

**Patent Assertion Entity Activities Workshop
Transcript, Part 3 of 4**

**December 10, 2012
1:30 PM (Lunch) to 4:00 PM (Afternoon Break)**

NOTE: This transcript has not been completely proofed and is intended to be temporary. A final version will be posted soon.

ANNE LAYNE-FARRAR: --it says in the PTO. And I think today is just a wonderful experience and just a wonderful example of that. So I'm really glad that you're here.

Dr. Graham is the chief economist at the United States Patent and Trademark Office, where he manages a team of economists researching the impact of intellectual property on the economy. His research focuses on the economics of the patent system, intellectual property transactions and the relationship of IP to entrepreneurship and the commercialization of new technologies. He received his Ph.D. at the University of California and holds other advanced degrees in law, business and information systems.

An attorney licensed in New York state, he has written on companies intellectual property and litigation strategies, patenting by high tech start-ups and entrepreneurs, and comparisons of the United States and European patent systems. His recent research has been published in the journal Science, the Berkeley Technology Law Journal, Management Science, the Journal of Entrepreneurship and Management Strategy, the Annals of Economics and Statistics among other venues. Dr. Graham is currently serving the United States while on leave from his academic post at Georgia Tech. And I'd like to join in everyone for a round of applause to welcome Dr. Graham.

[APPLAUSE]

DR. STUART GRAHAM: So thanks very much. Thanks for everyone for coming back from lunch in a relatively timely manner. I promise not to spend the entire 30 minutes with my comments. That will enable us to get to a bit more on time, because I know we're waiting to hear from Dr. Cockburn and others this afternoon.

So good afternoon. I am very happy to be here today representing the United States Patent and Trademark Office to speak about what the USPTO has been doing to help make the marketplace for innovation work more effectively. Our office is committed to that goal, and we appreciate the opportunity our colleagues at the commission and the department have given us to comment at this timely and important workshop.

Innovation is an increasingly important driver for the US economy and for our national competitiveness. As President Obama's innovation strategy makes clear, high quality intellectual

property rights are an important part of the equation for continued growth. But IP must work within our system of competition to ensure that we are not creating and supporting an environment that unnecessarily undermines economic activity.

Patents create legal incentives to invest in invention, but research from economists-- some of whom you'll hear speaking today-- increasingly shows that patenting is doing more than just incentivizing invention. Patents are also playing a positive role in technology commercialization, in technology transfer, in technology entrepreneurship by providing a platform for effective market entry and vertical specialization among companies and in smoothing the markets for entrepreneurial capital.

Of course, a strong vibrant IP system is part of a strong competitive environment. Competition is the great engine of growth. Patents and the limited exclusive rights that they provide by their nature represent an investment to foster more, better and faster innovation in exchange for a temporary marketplace advantage. We make this investment as a society in order to reap the benefits that patents bring to us. These benefits include providing rewards and profits to innovators, and relatedly bringing greater disclosure of technology, from which the next generation of innovators may learn and build.

Innovation happens in a marketplace. Inventors, investors and commercializers act in a marketplace. Products like this one are conceived, developed and sold in a marketplace. And this marketplace includes both tangible items, like components and the capital that goes into funding, and intangible component like ideas. But markets are often defined by the quality of information available to investors and competitors alike.

Risk and uncertainty can lead to inefficiencies and produce sub optimal outcomes. We at the USPTO realize that how we conduct our operations-- things that we do-- can work to reduce uncertainty in the markets for innovation. We have an important role to play along with the courts and Congress, and our sister agencies to help the markets for innovation to work effectively so that innovators are rewarded fairly, but not so to unnecessarily undermine economic activity.

The effect of operation of markets for innovation is at the heart of questions about how the PAE phenomenon has developed. On the one hand, we recognize that patents offer excludability, and this right to exclude provides a valuable incentive in the system. On the other hand, uncertainty over what the rights are, what they encompass and who owns them may provide additional market power to those holding patterns. In the simplest terms, society bargain to award an exclusive right to the inventor covering an invention.

But society may not have bargained for the ability of the patentee to use information asymmetries to increase market power and to so fear uncertainty and doubt in the innovation ecosystem for a profit. It is axiomatic to economists that markets work best when the assets being invested in or traded are identifiable and certain. Many of the USPTO's administrative reforms during the last four years and many of the provisions of the America Invents Act are aimed at reducing uncertainty.

Anyone who has been watching us at the PTO will know that increasing the quality of our examination and our outputs, while also reducing the application backlog and reducing pendency, have been job one at the agency. As of last week, I can report the application backlog at the USPTO has been reduced from 750,000, when the administration entered office, to just over 600,000, even though application filings have grown year on year. This reduction is allowing us to drive down pendency to our goal of reaching an overall average pendency of 20 months by 2015.

Completing examination and finalizing patent claims sooner in time reduces uncertainty for investors and competitors alike. But faster processing is only one part of the solution. Increased examination quality also reduces uncertainty and has been a primary focus of our efforts. In 2010, for example, we strengthened our Section 112 guidelines used by patent examiners to determine which inventions are eligible for patent protection, tightening how written description and enablement are handled by the office. In 2011 we published comprehensive guidelines that have proved to measurably improve the clarity and sharpen the scope of patents.

The USPTO internal quality assurance review found a higher level of compliance with the new guidelines based on nearly 29,000 examination reviews over a five-year period. Both allowances and final rejections were found to be compliant in more than 96% of the cases. We've conducted extensive training with our examiners on the new guidelines, and a follow-up study showed us that these steps have led to a measurable improvement in examination practices and patent quality. We have also reformed our examination processes further through the reclassification process to ensure higher quality reviews by expert examiners. We've also given all of our examiners more time to review applications, particularly in many of our most complicated cases.

The America Invents Act, signed by President Obama in 2011, gives the agency new tools to focus on quality and timeliness, so that we can reduce uncertainty in the marketplace. On September 16 of this year, the USPTO implemented most of the final rules of the AIA. Our AIA rules help companies and inventors to avoid costly delays and unnecessary litigation, and let them focus instead on innovation and job creation. We can now more effectively work to improve the quality of issued patents, while weeding out overly broad ones.

For example, a provision in the AIA for the first time in the history of our patent system allows third parties to submit examples of prior art. Any member of the public or any competitor can participate in the patent system and contribute to greater patent equality. They can do this during the examination process using a simple streamlined internet-based system. And we're already seeing those submissions coming in, two months after implementing this option. As of last week, the USPTO has received over 200 submissions covering all types of technologies.

So the Third-party Submission Provision of the AIA should improve the patent quality landscape going forward. But what about patents being issued now? Or that have been already issued over the past two decades that are still in effect? The AIA provides three new procedures to challenge patents after issuance. They are sent to our Patent Trial and Appeal Board, made up of administrative law judges who are legal and scientific experts. These new proceedings, known as "post-grant opposition", "inter partes review" and "covered business method patent review" can

be far more effective and affordable than challenging a patent in federal court, thus providing increased opportunities for certainty in the system.

To start, each proceeding is statutorily mandated to be completed in less than one year, which will save millions of dollars in litigation costs and insure resolution far faster than the district courts can offer. One of those proceedings, "the post-grant opposition", will allow third parties to challenge an issued patent on any ground, including basic eligibility and clarity, to areas of particular concern with many of the issues facing us today. It is noteworthy though that this procedure will only apply to patents issued after we complete the switch to the "first-inventor-to-file" system next spring. And so it cannot address patents granted in the past.

Yet a third proceeding focuses on "covered business method patents", as defined in the statute. It is noteworthy that this procedure is available for any patent issued at any point in time. So the USPTO has been working diligently to improve the quality of information concerning the boundaries and scope of the patent asset.

But that is not the only information that can be relevant in the markets for innovation. As we have heard from commenters earlier today, the hidden nature of the parties identities can also create havoc in the efficient operations of these markets. We have recognized the problems with PAEs can arise, because innovators have trouble identifying who actually owns patents in the first place. At the heart of a well functioning innovation environment should be good information about what the relevant technologies are and who owns them, so that you can seek a license if you need one and understand the investment environment and technology.

We would like to contribute to solving the ownership transparency issue. Last year we issued a call for comments on the possibility of the USPTO requiring greater transparency of assignment records, both for published applications and owners of issued patents. Most of the comments we received encouraged us to move forward. Currently at the USPTO we provide a public depository for the recording of patent assignments, but there is no requirement, per se, that assignments be recorded at the agency. Furthermore, until recently, we charged a \$40 fee for such a recording.

But we are taking steps to provide better information on the ownership characteristics of the published applications and issued patents. First, our new fee schedule, announced in a notice of proposed rule-making in September, reduces the fee for an electronic assignment with the office to zero. Better assignment information is better for the patent system, and we do not want even the smallest fee to stand in the way of increased transparency. In addition, the USPTO is holding a round table at our Alexandria, Virginia headquarters on January 11, 2013, directed to the issue of identifying the real party in interest on patents and applications throughout their life, during prosecution and throughout patent maintenance.

We are considering means for collecting and disseminating that information. To avoid business and legal risk, the clearing of intellectual property rights is often undertaken by manufacturers or distributors prior to production and marketing. In such cases, the clearance of intellectual property rights is often made more difficult and time consuming, legally risky and expensive, because current ownership information on patent applications and issued patents is not available.

An incomplete ownership record thus presents a significant barrier to competition and market efficiency. Markets operate most efficiently when buyers and sellers can find one another. Yet in our current system, fragmented ownership in the patent rights covering complex products leads to potential buyers facing difficulty finding sellers, and to potential innovators not understanding the nature of the marketplace they're considering entering. To address the need for accurate ownership information for pending patent applications and issued patents, the USPTO is interested in providing more complete patent ownership information to the public, in accordance with the offices duty under 35 US Code Section 2 of disseminating to the public information with respect to patents.

Beyond providing these public benefits, accurate and up-to-date ownership information is needed to facilitate examination of patents by the USPTO, particularly in light of certain new provisions of the AIA. The USPTO has a strong interest in seeking ownership information, in part to ensure that a power of attorney is current in each case. Moreover, for patent proceedings before the office, it's important for the USPTO to know the real party in interest in order to avoid potential conflicts of interest for judges and examiners, the latter of whom are quasi-judicial officers.

Additionally, changes made by the AIA to the categories of what constitutes prior art increases the need to have accurate and up-to-date ownership information about patent applications and issued patents in order to make determinations of novelty. Furthermore, the availability of new types of third-party proceedings that may be filed with the USPTO, has created a need for the office to collect and publish accurate ownership information.

We are now taking requests for participation in our round table. I encourage you to contact us at the address provided in our federal register announcement that was published on Monday, November 26, 2012, if you wish to speak at the round table. Otherwise, the January 11 event is open to the public for all comers. We welcome your feedback and suggestions on this important proposed initiative at the USPTO.

To sum up my comments today, the health of the patent system is an important part of a healthy innovation ecosystem. Transparency and the quality of information matters and how the markets for innovation operate and the USPTO continues to work to do our part to improve its functioning. We recognize that this system does better when we do better. We appreciate you being interested in helping us to do that. Thank you.

[APPLAUSE]

ANNE LAYNE-FARRAR: So now, if you'll bear with me for just a minute, I'm going to dial in our colleagues who were unable to make it due to the fog. We just need a couple seconds here.

TELECONFERENCE AUDIO: Welcome to AT&T teleconference service. Please, enter your access code, followed by the pound sign. To join the conference as host, press star. Please enter host password followed by the-- There are one participants on the call, including you. You're joining your conference as a host. For a menu of available commands, press star pound.

ANNE LAYNE-FARRAR: Tim Simcoe and Iain Cockburn will be joining us via conference here.

TIM SIMCOE: Hello, this is Tim.

ANNE LAYNE-FARRAR: Hey, Tim. We're here.

HOWARD SHELANSKI: Hey, Tim. One moment.

ERICA MINTZER: Professor Simcoe and Cockburn dialing in. And I'm sorry, who do we have on the phone?

TIM SIMCOE: Tim Simcoe.

ERICA MINTZER: Great. Hi. This is Erica Mintzer with the Department of Justice.

TIM SIMCOE: Hello.

IAIN COCKBURN: Yes, Iain Cockburn here.

ERICA MINTZER: OK. Great. We are just transitioning to your panel. And so our next panel is going to be a discussion on the potential efficiencies and harms from PAE activity-- the affects on competition and innovation. So if our panelists could come up and get situated, and then we can kick this off. And I know we've got Howard Shelanski of the Federal Trade Commission moderating. And making a grand exit any minute will be Fiona Scott Morton, who also got impacted by some of the travel issues that others were.

