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Federal Trade Commission
601 New Jersey Avenue, N.W.
Washington, D.C. 20001

The above-entitled hearing was held, pursuant to notice, at 9:00 a.m.

P R O C E E D I N G S

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DR. CHESNES: Good morning everybody. Welcome back. I'm Matthew Chesnes. I'm a staff economist here at the FTC. I'm going to introduce our third keynote speaker. Before I do, I want to go over a couple announcements, just to remind people and then because there are probably a few people who weren't here yesterday.

We have a stenographer in the back, so if you have questions, just come up to the microphones. They're in the back and they'll be roaming around.

If you have evaluation forms, turn those into the table upfront. It helps us with feedback and to improve this conference in the future.

Rest rooms are out to the left of the security desk. Just follow the signs out there. Internet accessibility is now working. There's a code inside this pamphlet.

And the security briefing: Again just briefly, if you go outside the front doors, you're going to have to go through security to come back in so just leave time for that.

In the event of a fire, exit through the front doors and cross the street to the Georgetown Law

Center. Just congregate there or just follow the directions if they tell us to stay inside. If you spot suspicious, activity please alert security.

So those are all the announcements. Now I would like to introduce our third keynote speaker, Fiona Scott Morton, from Yale University School of Management. Fiona started her career at Stanford University Graduate School of Business before moving to the University of Chicago. Since '99 she's been at Yale, where she is now the professor of economics and the senior associate dean for faculty development.

Her research focuses on empirical studies of competition among firms in areas such as pricing, entry and product differentiation. She's published her research in a variety of excellent journals including the RAND Journal of Economics, the Journal of Econometrics and the Quarterly Journal of Economics.

She has a BA from Yale and a Ph.D. from MIT, so please join me in welcoming Fiona Scott Morton.

(Applause.)

DR. SCOTT MORTON: Thanks.

I wrote these remarks last week, but just to warn you all, unlike the previous two keynotes that have actually delivered 20 minutes on the same topic highlighting research they have done, this is going to

be a keynote on multiple topics highlighting research that no one has done, but which I think would be interesting to do, and is hopefully topical.

Why am I giving a talk on healthcare? I think it's a fascinating industry. We have renewed focus in this sector because of the recent reform. Healthcare is a very significant fraction of GDP, and my experience as a consumer and reading of the literature suggests that it's really incredibly inefficient compared to an experience one might have, for example, walking into Target and trying to buy something and walking out again.

You see a level of efficiency in many businesses in the United States that you do not see in the healthcare sector. Is this because management isn't very good? Is it because it's an inherently unproductive sector? Is this because incentives are wrong? Maybe competition is one of the things that we could look at that would help productivity here.

So I'm going to spend the first minute or two on biosimilar medications. This is mostly to educate the non-FTC audience. The FTC produced an excellent report last year on biosimilars, so I'm aware that the agency is well tooled up here. I think this is an important area where we're going to see more

competition and which could potentially have an impact on healthcare costs. The reason this is important is that biologics have a 15 percent market share of pharmaceutical spending at the moment.

This segment is growing at 12 percent a year, in contrast to traditional pharma or small molecule drugs, with expenditure on those growing at about 3 percent a year.

What's a biosimilar? Well, it is a subsequent version of an innovator biologic drug that is marketed after expiration of the innovator's patents. Currently, an innovator biologic drug does not face competition from generics. Until the act was passed this spring, there was no pathway -- well, there still isn't a pathway -- for a biosimilar to be approved. The other words for biosimilar are bio-generic or follow on biologic.

The Patient Protection and Affordable Care Act instructs the FDA to go out and create such a pathway. but We don't have regulations yet, so we're largely speculating on what would happen when we get this kind of competition.

The impact of a conventional generic on market outcomes is very big. As you all know, within six months or so, the brand loses almost all of its

market share, and the prices typically drop significantly. When you have a molecule that attracts more than a dozen or 15 entrants, you end up with prices for the generic that are often at 15 percent of the original branded price, so it's really a massive decline.

Biosimilars, we think, are going to be different. This is because they're not exact copies, so instead of price competition among homogeneous products, you have differentiated products competing. Nonetheless, this is going to be the first instance of direct competition for many of these innovative products. We expect it to benefit consumers.

We also anticipate that we might see some strategic behavior just because we have seen this in the existing generic industry. For example, there has been work on the impact of authorized generics, reverse payments, or pay-for-delay, these kinds of things, and so I think that it's fair to consider whether that kind of behavior could arise in the context of a biosimilar.

The FTC report from 2009 that I previously mentioned talks about the desirability of delinking the whole patent litigation process from what the FDA does by way of approval, which I think is a very sensible point and may help contain undesirable strategic

behavior in the biologics area.

In order to get the prices of biologics down, what do we think we should do? We need to have entry costs that are reasonable, but these are going to be established by the FDA in the sense of the amount and standards for testing the new product. There are intellectual property barriers that are going to just play out in the courts. This will be very interesting; and then there's something that I think is new, which is the process of manufacturing.

Biologics are quite delicate to manufacture. There are multiple steps. How long you cook it, at what temperature, in what medium, through what filter it is strained, etc, all make a difference to the final product. So there's going to be, I think, a whole new area of entry problems surrounding manufacturing.

There's also going to be a whole new set of problems around contract manufacturers. When an innovator uses a contract manufacturer, this contract manufacturer is really going to learn something of value because the manufacturing really matters and is tricky. That party will have low entry costs to producing a biosimilar.

The contract manufacturer will have information that's a competitive advantage and I'm sure

the contracts that they sign will reflect the information that they're gathering and the position they are in. This will be an interesting area for future research considering how such contracts might affect competition.

There is also the possibility of significant multi-market competition. The major makers of biosimilars are likely to be branded innovator pharmaceutical manufacturers because the kind of skill set you need for the two products is rather similar. You need to do more serious clinical trials and you have to market differentiated products. The manufacturing, as noted previously, is really critical.

So if I'm making an innovative drug and I choose to make a biosimilar in someone's market, than perhaps he's going to do the same thing to me and launch a biosimilar to compete with my brand. I think that's quite a different set up than the current typical industry division that we have, where essentially you've got brand makers and they compete hard against generic makers, but they are two different types of firms.

I also think that regulations concerning the promotion of biologic drugs - which the FTC may actually have some impact on - is going to matter

because these products face less price pressure the more the buyer views them as differentiated. So of course, we would expect biosimilar and biologic manufacturers to try to promote their products to physicians as being differentiated. For example, you shouldn't put your patient on my rival's drug because it's not as good or it's different in a certain way or whatever.

So the way in which the promotion of biosimilars is allowed to go forward will have an impact on how close they're viewed as substitutes which of course will have an impact on final prices.

Now I want to change topics and spend the next ten minutes or so on insurance competition, which I think is a really, really interesting area in which there's not very much work.

So first, many people think the insurance industry generally has concentrated markets. That may be. However, we don't know because the data are just terrible. One of the only pieces of research I guess I'll cite in this talk is that Leemore Dafne, David Dranove, Frank Limbrock, and I are about to come out with a very tiny paper just pointing out that the health insurance market share data are terrible. One data source leaves out HMOs, another leaves out all

self-insured employers. The market shares fluctuate from year to year in ways that are completely implausible, and so on. I think that since we're running a lot of government healthcare through the private sector now, we really need to know more about this industry, and I think this lack of data is a first order problem.

The reason we don't have data is it's really hard to ask a person about their health insurance because it comes usually through their employer, and so consumers don't know a lot of the details that the researcher would like to know. It would be great for research on the insurance industry and policy-making if somebody in the government figured this out and collected good data.

Why is this a critical policy issue? Healthcare is 17 percent of GDP. A significant fraction of our expenditures on healthcare flow through the private insurance sector. This is the direction in which we decided to move with healthcare reform. We didn't choose a single payor system. We didn't organize a public auction to be the insurer for subsidized plans. We really are routing people through the private sector.

So if we are paying a markup on all of those

dollars due to insufficient competition, that's a large piece of GDP, and we would like to know that. Perhaps we have an efficient insurance industry; that may be. But if we can't get an efficient private insurance sector, then as a society maybe we need to revisit how we're using it.

So what will health reform do to insurance competition? I think there are a couple things we could speculate about. First I have two more papers that I'm going to cite today on switching costs that are relevant to these questions. It's possible that with electronic medical records we could really reduce switching costs across providers and insurers. Lower switching costs have been shown -- in the context of phone service by Brian Viard and employer insurance with Leemore Dafne -- to reduce prices. In other words, switching costs give the provider of the insurance some market power.

So if we really had the ability to drive these switching costs down a lot, maybe that would have some impact on pricing, all else equal. Those switching costs would presumably go down if we have easy-to-shop-for insurance in an exchange and we have an electronic medical record.

Also, we may get a little more transparency

through the exchange because of the standardization of the products. In an exchange I can only sell something that's bronze or silver or gold, which are all pre-defined, and it has to be described in a standardized format.

If I've got really easy to shop for products and they're all standardized and the prices are transparent and I don't have switching costs, then things like the value of the firm's reputation falls, search costs fall, and we might think that equilibrium prices would fall. It's certainly a possibility. On my slide I note that the poor quality plan is now effectively not allowed.

The way I think about that is that if there's some fine print, and I as a consumer am worried about what the fine print says and I'm not quite sure what it does say, the reputation of the firm is valuable to me. An insurer with a reputation for being fair can charge a premium price for this reason. However, if I believe the government essentially made all the fine print irrelevant because it has regulated quality, then there's no catch in there. Now I may not really care anymore so much about the reputation of the firm and its price is likely to fall commensurately.

I make a point on the slide about entry. It

seems to me that you could make an argument that the exchange will lower entry costs for insurers. First of all, there is a large pool of consumers in this exchange. The mandate to buy increases the size of that pool presumably.

There's a standard for insurance that is set by the government, not designed by the entrant, and now the entrant doesn't need to build a distribution channel because of the exchange. The entrant may have low entry and distribution costs because all it has to do is list on the exchange. The main cost of the entrant is likely to be the formation of the network of providers. In order to enter this exchange, which might be easy, I have to have a network of physicians and hospitals that passes the test of being an acceptable network.

For example, one of the things that the law lays down is that an insurer has to have a network that doesn't avoid poor areas and has sufficient physicians in all specialties and so on and so forth. The enforcement of that standard may impact how much entry that we see. If there isn't enough entry, perhaps there is a way to use the multi-state option to add products to the exchange.

Rural areas could be a problem when thinking

about insurance market competition . How do you create competition in rural areas? If there's one doctor in the town, there's one doctor in the town. It's hard to think about how you get a network that's different or if everyone just has to contract with that doctor, in which case you're not really getting competition among networks.

We might need to think about innovation in these networks if we want folks in rural areas to get the benefit of competition. Is an insurer allowed to have a mobile van that shows up for appointments? Is tele-medicine permitted? Can the insurer substitute different kinds of human capital for physicians? It is possible as we got forward that the incumbent is against such innovations and argues that they are bad for consumers and provide poor healthcare. That is something to think about.

It is hard to come up with a really good solution for rural markets, I think, in terms of insurance competition. The good news is that not very many people live in rural markets, so if we are lucky, this is not a first order problem.

A real first order problem is the pricing power of the flagship hospital. If you have a flagship hospital in a geographic area and it's got high

quality, that gives it some market power. As Kate Ho and others have shown, people care about these hospitals when they're thinking about what health plan they buy. If there's an inelastic demand for that hospital, we're going to see it charge higher prices, which will affect the cost of healthcare.

It's hard to know what to do about this. You cannot really divest parts of the hospital like we did with AT&T. That's not really going to work because there are significant economies of scope across parts of a hospital.

Another option would be regulating prices. As a society, we might decide there's nothing we can do, that this hospital has marketing power and demand is inelastic. A regulator will just have to regulate its prices in order to keep costs down.

Another option would be to try to create more cross price elasticity of demand with other hospitals using some kind of protocol designed by the insurer. For example, if an enrollee is going to have a baby and it's not complicated and it's the mother's second baby and so on and so on, than the rule is that the enrollee goes to the local hospital because it provides excellent uncomplicated deliveries. Only when the patient has some kind of complicated or more serious

condition is the referral to the higher priced hospital triggered.

This type of system is used in the pharmaceutical area, which is the part of healthcare with which I'm most familiar. For example, a PBM takes, let's say, four equivalent brands that treat the same condition and says to the manufacturer, "All right, in my pharmacy plan, we prefer Brand A because Brand A offered me the lowest contract price. Unless one of you offers a lower price, I will steer my people to Brand A."

The insurer may be able to create some cross price elasticity of demand across hospitals this way -- in theory. Now, I think of course there are limitations. This type of program sounds potentially feasible when you're talking about pregnancy. It doesn't sound like it would work so well with liver transplants or other services that are very specialized. The local community hospital likely doesn't provide these specialized services, so the insurer is stuck with the flagship hospital.

Now, having said that for many conditions a patient might be able to obtain care in a different region. There could be competition between the flagship hospital in the insurer's city and the next

door city for treatments that can be planned ahead of time.

Contracting is an interesting new area to focus on when thinking about competition. Let me just go back for a second. The insurer here, like a PBM does with formularies, is trying to create significant cross price elasticity of demand. What you get is broad formularies that are expensive and you get narrow formularies that are less costly. One of the best examples of a narrow formulary that I know of is the VA. They run a very, very tight formulary and it's very, very low cost. Kaiser Permanente is one of the best examples in the private sector.

Why don't we see this network variety in health insurance? I think that's a big puzzle, and I've been thinking about this a little more since last week when I read Martha Cockley's report on insurance market competition in Massachusetts from last March. What that report discusses is the kinds of contracting that go on between health insurers and hospitals.

We all probably know about the MFN part of that report because the Justice Department has filed a complaint in Michigan on that topic. What was interesting to me was that that was actually not the only contractual provision that was described in this

report. Let me talk about four of them.

To review, the first provision described in the report is the most favored nation clause. This is price protection relative to other insurers. In the simplest form, suppose I'm Insurer X and I contract with Hospital A and we agree on a price of a hundred and a MFN. Then what that means is that Hospital A must charge a hundred or more to any other insurer that wants to send patients to Hospital A. If Hospital A were to reduce price to another insurer to 90, then Insurer X would be entitled to pay 90 for services at Hospital A.

So MFNs are well known in the antitrust literature. I have done empirical work myself in the pharmaceutical industry showing that when the industry adopts a most favored nation clause, you can actually drive up average prices.

