we just talked about whether the agencies will step up on innovation, and I want to point -- and in terms of what can the agencies do, the Federal Trade Commission, in particular, has had in my opinion an admirable record of being on the edge of, in my opinion, positive antitrust enforcement actions. For

example, reverse payments. You know, there was a time when it was the scope of the patent and if you were in the scope of the patent, you could do anything you wanted with the patent.

And the Federal Trade Commission really led the charge to say that, you know, many of these reverse payment cases are like disguised mergers and raise significant competition concerns. And the agency faced enormous headway in bringing those cases but the agency persevered. And now, you know, they don't win all of these reverse payment cases, but I think they've gotten the courts to understand that reverse payments are a very significant competitive issue.

Similarly with standard essential patents and injunctions, and I think the agencies can do the same on innovation, and in particular the Federal Trade Commission can, by bringing strong cases like Thortech HeartWare, where it was a very clear innovation case, the parties abandoned the transaction, but I think if you took that one to court, you could well have won it. And hopefully you will continue to bring the right cases and bring them because they're right, even if they don't fit the law in exactly the precise way the law has been

constructed.

MR. EZRIELEV: Thank you.

Jim.

MR. BESSEN: So I guess my main point is that we need to think about innovation policy, not just about the initial innovations, but about the whole sequence of innovations and cumulative knowledge development, and this requires sort of a broader perspective on policy, and maybe some policy areas that we don't traditionally think about when we're thinking about innovation.

In patents, it may mean some ways of improving patent quality so we're narrowing scope or vagueness. And Rich raised some interesting ideas about compulsory licensing that might be relevant.

In trade secrecy law, I think there's growing evidence of things like the inevitable disclosure doctrine may be problematic from the point of view of employee mobility and this tremendous rise in noncompete agreements in employment law is a factor affecting employment mobility; and employment mobility, I think we have good evidence, is often key to sequential innovation, cumulative innovation. It allows people to start new companies. It allows people to transfer knowledge from one place to

another. So I would say we need a broader perspective often when we think about innovation.

MR. EZRIELEV: Thank you. Michael.

MR. FRAKES: And I really quite like that idea, thinking more broadly and thinking about other things, sort of other policy approaches, and maybe some that sort of relate to sort of employment mobility, and I echo some of the views about compulsory licensing.

I'll probably say specifically sort of just discuss, you know, probably what I'm more comfortable discussing, which is actually the issue of patent quality just because I spent more time thinking about and doing research in this particular area. And, again, I just emphasize not to the exclusion of other great ideas when stepping back and thinking more broadly, but at least as it comes to, like, at least like some of the questions that were to some extent posed to me today, well, should we think about sort of more technology-specific tailoring of the patent system, or should we think about sort of making improvements in patent quality at the Patent Office.

I tend to think sort of let’s kind of focus more on the latter, maybe in part because we might have a stronger evidence base there right now, and it

might be sort of more tractable, intractable and also, maybe more legally feasible. But -- so much of what I'll say here it's really much of what was discussed, I would say, sort of in the first panel today.

And first something that often starts with sort of a good, you know, adoption of a definition of what patent quality is, and I'd probably just really defer to the nice statement by Professor Marco earlier today and then first I think we should think about it in terms of patent quality, not in terms of -- you know, value in some sort of economic sense so much as sort of, you know, the legal validity of the patent, to the extent that those patentability standards are at least hopefully set properly with the types of big-picture balances that we do have in mind. But quality in terms of validity of the patents that are issued by the Patent Office and also sort of less vagueness, more certainty with these patents and to try to push for not just passable patents, as Professor Marco said, but let's try to push towards A-plus patents.

And are we there yet? So do we know exactly what to do? I think in part, you know, we start to have some ideas. And, again, Professor Wasserman and I have been trying to advocate certain ideas. One just sort of relates to the question of, you know, ex

ante versus ex post, investing more resources in the Patent Office. Or is it should we just not care about quality that comes out of the Patent Office because the courts will just sort of deal with it later on?

And, again, I sort of at least feel relatively strongly at this point that we actually do. I think we ought to sort of think much more closely about the quality at the Patent Office. And I will say we've made nice strides in recent years, in part by the great data dissemination efforts that have come out of the Office of the Chief Economist at the Patent Office, and Professor Marco deserves a lot of credit for that, and so kudos to that. And hopefully we keep seeing more of that moving forward.