HOWARD SHELANSKI: Good afternoon and welcome to our twin panels on the efficiencies and harms of patent assertion entities. We have two wonderfully distinguished scholars who have agreed to join us today, but the fog defeated their travel plans from Boston. We need to diversify next time and make sure that we don't have both of our key speakers coming from the same city.

But we have Tim Simcoe, who's going to start us off with a PowerPoint presentation that I'm assuming is in front of him. Tim, I will just let you know, or you could just tell me when you want a slight to change and I will move them forward with you. And after that we're going to hear from our distinguished panelists. And hopefully they will react to some of what Tim tells us.

And I will try to direct the conversation a little bit as needed with some questions, as will my co-moderator stuck in fog coming from Hartford, but to be here soon, Fiona Scott Morton. But after we've finished with the efficiency side of the panel, Iain Cockburn, also in Boston, will dial in, and we'll go through his slides on potential harms for patents assertion entities and bring up our panelists to discuss those slides. So without further due, on the phone Tim Simcoe. Tim, would you like to get started?

TIM SIMCOE: Sure. As long as everyone can here me?

HOWARD SHELANSKI: Can people hear Tim? I'm getting lots of thumbs up, Tim. OK, so why don't you go ahead and just-- we're at your title slide.

TIM SIMCOE: Great. So first let me just say thank you to everyone at the Department of Justice and Trade Commission who helped organize today and for inviting me to participate, in particular those who set up this dial-in at the very last moment. As I sat on the runway at Logan this morning hearing many announcements about fog, I was thinking that I was sorry to miss this morning session, which maybe dispelled some of the fog around this issue of patent assertion entities.

So I guess we can go to my second slide, which is titled potential benefits of PAEs. What I've been asked to do this morning is provide a few introductory remarks on the potential benefits of patents assertion entities. And since there's a number of other panelists would like to speak on this topic, I'll try to keep my remarks brief. My objective is just to lay out the economic arguments, which I've divided, I guess, into two broad groups.

The first set of arguments for efficiency benefits of patent assertion entities is related to the market for patents. So this you can think about as the market, where intellectual property rights are bought, sold and licensed-- the main realm of patent attorneys, and I imagine there are many there. And then the second set of arguments is related to the market for ideas, or what some might call the market for technology. So this is the market where innovators sell or license, or otherwise transfer technology to firms that hope to commercialize it.

And it's important to keep in mind that patents are only one piece of the market for technology, transactions in this market also implicate ongoing research and development collaboration know-how, human capital, trade secrets, specialized inputs, et cetera. Nevertheless, my comments will focus on the idea that a more efficient market for patents helps to support a more efficient market for ideas. And after discussing the potential efficiencies of PAEs in those two related markets, I'll briefly discuss the topic that I think of as red herrings, right?

These are common arguments that make PAE sound potentially bad, but not necessarily demonstrate a real inefficiency in either the market for patents or the market for technology. And, finally, before I get into the substance, let me offer one important caveat, which is that I won't present any empirical evidence on the size of the potential benefits that I discuss here, nor will I delve into the question of potential harms which has been left to professor Cockburn in the second panel.

So, if we could go to the next slide, which is entitled, potential market efficiency, or patent market efficiencies. OK, in terms of the market for patents, the first economic argument for patent assertion entities is a very simple one. They may be more efficient than inventors at evaluating patents, negotiating deals or managing litigation.

These kinds of efficiencies could arise through scale or through learning, through superior access to capital, if innovators are capital constrained. But none of that is really strictly speaking necessary, right? Patent assertion entities don't even need to have an absolute cost advantage in these activities. Simple economics tells us that the only thing required to produce games from

trade is that patent assertion entities have a comparative advantage in consummating transactions in the market for patents. To be clear, arguments based on comparative advantage don't imply that there has to be a patent sale. In principle, PAEs could contract out these kinds of evaluation, negotiation or litigation services. And that's what distinguishes the first bullet point on this slide from the second.

The gains from trade arise due to efficiencies in allocating risk across the two parties, where the risk may come from the probabilistic nature of patents, whether they're valid and or infringed, then in that case we do need a patent sale, because the patent assertion entity needs to be the residual claimant or the actual owner of the patent to bear the risk. At an intuitive level those first two points are really about allowing innovators to focus on innovation by having somebody else - the PAE assume ancillary activities related to the patents.

And my final point on this slide about the market for patents highlights a somewhat different type of efficiency that can arise. And this kind of efficiency arises when there's externalities across transactions in the market for patents. In particular, PAEs can reduce transaction costs by assembling bundles of complimentary intellectual property rights. So, compared to a world of fragmented licensors, setting up a one-stop shop in a particular technology can reduce search and bargaining costs, and may give PAEs the incentives to price below the rate that would be charged by a collection of independent monopolists, similar to what we observe with patent pulling.

OK, next slide, please. Idea market efficiencies. So how might potential patents market efficiencies carry through to the market for ideas? The most obvious answer is that a thicker patent market can increase liquidity in the idea market as well. So what economists like to call "Arrow's paradox" is the idea that it's hard to sell an idea, because once I tell it to you, your incentive to pay me for it more or less disappears.

Well, there's many transactions in the market for technology that don't get to this extreme kind of hold up problem, easy to see how patents do support trade when it arises. On the other hand, for patents to work, they need to be enforceable. And patent assertion entities can help in this regard by making litigation threats credible, when an innovator is smaller or credit constrained.

Another benefit of a more liquid market for patents is that credit constrained innovators can convert their patents to cash more easily. This doesn't only have to take the form of sales, for example by facilitating monetization of patents, PAEs may make it easier for innovators to pledge those patents as collateral in seeking a loan, for example. And ultimately, the economic benefits of a more efficient market for patents on the efficiency of the market for ideas flows through the two channels that I refer to on this slide as corollaries.

All else equal, it seems sensible to think that a more liquid market for patents increases the incentives to acquire patents, presumably through innovation. And secondly, a thicker market for patents allows greater specialization in innovation. A stylized factor observation is that many innovative processes seem to benefit from decentralized kinds of search in invention, carried out in a wide variety of different organizational forms. PAEs can contribute to that sort of efficient division of labor.

OK, last slide. Onto red herrings, so now for the red herrings. I've observed over the last few years that there's been an evolution in terminology in this area from trolls to NPEs to PAEs. And I'm probably missing other terms and acronyms here. I think that this increasing precision is useful.

But it also highlights the problem of trying to come up with a bright line type of definition here. It's probably unsatisfactory to fall back on Justice Potter's definition of pornography. I'll know it, when I see it. On the other hand, that may help us in an area, where trying to define a bright line rule is inevitably going to be problematic.

Second kind of a red herring is getting too focused on transfers. Economic models are fairly clear on the point that transfers from one party to another need not be inefficient. Many firms may be upset if patent assertion entities changed the calculus of a familiar type of bargaining game. But that's insufficient for there to be harm to competition, as opposed to a particular competitor.

The burden of evidence, we need to have some kind of evidence that increasing costs are being passed through to consumers or that PAEs are actually harming competition in some way before we seriously contemplate enforcement. Third, on the question of patent quality, we just heard from Dr. Graham that parts of the America Invents Act are designed to address perceived problems with patent quality. And the assertion entities are presumably justified in arguing that regulating their activities is not a solution to problems with patent quality.

And finally, the last remark I'd like to make. I'd like to raise this issue of what is the appropriate benchmark for making welfare comparisons of a world with and without PAEs? My impression is that many analysts adopt a model, sometimes explicitly and sometimes tacitly, brought cross licensing at low or zero rates among more or less symmetric firms that are typically vertically integrated. That is they participate both in innovation and commercialization.

I think this is a reasonable description of some parts of the information and communication technology sector in the recent past, but it is not the only possible equilibrium to an economic model of licensing. Nor is it clear that this is the only equilibrium we should expect going forward. Or that PAEs are a cause, as opposed to a consequence, of any shift away from the equilibrium. And so coming up with the right definition, the right benchmark, I think, is a complicated problem that deserves further research.

So in conclusion, let me reiterate, I guess that my remarks were not meant to establish the welfare benefits of patent assertion entities. And particularly, I only looked at one half of the welfare ledger-- the potential benefits. But I hope that you found these arguments thought-provoking and perhaps persuasive. And that they'll facilitate a discussion that focuses on harms to innovation and competition, as opposed to the effect on any particular competitor. Thanks.

HOWARD SHELANSKI: Thanks very much, Tim. Really appreciate that. Can you hear, when I speak into this microphone?

TIM SIMCOE: Yes, I can.

HOWARD SHELANSKI: OK, good, because that way you'll be able to hear the panelists react to you. And, well, there's a certain temptation to have them react without your hearing. I think we would probably be better to have a more interactive dialogue.

Well, we do have a wonderful panel here to comment, to, I think, make a number of points on their own, and, I think, to offer some reactions to what Tim has presented. And I would like to start with Ron Epstein, the CEO of Epicenter IP Group.

RON EPSTEIN: I thought I got sat at this end so I'd be last.

HOWARD SHELANSKI: Well, I've defeated your plans by listing you first.

RON EPSTEIN: Great. Hi, everyone. My name is Ron Epstein. I run a company called Epicenter IP Group. I mostly participate as a market maker in the IP monetization marketplace. What does that mean? So we've done over \$400 million worth of patent sales transactions and have participated in over \$1 billion worth of licensing transactions, not as an owner, but as an agent.

And my background is having spent most of the first half of my career on the buy side, as I now call it, otherwise known as the "dirty rotten infringer side." First being a lawyer at Wilson Sonsini, protecting small companies from the depredations of the portfolios of large companies. Then at Intel, defending Intel's microprocessor and promoting the depredations of large companies' portfolios on small companies, and then doing the general counsel thing before starting this business up. And launching into my comments, just to give you a perspective of where I'm coming from.

I thought the professor's comments were actually very on-point and very thought provoking. He mentioned a couple of key points, and I guess I would expand and emphasize on them. The first is the canard on patent quality. I think we can all agree that a large percentage of the patent estate in the US is not of great value. To borrow a statement from a good friend of mine, Mark Kaufman at Reed Smith, over 75% of the US patent estate is abandoned by the end of the second maintenance period. So we can look at the patent holders themselves and hear this news.

The second part is that obviously within the patent prosecution process you're filing patents years before the technologies are adopted. And as a consequence you're going to guess wrong a lot. And, oh by the way, that is you're going to file patents on technology that's not ultimately adopted. And oh by the way, the debate between the inventor and the patent office is usually a debate over whether or not this pattern should be issued, not a debate about whether or not this patent is enforceable. That's a different debate, happens at a different time.

Well, So. To summarize, let's all agree that there are in fact great inventors out there. And every once in a while, they're lucky enough to get a good patent that's actually enforceable. So I think we can all agree on that at some point.

The second comment is on, what I like to call, the sources of innovation. And the importance in often lost aspect of the importance of innovation by observation as a primary driver in our technology industries. What do I mean by innovation by observation? Pretty simple, you guys,

we're all familiar with the cell phone wars. Are each of those companies coming up with all those features by themselves, or are they looking at their neighbors products?

The day before the iPhone came out, there were cellphones, they did have Wi-Fi, they did have touch screens, there were app stores. All of that technology pre-existed the Apple iPhone. What they got to do was build a wonderful incredibly useful user interface on top of that. But those technologies came from somewhere else, right?

So where do these technologies come from? Real quickly, number one, internal R&D, by far the smallest source of innovation at large companies. We pay for that with R&D dollars, and R-side of that is constantly shrinking. The second sources is your-- what did you call them, the large vertical integrated companies, otherwise known as contributors-- your customers, suppliers, and competitors who were spending money in the same place you are.

And the third sources is from failed entrants, like universities, who, of course, are failed entrants, because they don't try to enter. But also in Silicon Valley with about 2,000 new companies started a year. And in the 25 years I've been doing this, that works out to what, 40,000 companies that have been started? If you look at the tech 1,000, the 1,000 biggest tech company makes about \$5 million to \$8 million a year. So that means almost every innovator in tech in the Silicon Valley has disappeared, either through acquisition or failure of timing on the market, or whatever.

So with that being done, it begs this question, what service does the patent system do to promoting innovation given that there is much innovation coming from this third segment, the failed entrants segment? And the importance of patents to that. But before I use up everybody's time-- maybe we'll come back to that at the end.