A second provision in the report is called anti-steering. This means an insurer may not create a product that steers patients away from certain providers. I'm the doctor or hospital and contract with the insurance company, the insurance company is not allowed to steer its patients away from me, perhaps using financial incentives.

A third provision is guaranteed inclusion.

If the hospital signs a contract with the insurance company saying that the hospital will be part of Plan A, the hospital also gets to be in Plans B, C and D, even if Plans B, C and D are a narrower network, or broader network, or geographically different network from Plan A.

Lastly, we have product participation parity. If the hospital agrees to participate in a rival insurance company's narrow plan, for example, the hospital has to participate in my insurance company's narrow plan also.

When one thinks about all of these provisions operating simultaneously, clearly the contract environment gets complicated. I haven't thought about it for too terribly long, but it seems like in this situation it might just be easier for each insurance company to sign up every provider to be in every plan and, perhaps, for there not to be very much price competition because it's too difficult to bargain with all these contracts in place, each creating a different incentive or constraint.

I bring this up because I think this web of contracts is a really interesting possible explanation for why we have not seen the type of network formation or formulary design in hospital-insurance contracting

that we've seen in pharmaceuticals, for example.

Massachusetts changed its law promptly after the publication of this report. There is a new law, passed in the summer, that took effect October 1, that essentially says contracts may not reference other prices or be contingent on other agreements and that every contract has to be bilateral between a plan and a hospital. That means the agreement is between the hospital and the particular plan rather than the insurance company and the hospital. The hospital can make a separate contract with the wide plan, or the narrow plan, or whatever.

Moreover, I cannot force my whole hospital system to contract with the narrow plan. The narrow plan has the right to contract separately with each hospital in that hospital system. Finally, the law mandates that every insurance provider have a narrow plan that is at least 12 percent less expensive than their other baseline plan. This is interesting because it demonstrates that not only are policy makers removing barriers to the creation of narrow network, inexpensive plans, they are actually mandating it. The law forces insurers to go out and construct the narrow product that costs less, as well as removing this web of contracts. So I think it will be very interesting

to watch how health insurance competition evolves in Massachusetts.

I just want to spend my last ten minutes on off- label marketing. I think this is another interesting area. The reason I think it is interesting is it appears to me just from casual observation, that current regulations are not working. It seems that we have a lot of litigation, which is kind of a proxy for regulations not satisfying all the parties.

What is off-label marketing? Drugs are approved for a particular indication. Physicians, however, may use the drug for any purpose they feel is appropriate once it is approved by the FDA. Firms are not allowed to directly promote off- label use, but they earn profits with no liability when somebody uses the drug off-label.

There are detailing representatives selling these branded products. They're usually on a fairly steep incentive scheme, which means they are paid more if more of the drug is sold in their territory . They can answer questions the provider asks. They can give out literature on the off-label uses, but they're not allowed to promote the product for its off-label uses. Despite these restrictions, there is a lot of off-label use in this country.

Why might that be? There are good reasons for off label use.

First of all, you may actually have physicians who know something about the science behind the drug. They run an experiment and discover some new use for the drug and then they prescribe the drug for that use. Secondly, most pediatric uses are off-label because we don't have enough testing in children. The same is true with obstetrics.

Also there is a lot of off-label use when the patient is really, really sick and there are no other options. If a patient hasn't responded to the cancer drug, the physician is going to try anything he or she can to save the patient's life.

There is also off-label use that has a lot of scientific support but no official FDA trials because the innovator has no financial incentive to carry out the appropriate trials. For example, if I discover there might be a new use for my drug, but I have two years left on my patent, it's not worth it for me to run a test because by the time the use was approved, the generic entrants would be the beneficiaries. So in general we have a problem of incentivizing the collection of valuable information late in the life of the patent or after it's expired. This is a problem in

general - for example, in the case of carrots. Who is doing a study on carrots? Well, nobody except public and nonprofit agents because there's no intellectual property in carrots. However, if you don't have large randomized trials for a new use, you don't learn about the right instances to prescribe the drug or the correct dosing of the drug the way you otherwise might. Because new uses are profitable, whether on-label, when found early, or off-label, with no trials, the innovator has an incentive to go out and find new uses. So what we see today is the innovator running a lot of small clinical trials looking for new uses. That's fine. Some show significant results and many do not. Next we have to worry about the mechanism by which these findings are turned into journal articles distributed to physicians.

The innovator chooses which of the experiments it funds to publish and distribute, and typically it is not all of them, but a selection. The selected trials may have positive news about the drug. It's important to know that all trials must be registered at their start in a nonprofit clinical trial database if the sponsor wants to publish them later in a medical journal; so there is a complete database of trials available and the physician could work out which

had been published and which had not. But, for an individual doctor, receiving a journal article in her office, it is difficult and time-consuming to figure out how many trials of that drug for that use were started and how many ended up being published. I am guessing an individual doctor being visited by a detailing rep is not going to take on that project. In that case, the physician doesn't know if she is reading about results that are similar to the other 19 trials undertaken, or if the results she is reading about were the only instance of an effect and the other 19 trials yielded no effect of the drug at all.

The innovator has the right to have free speech and tell physicians about it's trial, of course. Any one of these articles very likely contains correct analysis and accurate data and so on. But nonetheless, I do not think the physician faces the correct statistical problem when she tries to update her beliefs about the efficacy of the drug.

This is because there is a group of trials out there, and the physicians are seeing one little sliver of it. So I think that's an area where some new research would be very valuable. That's all.

(Applause.)

DR. SCOTT MORTON: Are there questions? I

was crystal clear? Okay.

DR. CHESNES: Now we're going to move to Paper Session Four on the Theory of Industrial Organization, chaired by Roman Inderst.

PAPER SESSION FOUR: THEORY OF INDUSTRIAL ORGANIZATION.
ROMAN INDERST, Chairman, Goethe University
PRESENTER: HESKI BAR-ISAAC, New York University
DISCUSSANT: JUSTIN JOHNSON, Cornell University
PRESENTER: PATRICK DEGRABA, FCC
DISCUSSANT: LUCY WHITE, Harvard Business School
PRESENTER: VOLKER NOCKE, University of Mannheim
DISCUSSANT: JOE FARRELL, FTC

DR. INDERST: So I'm going to chair this session, and I'm going to sit right here in the audience too, so I can see the three very interesting papers. I want to thank the paper presenters and the discussants for being here and I think we've got an excellent choice of both applied but also theoretically interesting papers. Heski is going to start.

DR. BAR-ISAAC: I would like to thank the organizers for putting together a great program and for including this paper among these great papers.

So this is a research paper. It does exactly what it say on the tank. So it's going to be a model of consumer search. We're going to have firms choosing designs, and we're going to look at the implications for market structure.

Time is short, so we're going to kind of put

the tank away right upfront, which can serve as motivation as well. This is just a very simple idea that says that as it becomes easier for consumers to find quirky stuff that they're going to fall in love with, firms are going to provide that kind of quirky stuff or the information that's going to allow people to figure out that they love this quirky stuff. And this is going to have equilibrium effects on profits and sales distributions and market structure, so on and so forth.

So what's going to be interesting and tough in the paper is to put enough structure to explore what these equilibrium effects are. A little bit more in terms of motivation, this goes back to the slides I inherited from my senior colleagues when I started teaching microeconomics at NYU where, embarrassingly still in 2003, the slide said the Internet is going to make a world with perfect competition. We're going to see prices converge. We are going to see efficient firms arise -- and I think there was a feeling, not in 2003, but whenever it was that the slide that I inherited was written, presumably in the 1990s sometime -- that the Internet was going to do these magic things.

The first round of empirical studies that

were out there looked at price dispersion, so I think that was the starting point and made the observation that there was still considerable price dispersion out there.

My touching up on the points is really going to be a second generation of empirical work that said, "Well, as interesting as it is to try to understand price dispersion, there's also been changes in market structure." In particular, in the popular literature, there's Chris Anderson, the former editor of Wow Magazine, who in 2004 wrote an editorial of the long tail in 2006. The book came out, The Long Tail. The 2009 reference is to the second edition, the longer long tail. There's no end to this tail apparently.

So what is this long tail? The idea essentially is that small sellers are a much bigger deal than they used to be, so in a traditional bricks and mortar store, the kind of story you would hear is that the top 20 percent of sellers let's say account for 80 percent of the sales, and the small sellers don't really add up to much.

Instead, if you go to Amazon and you don't count the big sellers, well, it's still going to be the case that Greene's econometrics book and Winston and the rest of us add up to a considerable size. There

are enough people buying these very niche products to add up to something significant.

At the same time that we have this evidence on these long tail effects, there's evidence on the Internet about superstar effects that the blockbusters are even more blockbuster-y than they used to be. I don't know if anyone was doing it last night, but people are still queuing up at midnight to watch the new release of the Harry Potter movie or whatever it is. If I look tired today, I'll leave you to speculate.

Interestingly enough these two things don't seem to be in contradiction, so there's empirical work that suggests that we have both these long tail effects and the superstar effects arising simultaneously. I'll say a little bit more about that, and the model is going to be able to generate both effects at the same time.

Really, the jumping off point is the last bullet point on this slide that's saying that there's just been tremendous changes to industries. If you look at the numbers on something like book publishing, which is a slightly disingenuous thing to do inasmuch as there's been a lot going on on the production side as well, we have the rising books on demand and on

demand publishing, but at the same time, just the growth has been dramatic.

So between 2002 to 2007 the number of new book titles in the U.S. rose from 250,000 in '02 to 400,000 in '07. The statistics nicely break out how much of that has been on demand. About half that growth has been on demand titles, but the other half of the growth is in new titles. I think just by introspection of looking at the phenomena of new businesses that arise on EBay or the 15 books on how to be a power seller on EBay that have been written since EBay's arrival are suggestive to say the least.

I'm going to skip this quote. Just say this is a standard search model, so this is a very exciting paper to be presenting now. Everybody knows about search models in the last few weeks, since Peter Diamond won the Nobel prize in Economics. Some guys in Sweden did me a big favor in motivating this paper.

In the standard search models people are running around to get price quotes and learn their metrics. The starting point is sort of the Diamond model where people are running around to get price quotes. What we learned from the Diamond model is the sort of startling result that there's no heterogeneity in prices in the world.

Various people have thought about how we get more heterogeneity in the price decisions.

What we're going to do in this model is endogenize this heterogeneity to a greater extent by allowing firms to control it. Firms are going to control the sort of designs that consumers face, so there's going to be two interpretations here, and maybe Justin is going to say a little more about these things. One is the marketing or information provision interpretation that says if I tell consumers more about the good, then they're going to realize to a greater extent whether they like what they are seeing or whether they don't like what they're seeing.

So the design for us is going to be thought of as a mean preserving spread. It can be a little more general than that, but more information, we think, might lead to more dispersed valuations or on the designs directly. The point is going to be that search costs affect both pricing and product variety.

To give you an idea of what I mean by a design that's broader or more niche, I think the design on the left is one that people are going to feel relatively similar about, and no one is going to get super excited or unexcited. The niche design on the right might invoke stronger responses, quite possibly

negatively.

So the contribution here is going to be several fold. There's going to be a modeling contribution that's going to bring together I think two classes of models that have been of interest to people in this room. One is this model on search on the consumer side and information gathering, and on the other side, the firm response in terms of providing more information or design.

I think typically these things have been looked at separately. We're going to bring them together, and if you would rather think of this as competition in these models of information provision or endogenous designs in the search models, I'm happy with either way of perceiving it.

What we're going to do in the paper then is set up the model, characterize the equilibrium, and then run the comparative statics. In particular the comparative static we're going to be interested in is the effect of the lower search cost, what the Internet has done, and I'll get to the results when we get to the model.

So formally the model is going to feature a continuum of firms endowed with some production technology, so you can think of this as vertical

quality. Maybe that's what we should run with, but thinking of variation in terms of marginal costs would run just as well. It's not terribly important, but it's going to give me some additional economic insight to have this ex ante vertical heterogeneity. We can run the model, and in the paper it's there with a degenerate distribution where everyone has just the same vertical quality.

A consumer, when they go to a firm, is going to get this vertical quality. They're going to get this match. This match is drawn from some distribution, a parameterized distribution, and the key thing here is that the firm is going to control that distribution. The F that this match is drawn from is going to be a strategic variable for the firm.

On the search side, the search is going to be completely standard. We've just got constant returns to the search technology. You can also spend C to go visit another firm and get a new price quote.

The firm strategy is going to be to choose prices as usual, but in addition they're going to choose the design from a parameterized family of designs. There's a lot of math there. I think it's going to be easier to show it in terms of the picture.

So thinking of firms as choosing between

relatively more dispersed and less dispersed designs. It doesn't have to be at the mean. It doesn't have to be all rotating at the same point, and again I might defer to the discussant who might say more about some of these things.

I should say that what we're doing here in terms of the design, is I adopted the framework that Johnson and Myatt adopted in their 2006 paper in the context primarily of a monopoly model, and the monopolistic competition of a search environment allows us to think of competition in the choice of designs.

So the consumer strategy is going to be a standard one in the search model. It's just going to be an optimal stopping problem for the consumer, and some level of utility that you're going to have to give them as a firm in order to get them to stop searching. My U is just going to be a search threshold. It's a standard search model, but just has a few more integrals thrown in to account for the fact that we've got heterogeneity among these vertical qualities and different designs potentially.

Now consider Nash equilibrium. We're just going to characterize static Nash here. There is always going to be a class of boring equilibria where firms are going to charge very high prices and design

is going to be irrelevant because nobody is going to be shopping around. If consumers expect that there is nothing out there to look for, they're never going to have the opportunity to be disappointed.

There are more interesting equilibria as well, and what we're going to see is it's going to be optimal for firms to choose a broad or niche design. They're going to very simply characterize equilibria by thinking about what's stopping the consumer, and how a firm may be indifferent between choosing a niche design and a broad design.

So to see the result for firms that are going to want to choose extreme designs, I think that the pictures are very useful here. If you think about just the monopoly case, what's going on here is the firm is going to choose one of these demand curves. A firm is going to want to choose something that's on the upper outer envelope of what's traced out, and the outer envelope is traced out by what is the most niche design or the broadest design.

Similarly, it's very intuitive that it's going to be the more advantaged firms that are going to choose the broad designs. If we think of the variation in terms of marginal costs rather than vertical quality, the two things that are equivalent here, if I

have a very crappy firm within a very high cost, it's going to have to charge a very high price and the only way that anybody is going to buy at that very high price is if they absolutely fall in love with the product.