And then also, we talked about this -- they talked about this in the first panel, it would be nice to see some more experimentation so that some of the tools that we have with fee-setting authority and with other sort of parameters of the system, that we might have a better sense about how to tweak them moving forward that might be informed by not just the observational data that we've been producing, but maybe some information coming out of targeted experiments at the Office. But so my suggestions are to sort of -- which are consistent with already sort

of very strong desires to sort of improve quality at the Patent Office to sort of -- I just -- I say I endorse many of those efforts.

MR. EZRIELEV: Thank you.

Anne?

MS. LAYNE-FARRAR: I think given the complexity of the issues that we're talking about, how IPRs of all types -- patent quality, patent scope, copyright, trademark, trade secret, et cetera -- and the ability of all the parties within a given industry or a given market area to react to one another and re-react, that theory only gets us so far.

So my main policy recommendation would be encouraging additional empirical research. The panel right before us talked about all the different reforms, both legislative, different rulings at the courts, experiments at the USPTO, et cetera, we should be using those as a springboard to test empirically what happens when these things did? What happens to this constituency versus that constituency? What were the unintended consequences? I think we just can't barrel ahead on the basis of theory, that we really do need more empirical research on these fields.

MR. EZRIELEV: Thank you. I think that concludes today's panel, but don't go away yet. We

have a speaker to close the hearings. We're honored to have closing remarks by Commissioner Rebecca Kelly Slaughter.

Commissioner Slaughter was sworn in as a Federal Trade Commissioner on May 2nd, 2018. Prior to joining the Commission, she served as Chief Counsel to Senator Charles Schumer of New York, the Democratic Senate Leader. A native New Yorker, she advised Leader Schumer on legal competition, telecom, privacy, consumer protection, and intellectual property matters, among other issues.

Prior to joining Senator Schumer's office, Ms. Slaughter was an associate in the D.C. office of Sidley Austin. Please join me in welcoming Commissioner Slaughter.

(Applause.)

CLOSING REMARKS

COMMISSIONER SLAUGHTER: Thank you so much. It is a pleasure to be here to close two productive days of hearings about innovation and intellectual property. Before I begin, I want to note the usual disclaimer that I will be expressing my own views only and not those of the Commission or any other Commissioner. I will also apologize because I ran over here from headquarters and got a little winded, so I'm sorry if I'm speaking a little quickly.

So I want to commend all of the FTC staff who worked very hard to put together these thoughtful panels, and thank you to the many panelists and presenters for contributing to the Commission's reexamination of the state of antitrust and consumer protection law. I am particularly pleased that Drew Hirshfeld, the Commissioner of Patents, and the Honorable Scott Boalick, the Acting Chief PTAB Judge, joined us earlier today. The FTC and PTO have had a longstanding and invaluable working relationship. We have much to learn from each other so that we can both improve how we use our tools to foster innovation.

The conversations at these hearings over the past two days were extremely animated. As I learned working on IP issues on the Hill for many years,

intellectual property can get pretty spicy. I used to find the depth of emotion and passion around IP perplexing. At first glance, these issues seemed like they should be much less emotionally and politically fraught than the policy areas that more directly implicate life or liberty, and yet I found them to be equally, if not more, charged. But intellectual property is fundamentally about the right and incentive to create and the potential to foreclose others from the fruits of that creative process.

It is hard to imagine anything more personal than the ability to have an ownership right in the work of one's own mind. Whether you believe IP needs to be strengthened to promote creativity or that IP rights are abused to stifle it, you are likely to care very much about the policy being applied properly to allow human intellectual potential to thrive.

All of that is to say I get the passion and I appreciate the energy we have seen displayed here today and yesterday. One of the many reasons I am so excited to be here, both at the Commission generally and here today at the hearings specifically, is because the FTC has long been at the forefront of tackling difficult questions of how intellectual property rights intersect with competition and

consumer protection.

At the heart of these questions is something of a paradox. IP law and antitrust law share a common goal, the promotion of innovation, but at the same time, IP can seem in conflict with competition policy because intellectual property is fundamentally about the opportunity to exclude competitors, a concept that generally invites scrutiny under antitrust law.