HOWARD SHELANSKI: Great, well, thanks so much, Tim. Did you have any reaction that you wanted to offer to any of the points that Ron just raised?

RON EPSTEIN: Maybe it makes sense for me to collect comments and observations from a few of them before responding? So nothing immediately.

HOWARD SHELANSKI: OK, that would be just fine. In that case, why don't we pick up with Anne Layne-Faffar from Charles River Associates, where she is vice president for antitrust and competition economics.

ANNE LAYNE-FARRAR: OK. Thanks. I wanted to follow up on one of the things that Tim was saying under the red herrings column, which is that PAEs may change the rules of the bargaining game. But this in and of itself isn't evidence of antitrust harm.

And I think, going back to what Ron was talking about, about the mobile wars, we see a good illustration of a lot of these issues. So if you think back to 2011, when there were a whole lot of patent auctions, patent acquisitions, and think about who was putting those patents up for sale and up for auction, I think we see examples of all of the PAE types of acquisitions that we've heard about thus far today.

So first you had some firms that were filing for bankruptcy, like Nortel. You had some firms that were exiting a particular market niche that was no longer profitable, like Motorola Mobility. And yet other firms like Nokia, where they were trying to monetize and sort of keep their portfolios fresh.

So those illustrate some of the potential benefits then from the PAE model, first being exit value, to the extent that you have more assets to sell after you've had a failed entry attempt. That's going to reduce the risk of entering in the first place. That makes entry more likely. And it also makes it easier to get funding for entry, if the funders think you've cut assets, that I'm going to get something out, if you fall flat on your face. And giving the high odds of falling flat on your face, that's a good thing.

In terms of the getting rid of or shedding divisions or business practices that are no longer profitable for you, this can also be highly competitive enhancing competition, because it helps firms remain flexible. So I may not be able to earn a reasonable profit on these particular assets anymore, but that doesn't mean somebody else can't. And if I just let them lie fallow, as opposed to turning them back into the marketplace, not only do the remaining players not benefit then, but I also lose the source of revenue that could be funding my entry into other divisions or helping me survive elsewhere in keeping me overall healthy and profitable and, therefore, competitive.

So I think it's important to step back and remember that, yes, the mobile patent wars and all of these patent acquisitions have a downside-- in that there's a lot of litigation-- there's some good things underlying this too that sort of emphasizes the positive role that PAEs can play. I think you can see this as well on the other side. So we just talked a minute about who was putting these patents up for sale and where the patents were sourcing. But look at who purchased a lot of them.

I know that at the initial auctions there was a huge fear that it was going to be PAEs who were buying Nortel and the Novell patents. But it ended up, instead, being new entrants into the mobile space. So it was Apple and Google with Android, and Microsoft. These are big well-funded firms, but firms that were not participating in the original standard development efforts for the mobile phones. They were big incumbent players, already in place.

We heard from them on one of the panels earlier, research in motion with Blackberries. They were huge. And these firms were able to enter this market and do so-- certainly in Apple's case and in Android's case-- in a highly successful way, in part, because of the market for patents. They could enter the downstream market without having to do a whole ton of their own, instead acquiring a lot of the patent assets that they needed to flesh out their entry strategy.

So again, I think we need to keep in mind that it's not all about the litigation aspect, that they're sort of good and bad involved in some of these things. Which I think then says that our panel is going to be hard pressed to focus only on the potential benefits and the later one only on potential harms. These really are two sides of the same coin. They're all mixed up together.

And you're going to have to accept some good with some bad. And then the question is, what's the ultimate trade off? What's the weight? And I think that goes then to the comments that Carl gave this morning about how much is lost in the bucket and what's the end calculus.

HOWARD SHELANSKI: OK, thanks. Thanks very much, Anne. I think I will have some follow-up questions on some of the points you've made. But I want to hear from the rest of the panelists first. So with that, we'll turn to Professor Adam Mossoff, who's come over to join us from George Mason. Adam.

ADAM MOSSOFF: Thank you. I'm happy to be here, even though I'm not an economist, nor do I play one on TV. I'm actually somebody who is a tech geek in my background and which is what got me in the patent law. I since have been doing a lot of historical research actually on the American patent system, and actually focusing a lot on past patent wars and the aspects of licensing that had made the American patent system historically so unique and successful.

And I think it's important to recognize the patent system, although has been recognized as promoting dynamic efficiency. It promotes dynamic efficiency in two, I think, and very important ways. In the first, of course, is by promoting new inventions. That's the one most people think of. But the other one, and it's just as equally important, of course, is promoting commercialization of those new inventions, turning inventions into usable technology, usable innovation that people benefit from in society.

Now, in evaluating these two aspects of the patent system, I think it's really important that our evaluation and our assessments be data driven, not rhetoric driven. Now, the reason why I'm emphasizing this is because, like my other co-panelists and others have noted, I do not like to patent the acronym "patent assertion entity", as it has evolved over the years from patent troll and what not. This is rhetoric.

We should really identify these entities for what they do, which is a licensing model. That's what they engage in. No firm wants to be in litigation. They sue when firms do not enter in licensing agreements with them, or they have difficulty getting their attention to try and enter into licensing agreement with them. Of course, there's always a bad actors, obviously in every system. But the majority of these people exploit the benefits of patent licensing to bring innovation to the consumers.

Now, in this respect I think there's three important points that I would like to make. The first is that we should recognize that, as a historical matter, there's always been a secondary market in patents in the United States. Patents have always been traded.

In fact, this was unique American approach. We broke with England. We created a new patent system. We recognized what it meant to secure your patents as property rights. Property rights are commercializable, they are tradable. You can convey them to other people, you don't just have to manufacture.

And this is exactly what early American patent owners did. Just a couple quick examples from the subject that I know well, which is I'm known for researching the patent war of the sewing

machine, which was called in the 1850s "the sewing machine war". It had a lot of similar parallels to our current so-called "smartphone war".

One of the early patent owners of one of the element of the sewing machine, John Bradshaw, transferred his patent actually to AP Klein and Edward Lee. Edward Lee then later a year later threatened another patent owner, Alan Wilson, for violating their patent. And, as a result of this threat from Klein and Lee, Wilson settled the lawsuit by transferring his patent to Klein and Lee. So that's so the patent, which was a commodity, which was valuable asset, he transfer to them as a way of settling this lawsuit.

Wilson then went on to come up with a bunch of other patented innovations in technology market. Also John Bachelder came up with a particular patent on some components for the sewing machine in 1849 and transferred those to Isaac Singer, very many people know from Singer sewing machine. So those are just a few examples of what was a very active prominent secondary market in patents, even in the early years of this country in the 1840's and 1830's.

In fact, one of my favorite classified ads from the back of A Scientific American. I think it was 1845. Someone was offering to sell a patent on a new type of an engine, called a Dynamo at that time, because they wanted to build a gate, a new gate for their fence. He said, I'll trade you my patent on this engine, if you give me a gate.

So now, why is this important? Well, I think it's important to recognize, because-- this my second point-- aggregation is good. Aggregation represents the division of labor and specialization in our society, broadly even beyond the patent context, right? I mean, this is corporate law corporations, and aggregations of copyright of property and contracts.

But even within patents, we've seen aggregation over the years. The formation of the very first patent pool in US history was the sewing machine combination of 1856, which was the solution to the sewing machine war of 1850s. And even more broadly what we know today now is aggregation is good, because we all benefit from it, because there's an aggregation of research and development.

So there's been creation of firms like 3M. And, of course, Thomas Edison's Menlo Park, which were invention factories, aggregation of inventors. And, of course, most modern corporations have research and development departments, which are aggregation of inventors. And so, obviously, aggregation of inventors has produced massive amounts of efficiencies in the creation of new inventions. And we should expect and have seen aggregation of commercialization on the back end as well.

And so it's little surprise that taking advantage of modern developments in corporate form-- they didn't have corporations the way we now have them in the early 19th century. Taking developments of modern technology-- email and all the wonderful ways that we can communicate. And taking developments in market innovations, a new financing mechanism, what not.

We have seen the development on the commercialization side of patents, aggregation of patents for purposes of deployment aggregation. Taking advantage of the exact same division of labor and specializations that had made the creation of inventions possible, we now have seen it being deployed on the commercialization and development of new technology. And, ultimately, innovation. Thank you.

HOWARD SHELANSKI: Thanks very much, Adam. Very interesting. I'd like to turn next to C. Graham Gerst, who is a partner in the Global IP-- or a member of the Global IP Law Group and get your reaction.

C. GRAHAM GERST: Last time I checked, yes.

So just a quick background on our firm. We were formed about four years ago. Early on we got engaged by Nortel Networks to help them with their patent-- really to figure out what to do with this treasure trove of patents they had. And we ran that monetization process to conclusion last summer.

My background, my personal background is primarily in the area of patent litigation. I spent some time at Justice Department as well handling IP and technology-related national security type issues. I was one of the original partners of Global IP. And the focus of the firm is on patent monetization through sales, licensing and litigation. But our real focus has been in the sales area.

And that's what I want to talk about a little bit here today in terms of establishing efficiencies from PAE activity. And the biggest point I want to emphasize is something that a number of speakers have spoken about today. And I know there's been some questions about it. But it's the question about whether or not the money through PAE activity actually does go to innovators.

And I deal with innovators and innovative companies every day. And I can assure you that the money does go to them, and it goes to funding further innovation. Let me just bring up a couple of examples of-- one from a transaction that I recently concluded and another that's currently in process, both involving PAEs. The first was on behalf of a public company that was really one of the seminal developers of DSL technology, which is a pretty important technology that a lot of us use in our homes every day. And this company had actually developed the largest single collection of DSL standards essential patents that existed in any one place through actually being the innovators that developed this technology. When the service providers were trying to develop DSL to allow communication using old phone lines for dial-up communication, they didn't want to spend the money on R&D. So they convened these meetings with a lot of smaller companies and asked them to develop the technology. And this company was one of those that really played a role in developing that technology.

Ultimately, the business has shifted, and they're moving into a different area, a different business area. And they had this giant trove of patents. And they wanted to try and get some return on that investment. So they ended up selling that patent portfolio this past summer. And that money has gone in some part to the investors in the company, investors who see potential in innovation and then recirculate that money into other innovative companies. And also to that company itself, which was able to dedicate some of those additional resources to its ongoing businesses.

The other transaction that I referred to is-- at least I hope it ends up being a transaction-- is on behalf of a portfolio company for a very large, well-respected private equity fund. And it funded a small company that had some really innovative ideas, made a go of it, but was unable to compete against a larger handset companies. But they came up with some interesting intellectual property.

The company is now, essentially, in a kind of a sell-off mode. And we are trying to sell that company's patent portfolio. And I expect, given the nature of the portfolio, it will end up in the hands of non-practicing entity. But that money is going to go to ultimately this private equity fund, which will then subsequently go and invest in future technology companies. So there is a real efficiency there in encouraging future innovation.

Now, one of the questions that was raised earlier today about whether or not enough of the money goes to the innovators and inventors. And what I can tell you is, if there weren't these PAEs out there, these innovators and inventors would not get anything. If your problem is they're not getting enough money, your problem is with the transaction costs of the US legal system. And that is something that's inherently US legal system. We have the largest most expensive legal system in this country. That's the problem, but that's not an issue that we're really talking about here today.

And the other thing that I would say is part of the reason why the transaction costs are so high is by activity by the large practicing entities, which absolutely refuse to negotiate with small tech companies, small individual inventors over licenses. One of the panelists earlier today said that that panel's company absolutely respects intellectual property rights. But I can tell you that that company absolutely refuses-- even when we make selling-type approaches, no assertion or anything-- would you like to buy this portfolio? They refuse to take a look at it.

And that's not uncommon. So these companies out there refuse to talk to anyone, unless they're sued. Somebody prominent from Microsoft several years ago at a panel said, look, don't talk to us. If you want any real money, you've got to sue us. That is part of why the transaction costs are so high.

HOWARD SHELANSKI: Thanks very much, Graham. Tim, do you have some reactions at this point that you would like to offer to what you've heard across our panel?

TIM SIMCOE: Sure. Just let me try to make two comments that tie together a few ideas that I've heard from the panel, and then throw out a question that people can maybe respond to or maybe not. So, in terms of comments, I liked Adam's point about the importance of data and empirical evidence in this entire debate. And I was thinking about that. And putting that up against the list that Ron gave us about where innovations come from and sort of the relative proportion that come from internal R&D and tech innovators and failed entrants.