On the other hand, if I'm a very advantaged firm that's going to charge a relatively low price, pretty much everyone who comes into my store is going to want to buy. I don't want to give them any reason to be disappointed, so I'm going to choose a broad design. We have enough structure on our demand functions here so that everything is going to be monotonic, and so by characterizing the indifferent firm, we can see that all firms that are worse than the indifferent firm are going to choose the niche designs and all firms that are better than the indifferent firm are going to choose the broad designs.

So the characterization is going to be relatively simple. It is just going to depend on the stopping rule of the consumer and who is the indifferent firm.

We can characterize a search cost (CB) such that if search costs are higher than that, all firms look advantaged and they're going to choose the broad design. This is a possible result. Similarly, we can

characterize a search cost (CN) such that if search costs are lower than that, than all firms choose niche designs.

In these cases, we get the standard results that arise in these search models that lower search costs always make consumers better off. They're always going to drive down prices and profits for the industry as a whole.

We can potentially get multiplicity depending on whether CN is bigger than CB. Specifically, when CN is less than CB, there has to be some coexistence of different designs in equilibria.

What we mean by superstar effect and the long tail effect - the literature is a little bit fuzzy on these things - but for us, we're going to take a very strong stance and we're going to say a superstar effect is present if when we look at the firm that has the highest sales, the largest firm in the industry, it captures an even higher market share as the search cost falls. We're going to describe that as a superstar effect.

Conversely, we can look at the worst firm in the industry, the firm with the lowest market share and ask whether its market share rises as search costs fall. As the Internet comes in, is the worse firm

having a higher market share? If it does, we say a long tail effect is present. By continuity, similar things are going to happen in a range around this single best firm or single worse firm.

Surprisingly we get much crisper results, the more structure we're going to put on our model, so in particular, if we make some functional form assumptions on the designs and on the distribution of firm types, we can get analytic solutions and crisp results.

So in particular, because I'm not an empirical guy who works with extreme value distributions but an applied theorist who works with uniform distributions, I'm going to stick with my uniform distribution. So, I'm going to think about uniform distributions for the designs and uniform distributions for the firm types.

The notation that's going to be useful to hold on to here is that the firm types are going to be distributed between the lowest firms and the highest firms, and these designs are going to be indexed by niche and broad with the upper bar representing the best match in the distribution.

So with that, let me get to my proposition, which is, first of all, under these assumptions, so long as all firms are active (making positive sales),

there's going to be a unique equilibrium associated with each search cost. Furthermore, when different firms choose different design strategies, then as those search costs decrease, consumer surplus increases.

So if search costs are lower, consumers are going to be pickier is another way of interpreting this result. This is going to lead to firms to be more niche. The superstar effect always arises, so the best firm in the industry always captures the higher market share. The long tail effect can arise but need not arise, and the profits for both the highest and lowest quality firms might both go up.

The key condition for these profits rising and for this long tail effect to arise is whether or not this Theta N upper bar minus this Theta B upper bar is bigger than H minus L. This is a lot of notation, but it has some economic interpretation meaning. H minus L is capturing vertical differentiation in this industry, the difference between the best firm and the worst firm in this industry in the distribution of firm types for the industry. On the left-hand side we have something capturing horizontal differentiation. It measures the importance of changing from broad to niche designs in terms of the dispersion of match values.

So to make this even more concrete, we're

going to throw in some numbers and the number in the interesting case where this long tail effect is going to arise.

Here I'm showing profits of the worst, the best, and the industry average. What you see is an interesting non-monotonicity, so these kinks are coming in where both firms are broad or all firms are niche, then the usual search cost thing happens. Lower search costs intensify competition, bring down profits, but in this region where both designs are present, we've got profits increasing as we reduce the search costs.

I'll show you this one result and then I'll conclude. This is a result that's trying to capture this long tail and superstar effect. What I've got here is every firm indexed by its vertical quality and I'm showing you the distribution of sales for high search cost and low search cost.

As we move from the high search cost to the low search cost, the sales of the worst firm increase and the sales of the best firm increase. You can see those extra sales are coming from the middle. We have these guys in the middle who used to try to appeal to everyone with these broad designs. In this more competitive environment they can't get away with that, to quite the same extent. They switch to being niche,

and customers that used to get stuck at those firms are running around much more than they used to be. They're stopping at firms where they're really a good match or they're selling something really fantastic, so you have dispersion of consumers to both the tail and head of the distribution.

This is another graph that shows the same thing. Let me conclude by showing you a simple tractable model that integrates these consumer search decisions and firm strategic prices but introduces this relatively new idea of the product design choices.

Unsurprisingly, search costs are going to affect these product design choices, and we get here prevalence and coexistence of very different design strategies, so we've got some firms going to these different extremes, and this has implications for price and sales distributions.

Firms with better technologies are going to tend to adopt broader designs. This is something that's sort of been observed I think in other literature as well, so this comes out in some work of Anderson and Brynjolfsson in a marketing paper. We get this result that prices and profits may be non-monotonic in search costs, and industry profits can arise as a consequence of lower search costs.

I should highlight this isn't at the expense of the consumer. Consumers are better off. This is a win/win. With these lower search costs, we're getting better designs and better matches getting consummated here. These long tail and superstar effects arise simultaneously, and we can tell you when it is that this long tail effects arise and that these industry profits can increase. It's when we've got enough horizontal differentiation as compared to the vertical differentiation. So, if you think of some of this empirical work, if you think about what happens with bookstores, which are pretty much homogenous goods, Syverrson, Hortacsu, Onsel and Goldmanis showed that Internet penetration drove out small bookstores, so this is an environment where there's very little horizontal differentiation. They're literally selling the same books, and it's just the efficiency that dominates.

On the other hand, if you think about what happened to actual books rather than bookstores, there has been a tremendous increase in these niche books, kind of consistent with the intuition of this model.

The last point is just this vertical differentiation is convenient, I think, for giving some economic insights to purify what I think would be a

mixed strategy in homogenous firm case, but if you're offended by ex ante heterogeneity and the efficiency of firms, it's not critical for the results of the model.

So I'll leave it there and I'm interested to hear what Justin has to say.

DR. JOHNSON: Well, after yesterday afternoon, I think I'm supposed to trash your paper, but actually it's a completely lovely paper, so I'm not going to do anything crazy like that.

I was fortunate enough to see it I guess a year-and-a-half ago in Paris. It's highly polished. It's really an excellent paper. Because it is so highly polished and so progressed, I'm going to spend more time than usual trying to place it I think in the literature, explain why I think it's an important paper, and then perhaps suggest at the end some additional utility to the framework that's utilized in this paper.

So the paper is about product design, and I want to explain why I think the niche that this paper addresses within the broader product design literature is very important and I want to, first of all, discuss what the papers on product designs are at a very conceptual level.

There's lots of dimensions along which firms

can choose their product design. Some of these have been studied intensely, and others have not, so if we look at the literature on durability or on innovation, this is an enormous literature, justifiably. So these are important topics.

If we look at the literature on firms choosing simply the quality of their products, so thinking about vertical differentiation, we know there's a beautiful paper, a 1978 paper by Mussa and Rosen that delivers an extremely important intuition that I think most of us are familiar with, asking how we design this product line so as to facilitate the extraction of surplus from consumers.

I should say there are also some papers on vertical product line competition, both in a price setting and in a quantity setting environment. If we look at horizontal competition, then I think at least in some loose sense, the literature is less developed.

On the one hand, we have a very important intuition that firms want to take steps to relax price competition to some extent, and that's an important take away from a number of the early papers in this literature, but beyond that, it's not clear to me that literature has gone as far as it might have. I think there is one primary reason for that, which is that it

turns out to be rather difficult from a technical perspective to model horizontal price competition unless you think about a very stark environment such as a Hotelling line or unless you impose complete symmetry on firms.

When you start on firms, when you start to hear about firms offering products that are ex ante different, and there being multiple firms out there, the problem becomes potentially much more complicated, so that's one contribution of the paper that we're talking about today. I'll call it Heski's paper. Obviously it has two coauthors on it.

The other main contribution of Heski's paper is in incorporating a search environment, and there's an enormous search literature as well. Search is extremely important. Yet almost nothing in this literature incorporates the idea of product design, so we have this huge literature on search, this huge literatures on product design, but almost nothing that simultaneously deals with some of the more realistic levels of product design or types of product design and the search problem.

So this is why I think this paper is very important. I should at this point mention a paper by Nathan Larson, which is sort of contemporaneous to the

paper that was discussed today, which I think goes down a very similar path and is also a very worthwhile paper to read if you're interested in this topic.

So to talk about this paper, just to quickly summarize or to perhaps give a slightly different take on it, it talks about product design and search. It's primarily interested in explaining long tail effects and superstar effects.

A puzzle, as Heski mentioned, from the standard search literature is that usually we think that if search costs go down, firm profits go down as well. Let me just explain a little bit more what the intuition would be because I think it helps to see why that intuition does not hold when you complicate things a little bit.

So firms are selling ex ante identical properties, not identical properties but products that are drawn from the same distribution for each consumer, then if search costs go down and you think consumer utility goes up, that means that any time a consumer comes and visits me as a firm, I know that customer has a higher outside option, I have to lower my prices, so all prices go down.

Since we're all charging the same price to begin with, industry profits must go down as well, so

even though consumers are searching more and visiting more firms, the same number of sales exist. Everyone lowers their price. There was no differential effect in any firms, so firm profits have to go down. Even though consumers are better off, the firms are worse off.

If we have endogenous product design so we have a world where firms are offering different types of products, we don't need to have this phenomena arise. So, I just want to talk a little bit more about why the firms or at least some firms can be better off in this environment.

So let's suppose the search costs go down, and let's just assume that consumers are better off as a result. Why might some firms at least be better off? The intuitive key here is that firms are offering different types of products and some firms change the types of products that they offer.

So if consumers are better off, it's still true that when a consumer visits me after a decline in search costs that I feel like I'm in a worse situation. That consumer has a better outside option, so I do have to lower my price. That doesn't necessarily mean I'm worse off because what happens in this model is there's a group of firms that in response to the decline in

search costs begin offering products that are more niche in nature.

What does it mean for a firm to offer a product that's more niche in nature? It means that fewer consumers like that product enough to buy it. That firm also raises its price, so it's offering a higher priced product that fewer consumers like. That means that more consumers who visit that firm don't actually buy from that firm but go on and search somewhere else.

This implies that there could be a differential effect on who benefits and who looses from a decline in search costs. In particular, if I were already offering a Hello Kitty laptop, for example, then when search costs decline and all the firms in this section start offering more niche products, or whatever Heski called them, that's really great for me because now more consumers abandon those firms and spend enough time looking and eventually find my Hello Kitty laptop, and so many will like it because it's Hello Kitty and it's so cute and it's pink too, so that can be good for me.

It can also be good for the very best firms, and the very best firms are going to sell a very high quality product anyway. They're going to be better off

when you get more customers in the search environment, so here you can get both the long tail effect and the superstar effect at the same time.

Importantly, as Heski says, we'll go with business school jargon, it's a win/win situation. I am from a business school, so I think I can say that without being insulting.

I want to point out a couple other approaches that might deliver similar results, and I want to emphasize that it's not really in any way meant to impugn the results here because I think I've already emphasized that this paper fills an important gap in the literature by doing the things that I've already talked about.

Directed search: One thing that's become a lot easier for customers to do is find what they're looking for, so the search technology that's always used in the literature is that people just don't randomly search anymore, totally randomly searching. But of course it's now much easier for me to say, "Well, I love Hello Kitty, and I love laptops, so maybe I'll type in Hello Kitty laptop in Google" and up will pop Heski's private laptop that he doesn't bring on business trips. And I might be able to buy it. That's one way I could easily get the long tail effect.

I bet I could probably also get the superstar effect in a similar model because, again, if I have a paper or a product that's of inherently high quality, I'm probably willing to pay more for sponsored search.

Include social media, recommendations potentially through Facebook, people sharing their thoughts and ideas about what products are good or what products are bad and I think it's pretty clear that you could get some sort of cascading. You could get people sharing products they like with their friends. In as much as their friends have correlated preferences, maybe you also can get the long tail effect. I haven't thought about these carefully, but I think they might be some interesting directions to explore.

Just with another moment here, I want to make a plug for the general idea behind this paper and some work that I've done as well. For full disclosure, this paper considers a framework or analyzes a framework in which dispersion of preferences is really important.

So, it's not about which product is best or worst. It's about how preferences match the products that are out there. It turns out that's part of a general phenomenon, which is how preference dispersion influences economic activities, and there are a number of related examples in which you can get similar

effects.

So if you look at advertising, advertising that is either of the existive nature or persuasive nature, actually I heard a comment yesterday afternoon which had exactly the same effect on demand curves like pushing them outwards, but advertising that conveys product specific information of how well it might fit you actually generates the demand curve. I have some other examples listed in there that I won't talk about.

But just to emphasize that there are a number of ways in which you can get this dispersion or diffusion, and the long-term strategic effects are a little bit more subtle, but not a lot different. So all I want to say is that there are a few empirical papers that are starting to pop up, and there may be some additional opportunities there going forward.

Thanks a lot.

DR. INDERST: Moving on to the next paper, this is Patrick DeGraba followed by a discussion by Lucy White.

DR. DEGRABA: So thank you for having me back to talk about "Naked Exclusion by a Dominant Supplier."

Before I start, I will have to give the usual disclaimer. I'm an employee of the Federal Trade Commission. I'm on leave at the Federal Communications

Commission and so this paper represents neither the opinion of the FTC or the FCC, so I get economies of scope in my disclaimer.

I started to work on this paper because I needed to know, for a case I was working on, whether contracts of the firm where an input supplier says to a manufacturer, "I'll write you a really big check as long as you don't use my competitor's input in the stuff that you make," are that stuff going to generate harm to consumers?

So, there was already some literature on this, but I wanted to look in particular at a dominant supplier writing these contracts vis-a-vis a very small competitor.

Papers by Simpson and Wickelgren and Fumagalli and Motta were a huge advance in this literature because they tell us when the guy decided whether to accept an exclusive contract or not is a competitor with someone else, who is also deciding whether to accept an exclusive contract, the competition between them makes offers from someone else much less profitable for them, and that competition destroys some of the potential surplus in this market.

So there are some nice papers that say that you have to be worried about when an input supplier

goes to competing downstream firms and says, "Here, just use my product." The problem with this literature, at least the problem for me, was that all of these models have the same sort of structure which says there's an incumbent and there's an entrant, and all of these things keep the entrant from entering. So it establishes this guy is a monopolist, and then bad things happen when you have a monopolist.