Let me start by saying a word about the common goal of IP and antitrust, innovation. Each type of IP protection grants an exclusive ownership interest to the rightsholder with a level of exclusivity tailored to the specific nature of each type of IP in order to encourage innovation without stifling competition. The balance is not the same for research-intensive patent inventions as it is for the creative works in copyright, for example.

Whatever the nature of the specific right, each type of intellectual property promotes innovation and benefits consumers, and competition law is designed to do exactly the same. Our competition laws promote innovation by ensuring that firms do not exercise their market power, whether it is supported by intellectual property or otherwise, to thwart competition through anticompetitive conduct or

consolidation.

Often this work does not involve IP specifically, such as in many merger reviews. The FTC and DOJ first recognized that a merger could harm innovation when they included a section on innovation effects in the 2010 Horizontal Merger Guidelines. Since then, the FTC has brought several cases that include allegations of harm to innovation. And I want to talk about one good example of these efforts, which was the Commission's challenge to the merger of CDK Global and Auto/Mate, two firms that provide business software for car dealerships.

CDK Global was attempting to acquire Auto/Mate, a competitor, that while smaller in terms of market share, was a similarly innovative and disruptive challenger to the two market leaders. In this case, harm in the form of reduced innovation was a prominent feature of the FTC's inquiry, alongside allegations that the merger would result in increased prices and diminished quality of services. In the face of the court challenge from the FTC, the parties abandoned the deal.

The FTC should continue its careful scrutiny of deals with the potential to reduce innovation and be ready and willing to challenge a merger even when

the facts show that the prevailing, and perhaps only harm, is to innovation. In many cases competition law and IP law run peacefully in tandem and are even complementary in promoting innovation and competition. However, we wouldn't be here today discussing innovation and IP if that was the end of the story.

The most interesting and difficult questions, to me, arise when there is an overlap or a conflict between the application of intellectual property rights and the healthy operation of a competitive marketplace. In examining restraints and competition, the FTC considers not only the IP matter at hand, whether that be patent, copyright, trademark, or trade secret-related, but it focuses on the impact the exercise of that property right will have on competition and consumers.

As the Supreme Court held in Actavis, a patent does not provide a free pass from antitrust scrutiny. And patents aren’t the only area of challenge.

Yesterday, we had a terrific panel about copyright, the Commission's first of this kind, with discussions about how copyright law intersects with competition and consumer issues in various forms of media and online platforms. As content is

increasingly and often exclusively digital, there are many new challenges that I'm glad to see these hearings addressing head on. How properly to identify the line between where the right to exclude promotes innovation and where it inhibits competition and, therefore, innovation is extremely challenging and extremely important. These questions have only become more difficult with 21st Century innovations in data sharing, online platforms and the ubiquity of software.

I'm not the only one who thinks it's hard. We've seen case after case out of the Supreme Court on IP that each raise more questions than they seem to answer. That is why I'm glad these hearings have devoted two days to difficult IP questions and so grateful our panelists have donated their time and intellect to helping us think through these issues. While the Commission has been very engaged in some specific areas of IP study, advocacy, and enforcement, this week's sessions have been an opportunity to take a step back and reconsider the fundamental questions of competition, innovation, and intellectual property.

Participants throughout both days have shared their views on major trends in the IP landscape, including how businesses make IP decisions,

copyright challenges, patent quality, and patent litigation. Some of the debate sounded very familiar to me from my days working on these issues in the Senate, but there are, of course, new developments, new law, and new empirical studies that are continuing to inform the conversation.

This week's hearings reaffirm the critical role the FTC plays in bringing its competition and consumer protection expertise to help tackle key innovation and intellectual property questions. As I said, when I opened the second day of hearings, it is simply not plausible that we conclude this effort with a pat on the back telling ourselves that we've gotten everything right so far. Surely we will be able to distill key lessons that will inform our enforcement and policy priorities, and certainly there will be more to consider as IP markets and competition evolve.

Thank you again for having me and, again, thank you to all of you who provided us with two days of thought-provoking and spirited discussions. Thank you very much.

(Applause.)

MR. EZRIELEV: I think that concludes today's hearings. Thank you.

(Hearing concluded at 4:52 p.m.)

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I, Linda Metcalf, do hereby certify that the foregoing proceedings were digitally recorded by me and reduced to typewriting under my supervision; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were transcribed; that I am not a relative or employee of any attorney or counsel employed by the parties hereto, not financially or otherwise interested in the outcome in the action.

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