It wasn't obvious to me that we know what those percentages are. And so my first comment is sort of an empirical mea culpa from somebody who works in innovation economics. And just a note that in the whole debate we need to be careful about equating patents to innovations. The

two are pretty different. But in the area that I research, we often do that, because patents are easy to count and innovations are really hard to count.

The second comment is but a reaction to Anne, who noted correctly, I think, that it's hard to separate these two sides. So this exercise, I think, is intellectually useful, the exercise of separating out the potential benefits from the potential harms, but they're closely interrelated. So at the risk of undermining Iain-- since standard essential patents came up a few times, I have to say that one of my worries about PAEs is that some of the gains from trade may come from undoing things like FRAND commitments.

And then, lastly, let me put my question out there. Maybe the panelists will agree with this assertion or maybe they won't, but I think it's often useful to view litigation as basically an indicator of uncertainty. And I have seen empirical evidence that assertion entities hold many unusually highly litigated patents. And so my question to people who are out there doing this sort of licensing and litigation is, what do they see as the fundamental source or nature of the underlying uncertainty, if the assertion that litigation is really about uncertainty is right.

RON EPSTEIN: Well, can I take a shot at that?

HOWARD SHELANSKI: Yeah, sure, go ahead, Ron.

RON EPSTEIN: I'm going to first say that I completely disagree that litigation is a sign of uncertainty in this marketplace. It's not. It's the marketing program of the licensing business. Or let me put it a different way. I've been doing licensing for 23 years, and let me give you my "hyper oversimplified and yet still covers 97% of the transactions I've seen in my career" model.

There are three segments in the licensing model. The first segment I call the early adopters segment. This is the-- I can't remember the Latin word *ex pre* or-- part of the market. This is when a technology is first been developed. The potential licensee knows who the inventor is, is making a decision about whether or not they're going to adopt that technology by deciding whether or not they're going to take a license from that inventor.

It's in those situations where you tend to see whole integer royalties negotiated. Their alternative is not to do the technology and do someone else's. And why are they looking to use that technology? Two simple reasons.

Number one, price elasticity. And number two, market share, right? So they see, I'm going to pay you money in return for this technology, because I'm going to get better pricing or market share. At best, in a licensing market, one to three players take licenses in their category. At best.

The second category, which often disappears in licensing marketplaces, is what we like to call the ethical adopters. These are the folks who were saying, well my competitors have adopted this technology, and I can't make any more money by having it. And I can't gain any market share by having it, but I can sure as heck stop losing market share and maintain my prices if I have that product line.

But I'm reasonably ethical. I know who the inventor is. This is very true in standards licensing, by the way. I know who the inventor is, and I'm willing to negotiate a license. But that license is going to be at a much cheaper price than whole integer royalties. It's going to be a fraction of an integer royalty, and it will usually ultimately end up being summed up into a single lump sum payment of some kind. That's maybe 10% to 20% of the licensing market.

The final portion, which is somewhere between 75% and 100%, depending on how fundamental the technology is. That is the more fundamental, the more likely this is to be 100%, is what I call everybody else. We can come up with epithets like troll later to apply to this marketplace, but here's the fundamental economic transaction.

I never heard of the inventor and I don't know where this innovation comes from, and I don't care where this innovation comes from. My competitors have this feature, I'm putting it in my product. And the financial transaction in that situation is the licensee saying to the licensor, you want me to pay a royalty, you and what army? All right?

So where does litigation fit into this? It is not a sign of uncertainty. It is the marketing plan. It is because the licensee is in this third market, otherwise known as the everyone else market, aren't taking a license, unless you bring an army to the table the force them to do it.

So why do the PAEs exist? Because the cost of entry at that market as much as I've heard-- and I spent most of my career on the defense side-- as much as I've heard of how expensive it is to do the defense side, let me tell you, costs just as much, if not more, on the other side. And they have to find financing to go after that.

PAEs are simply arbitragers. They are simply an arbitrage. In every market I'm aware of, there is an arbitrage. It's not shocking that these patterns that are worth more than nothing, for which the patent owners were getting nothing, an arbitrage showed up. It's not shocking. And that's really the service at play.

ADAM MOSSOFF: Litigation can be the result of a well functioning market. Litigation can be the result of a legal uncertainty. But we see high litigation rates, you don't know which is the cause. You can't just say there's a high amount of litigations, so therefore this is legal uncertainty or these are bad patents. You have to get into the data.

But it's interesting to note, just as a general point, that we hear a lot about, oh, litigation today is so horrible, so horrible, so horrible. Average patent litigation rates-- not a lot of people know this-- are around 1.5%. Do you know what the average patent litigation rates were between 1790 and 1860? 1.65%.

FIONA SCOTT MORTON: There is a difference.

ADAM MOSSOFF: Well, these are normalized against the number of issuing patent, right? But that's your baseline, right? They're not just adding up. But that's an important difference. That's an important difference. So yeah, you're right. If you normalize what patent litigation is.

C. GRAHAM GERST: But not for patent quality.

ADAM MOSSOFF: Well, but see, no one can even agree on what's the standards for patent quality. Now--

C. GRAHAM GERST: It might changed in 200 years.

ADAM MOSSOFF: Well, people think. But, again, data is-- what's the data on that? People think, people have intuitions, but there's no real data. Now, interestingly enough, patent litigation rates didn't stay at 1.65% every decade, they fluctuated substantially in the first 60 years of US patent system. And in the decade that they skyrocketed, from 1840 to 1829, it went to 3.6%.

Now, the only significant change or the thing that people were litigating over-- actually, I've read every patent decision in the 19th century, and I have to confess, there's about 1,400 of them in the court reporters-- is the 1836 Patent Act. Now, that's an example of legal uncertainty causing litigation, because there were a lot of new provisions in the 1836 Patent Act. People were litigating over them to resolve it and things of that sort.

Litigation rates then collapsed in the 1850s again, even during the sewing machine war, when there was massive amounts of litigation at that time. And the sewing machine war really did have all of the attributes that we now associate with the smartphone war. Lawsuits in multiple jurisdictions, defendants and plaintiffs both being both defendants and plaintiffs in multiple different lawsuits. Complaints of excessive cost.

I mean, this is a time period before typewriters, before computers, telephones. Elias Howe had to risk his life and limb to go to Isaac Singer to ask for a license-- you talk about manufactures rejecting license offers-- He had to go and visit him personally. Isaac Singer tried to kill him. And he went twice.

C. GRAHAM GERST: It's not that bad anymore.

ADAM MOSSOFF: Yes, today you get a hotly worded email or FedEx letter in response. And Elias Howe then was so destitute that he had to sell security interest in his patent in order to bring his lawsuit. He's one of the very first users of third-party financing, as well as selling a security interest in his patent. Now, was it efficient for him to be the one bringing a lawsuit? Or should he have turned it over to someone who actually had the capabilities and benefits to do it better?

FIONA SCOTT MORTON: I'd like to just ask a question to the panel. My name is Fiona Scott Morton. I'm the deputy for economics at the Justice Department. And I spent a delightful six hours in Bradley airport this morning. I look forward to hearing about this morning. And I'm sure it was better than the airport entertainment.

But what I'm hearing a little bit here is a call for empirical work. And a couple of points that came up on the panel, I think, were asserted without really us having the data to do that. So, for example, do patent assertion entities aggregate or do they disaggregate? Right?

We can think of it either way. They're aggregating, if they're buying up each individual inventor's patents. But they're desegregating, if they're buying Nokia's patent portfolio and splitting it up. So I think that in terms of value weighted, we might want to know the answer to that.

I also think in terms of stimulating innovation. Well, it's true that the bondholders of Nortel did fantastically well out of this. Was that really what causes Nortel to be founded in the first place? Did the founders of Nortel think for themselves, some day in 25 years, when we go bankrupt, our bondholders are going to get a lot of money. And that's why everyone should invest in us.

So there's some scenarios, where you can see, like the small Silicon Valley guy, who maybe can sell out or get venture capital funding because he's got a couple of patents. And there are others, where we think probably that that was not really a motivation. And we should be able to look at these markets and try to measure that.

RON EPSTEIN: But the motivation is the value in innovation. And we have the most innovative economy in the world. And we also have the most robust patent enforcement system in the world. And perhaps there's some link between those two things.

And this notion about regulating and getting involved in the regulation of this market, when the data that we have, several panels have noted that we have real dearth of data here. And the data we do have is pretty suspect from what I've seen today. So to jump in and try to regulate a very complex ecosystem that is not fully understood and is also one that's evolving very rapidly.

The marketplace today, both for enforcement and for transactional work, is very different today than it was 16 months ago. And so to try and gather empirical data, it's always going to be lagging. So we run the risk if we start regulating without the right analysis behind it to doing some real national harm. At a time, when the rest of the world is trying to bolster their patent systems, we are engaged in a process where we're weakening ours, which may not make a lot of sense.

ANNE LAYNE-FARRAR: If I could just add a little bit to that. So I think the other side of the Nortel thing is who got the patents? And you may say, well, they only got them for litigation, and litigation is bad. But that brings us to the question of how much litigation is needed in order to have a real meaningful patent? It's a right to exclude.

If the other side knows you can't enforce it all, of course, it's worthless. So there's some amount of litigation that has to go on in order to make this a meaningful right. But what is that amount? And I don't think we really know the proper benchmark or counterfactual for that. And so in the meantime, while we are trying to collect this data and figure that question out, it can be quite useful to entrance to a market to say, OK, I don't have to do all these patents myself, let me buy some. And then I'm on equal footing, at least in the litigation that I have to face.

RON EPSTEIN: Can I add two questions to the questions you're going to look at empirically? One is what is the correlation between highly innovative markets and lots of patent litigation? I would argue that the highest areas of patent litigation right now are mobile telephones-- or

mobile computers, I guess, we're now calling them-- television sets, retail models, retail-like internet commerce.

Well, that sounds like the same three markets we think are moving incredibly surprisingly fast. I don't know how about you guys, but I seem to get the need to buy a new TV every three or four years, because they change so much and they're innovative so fast. And we all know that's true for handsets.

So one question I think is this whole debate a canard? Is it in fact? Is this patent assertion litigation in fact negatively affecting speed of innovation in the markets where there's an awful lot of litigation? I'm not sure I've seen a lot of work on that.

And secondly, one might look and see how seriously this problem is really being addressed from a business perspective before government regulation starts. For example, when I had a survey of chief IP counsels and I asked them, how much money they were spending on patent prosecution for each head that they have internally managing patent prosecution? The answer is around \$2 million plus or minus.

That means for every \$2 million they're spending on that, they have a head managing that. How about for patent litigation? Turned out to be closer to \$20 million to \$30 million. So here's my question, they're spending \$20 million to \$30 million on patent litigation for every person they have managing patent litigation. Obviously, lower in some places and higher in others.

Well, that begs an awfully interesting empirical question, has this yet been embodied within the economic model? That is knowing that innovation is coming from outside, people like failed entrance and people like your competitors. Are you devoting the adequate resources to determine the value of that thing prior to litigation being filed?

My experience is no. You have to file litigation just to get high enough on the list to get intelligence applied to the patent debate. That is in-house counsel are awfully hard working people, and they're usually way understaffed. And is there even organizational structural elements that are hidden behind this debate on litigation ?

HOWARD SHELANSKI: I'd like to follow up with a question that I think picks up on a couple of the themes that have been raised. One thing I would just note on the empirical questions you just raised, Ron, is that there is a big counterfactual that would not be picked up in any data. And I think it harkens back to some of the things Stuart Graham raised in his talk, but to the extent that there are people who think that there is too much uncertainty, too much of a mine field out there.

Small innovators going forward, not being able to discover what is protected by a patent. And if so, who owns that patent and who to talk to. It would be very hard to pick that up in sort of any empirical analysis of the type that you suggest. So It's just something we need to keep in mind as we do that analysis. So I don't think you disagree.

RON EPSTEIN: I don't disagree at all.

HOWARD SHELANSKI: But it does make it quite unclear what the results would be. We're hearing a couple of different themes. And one thing that I think, Graham you've probably pushed most forcefully on this panel, is the notion that an entity that at the end of the day is there to monetize patents that failed entrant the firm, somebody has lying around, is providing a very valuable function.

And I think actually the emphasis on pass-through to a future innovation may be we shouldn't go too far in doing that as the only value. You may actually incent innovation today, just by letting people to know that, even if I can't reduce this to practice, even if I can sell this in the first stage of the market that Ron alluded to, there is going to be some entity out there that may help me monetize this.