I was sort of stunned by the fact that I talked to lots of people, and they would take this result in the literature and make the statement that exclusive contracts can only be bad if they completely drive out a competitor, so either keeping an entrant from entering or taking a small guy who is already in the market and driving him out of the market.

So the question remains, there are whole bunch of situations where you have a large input supplier and a small competitor, and these types of contracts don't drive the small competitor out. They do keep them from expanding, but he's in and offering prices and observing price competition, so the question is: In those circumstances, can you still get competitive harm from exclusive contracting?

The answer is yes, so that was the motivation for this model. The formal models that are out there

typically use a sort of first mover advantage, that only the incumbent firm can offer an exclusive contract, and the entrant who has a better product is unable to offer an exclusive contract, and the entrant has to spend some fixed cost F to enter.

So if you want to look at a bunch of situations and ask empirically, "Do you see this happening," the answer, of course, is no. You can take the intuition from those models and apply them to a world where, in fact, you have a large incumbent or a large supplier and a small supplier coexisting, but the large supplier uses these exclusivity type of contracts to keep down the competition and make customers worse off.

So I wrote down this model to describe this situation. The advantages of this are, as I said, it gets rid of a couple of assumptions that don't really match up with what happens in the world. It also is a model that gets what are called loyalty discounts or contracts with a firm, such as, "I'll write you a really big check if only 10 percent of the stuff that you use is my competitor's."

The existing literature can't generate harm from those kinds of contracts, so the model spits out that as a result. It also tells us how big these

payments have to be, and this model will also address what's called a price cost test.

One of the propositions in antitrust is that if you're looking at payments for exclusivity, one of the ways you can tell whether they're good or bad is to take the payment, allocate it, if you will, to the incremental units that get sold because of the exclusivity contract. Call that an implicit discount; subtract the implicit discount from the price you observed to get an effective price.

If that effective price is below cost, then you have a problem, and if that effective price is not below cost, you don't have a problem. This model is going to say that's a bad test on the second side, that in fact there can be situations where the effective price is above cost and you can still get consumer harm.

So the results from 5,000 feet or 50,000 feet, I got further away: I've got a model where you have two consumer segments. There's a large segment that really likes the final good made with a particular supplier's input, this defines the dominant supplier. There is also a smaller consumer segment that prefers the final good made with the rival's input, and they prefer it just a little.

So what the dominant supplier is going to pay the downstream firms or downstream manufacturers not to use the rival's input. That payment is going to be the incremental value of the rival's input in that small segment, and that payment is going to be enough to keep all of the downstream manufacturers from using the rival's input.

That establishes the dominant supplier as a monopolist. He then gets to charge the monopoly input prices, extracting the monopoly rents from end users, and then those monopoly profits essentially finance the payments that got paid to the downstream manufacturers.

So in the formal model, there's a dominant firm D and a small rival R. They each sell inputs to downstream producers. There are M producers that turn one unit of input into one unit of output. There are no costs in this model because it just adds extra notation.

The downstream firms are undifferentiated Bertrand price competitors except for which input they use. End users view the downstream manufacturers as homogenous except for whatever the input is that they use. Most end users will pay a big premium if the dominant firm's input is used, and a few of these guys will pay a small premium if the rival's input is used.

Here is a graph of the market. This entire paper can be done on this graph; so what does this graph say? The green line WD is the willingness to pay by all consumers for a final good with the input from the dominant supplier. And to make life easy, every customer has exactly the same willingness to pay for the dominant supplier's base good.

The red line is a demand curve for the final good with the rival's input. QC is a relatively small number, so all the guys from zero to QC are willing to pay WCR, which is bigger than WD, so those are the guys who are willing to pay a little bit more of a premium for the small rival's base product.

Then all the rest of the guys, the low part of that red line, are willing to pay a lot more for the dominant firm's product. We'll call the small market the contestable segment because these goods are kind of close in willingness to pay. We'll call the big segment the non-contestable segment.

It's important here that firms get to price discriminate across the two segments, so downstream firms can tell who the guys are that like the rival's product a lot or like the rival's product a little and who liked the dominant firm's product a lot.

Also, this is going to be a crucial thing and

somewhat controversial amongst theorists, although not nearly controversial amongst people who do this for a living: The input suppliers can price discriminate across market segments.

If you don't believe that can happen, there's a nice little link in the references to New York state's complaint against Intel, and in that complaint, there's about a five or six paragraph description of a discount program where Intel gave credits on an RFP by RFP basis. It would then decide whether that was going to be a competitive auction or not so competitive auction, and it would give discounts on a basically customer by customer basis.

I'm going to use that in here. It's going to make the math a lot easier. In fact, it's going to make the math so much easier you don't need math, you just need the graphs. If you don't like that assumption, you're not going to like the rest of the paper.

So this little graph basically has four boxes in it that all have some intuition. Box A is the incremental value of the small rival's inputs. Box B is how much profit the dominant firm could generate if it became a monopolist in the contestable market. Box E is the extra value that the dominant firm generates

in the non contestable segment, and Box C is the value of the small rival's product in that segment if the small rival were a monopolist in the non contestable segment. So, those are the four sort of ideas or the four variables, if you will, that kind of run all the analysis here.

So we can ask the question: What would happen if you had a simple Bertrand game where each input supplier announced a price, and the price for the input was segment specific, and then the downstream firms looked at those input prices, treated them as marginal costs and set retail prices, what would you get as an equilibrium? You would get basically what you think of as the standard Bertrand result, and the blue dotted lines are the prices.

In the contestable segment the input price is really low, and it reflects the difference between the small rival's value and the dominant firm's value. So, the dominant firm would set a price at zero in that segment. The rival would set a price of WCR minus WD, the incremental value of its good, and it would basically earn this box here as profit. That's going to be a huge factor later on.

Over in the dominant firm's market, because consumers are willing to pay a little bit for the small

rival's product, the small rival sets an input price at zero, and then the dominant firm has to shade his input price from WD down to WD minus WNR because there is some competition in that market. So, the retail price would be pretty high.

That's what happens in the simple, naive Bertrand world. Exactly what you think ought to happen happens. Firms that have some scarcity should get all the rents from those scarcities, and those are the input suppliers. The downstream firms who just provide a homogenous service of being a manufacturer get zero.

That's the benchmark model and we want to compare it to a game where there are exclusive contracts offered, so the game goes as follows: Both suppliers offer a payment for exclusivity. The M producers look at these payments and then announce whether they're going to accept the payment or not and be exclusive.

The suppliers set a transfer price that, again, is segment specific. The producers then look at the prices and announce whether their decision to be exclusive or not was a good idea or not. So at this point you have an option to decide if they're going to breach and announce whether they're going to breach the exclusivity or not.

If any producers decide to breach exclusivity, suppliers get to do another round of transfer prices because the world just got different, and so they can offer lower transfer prices in response to this breach of exclusivity.

Once all these transfers prices are set, the downstream manufacturers set prices and all players observe all decisions. It's about as vanilla of a model as you can imagine, and so we're going to ask what the equilibrium is in that game.

It turns out that there are two conditions that you need for there to be an equilibrium in which exclusive contracts are offered and accepted. The first one is the number of firms times that little Box A is less than B plus C. What does that mean?

Intuitively, if you look at B plus C, that's the extra profit that the dominant supplier would earn if he were a monopolist in both the non-contestable segment and the contestable segment relative to the Bertrand outcome, so that's the benefit if, if you will, for him being a monopolist.

What is M times A? M is number of downstream producers. A is the incremental value of the small rival's input to the market, and that's going to be the total payments that the dominant supplier has to make

to all of the downstream firms in order to induce them to be exclusive to himself.

And so that first condition simply says if the sum of the payments you have to make to be a monopolist is less than the total benefits of becoming a monopolist, then you make those offers and firms accept them.

Why is A the amount you have to pay a firm in order to be exclusive? And the answer is simply this: The dominant supplier is a monopolist and he charges the monopoly price in the non contestable segment. If there's competition or if one of the downstream firms decides to use a small rival's input, then the dominant firm lowers its price in that segment from WD down to zero, so there's very intense price competition.

The only thing that the small rival can earn, once he's competing with a dominant supplier, is in fact the incremental value. And that's the most that he can offer a single firm to stop the firm being exclusive to the dominant supplier.

So as long as the dominant supplier pays the most that the small rival could pay in terms of profits, no downstream manufacturer has an incentive to defect.

The first condition simply says the dominant

supplier simply has to pay as much as you could earn from being the only supplier or the only manufacturer using the small rival's input, and that will keep all these guys in line.

The second condition is a condition on how big the dominant supplier has to be. Notice E is the amount of profit that the dominant supplier earns if he's competing in a Bertrand world against the small rival. A plus B plus C is the most that the small rival could earn if he were a monopolist in this entire market. A plus B plus C divided by M is the most that the small supplier could pay each of the downstream firms to be exclusive to him and not be exclusive to the dominant firm.

And so if the most that the small supplier could pay each firm to be exclusive to him is less than the profit that the dominant firm would make by getting one firm to defect, then there's no equilibrium in which the dominant supplier can be knocked out of the market. So, that second condition there is just a condition that says the small supplier is always going to be competing with the dominant supplier; that's what I just said about MA being less than B plus C.

That's essentially what makes the equilibrium run, and again the key thing that makes this model work

here is that if one of the downstream manufacturers decides to breach and uses a small rival's input, that generates competition, which basically destroys all of the surplus from this market. And so no firm has an incentive to breach the exclusivity because it's already being paid A in order to be exclusive. By accepting a lower price, he generates competition, and the most he could earn in that situation is also A. That was the equilibrium, and it has the feature that, in equilibrium, the small rival makes no sales at all.

The last thing I want to do here before my time runs out is to do what I promised, which is to say, talk about an equilibrium where the small rival does, in fact, make some sales. If you go back to this graph here, the whole point of the equilibrium is that the payments M times A is less than the monopoly profit or the extra profits that the dominant firm makes.

We now change the model just slightly and suppose in the contestable segment that there are two kinds of end users. There are some that really, really, really like the small supplier's input, and they're willing to pay WZ for the input. And then there are some other guys who like the small rival's input, but not quite as much, and they're still willing to pay the old WCR from the last model.

In this model the profit maximizing thing to do for the dominant supplier, rather than try to take over the entire contestable share, is pay each downstream firm what is the new letter A, which is just the value to customers between QZ and QC to be exclusive in that portion of the market, and leave the smaller portion of zero to QZ portion for manufacturers to go out and use the dominant supplier's input.

That can easily be generated by a contract that says that everybody's going to sell or the contract is just a percentage contract. You figure out what percent of the market zero to QZ is and say, "As long as you don't use more than that percentage of your product using the rival's input, then you get the payment A," and that equilibrium generates exactly the same result as before, which is in the markets where the dominant supplier is dominant, he gets to charge a monopoly price.

Consumers are worse off because, first of all, they're paying a higher price than they would have in the Bertrand equilibrium. And secondly, in the contestable market, the QZ minus QC customers would prefer to be buying final goods that use a small rival's input when, in fact, they end up buying the final goods using the dominant firm's firm input, so

there's actually a dead weight loss to society as well.

I'll presume 20 minutes is up, and I will leave the rest of these slides undiscussed. Thank you.

DR. INDERST: We'll move on to the discussant, and then we'll move on to the final paper and possibly have questions right at the end if there's time.

DR. WHITE: Thank you very much for inviting me to discuss this paper. I really enjoyed it. I think it's very important. I think if anything, Patrick probably undersells it because he said that there's this literature and he wanted to change the assumptions a bit, but the assumptions of the previous literature are pretty important and pretty restrictive, so it's quite important to relax those assumptions to get a more realistic setting.

This paper shows that exclusion can be used to limit the expansion of a rival supplier who's already in the market, so it's not just about keeping entrants out, but it's about keeping small rivals small.

The argument here doesn't depend on making it impossible for a firm to cover its entry costs because there are no entry costs. The firm is already in the market. And as Patrick said, in practice it's also the

relevant case. Notice that the previous literature depends on having some kind of coordination failure between the firms, and this paper doesn't rely on that either.

So there was a numerical example in the paper, which I thought you might do in the presentation but which you actually didn't. I don't know if it's actually useful to use this side because the numerical example is a bit misleading in some ways because it's really a numerical example about the previous literature.

There are two things, the market, R, and D, the dominant firm, but exogenously R can't offer exclusive dealing contracts. Only D, the dominant firm, can do that, so that's what's been done in the literature so far.

Now, if R sells something, then he's going to be in competition with D because he's not allowed to offer exclusive contracts, so the maximum profit that he can earn can be thought of as the value R for R's products minus the value D for D's products because if D, you have competition.

So if D sells and offers exclusivity, on the other hand, he can sell his product at D, so the dominant firm has a choice of selling these products at

a D or else letting the rival enter the market. And if the rival enters the market, the most that rival is going to be able to get is R minus D.

So to keep the rival out of the market, you have to be able to pay all of the downstream firms that are going to sell the rival's units, R minus D, because that's the maximum surplus that's going to be created by R entering. R minus D can easily be smaller than D.

So that's the interest for the paper. By keeping the rival out, you can manage the price and monopoly price D, and if he comes in, the most he's going to make is R minus D, which is the competitive outcome. And so the competitive price that the rival makes may be a lot smaller than the monopoly profit that the dominant firm would make if the rival were not in the market, even though the dominant firm in this example has an inferior product to the rival firm.

Still the monopoly price for the dominant firm's inferior product is going to be a lot larger than the competitive price for the rival firm's better product, and therefore it's profitable for the dominant firm to exclude the rival.

This example depends on the fact that R isn't able to fight back by offering exclusive dealing contracts because if he could, he could pay a higher

price to keep the dominant firm out of the market than the dominant firm could pay to keep the rival out of the market because the rival's product in this example is more efficient.

So, the contribution of the paper is that you can show that you can get rid of this assumption. And how does that work? It's basically because D has another source of rents to bribe firms to be exclusive, and another reason to prevent the rival firm from selling anything. This reason is D has a core market and in the core market, the dominant firm's product is more dominant than the rival's product.

So the dominant firm's core market is more valuable than the rival's core market, and so the dominant firm intuitively is willing to pay more to protect his core market than the rival firm and is more able to pay to protect his core market. So in the battle of the exclusives, the dominant firm wins because he's got more to protect, and he can also credibly promise more rents to the downstream firms because he has a larger monopoly profit in his core market.