So I could see how there's some real benefits to innovation there, but, of course, lots of questions in then, what the assertion entity subsequently does with the patents. And I think there is a big difference in whether they're aggregated or desegregating. Carl Shapiro made that point, I think, this morning, where you can start to have real problems when you have to subsequently license each small tranche of what you need to go forward with innovation. It can really add to the cost. So, well, I think there are clearly some benefits and a lot will depend on what the actual business models and the actual practices are.

Going to a point that Anne made. You painted a very rosy picture of some--

ANNE LAYNE-FARRAR: Which you asked me to do. I'm on the potential benefits panel.

HOWARD SHELANSKI: That's true. Thank you for presenting the very rosy picture of acquisitions of large sets of standard essential patents. And you've painted Apple and Google as humble entrants who--

ANNE LAYNE-FARRAR: Not humble, but entrants.

HOWARD SHELANSKI: But entrants who've gone forward, acquired these patents and used them to enter very successfully. And there's a huge payoff to that. There is also a cost to that, and the cost is, when you take the standard essential patents from entities that maybe weren't going to practice them, or were not going to enter or not able to produce a smartphone, and then transfer them to somebody who has this downstream competitive interest, you make it a shift in incentives for licensing those standard essential patents.

So before the transfer, fine, we'll license them on friend terms. We don't have a horse in the downstream race. Now you transfer them to that entity, which finds them most monetizeable. This big powerful entrant, like an Apple or a Google. And it's great they use them to enter, they can really get a lot of value out of them. But their incentives for follow-on licensing, for licensing to potential rivals, are much less. So there's a trade off there.

Now, we're not talking about these firms that are acquiring large patent portfolios. What about patent assertion entities? And I guess the question I have is, should we think very differently about pure patent asserts from the entities? And those that are somewhat hybrid in form, and are

connected to firms that are also participants in certain downstream markets, for which their patents will need to be licensed too a real new entrant?

ANNE LAYNE-FARRAR: Well, yes and no. And I would say both because one, I think to go back to some of the points that were made this morning-- which was very good, by the way, Fiona-- it's really not a business model that we're upset about. I mean, aggressive litigation, seeking to foreclose, excessive royalties, non-friend licensing on SEPs-- that can be done by anybody who's got a patent, whatever their business model is.

So I understand the need to make these distinctions between a pure PAE and a hybrid, and a vertically integrated firm and such. But it worries me to think in policy terms in those buckets, because, what I think we should be focused on, is not the business model, but rather the conduct. And what conduct do we have problems with? And how can we stop that anti-competitive conduct without squelching different business models that are going to have upsides, as well as downsides and might lead to other kinds of innovations? So that's that. I think we need to be careful of that.

FIONA SCOTT MORTON: But just remember that a business model means there's an incentive. And an incentive means you get conduct. So these things are not-- a business model and conduct are not unrelated.

ANNE LAYNE-FARRAR: No, but I think there's incentives to foreclose rivals or to gain excessive royalties, whether I'm practicing or not practicing. And in fact, some kinds of bad conduct, like the foreclosure, is higher with vertically integrated firms than it is with the non-practicing entities, because they want the royalties.

FIONA SCOTT MORTON: Yeah, one of the things that no one on the panel has said, but I think makes a nice summary of some of this discussion is that PAEs are neutral. That meaning in the sense of if there's a market out there with four widgets competing with each other, the PAE wants dollars, and doesn't really want a particular widget to win.

C. GRAHAM GERST: Sure enough.

ANNE LAYNE-FARRAR: And in that sense they can expand the market, because they're trying to license everybody.

ADAM MOSSOFF: But that was exactly Elias Howe's role in the sawing machine industry He was the only non-practicing entity-- I always come back to sewing machines. I am the sewing machine guy-- And he actually got the sewing machine company to agree to a minimum of 25 licenses a year, because he made all of his money from licensing. He didn't manufacture.

And he was in-- my concern here is that how people have defined a patent assertion entity. He would fall under that. Because he came back from England after trying unsuccessfully to commercialize his patent into England and found a lot of people infringing his patent. And went to them and said, you're infringing my patent on the lock stitch. And they said, sue me. And so he had to sue them in order to get his due payment for his licenses.

And he started the sewing machine war. But he also was key to the sewing machine combination being very successful. And a lot of extensive dynamic commercial innovation that came out of it.

HOWARD SHELANSKI: Well, thanks so much. I want to give Graham and Ron, if you want, to take a very brief last word. And then we'll transition to our harms panel, because, I think, we're starting to move over to a bit of that focus here.

C. GRAHAM GERST: The only other thing that I would say, one efficiency that we haven't talked about, market efficiency, is the fact that a patent-- even inside the friend patents. Patents that are non-friend, a practicing entity today can get an injunction and preclude others from the marketplace, whereas a non-practicing entity, unless one goes to ITC, which is a fairly rare occurrence, cannot.

And so to the extent that you do you want a more vibrant marketplace, there's some reason, perhaps, to allow assertions by non-practicing entities, because if those patents are used by practicing entities, they can make the whole marketplace a lot less competitive. And I mean, if you read Judge Posner's opinion in the Motorola-Apple case, the concern there is about injunctions. He was sort of hoping that the parties would just come to some sort of monetary resolution, which is what non-practicing entities are seeking to do. Whereas the parties are kind of at each other's throats, because they want to exclude each other from the market.

RON EPSTEIN: Yeah, I guess my final comment is I think PAEs exist as a necessary arbitrage in this market, given the costs involved. I don't know that it's inherently evil for someone who did not invent the invention to enforce the patents, otherwise how would large corporate assignees have any more right than the other individual companies? But I think it begs ultimately the question of what is the value of the patent system, vis-a-vis innovation? That is, is it an inventor of innovation?

Every patent inventor that has come to me and asked me to sell their patents-- and I'm sure this experience has come to you as well-- had spent the work, filed the patent for a reason, typically, which was they had dreams of riches. So everybody files these, especially the individual inventors, which are roughly 50% of the patent estate. Especially the individual inventors choose not to buy a new car, choose not to remodel the kitchen and spend that \$25,000 to \$100,000 on a patent portfolio, because they have dreams of riches. And the PAEs provide liquidity in an otherwise illiquid market. And, ultimately, is this valuable?

I like to use the analogy of the X Prize. How many all familiar with the X Prize? I keep mentioning it, and people ask me what it is. Well, the X Prize is this organization that gives out these rewards. Like \$10 million to the first company that successfully launches a private space vehicle twice in a week. They gave away \$10 million. It ended up generating \$100 million in investment in space vehicles across 10 teams, right?

NFL, so 200,000 guys go out to play some form of college football, and every year 250 of them make it to the NFL. Every year 80,000 women participate in competitive gymnastics. Every four years five of them make it to the Olympics, right? It's not a question of optimizing each individual transaction, but rather a systemic question, which is, does this liquid market ultimately

provide an incentive to innovation? And I think it does, as the thing that holds out all these people trying to continue to invent.

HOWARD SHELANSKI: OK, well now for the counterpoint. I'd like to thank our current panelists and invite up the harms panel.

[APPLAUSE]

HOWARD SHELANSKI: OK, if we could bring everybody back in so that we could continue with the panel and try to stay reasonably on schedule. OK, so the last panel focused on efficiencies of patent assertion entities. This half of the panel will, in our somewhat artificial way, now focus on some of the costs of potential harms of PAEs.

And to kick us off with this discussion, we are fortunate to have Iain Cockburn, who is a professor of economics and finance at Boston University. And, Iain, your cover slide is up. The floor is yours. And just tell me when you need to be advanced.

IAIN COCKBURN: Great. Thank you. Apologies for not being there in person. We did see this educational spectacle of our junior senator from Massachusetts trying to use his senatorial privilege to get the airlines working this morning. But, apparently, Senator Brown was unable to do that.

We exhausted our stock of puns about lame ducks and then flying and so forth in the course of the lengthy wait. Though I'm pleased to see that Fiona managed to get through this. And we can draw our own inferences about the executive branch versus the legislature from that.

I will try and go through fairly quickly here a list of what I believe a potential costs imposed by patent assertion entities, or at least categories of costs, where I think there's a good economic argument to suggest that these may exist and may be significant. I'll echo other participants' remarks that I think this is both something, where, I think, evidence is in the process of being accumulated. And also it can be very difficult, I think, in practice to tease out what we actually care about, which is the net impact of PAE activity on innovation and competition.

So I'll cover four categories. If you could go to the next slide. And try to do so relatively expeditiously and not to steal too much thunder from the other participants. So we go to the next slide, overcompensation. Now, this has been much discussed since Mark Lemley and Carl Shapiro and others started writing down models which would demonstrate the nature of a PAE, maybe such from this activity, maybe such that the kinds of awards given through litigation, or the threat of litigation, maybe, in some sense, too high, relative to some benchmark we may care about.

Why should we worry about systematic overcompensation if indeed it is large and pervasive? Well, one thing is that the royalty rates generated through the litigation or negotiation about the prices in the market of technology. And if that's somehow some institutional set-up, which results in these prices being wrong, then, from an economic perspective, we're likely to see misallocation of R&D, which responds to these price signals.

Another way in which royalties or settlements or so forth being too high may matter, is the extent to which they pass through into end user prices and welfare losses to consumers generates a familiar kind of distortions we're familiar with in terms of the double or treble modularization, as we look at the value chain of an industry. And thirdly, I think that's at least a possibility that the pricing going wrong in this market is going to somehow skew perceived risk reward to innovators and, therefore, affect the pace of innovation.

Let's go to the next slide. That last point, I think, bleeds through into the question of why I'm calling it resource diversion. As we think, or often tend to think, about innovation competition as taking place between, if you like, horizontal competitors, and worry a bit about the transfer of economic rents between these innovators, as was pointed out by Tim earlier, I think here we're probably not *prima facie* worried about the impact of this. Whereas if we may be concerned about the transfer of money between innovators and PAEs, as if this results in large amounts of resources, if you like, exiting circulation from within the innovation economy.

So these are payouts going to investments in PAEs, which are not finding their way back into investment in R&D. I think there's-- and we probably believe this-- likely to be some impact, potentially large over the long term on resources going into innovating of new products and services. And that's probably something we care quite a lot about.

Another thing which PAE entity may do is just raise the level of litigation activity, which generates unavoidable costs. And to extend these are not associated with productive activity, this is the kind of thing which economists have historically worried a great deal about. I don't know how much the equilibrium level litigation has raised by the PAE business model. Or I know people have started trying to tabulate these costs. But I think it's, again, another potentially important category.

Third point here, I think, is one which, again, bears some thought, which is where the opportunity costs of the talent and money, and resources that are soaked up by PAEs in the course of their business. If these technologists or patent lawyers, or other people involved in the process, could be working directly on the innovation, rather than on assessing the value of these assets. That might be something that is a concern. Dr. Graham probably knows better than me, but I think there's at least the potential that people discover these arbitrage opportunities in creating patent rights without any real intend to commercialize them. We saw these bursts of this during hiccups like the business method patent explosion following State Street.

And maybe that the PTO is being unnecessarily burdened with people rushing out, cracking open a microeconomics textbook and then filing dozens and dozens, and dozens of penned applications on well understood principles, except for a web browser. Now we've moved on from that, but I suspect that the vigilance and incentives of the PAEs may lead them to be looking for these wrinkles in a way, which is not helpful to the PTO, helpful to the system.

The final category of diverted resources, which I think is worth thinking about, are the kinds of responses that are a high level of PAE activity, might induce in terms of the people who are innovators, or producers of innovative products. That is to say the prospect of hold-up in the future, or having to deal with sophisticated and effective assertion entities, I think it's quite

conceivable this will lead people to abandon projects there some way down the line. Then they'll realize, whoa, this is more trouble than it's worth to try to pursue this in the face of anticipated vigorous assertion of rights, which weren't clear to this entity when it began spending money on R&D. So that they abandon projects or diversion of innovative effort into solutions, which are second best but are believed to be non-vulnerable to exposed hold-up.

That may be the case that companies or institutions who'd believed themselves to be particularly vulnerable to PAEs, may spend money, which has scarce resources on acquiring large amounts of IP, which are not central to what they're doing. They don't believe they are particularly helping them, but are there to stop them from falling into the hands of PAEs.

Let's go to the next slide. I've titled this unpooling. I think it's an ungainly term. What I'm referring to here is the challenges that are created when we think about large portfolios of patents or other kinds of IP, which are strongly complementary in the sense that it is very difficult to tease out that the value of any individual component or subset, or sub-portfolio. Within the world of innovators and producers, I think that industry practices being to take these portfolios and think about them in terms of a specific technology in a specific product and to license or price the portfolio on that basis.

An entity which is purely focused on maximizing now the value of this IP and trying to capture it, it may go through is unbundling exercise. So rather than licensing 1,000 patents for x%, you may try to turn that into five portfolios of 200 patents, each of which is attracting a similar royalty. You can see these paradoxes can arise very easily, where the value of a portfolio as a whole doesn't easily separate into the value of its components. I think that is one of the phenomenon potentially underlying systematic overcompensation.

We'll go to the last slide in my deck. Here I listed out where I think there are potentially deleterious impacts on the competitive process and the pace of innovation. So one thing we see in many industries is, if you like a truce between major innovators and R&D spenders, the threat of entering into mutually assured destruction types of suits and cross suits over intellectual properties, one of the things which, I think, leads to the pervasive phenomenon, at least historically, of large scale cross licenses. Now, to extend that these are efficient, or are better than alternatives we can think of. The appearance of new entities who don't play by the rules have different cost-benefit calculus, may start to break apart this delicate balance and result in not just the litigation or enforcement activity of the PAE, but result in this collapse of detente, if you like, between the existing parties.

I suppose, at least in principle, you could imagine a very well funded and very vigorous entity managing to accumulate enough intellectual property to have a dominant position and significant market power within the market for IP. I don't know that I've seen that jump out at me, at least in the industries or cases that I've looked at. But I suppose it's at least possible. And we may care about monopolization of upstream intellectual property. I suspect this may be a topic for discussion in the next panel, where, no doubt, they'll be some reflection on the guidelines for antitrust and licensing.

Another antitrust type issue-- and I don't want to steal thunder from the next panel-- is at least the possibility that the presence of a PAE can create a situation, where one product market competitor can come up with a contractual arrangement with a PAE, which in the end results in this product market competitors being able to successfully raise its rivals' costs and distort competition in the ways that the agencies are often interested.

Lastly, and this is to pick up on something that Tim said earlier, and it, I think, has probably come up a few times is-- I'm calling it time consistency. This notion that a next post mover can break apart contracts that were entered into, for example, over a pool of patents containing standard essential patents and then friend licensing agreements, that may have been constructed privately and with some degree of social efficiency to solve these problems with portfolio evaluation and so forth.

Another entity arriving on the scene, he doesn't have the stakes in the product market and can, if you like, acquire some of these assets ex post and try to renegotiate these terms. And it's obviously a big headache. Lastly, and I'll leave off on this point, and I think we used to spend a lot of time in innovation economics worrying about the shoulders of giants problem and sequential innovation, and reflecting on that.

The very interesting papers written by Suzanne Scotchmer, Jerry Green, and Ted O'Donoghue which make the, I think, very important point that incentives to innovate depend a great deal on the prospective division of surplus over time between the original inventor and then a series of improvers. Now, I won't pretend to have thought this through in any depth, but I think it's certainly an important possibility here that a PAE who's not engaged in the activity of innovation, is not concerned looking forward about this division of surplus issues and providing enough incentive for future improvers to come along, and keep moving the technology forward, may break the equilibrium or the explicit or implicit contract in the sequential incremental innovation process.

So, I'm afraid, it's a fairly long laundry list. I'll reemphasize I think what to me that critical question, which is the empirical data, which will help us understand the magnitude of these effects and the value of thinking about these problems holistically, and trying to look at the net benefits versus costs in a particular competitive context. So thank you.

FIONA SCOTT MORTON: OK, we have a fantastic panel here to discuss harms. And I think we will kick it off with Robin Feldman. Take it away. Thank you.

ROBIN FELDMAN: Thank you very much and thank you to Iain, the voice from above. The potential harms that Iain identified have to be understood against the backdrop of uncertainty within the patent system. This is not just because the Federal Circuit overturned so many trial court decisions and patents, which it does. But it's because it is very, very difficult to actually know what a patent covers, even at the time that the patent is granted.

It's whatever words we choose to describe the invention, those words will be measured against things that didn't exist at the time that we chose them. And it's very difficult to know what words we're going to need. So patent drafters deal with this problem by trying to create a library of

terms within each patent that they can draw on, depending on how the different products emerge in the market, and how the negotiations over each particular patent bargain unfold.

It's difficult for the individual who has the patent or even the individuals drafting the patent to know what terms they're going to need. It's difficult for the Patent and Trademark Office examiners to know which terms they're going to wish they hadn't given you. And that's true, even if we gave patent examiners all the time in the world to do the job that we are asking them to do.

And so within this structure of uncertainty, you create the type of market that is right for the harms that Iain identified in terms of companies being able to bargain, or patent holders being able to bargain for far more value than an individual patent is worth, or than a handful of patents might be worth. It's something Iain talked about, and a number of our speakers today have alluded to.

Now you add monetization into this particular landscape. Monetization in which patterns are stripped from any underlying product, they are operating essentially as a commodity on their own that can earn a reward through litigation or through licensing. They are tradable, and now they are being traded. That is the new level that you have to understand and look at as a market of its own. I think it's useful to think about all of the harms that Iain raised on two levels. So the first level is in this market for patent monetization itself. That is the buying, selling, and the trading of patents.

It is its own market, and as with any market, it is subject to manipulation if there's not any regulation of that market. At the moment, there are virtually no constraints in that market if parties in that market were to wish to collude, to divide up the market, to manipulate that market in various ways. It has arisen so quickly that we are only beginning to think of it as a market on its own.

That's the first level of harms I think is worth thinking about. The second level of harm relates to the individual intellectual property markets underneath the layer of the market for patent monetization. So Iain alluded to the fact that we might have a potential concern that a patent assertion entity might acquire enough intellectual property in one particular product market that it could influence the cost of products in that market.

I would like to suggest that in this new world of monetization, the problems may run even deeper than that. So it may be that you don't need power in a particular intellectual property market in order to affect goods prices in that market. So let me give you an example. Suppose you are an automobile manufacturer and I have a patent in the banking industry.

And I knock on your door, and I say my banking patent effects reads on your automobile. Now, that may be an absolutely ridiculous argument, but if I have enough ridiculous arguments to make and I am willing to wave them at you, and I have a reputation for tough tactics in waving these at you, then you, the automobile manufacturer, may decide that it's worth just paying what it is that I demand.

And so may everybody else in the automobile industry decide that it is worth paying what I demand. I have exercised a potential power over the price within that market. And I have done that with perhaps even just a few mediocre patents in automobiles, a lot of other patents, and a reputation for tough tactics. I think those are the types of harms that one needs to think about in thinking about how this market for monetization is developing.

And in thinking about these two level of harms, I think it would be an important step for regulatory industries, I'm sorry, for regulatory agencies if we begin to think about the market for patent monetization as a separate market, and to understand that it may operate in unusual ways.

Finally, I would like to comment on something that I've been hearing about a lot this morning, and that is the potential difference between defensive posture versus offensive postures within patent entities, licensing versus litigation. Whether there is a difference between those. I recognize that there are a lot of strong emotions about whether defensive is positive, is it different from other types of patent assertion entities.

And I would just like to suggest that it's not clear to me from a harms perspective or at the end of the day that there is a difference in this type of posturing. And I'd like to offer a hypothetical, and it really is a hypothetical. It does not reflect anybody's behavior, but I think it will help me explain what I consider is troubling about why in theory it may not make that much difference.

So imagine that I have a bag full of patents and I knock on your door. And I say, would you like to take a license to my patents? The operating company says no, go way. Sometime down the road I transfer some of my patents to a nasty third party that now goes back and sues the operating company.

After an extended period of time, a lot of money spent in litigation, a settlement value that's above what I was offering for my bag of patents, that eventually settles. I now knock on the same operating company's door again, and I say, I have another bag of patents. Would you like to license this? They may be much more willing to license my patent at that point.

When you think about the company that's offering its bag of patents, even though it has never litigated anything, has never sued anything, it is benefiting from what is happening in this entire system. So the price at which that entity sold its patents to the nasty third company, that price takes into account the litigation value.

At the same time, that entity's ability to get future operating companies, even the same operating company to license its portfolio also benefits from the entire system that has happened from the transfers that are occurring. My point is simply that at the end of the day, it is not clear to me that having a defensive posture as opposed to a litigation posture matters.

And finally, in terms of a defensive posture and a defensive perspective. From an antitrust perspective, there is always a concern when competitors get together, even for defensive reasons, that there is a temptation to bash everybody who is not in the room with them.

Or to use whatever the defensive mechanism is in a hub and spokes manner so that the defensive hub becomes the hub in a hub and spokes anti competitive enterprise. So I want to thank the FTC and the DOJ for putting together this remarkable day of discussion.

FIONA SCOTT MORTON: Thank you very much, Professor Feldman. All right. I neglected to give a title last time, which is my mistake. So next we have Michael Muerer, who is a professor of law, and a Abraham and Lillian Benton scholar at Boston University. We have a high proportion of Boston University today, which must reflect favorably on that institution.

MICHAEL MEURER: We sure do, but I'm the only one that made it here today, and my flight back was canceled. So I hope someone can put me up for tonight.

SPEAKER: Your economist colleagues were simply much more efficient.

MICHAEL MEURER: They were, they were. The issues raised today are vitally important. Society needs an effective policy response to socially harmful patent litigation, and my best evidence on this point comes from Zach, my eight-year-old son, who was nearly brought to tears when he overheard me talking about a patent that was asserted against Notch, the creator of his favorite computer game, Minecraft.

I reassured him that Notch was not a bad person, and the game will probably continue to be available. But there's no end to the interesting anecdotes that we can mine, but I think Iain's probably not going to be content to hear me talk about more anecdotes, so I want to talk about some of the research that I've done relevant to the patent system generally, and to PAEs in particular.

So for a long time I studied the successes and failures of the patent system to incentivize innovation, and to perform like a healthy property rights system. In my book, Patent Failure with Jim Bessen, we conclude that based on research, covering the period from 1984 to 1999, the patent system does indeed reward chemical innovators, including those in the pharmaceutical industry.

But for most kinds of technologies and most other industries, the patent system imposes a tax on innovation. So please observe that we reached that conclusion studying a time period during which PAE activity was insignificant. We reached our conclusion by estimating both the costs imposed by patent defense and the profits derived from owning and enforcing patents.

Recently, Bessen and I conducted two new studies using data from the decade of the aughts that focus on the costs of defense against NPE lawsuits. Likely most of those are PAE lawsuits, but we were using the notion of NPE instead. The first study relied on a survey that was done with the assistance of RPX.

And the direct cost of patent assertions are substantial, according to that study, totaling about \$29 billion of accrued cost in 2011, including the costs of non litigated assertions. Importantly, this figure excludes various indirect cost to the defendants' businesses, such as diversion of resources, delays in new products, and loss of market share.

In the other study, we're able to measure direct and indirect cost. We observe what happens to a defendant's stock price around the filing of a patent lawsuit, and we're able to assess the effect of the lawsuit on the firm's wealth after taking into account general market trends and random factors affecting the individual's stock.

We find that NPE lawsuits are associated with the loss of wealth to defendants that averaged over \$80 billion per year during the late 90s. These defendants are mostly technology companies. We've heard a lot about that today. They invest heavily in R&D, and to the extent that the litigation represents an unavoidable business cost to technology developers. Again, we've heard a lot about that today.

Differing opinions, but I'm convinced that mostly it's inadvertent, mostly unavoidable. It reduces the profits that these firms make on their technology investments. That is, lawsuits substantially reduce their incentives to innovate. So Carl Shapiro's not sure these magnitudes are plausible, but you're willing to be convinced, right? So I'll give that a shot.

The stock market event study estimates that the mean wealth loss per lawsuit is \$122 million in 2010 dollars. And the median loss is \$20 million, or \$20.4 million. So \$122 million is a scary number, and I wanted to convince myself that it made sense. It seems big. Can it be right? Obviously, I think so. My intuitive reaction to the world gives me better hunches about medians, rather than means.

So let's ask instead about the \$20 million figure to see if that makes sense for a typical lawsuit. So if we expect to spend a million or two dollars on legal fees, we still have a ways to go before we can get to \$20 million. The simple answer about how to get there is that most of the cost to the defendants does not arise from payments to outside counsel. Part of the expected cost comes from damages.

Unfortunately, we don't have much data on damages and therefore it's hard to calculate them with much confidence. So like Professor Shapiro, I don't expect, I don't think that expected damages alone explain a big chunk of this expected cost. They're significant, but there are other things I think that are more significant. Excuse me, more significant. I suspect that the bulk of costs arise from the threat of injunction.