So how do we generate this result in the model? As I said, we've got to introduce two market segments: One that prefers the D input and one that

prefers the R input. The dominant firm can sell into either market or either type of customers, other the ones that prefer D or R, and this can't be verified.

It can be observed by watching the firms, but it can't be verified, so I'm giving you this input, and you're not allowed to sell it into the other market. This means that if R's input is sold at all, then it could be used to compete on D's core market, his turf, reducing D's monopoly profits there. Therefore D has a very strong reason to prevent R from entering at all because if R enters into the market where it's actually more efficient for R to enter, the problem is that there may be a temptation for this input to somehow move into the core market of the dominant firm, pollute that market, and destroy the monopoly's rent there. And D is very anxious to prevent that.

However, the model is symmetric in that R also has a strong reason for preventing D from entering his own turf, his core market. So D and R are going to try to offer exclusivity to prevent competition from arising, and that's in their mutual interest. They don't want competition to arise.

The problem is that the size of the bribes that R is able to offer is smaller than the size that perhaps D is going to offer for two reasons, one of

which is more important the other, and that's the one you focused on in the presentation.

The problem is that when D competes in R's segment, the rent that can be earned in that segment is smaller because that segment is smaller in terms of market size and also because in the paper, although you don't necessarily require it, the amount by which the rival firm's product is preferred for the dominant firm's product is smaller in the rival's market than it is in the dominant firm's market.

So, for example, if the D segment is simply larger in terms of quantity demanded, then D is going to have a much larger turf to defend, and it's going to be much easier for him to attract one single dominant firm away from the rival supplier because he can offer him a very large market. So, if the rival's trying to get everybody to be exclusive, then it's very easy for the dominant firm to attract away one of those firms because he can offer them a very large market. Also in the paper, the number of dominant firms that can sell a product might be rather small compared to the ability to sell these products, so you don't have to bribe very many different firms.

This model has also the nice feature that there's no explicit penalty for breaching exclusivity.

Nevertheless, exclusivity is maintained because after a downstream firm reneges on the agreement, the upstream firm will get a chance to revise its price, and prices may fall dramatically, which will destroy rents. And that limits the amount of the size of the bribe that you can pay people or you can promise to pay people in order to maintain exclusivity.

The model doesn't completely, in the base model at least, deliver what's promised because, as we've just seen, what's going to happen is that the dominant firm is going to want to prevent R from selling anything at all, so it's not very different from preventing R from entering. The only difference is we don't have a formal entry cost here, but we don't see any sales in the base model.

How are we able to fix this -- and you saw this in the presentation -- by introducing a third segment, which has two distinct possibilities.

Either a distinct set of downstream firms serving its customers, and so there's no possibility of exclusion, no possibility of leaping from this third market into the two core markets because the downstream firms are simply segmented. And so you will see then that the dominant firm would allow the rival firm to sell into the segmented market but not into the two

markets.

Or in the alternative, maybe less realistically but maybe theoretically nicer, you could -- and Patrick showed you this with a paper -- have a third of the consumers whose preferences for R are very strong. In that case, even if the downstream firms can all sell to anybody, it's still unprofitable to exclude R from this segment because the preferences in that segment are so strong. So then you can't use exclusive dealer contracts because it's unprofitable to exclude if you have to exclude over all of the consumers, even the ones who's preferences are very strong, and instead what you see is partial exclusion which allows multiple discounts.

So the only problem is that what you have exclusive dealing and zero sales by the rival, or positive sales but not exclusive dealer contracts rather than market share contracts.

So one suggestion is: Can you build a model of perhaps the most realistic case where you do see exclusivity and positive sales? For example, D could alternatively sign exclusivity deals with some producers and not others in the same market. One way to do that would be to introduce capacity constraints for the downstream firms so you can sign exclusivity

deals with, for example, the very largest firms and then just leave out the very small downstream firms and they could serve this niche segment with the very high preferences for R.

So, then you could more neatly capture what's going on in reality. Moreover, it would be quite interesting if you introduced downstream heterogeneity, if you could say something about which downstream firms would be offered the exclusivity payments and which not.

The paper makes an important step forward in understanding how exclusive dealing can be profitably used against an already present but smaller rival, but I think there is still more to understand. For example, if the exclusive dealing were banned, could you use any other instruments for the same effect? So, for example, maybe exclusive territories could be used, or you could somehow say you're allowed to sell to those types of consumers, and I would like to sell to these types of consumers. And maybe you could replicate the effects of an exclusive dealing using other instruments.

Thank you.

DR. INDERST: I think we have to press on in the interest of time. Our next speaker is Volker.

DR. NOCKE: This is a paper on merger policy, a topic quite fitting to what we're going to see afterwards.

This is joint work with Mike Whinston, and I should emphasize this is still preliminary, which means that in the last few weeks, we got some new results that we have never written up. Therefore the discussant is unaware of them, for which I apologize, but none of the main results change.

I guess you all know, but when mergers are proposed to one of the antitrust authorities, the antitrust authority faces a trade-off. On the one hand, mergers are likely to create intense market power because of internalization of competitive externalities. On the other hand, they create a lot of new synergies or efficiency gains, which we realize will be beneficial across society.

The first formalization of this trade-off is due to Oliver Williamson, in a famous paper in AER in 1968, that was sometimes called the Williamson trade-off.

Now, in a beautiful paper by Farrell and Shapiro, they look at the same kind of trade-off, that in the firm level and there's sufficient conditions for a merger to increase consumer surplus and also

sufficient condition for a merger to increase equitable surplus.

Now, what these two papers do, and pretty much all the literature does, is to consider a single merger in isolation. And what that means in particular is implicit in the literature is the idea that if the merger is approved, the market structure changes, but it's not going to stay the same afterwards. And if the merger is not approved, then we're going to have just the pre- market structure continue further.

So in particular, there are no future changes in market structure, no future mergers in particular, nor does the literature typically look at the question of whether the merger was actually feasible. The merger that is being proposed is a selected merger.

So I think our first paper on the topic, "Dynamic Merger Review," addresses the first point here. It talks about a model of merger opportunities, where firms have to decide when not to pass mergers at any point in time and amongst any merger, but the antitrust authority has to decide which ones to approve and which ones to block.

What we're doing in that first paper, is that we might see potentially complex dynamic effects in the sense that when we approve a merger now, it will depend

on future market structure. That future market structure, of course, is the markets have to change an exogenous structure but are actually endogenous because whether or not we're going to approve the merger today will affect the profitability and the consequences of future mergers. So, the possibility of future mergers will affect what we're doing now.

Despite these particularly complex dynamic effects, under some condition, the optimal policy of an antitrust authority that tends to maximize discounted consumer surplus, has a very simple resolution. It has a very simple formula, that the antitrust authority can express by adopting completely a proven policy where it completely ignores the potential of future mergers and approves a merger if and only if it doesn't hurt consumers given current market strategy.

Here we consider what is the optimal approval policy of an antitrust authority in mergers when firms can choose which merger to propose to the antitrust authority. We do this in the simplest possible setting where there's one pivotal firm, Firm 0, that is involved in each one of these potential mergers.

So there are several different mergers with different merger partners, and since these are with different merger partners, these mergers are mutually

exclusive, so at most, one can be proposed to the antitrust authority.

The main result of the paper is that the antitrust adopted policy is not naive in the sense that it's not going to be the case that the antitrust authority approves a merger if and only if it doesn't hurt consumers now. Rather, the antitrust authority is actually going to adopt a standard in terms of the minimum increase in the consumer surplus level that it requires. Furthermore, this minimum consumer surplus increases in that it will cause will actually be increasing the "size" of the merger, where by size, I mean the size of the combined pre-merger market shares of the merger target firm and the acquirer or partner firm. Now, the combined pre-merger market share is a naive computation of the post-merger market share. Thus, one can say that the analysis here provides a justification for discrimination between mergers based on a computation of the post-merger Herfindahl index, in addition to taking into account the effect on consumer surplus.

Now, the best thing to look at is the simplest possible setting. A firm here can merge with one of several potential acquirers. So, first of all, you have the naive computation of the post-merger

Herfindahl Index, which is actually the kind of computation that antitrust authorities do all the time. That is, you first compute the pre- merger Herfindahl Index, then you look at the post-merger Herfindahl index. A naive computation is going to mean that you're going to assume that all the firms that are not involved in the merger, have the same market share post-merger.

What we're seeing in this paper is that even if you knew what the effect of that merger would be on consumer surplus, you still are going to discriminate based on this naive computation of the post-merger Herfindahl Index. I'm going to skip the literature and turn to the baseline levels.

So the model is just a textbook Cournot model with constant returns to scale, and you make standard assumptions on demand that ensure the existence of a unique equilibrium and that the unique equilibrium is stable. There are K potential mergers and each one of these mergers is between Firm 0 and one merger partner, k. We are going to assume that these mergers partners are heterogeneous in terms of pre-merger marginal costs.

What is a merger? A merger is an ordered pair identifying the acquiring firm and the post-merger

marginal cost of the combined entity. Post-merger marginal cost is stochastic and independent across mergers.

The null merger is the status quo, MO. There are also some technical assumptions about no mass points as a part of these distributions.

If a merger is implemented, then there are going to be changes in consumer surplus and profits. Antitrust policy consists of a commitment to approve a set of mergers, A, defined by marginal costs. If a merger is proposed, it is approved if and only if the post- merger marginal cost falls into a particular interval or in a particular set I should say. If the post-merger marginal costs aren't as such, then the merger is not approved. Of course the set is chosen by the antitrust authority.

We're going to assume that the antitrust authority doesn't randomize. It's just a pure strategy if you would like, and as I mentioned, at most one merger can be approved.

For most of the talk, I'm going to assume that the antitrust authority's objective is to maximize expected consumer surplus.

So the question is given the antitrust policy, how do the firms decide which merger to propose

to the antitrust authority?

We're going to assume that essentially it's a bargaining process. For now we're going to assume that it's given by Segal's offer game. Firm 0 makes a take-it-or-leave it offer to an acquiring firm for which the increase in combined profits from the merger is the greatest. Firm 0 is expecting there to be some transfer if the merger is made. The acquiring firm can reject the offer, in which case no merger takes place. Given that, the antitrust authority is then going to choose its approval set.

Let me skip these things given the time; let me try to make these things graphic. Here the vertical axis is the change in consumer surplus. The horizontal axis is the change in the merging firms' bilateral profits.

These different curves refer to different mergers. For merger Mk, the post-merger change in profits and consumer surplus lies somewhere on the curve labeled Mk. The curves are upward sloping because we assume that the post-merger marginal costs falls, and in this case a given merger is associated with higher bilateral profits and greater consumer surplus. Also, these merger curves can be ranked in the sense that the curve corresponding to the larger

merger is to the right of that of the smaller merger. This occurs because, holding the change in consumer surplus fixed, bigger mergers are associated with a greater increase in bilateral profits. Thus, there's an intrinsic bias in firms' proposal incentives relative to the interests of consumers. If two mergers produce the same change in consumer surplus, then the larger merger will increase profits by more than a smaller merger.

This result doesn't rely on the particular bargaining. Efficient bargaining gets us the same thing. The only difference would be that delta pi would now be aggregate profit instead of bilateral profit.

What is the main result here? The main result is that because of this intrinsic bias in firm's proposal incentives, the antitrust authority should optimally have a policy that discriminates against larger mergers. It's going to approve the smallest merger if and only if that merger is CS nondecreasing. Furthermore, the minimum acceptable change in consumer surplus levels will be strictly positive for any larger merger and actually will be increasing in the size of the merger. In fact, it could be that the largest mergers will never be approved at all.

I don't know that I'll have any time to go into this. So, let me just say that you can very generally rank these mergers. You should use this naive computation of the change in post-merger Herfindahl Index to discriminate between mergers.

So, I have this simple baseline model and a model where this pivotal Firm 0 can choose which merger to propose to the antitrust authority and the antitrust authority's optimal policy involves discriminating against larger mergers in the sense that the optimal policy has a higher minimum consumer surplus standard than for a smaller merger. Discriminating between mergers on the basis of their naive computed post-merger Herfindahl Index might be optimal.

I have lots of questions and a lot of things that we ought to do in the future, but let me just stop here. Thanks.

DR. INDERST: Let's move on to the discussant, Joe Farrell.

DR. FARRELL: The disclaimer -- you know this -- is these are my views and do not necessarily represent those of any Commission or any individual Commissioner.

As Volker described, almost all of the pretty large economic theory literature on merger evaluation

is advice, analysis of how to analyze this merger in isolation. What Volker and Mike Whinston, his coauthor, have done in these two papers is to go beyond that and start talking in a broader way about more forward looking merger policy.

In their first paper, the 2008 paper that I guess is now forth coming, they do this by asking: What are some conditions under which a myopic policy would be optimal in a broader sense?

The key thing that I wanted to communicate to you is that the answer they give is one that completely rejects what I think is a very powerful intuition and an ingredient of real merger policy, which is, "Enough is enough." In real world merger policy, rightly or wrongly, if you start with six firms in an industry, and they're all the same size, two of them can merge, probably without trouble most of the time these days. Another two can probably merge with not much trouble. Then it starts getting hard, and there's an, "Enough is enough" dynamic.

"Enough is enough" fails to show up in the first Nocke and Whinston paper and I want to explain to you my understanding why that's true and take from it a spiritual lesson about these authors and how they think of merger policy. We'll come back to this.

If you think, for example, in the cell phone PCS world after the introduction of the PCS spectrum in addition to the cellular spectrum, there were, I believe, six licenses in each geographic region, and there was consolidation. At one point I think the FCC quite explicitly said, "Enough is enough." This is a very familiar idea to those of you that do merger policy day-to-day.

So what Nocke and Whinston say about the, "Enough is enough" idea is it doesn't apply in the Cournot model, and here's why. As Carl and I showed in our 1990 paper, in the Cournot model, a merger is not harmful to consumers if and only if the marginal cost efficiency exceeds the gross margin.

In more recent work, you can recognize that this is what you would get in a differentiated product setting if the diversion ratio is equal to one. By the way, Sonia Jaffe, who was here last summer and her thesis advisor Glen Weyl have studied these issues, but that's a technical footnote.

So what happens if you only allow non harmful mergers is that a merger that would have been permissible before the first merger took place is now all the more permissible because the first merger reduced P, and it left the marginal cost efficiencies

and the costs for the second proposed merger where they were.