A lot of my research covered a time period before eBay. And various indirect costs, such as diversion of managerial, engineering, and scientific talent, delays in new products, and loss of market share because the relationships with customers and vendors deteriorate when a firm is embroiled in patent litigation.

So recall that Tucker finds an Acacia suit was associated with a one third decline of sales of medical imaging software by targeted firms. She attributes the sales decline to a lack of incremental product innovation during the period of litigation, and she conjectures, I share this conjecture, that the incremental innovation was deterred by concerns that it would create additional risks in the ongoing litigation.

The mean and median figure are very different because the estimated defense costs are highly skewed. The skewness might be attributable, I believe it is attributable to the distinct business models of PAEs. Many nuisance suits and the occasional big game hunter. If Karl is still skeptical, he might be willing to buy the results from the other study.

Although Dave sitting next to me will also be skeptical, and might express some of that skepticism about the other study. But anyway, I'm hoping at least Karl will come along with the other study that focuses only on direct costs. The survey study estimates the mean legal costs per defense range from \$420,000 for small and medium companies to \$1.52 million for large companies.

And the median total litigation costs for small or medium companies is \$318,000, and for large companies, \$646,000. So those numbers probably sound familiar. You think about a typical case, you think about medians and you hear those numbers, I think they're going to sound fairly plausible.

So to conclude, I want to emphasize that much of the harm associated with PAE suits is simply harm caused by a patent system that provides poor notice. It's likely true that PAEs amplify this harm. But if PAEs disappeared overnight, we would still have, and we'd still find that notice problems create significant patent notice costs that should still be a huge concern.

I favor reforms that are addressed to troll-like behavior, but I think more of our attention should be independent of the identity of the litigator. Good patent policy needs to implement reforms to improve notice.

The AIE-- AIA makes some progress, but not much in that regard. My work with Jim Bessen and with Peter Menell offers lots of ideas for reform, but alas, I don't have time to discuss those right now. So thanks for your attention.

FIONA SCOTT MORTON: Great. Thank you very much. We will continue on this topic with remarks from David Schwartz, who is an associate professor of law at the Illinois Institute of Technology Chicago Kent. Thanks a lot.

SPEAKER: Thank you very much. I'm excited to be here. Is this on?

FIONA SCOTT MORTON: Start talking, and maybe they'll get it.

DAVID SCHWARTZ: OK, thanks. I'm excited to be here. And so my first point that I think others have made as well is that we needed data driven objective approach to the issue. And I think I was asked to be on this panel in part because I'm a skeptic of the claims that are based on the existing data of high harms caused by PAEs. And so let me tell you a little bit where I'm coming from.

I'm not like one of the big tobacco's lawyers from the 1960s that every time they saw a study that showed smoking caused cancer, would say that's not good enough. I am completely convincible

by data. However, the data as it exists today and that I've reviewed is not convincing. That's not to say that it can't be empirically shown, it just hasn't been empirically shown yet.

And we need better data on benefits as well. And so there's surely anecdotal information, and we heard some of that this morning. There's lots of theories on why PAEs may cause harm, but there's very little data. And much of the data that exists is mixed and inconclusive. And so I want to talk a little bit more about data on potential harms.

But before I do, I just want to raise a preliminary issue, which is a definitional issue about what a PAE is. Because Chairman Leibowitz and Professor Shapiro talked about PAEs being patents that are acquired or purchased from the regional inventor. And some other people, I think, include original inventors or failed start ups that are enforcing their own patents as part of PAEs.

And actually, I think it matters because there's a decent chunk of litigation that is initiated by individuals or by companies that are the original owners of patents. And so in the past, I've argued that you should, even if you think one definition is better than the other, you should de-aggregate your results so we can look at it both ways.

And one reason I don't really take a position on which is the right definition, other than to say that to the extent that one of the arguments is that the bucket is leaky, and not enough money is being returned to the original inventor, then that isn't really applicable if the inventor is the one enforcing the patent, because they're reaping most of the rewards, I presume.

And so that leads me to my second point, which is we need a baseline for comparison. And for that, I mean PAE harms, or costs, have to be compared to something. And that's something can't be zero, because all litigation has costs, and patent litigation is notoriously expensive, with very high attorney and expert fees.

And so in work I've done in the past with Jay Kesan, we suggest that we compare PAE litigation to either patent litigation in which the patent holder is a practicing entity, or maybe just complex civil litigation more broadly. And there are few, if any, empirical comparisons, broad comparisons of PAE litigation in general in other patent litigation.

Now, one article that provides some comparative information is an article that was mentioned by few people this morning, and that was done by my co-panelist Robin Feldman. And so that article picked 500 cases at random from the last five years. And so in preparation for today, I reviewed that study.

And at the end of the study, she reported some tables on settlement rates, summary judgment loss rates, patent holder win rates for a bunch of categories, including practicing entities, individuals and monetizers. The paper didn't do any statistical or hypothesis testing of her results, and so as I looked at them, I thought, wow, those numbers across all the categories looked really close.

And that actually isn't consistent with some of the data we've heard this morning about really high loss rates for NPEs. Granted, her study was different because she had a random sample

rather than some of the-- I'm thinking of the Allison, Walker, Lemley study. And also, Michael Risch has a study that looks at kind of the most litigated patents, or the most litigious PAEs.

So it might be looking at outliers. And so to get a better handle on this, I recreated her data from the disclosures that she made in her article, and then I ran statistical tests on the results. And as it turns out, there's no discernible statistical differences among the different types of entities she reported.

In other words, from the data that she provided, we can't say that there's a difference either way, with 95% confidence among PAE plaintiffs or practicing entities in terms of settlement rates, summary judgment loss rates, or win rates. So I think we need better data on the differences, if any, between PAE litigation and other patent litigation.

And as I look at the list that Professor Cockburn put in in his slides, a lot of those harms, for the most part, appear to be really potential harms that are just tied to patents, or to patent litigation in general. And few of them seem really unique so PAEs. And so I see very little evidence right now that PAE litigation is materially more costly, or that the claims that are asserted are materially weaker than practicing patent entity litigation.

And so without that evidence, I'm just concerned that we're talking more about issues that are from the patent litigation system, or patents in general, rather than about PAEs. So briefly I just want to talk about Professor Muerer's study that he mentioned \$29 billion in direct costs, the estimate that he did with Jim Besson.

And so as Jay Kesam and I have previously written about, we believe that his estimates of direct costs are inflated. We think they rely on a non representative sample, which was likely biased too high. He also included individual inventors in his costs, and did not compare it, did not compare the kind of proportion of legal fees to settlement amounts in PAE litigation to what that is in practicing any of the litigation, which I think would be important.

And so to me, I think we should just focus more on the merits of the assertions. The question that we should be asking are, are the patents likely invalid? Is the allegation of infringement untethered to the original invention? Is the quantum of damages sought based on a sound damages theory? And so my final point is that we really also need to look at the distribution of cases in both practicing entity and operating company litigation.

Now to be fair, every patent is unique. There's stronger cases, there's weaker cases, and there must be meritless cases. There must be cases that are brought both by practicing entities and by non-practicing entities that are meritless. But the question is, are those outliers? Where does the median fit, where does the mean fit? And we need to compare practicing entity and non-practicing entity litigation, and look at the distribution.

And then if we decide that there are problems that we need to address, we can determine the best way to do it in a tailored manner. If the problem is there's a lot of cost of defense settlements and weak patents, or weak assertions, then we need cheaper ways to get to the merits. But we don't want to weaken all patents if the concern is just the outliers. So thank you for your time.

FIONA SCOTT MORTON: Excellent. Thank you very much. I think what we'll do is collect up - I'm assuming you would like to respond, but should we do that right this second? Let's keep going. We're going to keep going and collect comments at the end. Yep. OK. So Thomas Ewing is our next panelists, and thank you very much. Go ahead.

THOMAS EWING: Thank you very much for inviting me. So I have a couple of comments on PAEs. First of all, I could have been on the pro or con panel for what that's worth. But I think patent assertion entities, there are, when an operating company versus another operating company, there are countermeasures to the assertion, commercial countermeasures to the assertion that they just vanish when a PAE arises on the scene.

So what I could do one of my competitors were they to assert patents against me, I can't do against a patent assertion entity, and moreover, if it's a patent mass aggregator, I'm really out a luck, because there's not a whole lot I can do against those guys. They combine the best of the patent assertion entity with the best of the large commercial licensors. They give me an offer I cannot refuse.

If someone comes to me with 300 patents that I have to license, there is no forum for testing whether I actually owe them a penny. They might sue me over six of them, and we can test whether I actually owe them money over those six, but the other 294 won't be tested. Now when we go to settlement discussion, they likely will heavily discount my license fee, but if my license fee was actually in fact zero, I will still be paying something. The other thing about patent insertion entities, especially traded patents, it's a little bit different than operating companies. Operating companies tend to buy patents that are owned by their competitors, or people at least in the same field of business that they're in.

Which means once they buy them, they might know a little something about them. Once a patent's been traded four or five times, especially into a patent assertion entity, that entity doesn't know anything about the technology that they've just purchased. Which means if you look at these buckets that we've talked about today, good buckets, innovation, patents, technology.

There's not a single patent mass aggregator that has a prayer of being able to grant me a technology license. They don't know how this stuff works. They just know that they have certain legal rights, and they can transfer those legal rights to me. But as far as telling me what the patent's about, they're clueless.

If they want to know what it's about, they couldn't tell me any more about what it's about than I could tell by looking at the US Patent and Trademark web site, which is likely what they would do, because they probably don't have an electronic version of their own patent.

So there are inefficiencies in the system, and they apply to operating companies, and they apply to patent assertion entities. It's an inefficient system. Ironically, it's probably the world's most precise litigation system for patents, which is part of its problem. It's too darned elaborate. There are to many--

MITCH: Hey, it's Mitch. I'm here.

SAVANNAH: Hey Mitch, it's Savannah. I'm here, too.

FIONA SCOTT MORTON: I think we have someone else's telephone call. Could you people find a different line to dial into, please?

SAVANNAH: Certainly.

FIONA SCOTT MORTON: Thank you very much. Sorry, please go ahead.

THOMAS EWING: No, that's fine. We had an infringement on our line with Susan. OK, so we've developed this very elaborate system. If I wanted to admit I was stupid, I could say it's too complicated. But I won't. But it's an extremely complicated system, and every time a court adds a new test, it increases the cost.

Which means they've actually increased who knows how many settlements, because it increased the costs. So people will settle. So in fact, if I was a patent assertion entity, I would want the system to become even more complex. Let's add a test for damages. Let's add two more tests for damages, let's add three more tests for damages. We'll get out the truth. We'll increase the cost. We'll increase settlements.

Which is to say, and I guess the last point I'll put in, or maybe next to last, I am aware of non-US companies that do not enter the US market for reasons of patents. They're in a particular niche where they just don't want to deal with this, which means that US consumers are deprived of products from foreign entities.

Now as a long term solution, I'm just keeping little notes of this myself, I'm aware of approximately \$2 billion worth of capital that's being used by foreign entities now, governments to buy patents to protect their domestic entities engaged in business in the United States. So I think there's a legacy from the old, there are three things that ramped up the pro-patent era.

And one of them is this notion that some companies, particularly Texas Instruments kept themselves in the black for a certain number of years by virtue of their patent licensing program, and that somehow or another, this is good for the United States because, well, we can't manufacture anything efficiently anymore, but at least we've developed a technology and we can license it. Fine.

Except all the foreign competitors that sometimes we seem so worried about are spending huge amounts of money now to buy US patents. And I guess finally we shouldn't really break our arms patting ourselves on the back about the number of US patents that we have, because for at least the last 20 years, I'm sure one of you knows the statistic better than I do, half of those patents originate from abroad, anyway.

And a lot of the patent mass aggregators are now acquiring patents that originated from abroad. In fact, if I'm an aggregator, who knows the price of a US patent better? A US company or a foreign company? So most of the aggregators historically bought most of their patents from abroad.

Now, there are foreign companies that are engaged in business in the United States, and they don't really quite understand the value of a US patent. I think that's really all I have.

FIONA SCOTT MORTON: Fascinating. OK, and our final panelist is Brad Burnham, managing partner of Union Square Ventures.

BRAD BURNHAM: Thank you. So I've been thinking as I've listened to this panel that one of these panelists is not like the others. I am not a lawyer, not an academic. I'm an investor, and I'm an investor that invests primarily in internet services.