So horizontal mergers become strategic complements in that setting, so if you have accepted one, a merger that you would have accepted before is now all the more acceptable, all the more beneficial. Is that the world we live in? I wish it were, but it's really not.

The world we live in is one where because we have to convince skeptical courts, not to mention other layers of decision makers, if we oppose a merger than many times we will reluctantly let through a merger that we think probably will harm consumers to some extent. I think this is the leading reason in simple horizontal merger territory why this, "Enough is enough" thing actually does operate.

But what Nocke and Whinston do in this paper is they produce a different reason why different mergers might be alternatives, and they impose it by saying all the mergers involve the one firm and we're only going to see one of them. And what they do then is they show with a very sophisticated analysis that the optimal policy is one that, except for the smallest possible merger, demands an increase in consumer surplus before antitrust should allow it to happen.

I think it's pretty clear that we face a more skeptical environment than one that would allow us to do that. In that sense Nocke and Whinston, as in their first paper, are pursuing a line of research that takes a rather optimistic view, at least an optimistic view of the antitrust in terms of the enforcement environment.

So, if we look at merger retrospectives, as we're about to do and I think it's fair to say we'll get a more sophisticated read on this in a few minutes, we'll see that merger retrospectives tend to fall into two groups: Those that find price increases and those that say, "Well, we can't really tell."

So even given that there's a non random selection of mergers to retrospect, I think that tells you that we're not really starting from the Nocke and Whinston perspective.

A less optimistic perspective is for some mergers the synergies are indeed expected to benefit consumers, others we don't know or we have no particular reason to think that they'll have much effect either way, and some are expected to harm consumers. Some of those we think we can block. Others we think are going to be pretty hard to block, and what typically happens then is we try to negotiate

some remedy.

If we think about trying to move the economic literature on merger policy away from the perhaps over plowed, here's how to analyze the likely impact of this merger and implicitly say yes or no to this merger, one of the things that we should be doing much more of is thinking about the negotiation of remedies.

Another thing we might want to do a lot more of is figuring out how to make confident and convincing predictions that are based on, but not limited to, sophisticated analysis that non economists are going to find hard to parse.

DR. INDERST: I think in light of the time we should proceed to coffee. When should we back from break?

DR. ROTHSTEIN: 11:25.

(Applause.)

DR. CHESNES: It's now my pleasure to introduce our fourth and final keynote speaker of the public conference, Aviv Nevo, from Northwest University. We're going to combine the keynote with the final panel session, so this will all hopefully work together well.

Aviv spent time at Berkeley and MIT before moving to Northwest in 2004. He's currently a

professor in the department of economics in the marketing department at the Kellogg School as well as a research associate with the National Bureau of Economic Research.

His work focuses on empirical industrial organization and econometrics. Much of his work has been investigating demand for consumer packaged goods and implications for price competition, mergers, and marketing.

He received his BA from Tel Aviv University and his Ph.D. from Harvard. I would like to thank him for representing Northwestern in our partnership in helping to organize this conference. And importantly, I would like to thank him for making sure we got our sandwiches at yesterday's lunch. Please join me in welcoming Aviv Nevo.

(Applause.)

DR. NEVO: Thank you. Last year when I was on the organizing committee, I think Chris asked me to give a keynote address, and I told him I didn't do keynote addresses. And I guess you'll see this year, I still don't do keynote addresses.

What I'm going to do here today is just give sort of several informal comments and try to set up the panel that we are going to move right into afterwards.

So, I'll show this merger simulation research, and I'll try explain to you what I mean by that: knowns and unknowns. I also wanted to have unknown unknowns in there, but when I tried to write that slide, I realized that there's a little bit of contradiction here, so I dropped that.

As I said, I'm going to offer some discussion of some issues in the research of merger simulation and tie it a little bit to the merger retrospective panel that we're going to have next.

My focus, let me just reemphasize, is going to be on research, and obviously this research has direct implications for policy, but it's not about policy. So it's got nothing to do with the merger guidelines or current policy, but really just thinking of what we should do in terms of research, and again the hope is to set up the discussion.

So what do I mean by merger simulation? A couple years ago I was actually on a similar panel to this in the first FTC microeconomics conference, and I made a distinction that actually a lot of people later thought was interesting, so I just wanted to remind you.

I'm going to call my simulation the use of the model, an economic model, to simulate the likely

effect of a merger, and I want to call it a broader definition from a narrower definition. So, the key here is really what we mean with the model and is it economic or not.

Now, often merger simulation actually takes on a much narrower view, which is to basically say, "Well we're going to estimate demand," and you take whatever demand you want. You decide if you want it BLP, you want it an almost an ideal demand system, multi-stage budgeting, or linear. Take whatever your favorite demand system is, and we plug those into demand estimates into a first order condition coming out of a Nash Bertrand model. And we can back out marginal cost, and we can or cannot test what the right ownership matrix could be. But we literally assume a particular structure, and then we say, "How do we simulate the effects of the merger?" We're going to change the structure using the estimated demand, using the backed out marginal cost, and now just changing the ownership matrix.

For the most part, this is what's done, especially in the economic literature, with sort of a few exceptions, and I think in practice as well, but maybe here, there would be others that could say better.

When we look at simulation, this is what people have in mind, this narrow view, instead of always thinking of the broader view, which in a lot of the simulation is about bringing a model, an economic model -- and we can argue what we mean by economic -- but bringing a model to try to predict the effect of the merger. And I think it's important to separate between these two when you start making claims or thoughts about whether we should or should not move forward in using merger simulation.

What's a merger retrospective? A merger retrospective is a measurement exercise of the value of the effect of a merger that actually happened, looking first at what the effects were. And the key here is that it's a measurement exercise, so why should we do this? I think we'll talk a lot about this in the panel, but I know three reasons to do it, so I'm just going to address why mergers happen and what the effects are. Just thinking of any reasons from pure curiosity or in terms of policy, you might want to know what was the effect of the policy, but just sort of a pure documentary descriptive analysis.

This maybe is not used as much, but I think some people have been pushing in this direction. It's to start saying, "Well, can we look at the effects of

past mergers to generate some prediction of a current merger." So, turn the measurement exercise into a model.

Now, it might not be an economic model. It might be a statistical model, so the simplest version of this is to say, "Well, we saw a merger of two retailers. In city A, we saw what the effect was and now we have to look at what happened in city B," and we're going to ask whether the effect going to be the same as it was in city A and decide whether we want that or not. So that's the simplest version.

Now, obviously in most cases, we're not going to have this clean of an experiment. So we see a merger, say between two supermarkets, and now we are trying to validate a merger between two office supply stores, just to randomly make up an example. Then we're going to say, "Well, that's not going to be the exact same effect, but let's see. We had a previous merger which saw the effect more directly between two pet supply stores." Well, you can think about how pet supply stores are different than supermarkets and what the difference is and use that difference to learn about how office supply stores are different.

We're going to have some sort of statistical model that's going to fit the effects of that, just

using the past merger. Then we have to think: Do we think that's a reasonable model or not.

Then the one that I'm going to actually focus on today in my comments here is the test of model simulation. So you might say, "Well, while we can do a pre-merger analysis where we're using this narrow version of the simulation or a broader version. So, here is what we predicted the effect of the merger to be, and here's what it actually was. Did it work? If not, where did it go wrong?" So, I'll talk a little bit about the literature that's done this.

But before doing that let me just, talk about two issues in the analysis of merger retrospectives. And again we'll talk probably more about this during the panel. This might or might not be an issue, but we are going to make a selection: In which major direction do you get to observe?

Now, for some things, that's not an issue. We could say we're just looking at the population of mergers that have been approved, and we're going to learn about that population, but we have to realize whenever we extrapolate that this is a selected sample, and we have to be careful what population we're going to extrapolate to.

The other issue, which I think of as a

concrete issue in any merger perspective, is how much to actually measure the causal effect of the merger. You might say it's easy. Look at what the prices were before the merger, or if we're looking at the prices or any other effect, what they were before the merger, what they were after, and we just take the difference.

That's basically attributing all the differences of the merger to the merger, though there might be other effects going on. So, now we want to know what happens in some control group and what's a relevant control? How do we measure that? And those are issues that we'll get back to.

So, let me get back to the third point, which is the one I want to focus on in a little bit, which is: How well does the merger simulation perform? Let me just emphasize most of the evidence on -- I was almost tempted to say all of the evidence on -- this very narrow view of merger simulation. And overall the results I have, as I wrote here are mixed, but actually I think the results I have -- at best -- they're mixed.

We look at our ability using that sort of simple model to predict the effect of mergers, and they're probably not as great as we would like them to be. And again I'm probably trying to use the most positive language that I can on this. Maybe you could

be much more negative about things.

Let me give you an example, and it's again an example that's easy for me to give because I was actually involved on one side of these. So, I'm going to look at the acquisition of Chex, a cereal brand, by General Mills.

This happened in the mid 90s. Ralston that produced Chex decided to do a spin off of its branded products, Chex was really the main one, and focus on producing private labels. At the time Ralston had about a 6 percent market share in the cereal industry, and Chex was about 2 percent overall, and the rest was private label of various other kinds of not well known brands. Ralston decided to focus on those brands spinning off the Chex division, and it was acquired by General Mills. I actually have a simulation of that merger in a 2000 paper that's published in RAND.

Recently, Dan Hosken, who I think is here, did a retrospective study looking at the effects.

So, let me try to show you this slide comparing the differences here, between the simulation, this narrow view of the simulation, and the retrospective, so let me show you the positive.

The positive is, I think, on average, the simulation doesn't do that poorly. When you look at

the average effect, and averaging across mainly the main brands here which were Chex, the two main General Mills brands, Cheerios and Wheaties, there was about a 2 percent price increase. That's what the simulation predicted, and the retrospective found about 3 percent. There was a whole range of numbers, but I think 3 percent is kind of roughly in the ball park. It's not exactly on, but once you put standard errors around that 2 percent, 3 is definitely in that range. And that's a good range. You might say the simulation did well.

Well, unfortunately that's not quite the case. I wish it were, but it's not. Actually it depends across brands, and I think this did something quite interesting. Between the brands, actually the simulation does horribly.

Well, the simulation predicted the Chex brand to have quite a large increase, about 12 percent without any cost savings. The retrospective found that basically there was not price increase at all for Chex. I think, the price increases were not significant, even ignoring the standard error. Just the estimated economic effect was less than 1 percent.

On the other hand, the simulation predicted that Cheerios and Wheaties, these were the General

Mills products, would see a very modest price increase, in the 1 to 2 percent range without any cost savings.

The retrospective, on the other hand, had a much larger price increase, about 3 to 4 percent. So while these two things benefit the large effects for Chex, the simulation with a small effect for Cheerios and Wheaties almost by coincidence seemed to sort of average out to a lot of the same things that were going into retrospectives. The picture painted here is actually very different.

I guess the one thing I want to comment about is the simulation results in some sense shouldn't really be surprising given the model we have had, because what do we have here? We have a large manufacturer, General Mills, acquiring a smaller brand. Now, think of that first order condition from a Nash Bertrand.

Basically what happens now is putting a whole bunch of cross price elasticities into the Chex first order condition, so now it's going to take you to General Mills portfolio of products, and as a result it's going to increase its price a lot.

General Mills, on the other hand, just added one product, so unless that product is a very close to substitute one of its own products, it's not going to

have a very large effect. So, now you would expect to see this from the merger simulation. So now you look at this and think the acquired firm is going to have the larger price increase. On the other hand the retrospective found something completely different, completely the opposite.

So the question is really: What is going on here? What in principle can explain the differences? The problem with the simulation, I characterized it in a little bit three different sets. And one you can say: Well, we got the demand estimates wrong, and I'll get back to this later, but it's the kind of thing you like to complain a lot about, maybe overly so.

The other is that they got their pricing model wrong. This idea of Nash Bertrand or the first order or condition prices according to this model are just off, and of course we combine the factors. You can say, "Well, maybe there's cost reductions that we didn't take into account." That's actually easy to take into account in a merger simulation.

There could be some change in the other dimensions of the behavior, like promotional activities that in most of these simulation are held fixed. There could be new products. There could be other factors as well, which we don't know on this very simple merger

simulation.

The problem of course is with the retrospectives is not all of these issues are talked about. Maybe there's a wrong control group. Maybe the event window is not the right event window, and there could be a number of measurement problems.

Of course, you could actually say, "Let's look at different control groups, let's look at different event windows and see how that effects the numbers as well."

The one issue that I have with this particular retrospective, but actually a lot of the other retrospectives that Dan, and Matt as well, produce is that sometimes you look at these numbers and you say: Forget this simulation for a second. Let's just look between the lines of what these numbers are, and can I cook up an explanation within the manner that would rationalize them.

So of course the one thing we don't have, but suppose you actually told me, "This is what someone is going to do and what the retrospective is going to find, how can I cook up my model to get that?" A lot of times it's not impossible.

So, let's think of what we have here in this example. How do we rationalize the fact that Chex had

such a small effect and General Mills had a much larger effect? We can go on the obvious thing, which is to say, "Well, there is a very, very large cost savings." You had Ralston, who was now a very small inefficient firm, not operating to scale, and it got acquired by General Mills, and General Mills now is going to be much more efficient. It's going to reduce the cost, and that's why we're not going to see that big price increase.

If you think of the costs savings, and actually you can infer that from this, it has to be huge. I mean, we're talking about 20 to 30 percent at least, maybe even more, in terms of the reduction in the cost. And that just seems to me a little bit larger than what's reasonable or what was even claimed I think by the parties. I actually don't know. I obviously had no involvement in that particular merger.

You also have to assume that maybe there's some mismeasurement of the cross elasticities, but then you would wouldn't see what happens with other brands as well, so it's actually pretty hard to rationalize.

Last year in my graduate course I teach, I gave a take home exam and actually assigned the Hosken and Weinberg paper where you try to compare the two, and one of the assignments was: Let's look at the

retrospective and try to rationalize them, just given an economic story handling them. It was actually pretty hard because you had to say, "Well, there were cost savings to this firm, but not this segment and that."

When we're looking back, of course we could rationalize everything, but then looking at this, we didn't want to believe that was the case. And it was a little bit hard, but of course the question is why, what is going on here.

There's a paper by Craig Peters at the DOJ and it was his Northwestern thesis. Actually he wrote the thesis before I arrived at Northwestern, so I know Craig but I had nothing to do with the thesis.

What he did was examine merger simulation in the airlines mergers of the 1980s and again compared it to a retrospective. He found that the merger simulation, using his words, "failed to predict actually the price changes in several of these mergers." Again, the same picture that maybe we're not doing as good a job as we would like to, but what he did was he actually tried to explore why.

So the fact that he has the demand system, and he has kind of the expert analysis, he can now say, "Well, let's go back here to kind of all these factors

that we have here and try and see what it happens." He's not going to look at the demand estimates but he's going to say, "Well, there are other factors, suppose we now take the unobserved factors, because that's what we all go into and say let's plug them in." Should we have known that that's what they were going to be?

They explain how much is left on the supply side and then he actually finds it wasn't the shifts in the demand in these other factors, but it was more on the supply side that seemed to account for most of the difference.

So, where does this leave us? I think there's a general idea -- and I was visiting FTC this spring and talked to a few people and I don't know if any of them want to go on the record -- or a general feeling that this whole merger simulation is a little bit hopeless. We have these complicated demand models that we really can't know what is going on and they don't do a good job.

The answer to that is two-fold. First it's kind of the question: What is the alternative? At the end of the day, this goes back to the separation between the narrow and the broader definition of merger simulation.

So I'm going to ask: What's the alternative?

We're getting this before a merger, we have to predict what the effect will be. You need some sort of a model. So you say, "Well, forget this demand model, forget this, let's just run some sort of regression of price and competition or something like that."

So Peters did something like that, and compared it to merger simulation. Now, I don't know if this has actually been done systematically. I don't know if any of the panelists would comment on that but we return to the question: What is the alternative?

Before we go beating up on either this narrow or broad definition, we have to think: What's the alternative? Would it be better to do a Herfindahl type analysis? No, I would say not.

Again, just taking as an example Matt and Dan's work, one of the things that they found was that there's a inversion of the ranking of the two measures. I think one of the mergers was 3 to 2, and one was 6 to 5, or I'm probably not getting the numbers exact, but there's an inversion there as well. So, that's my point to make.

Now, let me just go back to this point of demand estimation; what's the point about demand? Let me just sort of say a few things about this. First is there is no evidence to support the claim that what's

really going on is problems with the demand. If anything, this work from Peters would support that maybe it's not actually the demand.

So, I compare it to the description of the drunk looking for the keys under the light. If someone walks outside a bar and you see a drunk looking under the light. "Well, what are you looking for?" He says, "My keys." "Oh, did you lose them here?" "No, I lost them over there in the corner." "Well, why aren't you looking over there?" "Because the light is here." It's a little bit like that kind of that story.

It's easy to complain about demand. Everyone likes to complain about BLP and stuff that could go wrong with it, starting from the tolerance level to the computational algorithm to the instruments to -- I didn't invent this to -- you choose whatever it is you want of that. But in reality, it's not really where the issues are.

Let me just point out that if what we want to test the demand model, which I think is a very good thing to do as a side point, doing it as retrospective is not a very efficient way of doing it. I don't see how well the merger simulation would be at predicting this.

Let's look at further experiments. Now,

there are a lot of issues with that at as well, which I'll be happy to look at. I've actually seen some of that recently, and I think there's a recent paper hot off the press by Julie Mortimer and Chris Coakley where they use the example of vending machines where they actually are going to take a product out relevantly, that's part of their experimental design, and try to predict where this demand would go. And they match it up to where it actually goes.

We have a graduate student in our marketing department who is dealing with a large retailer trying to do that, but I can't go into the details of it. There are a lot of details, and they're going to be very important as to exactly what we're measuring, and there's going to be a difference between a short winded response and a long winded response. We have to ask ourselves what it is we want to do, but when we're looking at demand, that's the kind of thing that I think people should be trying to do and not trying to learn through retrospectives.

Going back to what I said about wanting to look at merger simulation in the broader sense, the question is how then to improve our models. So, let me conclude with final remarks and the directions for research. Some of these are ongoing and some are

things that should be ongoing, but are not. So I guess I separated them into three groups.

In terms of the model simulation, I think where there's a lot of interesting work being done -- and of course I'm biased because it's stuff I've been working on -- is dynamics and dynamics can arise for different reasons. These are durable goods. It can be habit formation. It can be learning. So, I think there's a lot of interesting work being done there.

We also are doing work on more flexible models of demand, so working within our framework, but trying to make demand models more flexible. And another thing that's a little bit interesting, in my view, is looking at the whole issue of instruments and the conditions we use to identify the instruments. There are two parts here.

One is that the instruments are weak, which has been a big issue in the literature, but is really always not discussed in the IO literature, at least up to now. And there's a question about whether the real transactions are down and how do we do an inference if these instruments are not valid. So, this is work that we have done that is similar, and I'm hoping to see more work on this.

On the supply side a lot of the problems are

with the model simulation. So, there there's simulation, no price effect of mergers, and it's probably also looking at dynamics. I think those are two active areas.

One area that's, as far as I know, really not getting much attention at all is the focus on the coordinated effects or generally moving away from the simple pricing model that we have. But the interesting thing, I think, is that it might be that this is where the largest path would be, so really trying to figure out what is going on. And this simple Nash Bertrand model is falling, and where exactly it's going, we'll have to figure that out.

I think it's going to be the combined work of using retrospective studies, using simulation models, but also I think there's potential for work and some good economic theory to be done here.

Then two final issues that I'm going to put on policy issues, just because I couldn't really fit them into the others. One is the issue of uncertainty. We tend to, for the most part, just ignore the aspect of uncertainty, so this is a simulation, and we put standard errors on it but these are standard errors that are coming from our demand estimates.

We just figured those out, but I think

there's a deeper issue of how we should think about this. And if you just think of the FTC and the DOJ's problems, it might just be a classical decision problem, and in some sense economics -- or if you want statistics -- gives us various ways to look at it. If you want to be Bayesian, you can be Bayesian. If you want to do Min-Max, you can do Min-Max, or whatever you want.

There's almost no work, theoretical or empirical, trying to look at that. Again, this is the part where I'm not saying one could say, "Well, from a policy point of view, this is impossible." This is the part where I'm talking about academic research. I'm not talking about whether this should be in the merger guidelines or not. This is a completely separate point.

The final issue is one which I just proposed. Think of the paper we heard just before the break, that Nocke and Whinston paper, that whole line of research, up to now, merger simulation has really focused on there being a given merger and you have to simulate and look at that effect. While I think what they're proposing is you look at what are the optimal policies, what are the implications of policy, dynamic implications in terms of which mergers will we propose

or not. And I think there's actually potential here for feeding this into this literature and tying in with some of the work that we've seen.

So, those are really my comments for now. I'm happy to open up for questions, or if not, we can just move directly to the panel on merger retrospective.

UNIDENTIFIED SPEAKER: I guess one question is you say there is little evidence to worry about demand estimation. If you look at the Craig Werden - Steven Chance paper from '99 or Margaret Slade's paper on the beer mergers from last year where they did plausible seeming merger simulations with different demand systems and got extremely different answers, how do you view that in the context of evidence?

DR. NEVO: Let me clarify. If you take a given data set and you try to estimate different demand systems, you could get wildly different numbers, but mergers are just one way, if you want to summarize those numbers in a particular way, you will get that.

It's a little bit hard to evaluate these papers because a lot of times it's very easy to take a demand system and get crappy estimates from it. So, in some sense that's not the right metric. The right metric, if you want someone who is highly motivated to

get it right, in that demand system is taking different channels and let them work hard at it to get the best numbers that they can. How different will the numbers be?

So that's a little bit hard to do in this context. Just to give an example that's shaped this, I am happy to see some numbers involved in the cigarette industry. There was an interesting proceeding that had to do with the settlement agreement, and not going into a lot of details, but there are a lot of numbers that were generated from that.

That was exactly a case where you got different experts all working as hard as they could to get their demand systems right, and what was interesting to me, at the end was the whole range of numbers generated there, but you could boil it down to some various assumptions you made on heterogeneity or not, validity of instruments or not, dynamics or not.

It ended up as actually the functional form of the demand and I'm not going to say it didn't matter, but I don't think it was a first order effect. So, whether you use an AIDS model or BLP model, that wasn't really the main thing that mattered.

I'm not saying you're not going to get different estimates -- you will -- but I think if you

try to get people who are motivated to actually get it right -- there are a bunch of things about what that actually means, but at the end of the day, at least from what I've seen -- the numbers all kind of end up being similar.

These demands are very hard to estimate. You don't have very good variation, or sometimes you don't have variation. And when we do have variation, you might think it's endogenous, so a lot of times you'll get crappy estimate from all of these models.

So that's brought some meaning to my thoughts.

DR. BALAN: So, you've said that there's all this sophisticated apparatus, and it's not performing as well as we like. And the answer is even more sophisticated apparatus, that people are going to develop.

What hope is there for the other kind of innovation, cost cutting innovation, where we can get an okay answers with a month of the time, or the person in the 70th percentile of BE to can come up with something reasonable?

DR. NEVO: I'm not sure. Maybe that's what I said, but I don't know if that's what I meant to say or your characterization is wrong. That's not necessarily

what I meant to say.

I said that what we have right now is not perfect, that we want to understand what's going wrong and we want to improve it, but I didn't necessarily say that it's by putting more complicated structure on it. I think we should explore alternatives, but what are the alternatives we put forward?

Computing Herfindahls is a very simple thing to do, but is it doing any better? I don't know. My impression is not, but I don't really have a metaanalysis here to show you that that's the alternative.

Running some sort of regression or let's say regressing price on a bunch of things and trying to use that to predict the effects of the merger. Again I'm aware of I think a single paper that did that, the Peters paper, and I think my reading of the results is it actually performed worse than merger simulation.

Now, you might say, "Well, now there's a cost benefit, we didn't do quite as well, but it's much easier to do, that's not a cost estimate that I can do." You have to know what the cost is of doing things.

What I'm trying to say is I think we need to look harder at what's going on and not dismiss it and

say, "Wow, merger simulation is crappy, we can't trust it." I think we have to look more carefully at what exactly is going on and see what are better ways to improve it.

So, I don't necessarily think it's much more complicated things, but maybe think of different ideas or different alternatives.

DR. BALAN: I don't know if this is probably the academic incentives of what's publishable at work here. There's activity in the direction of trying to fix deficiencies, which of course is a good thing, but I don't think anybody in your position gets ahead by saying here's something that works 80 percent as well, but can be done in a quarter of the time.

DR. NEVO: That's probably right. Fiona said it's right, so it must be right. She's going to take my spot.

PANEL SESSION TWO: MERGER RETROSPECTIVES

AVIV NEVO, Chairman, NORTHWESTERN UNIVERSITY

LANIER BENKARD, Yale University

JOHN KWOKA, Northeastern University

CHRISTOPHER TAYLOR, FTC

We are going to head into the panel. We have three speakers in our panel on merger retrospectives. We're going to go in, I think, alphabetical order

All three have some presentations, so I think the best way to do this is we'll have each give their presentations, and then maybe we'll have all three sit up here and open it to questions from the audience

So the first speaker is Lanier Benkard

DR. BENKARD: First of all, I'm not quite sure why they invited me because I've never actually written a merger retrospective myself, but I have worked a little bit on merger simulations. And by the way, I'm also not quite sure why I said yes.

Also I think Aviv and I are in agreement on a lot of things. I'm going to come to similar conclusions that Avid did and also highlight some of the things he said maybe in a little bit more in detail.

As somebody who hasn't actually written a

merger retrospective, in the time since about a month ago when I was asked to do this, I thought I would actually go back and familiarize myself with this literature because it's been given some attention recently. And I wanted to be sure I knew what I was working with here, so what I actually did was have an undergrad go back and do a literature search and go through this whole literature. I'm going to tell you some statistics about the literature just to start with, in part because I think there's been some activity recently, and people have been talking about the literature and saying it's deficient, and I wanted to characterize it and see if I can get a hold on what's been done.

The main criterion for this was looking at papers that evaluated a past merger that had actually taken place and had data after the merger. This is a little bit rough because it was done in the last month, and if we were to publish something, we would definitely want to clean it up.

We probably missed some papers in some lower journals I'm guessing, and it's possible that we misclassified the criterion a little bit so we would have to go back and fix that to be precise, but this will be a rough count.

First of all, I found 73 papers between 1985 and 2010. I think that's probably quite a bit bigger than people thought this literature was. Part of that is probably because we might have used a slightly looser definition of what a merger retrospective is, and this is getting a little bit back to what Aviv said about the narrow versus broader definition.

So let me just tell you about the industries that were covered: railroads, airlines, banks, hospitals, gasoline, radio, TV are the biggest ones. The thing that jumps out at me is these are the industries we study for almost all topics, not just mergers. I suspect that a lot of this is driven by data availability, with the possible exception of hospitals, which I think maybe that was an area of particular interest in the last ten years, and that generated some of the papers, but for a lot of the other industries you will see IO papers on all sorts of topics on those industries.

There are many papers in prestigious journals, so these papers actually I would say on average are pretty well placed. You can see RAND has a lot, AER, and there's actually a lot of stuff in the finance journals, so there's a lot of pretty good papers out there.

This is an imperfect measure of citations, since I used the Google Scholar Measure, which is not very good. By the way, let me tell you this: These are the top ten cited papers if you remove finance journals. The reason for doing that is the finance journals generate a lot more cites than other journals, and I think it kind of works the counts a bit. By the way, the top paper here is also a finance paper, but in the AER.

So, what I see when I look at this list is that there are a lot of good papers here, papers that are taught in graduate classes at every top university.

There are a lot of good papers, important papers in the literature, and also I would argue that there's a lot of papers here that when people think about these merger retrospectives aren't the first things that come to their mind. In other words, these are important papers for reasons other than just the merger retrospective, so I wanted to point that out as well.

This is the last thing I'm going to show you on the statistics of the literature. This is merger retrospective publications by year. Before the late '80s, there weren't really very many. I think I have a few more years that go back, and it was sort of like

one, one, one, but the main thing I take out of this is there's a big spike at the end, and if you look at the first half of the 2010, I think there were three or four already.

If you factor in the rest of the years, it looks like another fairly large year, so there's some evidence that there's recent activity. So, that's kind of where the literature stands.

My conclusions from this literature are that it is larger than you might have thought with some well placed evidence of recent growth. The literature concentrates on a small number of industries where there is a wealth of available data, and I speculate that the reason we got more papers than I expected was partly from using a broader definition of merger retrospective, so people have their own definitions, and I used a fairly broad one, I think.

Now I want to talk -- partly as an outsider to this literature -- about what I think we can learn from looking retrospectively at outcomes after a merger. The basic idea is there are a lot of mergers that have occurred.