With that, I come to this question with a unique perspective. I'm working with companies, we were, for instance, the first institutional investor in Twitter, Tumblr, Foursquare, Etsy, Indeed. All service companies that use technology internally to deliver a service. So

I become very involved in this question, not specifically the PAE question, but more generally the patent question, because about one third of our portfolio, we have 45 companies in the portfolio. About one third has been sued by someone. About almost half has been given some kind of demand letter by someone.

And the only difference between the ones that have and the ones that have not is the scale and the visibility of the company. I mean, we're an early stage investor. We often invest in companies with five or six people. But once you get to a certain scale, Twitter for instance has 14 active patent actions against it.

Once you get to a certain scale, everybody comes out of the woodwork and asserts that you have violated their intellectual property. What's frustrating about this from my perspective as an investor is that none of these companies that we have invested in knew about these patents. And I've heard arguments made that, well, gosh, they were irresponsible. They could have searched the patent office to find these patents.

But in fact, that really is not true. Most of the patents that have been asserted were asserted from an entirely different field. So earlier description of somebody in the banking industry with a banking patent going after an automobile industry really struck home with me. That's not a ridiculous assertion.

I'll use one example of one company that is not entirely out of business, but is a tiny shell of its former self as a result of being subjected to two patent suits in rapid succession by two different entities, neither of which would fit the definition of an NPE or a PAE. Both were failed entrants.

Both were failed start ups, and unfortunately the patents were being prosecuted by holding companies controlled by the original investors. So that's me. But this company, it's a company that provides-- I'm going to be a little bit careful, because the company did end up settling these suits, and as part of that settlement, agreed not to talk very specifically about them.

So I'm not going to mention the name, but the company was initially sued-- well, first the company was in the business of providing advertising services to major brands. And a lot of the

things that they did was allow you to create an avatar, a representation of yourself by creating your own eyes and nose and mouth, and putting it together and putting it up there. Sort of Mr. Potato Head, if you remember that as a kid.

And the first suit that they were hit with was from a company that was not in the business of consumer facing services at all. It was a business to business company that was providing software, not services, but software to police departments around the country to create composite sketches. So remember when you saw the police shows, they used to slide the mouth and nose and eyes together.

Well, this company has a patent on doing that in software. And so they asserted that patent against our company because we were doing that to create avatars online. So there's no way we could have searched for that patent. We wouldn't have gone to think, oh, yeah, of course. Police departments, avatars, that's the same thing.

The second suit that they were hit with was one of the really clever things, and one of the really exciting pieces of technology that this company created was the ability to put your face in a video and then share that video with your friends. And car companies would show you test driving the hot new Chevrolet sort of thing, and your face was in the video. Very sophisticated 3-D rendering technology.

This company of ours had six people who were experts in this field, acknowledged experts in this field working on that problem. Very difficult, technical problem. Well, there was a company that years earlier had allowed you to send a photograph into them, and you could have your child playing with Barney in a VHS videotape.

And the way they actually implemented that was by hand cutting and pasting the image, and then re-photographing it. And so completely different than what we were doing. Well, that hurt when they sued us, and we felt kind of put out. But it didn't have a huge effect. They hadn't gotten an injunction. But then they went on to sue our customers.

So these are people like American Express an American Airlines, and General Motors, and for our customers, the company in question employed 70 people. It was doing about \$10 million in annual revenue, and when they sued our customers, this was a nice to have, not a need to have, but it was a marketing program for the customers. They cut our revenue in half in three months.

And so we couldn't sustain the 70 people that we had on the payroll, and so we had to cut the company in half. And as we fought this patent suit, we tried to indemnify our customers. Our customers said thanks, but I mean, it's not going to help. It's not worth it for me. I don't want to be involved in this. You figure it out.

And so ultimately we were not able to raise additional capital into the company, and we ultimately shrunk the company back to five. The company now has five people servicing their existing clients, and no longer employing those 70, or 65 people that they had employed. So that's the horror story that we, and as I play that out, that's probably the most dramatic example.

We have lots of other examples in the portfolio. Again, none of those examples are ones that we could have known about, or should have known about, at least in my opinion. So what I want to do here is say that as we talk about doing all of this research, I really believe in empirical evidence, and I really think we should do it.

But I would ask everybody to at least, as they do the research, separate software patents and business method patents from other patents, because I think you'll find that a significant majority of the PAE prosecutions are on these vaguer, more abstract software and business method patents.

And I think if you do separate them out, you'll see some things that you wouldn't see if you conflated with pharmaceuticals and material science, and things like that. So sort of the summary for me is that software patents are just too abstract, and too difficult to research. So it's very, very difficult.

We are seeing, at least we are seeing bad patents asserted in completely different fields of use that we couldn't possibly have anticipated, and that doesn't feel right. One of arguments for patents is that, and for PAEs is that some of this technology is hard to reduce to practice, and therefore they need capital in order to be able to reduce it, so there's a justification for this market in the intellectual property independent of the practice.

That is not true in software. I mean, we have lots and lots of companies that are two person app development shops that are making lots of money in the app stores by delivering those products directly to market. So it's not really that same, we don't have that same problem. Finally, I think that in this market, we are uniquely victims of a problem that I heard Mark Lemley describe as patenting the problem, not patenting the solution.

So he used the example of a jackhammer, and said the patent office would not allow you to patent a method for breaking rocks. They would allow you to patent a jackhammer. The problem with the software patents that we're being hit with is that they never define the solution. If you go back to putting the video, the face in a video, we were using very sophisticated 3-D modeling to do it.

The company in question that sued us was cutting and pasting by hand. Part of the actual settlement agreement with that company was to provide the technology to them to enable them to do the thing that they had claimed to invent. That doesn't seem right to us.

FIONA SCOTT MORTON: Fantastic. Iain, are you still on the line after all the interruptions?

IAIN COCKBURN: Yes, I'm here.

FIONA SCOTT MORTON: OK, good. Would you like to offer some comments on the panelists?

IAIN COCKBURN: Let me just make one, maybe just a couple of observations. One is I think that, what is unique about PAEs and what types of behavior, or conduct may that induce that we

really care about. So there's two aspects of that one. It's asymmetry, and that they tend not to have made large sunk investments in anything except paper assets or IP.

The other is that they, and I sort of hear a strong sense of this from this panel, that they're not participants in the innovation ecosystem, and that are may not-- may have been involved in the generation of technology, or may have people who were engaged in it, but they're not in that, embedded to the degree that other participants are.

And those other participants have other important commercial relationships with all the other participants. The ecosystem that the PAEs are kind of exempt from caring about the consequences of their actions for--

The second thing I'll say is that on this topic of how well is this market working, and harking back to that, I think the last time I was at one of these FTC hearings, which was that we have almost no easily accessible data on what these transactions are, what's being paid. The real estate industry seems to be able to thrive with complete disclosure of transactions over heterogeneous assets, but somehow IP can't.

Actions taken by the PTO notwithstanding, I think we're still kind of stuck staring at what may be kind of odd and selective, and selective in a way that there's hard to understand samples, which are those which pop up in litigation, where settlements and damages are disclosed in court.

And I think a major problem for us to make headway on these difficult questions is to better understand how these prices are formed in these markets. And be able to kind of conduct the kinds of tests we'd like to be able to do about, are the PAEs adding liquidity and creating benefits sufficient to compensate to any degree the costs they may impose?

FIONA SCOTT MORTON: Thanks, Iain. We are running late, so I think what I'm going to do is take a few comments from the floor for people on the panel, or questions, sorry, from the floor. And then we'll leave enough time for a five minute break before the final session. So if there are questions, please raise your hand, and I assume there's somebody with a microphone? Erica. It looks like she has the microphone. Yes, please.

AUDIENCE: Hi, Barney Cassidy from One of the things I was struggling with the whole day was is we're talking about harms and trying to measure them one against the other and so forth, one system would do this-- but against what? How big are these problems compared to the value that the patent system, the innovation system brings to our economy today? Does anyone know that number?

The disclosure of all this technology and how it's implemented, and how that impacts our economy and the world economy? Because it seems to me a lot of these problems may be minuscule in comparison to that. Or they may be significant, and I don't have a sense of it.

FIONA SCOTT MORTON: Let me just adjust the question slightly. I think we could have in mind a world where we get rid of patents versus keeping them, and that probably isn't the focus

of today's discussion, but more since we've, a number of participants have mentioned the trade off there's, pros and cons, is there anything that can be done to enhance the pros and decrease the cons so that the consumer ends up getting a bit of a better deal? So I think it's a little bit of a less dramatic question, but maybe--

MICHAEL MUERER: Can I respond to the less dramatic?

FIONA SCOTT MORTON: Yes, please do.

MICHAEL MUERER: Or the more dramatic question. Bessen and I contend that for publicly traded American firms, if we abolished the patent system, they would have a stronger incentive to innovate.

We don't advocate that policy, but we contended that when you measure the rents, the patents deliver to innovators who get patents and put those on the other side of the scale with the costs imposed on innovators as defendants, that cost is larger.

FIONA SCOTT MORTON: A firm answer. Next question? Yep, sure.

AUDIENCE: Hi, this question is for the whole panel, but mainly for Brad. And I'm wondering, Brad, how come we don't see some of the venture capital investors like Fred Wilson and Brad Feld who rail against the patent system, talk more about entrepreneurship as a way of dealing with all the problems and harms that we've been talking about.

So among top venture capital investors, Izhar Armony really stands alone is someone who's really backed a lot of companies and entrepreneurs that are trying to do exactly that. So he did IV, he did and he did RPX most recently. Are you guys just not seeing the deals? Are you just seeing deals that are brought to you by founders who are not venture backable? Or something else?

BRAD BURNHAM: So Fred's my partner, and we wouldn't do one of those deals because as we talk to the engineers in our companies, they believe that on balance, at least when it comes to software patents, they do more harm than good.

And so we would be kind of taking a philosophical stance, even to the degree that the company was defining itself as defensive, we would be taking a philosophical stance that would require us to believe that software companies and particularly internet services companies would be able to get their engineers to sit down with a lawyer and write patents.

And what we're finding is that our engineers, the engineers in our portfolio companies are not willing to do that because they don't believe that the patent system is helping them. So it would be hard for us to do that, make that kind of investment.

FIONA SCOTT MORTON: Fantastic. One more, this side of the room, maybe. I wasn't looking that way last time. No? Right here.

AUDIENCE: Hi. So given the costs that are imposed on society by licensing transactions for the most part being secret, is there anyone on the panel who would just say, let's make it so that licensing transactions have to be transparent? The way stock market trades are transparent?

ROBIN FELDMAN: So I don't know that I would go quite that far, I haven't thought of it in those terms. I certainly applaud the PTO's exploration real party and interest information. I have contemplated, and I think it's worth contemplating a system for patents that looks more like the real property system.

In other words, if you want to have any type of interest related to a patent, including a license for that patent, that you should record it and disclose it. Not necessarily the price. I know that a lot of academics would like to know the price information, too. I would, too. I don't think we'll ever get that through, but I have contemplated a system like that, which would give us much more information.

BRAD BURNHAM; I would love to see a system where all you did was make it difficult, expensive, impossible to impose a contract term in a settlement agreement that required a gag on the selling parties, because I believe that if more of what was going on was, people were more aware of what was going on, it wouldn't continue.

THOMAS EWING: I'd answer your question in the reverse. What would the real property market be like if tax records weren't available publicly? I don't know that people would disclose them, because it's not to your advantage to do it. No disclosure is ever to your advantage, right? People only do it when they're forced.

Well, OK. A lawyers speaking to economists, so I'll shut up. Frequently it's not to your advantage to do it, and you only do it because you have to, right?

DAVID SCHWARTZ: So one thing, one thing that I would just add to it, as an academic, I would love it if that data was available. But from a system standpoint, it would also make damages calculations easier, right? It might add some efficiencies in the litigation system.

FIONA SCOTT MORTON: Fantastic.

AUDIENCE: We may be seeing more-- excuse me. We may be seeing more data made public because the Federal Circuit is now saying that settlement rates and litigation can be required to be disclosed in the next suit. And even the negotiations, in reaching a settlement negotiations, are going to be made available. So if you keep your eyes opened, there may be more trickling out.

FIONA SCOTT MORTON: Yeah. A big feature of these markets is asymmetric information. So certainly any change in that would make a big difference one way or the other. OK, thank you very much to the panelists for your time and expertise.

HOWARD SHELANSKI: Tim and Iain, thanks a lot, guys.