One thing we can do is go back and look and see what happened. The question is: What is the value of doing that? I'm going to start with a straw man;

after every merger we could go back and document what happened to the prices. And you can imagine the FTC has a department that does this, a group of people who after every merger go back, collect some data, run some regressions and say: Prices went up 3 percent in this one; they went down 3 percent in that one. We have a whole complete catalog of all of the effects of past mergers.

Putting this up as a straw man, what I want to argue is that that the data would not be very interesting on its own. I don't think it would be very useful. An individual study that simply says here's a past merger and what happened to prices, that only covers that topic, I think, probably is not very useful, and I think even a collective catalog might not be very useful.

I'm not going to talk about the fact that actually each one of these is probably hard to do well. Aviv touched on those issues, but basically what you see is prices before the merger happened and prices after the merger happened. You have a lot of things that could have changed other than the merger, and it's hard to come up with control groups and other things.

It's actually pretty difficult to do these things well, and I'm not going to touch on that. I'm

going to ignore it. Let's just assume we can do a good job and get the complete catalog. So, why do I think such a catalog would not be interesting on its own? I think it might be useful, but in conjunction with other stuff, and I'm going to conclude by suggesting what that other stuff is.

So now you have a complete catalog of price effects of past mergers. Aviv mentioned this problem; the first problem is we only see price effects for the selection of mergers that were approved. I think here I'm going to largely reiterate a point made by Dennis Carlton in a 2009 paper and probably others that Aviv mentioned.

Suppose the government did a really good job and only approved mergers that lowered prices. Then the average past effect across all mergers is negative so it looks like mergers are pretty good.

What if they relaxed the policy a little bit? Well, then you would have some mergers with a positive price effect and some with a negative effect. The average price effect could still be negative. So, what does a negative price effect mean? Well, it doesn't necessarily mean that the policy is too strict. A correct policy would end up with a negative price effect, and in fact, even if the policy was too lax,

you might get a negative price effect, so I don't think that the average is telling you much.

Now, of course you might see some positive price effects. It may be you would say, "Well, that means we made mistakes in those cases," but that would be putting a lot of trust in the government. Basically that says that we knew with perfect certainty what was going to happen, but suppose that we make some random errors. We have a certain amount of information. We do the best we can. Sometimes we goof and make positive errors. Sometimes we make negative errors, but on average we're correct.

Well, then there would be some positive price effects of past mergers, even if we were doing everything as well as possible and policy was set appropriately. It might not indicate a systematic problem. On the comments I made on the previous slide about on average, you could have a negative price effect and policy could be set correctly. That would still be true.

You would learn something if the average price effect was positive because then you would find that on average, the policy was letting through mergers that were raising prices, but that seems like a fairly extreme case, so I think it limits the usefulness. To

conclude, price effects may not be helpful in evaluating the appropriateness of the overall policy.

What about individual mergers? I think this is actually a bigger problem. I think for the most part, every merger is different, so even in a given industry, every merger is different. It depends on things like the closeness of merged and unmerged products, the firm's products, and consumer characteristics in the effected market.

Every market is different, including threat of entry and idiosyncratic cost savings available to the firms. Maybe their headquarters are across the street from one another in one case and maybe they're not in another, and, because of that, I think it's really hard to draw conclusions from the past mergers.

For example, related to the papers on airline mergers, if you asked me about what I think about future airline mergers, I would say which two? Which two firms? And I think for every pair, the answer would be different. If I knew the price effect from all the past airline mergers, I'm not sure what that would tell me about the next one.

If you look at say, for example, Mercedes brought Chrysler a little while ago, now they don't own them anymore, but they brought Chrysler and no one

really cared. Chrysler had 10 percent market share. What would we think if Mercedes bought BMW, which has a 2 percent market share?

Every merger is different, and if you just have a list of past price effects alone, it's not clear what it tells you. So, which past mergers would you look at when you're evaluating a merger? Clearly not all past mergers are relevant. Maybe they're in the same industry. The average is probably not relevant, quantiles, et cetera, are not necessary relevant.

Moreover, what if the new merger is unlike any past merger that's every happened? I think arguably that's a pretty common case. You can think of lots of cases, like satellite radio. There have only ever been two firms and then they merge.

So what you do? I think the obvious answer is you need economics to fill in the holes. So, having a catalog of past data on mergers, I think, is useful, but using it to just catalog the price effects I would argue is not.

My third comment is actually really short, which is: I think that many things matter other than price, things like product variety matter, even if prices don't go up. If product variety falls, that's bad. Product quality, local availability, how far

people have to drive to get something and then possible future investment, what's going to happen to innovation in the industry with the creation of new products are all really important things.

You could go back and catalog all these: What happened to product variety, what happened to pretty quality, et cetera? But I think the same criticisms apply, and it's even more complex for these types of things to try and actually relate them to future mergers.

This is where I come and, I think, really similarly to Aviv. What is useful to use past data on mergers? I think there is potentially a lot of good uses for using past data. It seems to me concerning the merger, we forecast price effects somehow, whether it's using a model in our head, whether it's using Herfindahl Indexes or a BLP model or whatever.

And what we have to do is we have to figure out how to improve these forecasts, so you can go back and look at past mergers, look at the techniques that were used in those mergers, whether it was an AIDS demand system or a linear demand system, or BLP, and try and figure out how those work.

So, suppose you forecast changes in prices using the BLP model, then go back and try to figure out

if the model worked or not, as Aviv and others have done. And if it did not work, try to improve the model. The thing about this is not only does this improve merger policy, but it's also a huge benefit to the field of economics.

We really learn about what supply-side effects are we missing, what's important, what's not important. Such papers would be potentially, not only important for merger policy, but also important just in economics and the kind of things you would expect to see in top journals, et cetera.

Only a handful of papers in the literature do this. I worked on the Peters paper, Weinberg and Hosken as well, and I guess Aviv's discussion did it, evaluating the cereal point, but I actually think this is a pretty useful way to go forward. And so to the extent that the literature is deficient, I would say there's not enough papers like this. That's what I would say.

I'm going to change modes and wrap up. This is my last thing. There come along times when the FTC or DOJ would be interested in research in certain areas. An example of this is the last decade with hospital mergers, and it strikes me given the fact that the past literature was mainly in areas where data is

plentiful, like you can download it off the web almost, that one of the biggest impediments to research is probably data availability. And if the FTC wanted to promote work in these areas, probably the best way would be to collect data and make it available.

Now, this wouldn't necessarily have to mean the private, proprietary data that they may not be allowed to released. Even just an effort to collect data on, for example, the hospital mergers, or to collect data of the kind that Kate collected and make it available publicly in a database. Just say that we would like to see people studying these mergers and put the data up and maintain it in a way that everybody can get access to it.

I can't imagine that would not lead to a lot of papers in the area, so given that we're here, I thought it would be useful to make that point. It would be really helpful if they could look into that.

DR. NEVO: Thank you very much. John?

DR. KWOKA: Thank you. I find in going after Aviv and Lanier and Joe Farrell, too, that much of what I might have had to say has in some fashion already been articulated. That's the bad news I guess from my point of view. The good news is we may get to lunch sooner than otherwise would be the case.

Let me thank Chris Adams and other organizers of this for the opportunity to be here. It's always a pleasure for me to come back to the FTC where I was very happy to have served some years ago now. I do want to talk about, from my perspective, the interest in merger retrospectives and try to add a little bit to what's already been said.

I want to talk a little bit about a project that I've undertaken to reexamine a lot of these studies, and also review with you the findings of one particular retrospective study that I've done and that will be published shortly.

The recent surge in retrospectives, I think, has been due to two or three reasons. One of them is, I suppose, intellectual curiosity. Mergers are an unbelievably common phenomena, and a very small fraction of them get reported to the agencies. An even smaller fraction of them get reviewed, but we are always interested in understanding what structural transformation in our economy entails.

Our way of looking at this 20 and 40 years ago was reliant on the structural presumption, and as that has withered, we have started to ask the harder questions, the right questions about the effects in particular cases.

The second reason, I think, for the surge is that there are increasing efforts on the part of the agencies to refine their merger evaluations and to challenge only those for which there is some very good reason for pursuing rather than to take a broader approach. The need to do that has been underscored and to some degree has been promoted by the merger guidelines, which articulate the notion that the agencies have an explanation for their anticompetitive concern, and that view has been adopted and maybe extended perhaps too far by the courts that increasingly insist on exactly that.

There certainly are other cases where the agency's views have been rejected by other regulatory agencies that have the final say or the courts that have seemingly rejected the agency's arguments.

We also have a number of cases recently where agencies have failed to act in cases that many outside observers believe action may have been warranted. So, that's the second reason: Simply a refinement in advance in agency's merger review process.

The third reason, I think, is to some degree methodological, in contrast to some long time ago, better data as Lanier also pointed out. But also the greater use of the difference in difference approach,

with all its limitations, seems to have invited reexamination of old questions and examination of some new ones with a fairly straightforward and serviceable approach. We can talk about its limitations, but it is certainly well suited in principal to merger retrospectives.

Merger retrospectives seem to be a new phenomenon, and that of course is not quite true, as a review just posted showed. I mean, I date them back I think to Barton and Sherman's publication in the 1984 Journal of Industrial Economics that looked at duplicating microfilm. And they examined, in fact, precisely a question that would be familiar to anyone looking at merger evaluations now.

They asked the question of how the price changed for duplicating microfilm before and after a merger, using as a control, the price of alternative forms of the same product where the two parties were not present. There was precisely all the evaluations, all of the data necessary, for that kind of evaluation, and recent surveys notably, on hospitals and other matters by Joe Farrell, Pautler and Vita and others as well, many of whom are in this room, have brought all of this literature pretty much up to date.

Where one grad student might have done

something like this in a month, a couple of grad students and myself up at Northeastern have been working for a somewhat longer time, trying to pull together those studies and others, less in some respects and more in other respects, in an effort to distill from them what it is we can learn about merger policy.

Let me try to explain how it is that our perspective has, I think, advanced over a simple survey. The idea is that to understand what we're doing, I need to specify the objective very clearly. The purpose of our review is to evaluate not mergers, but merger policy and to do that by assessing the outcomes of mergers in cases that rose to some level of competitive concern.

So the vast majority of mergers, of course, are of no interest to us, nor to most economists. But there are a lot of studies, including some in these surveys, that I think are not of great interest to our stated question either. For example, some of these studies review groups of mergers, and as a result may have assessed or concluded that one or two or 14 airline mergers on average raise price by some amount, but knowing that does not tell us, in fact, whether merger policy was appropriately implemented in any

particular study.

So we have kept track of those studies which simply look at groups of mergers, but we are, in fact, isolating only those cases that have looked at single mergers, evaluated single mergers.

We have also focused, at the moment, on published papers for the most part, but include some number of working papers that certainly seem to meet the standards of published research. And we have certainly looked at only those that have arisen in the U.S. for the obvious reason that we're trying to get an assessment of U.S. merger policy.

The data observations are not all independent. Some studies cover multiple mergers. They've been done by the same author. Some studies cover multiple mergers in the same industries, and as a result -- as Lanier pointed out and as I'll show in a moment -- the data really come from a rather non-random selection of industries. Then too, some mergers have been reviewed multiple times by different authors, and we need to pay some attention to that as well.

We've also included what we say has been normative judgment across semi-mergers, domestic airline code-shares and joint ventures. So we end up with a result where we have 37 individually studied

mergers, again excluding groups of mergers, involving 42 products. And given the multiple observations on some mergers, we also have 50 observations on prices.

The study is not done, and I'm interested in checking to see who else has additional sources that don't even appear on our yet- to-do list, but we do have 50 concrete observations on actual price inclusions from mergers. Most come from airlines in our sample. A number of them come from petroleum and hospitals for all the obvious reasons. These are industries that are formerly regulated, and have reporting requirements or for some other reason, the data has been particularly available.

Of those 50, a large fraction have price increases. 36, or more than 70 percent, of them show price increases. Two, and only two, show price reductions. There are 12 estimates that either have very mixed conclusions or declare the outcome to be simply uncertain. We also have, as I mentioned, six or are seven observations from joint ventures and code-shares. They tend to produce somewhat mixed results as well.

Amongst these studies, what I want to stress is that we are looking to try to evaluate not just the outcomes of mergers in close cases where policy

agencies review the merger very carefully, but we're also interested in appending. We are appending to these data, to these observations, information about the characteristics of the industry prior to the merger: concentration, entry barriers, and other dominating factors, in particular, representations made by the parties, to the degree that we can determine those, about what the effects of the mergers would be in an effort to convince the agencies.

We're also looking at what drove the agency to make its final determination after the fact. With only 50 observations and about 25 questions, I'm not what sort of outcome we'll get, but I think this is an effort to advance the ball in the direction that I think both Aviv and Lanier have suggested.

It's also true, as I mentioned at the outset, that we're looking only at consummated mergers. We're keeping track of mergers that were not consummated, as a result of either being withdrawn before the agency ruled or rejected in court, to see what it is we may be able to tell in the very few instances where there's commentary on that.

We're also keeping track of outcomes other than price. They include cost effects and quality measures that have been addressed in some small

fraction of these cases. We're concerned for all the reasons previously expressed about methodological issues, quality control of our own on these studies, and certainly the selection issues that Dennis Carlton and others have stressed.

I would also like to talk briefly about a merger retrospective that I myself have done with another grad student at Northeastern. This is a reexamination of the USAir/Piedmont merger, which at the time we did the study, was the last major airline merger not involving a bankrupt carrier. This dates back to 1987, 1988, '89.

The study is the one that I mentioned is forthcoming in the Journal of Industrial Economics. It is similar in most respects, so I want pause to describe the details to you, which are similar to difference-in-difference analysis.

The study that we undertook is different, however, from other airline studies, and even from two other studies done of USAir/Piedmont, one by my colleague, Steve Morrison, and the other by Craig Peters. The studies that those individuals did looked at changes in incumbent concentration in routes where the two carriers were both serving, and both found price increases from the merger on those groups.

So that kind of study, like I say, has been done on this merger and others as well. The focus of our paper was different. It took the spotlight and directed it to the outskirts of that market and looked at routes where one of those two, either USAir or Piedmont, was an incumbent and the other was a potential entrant, measured, as usually is the case in these studies, by an end-point-serving carrier.

So on those routes, of course, the merger did not effect incumbent concentration at all. I'm not saying this is what was done, but a policy that simply screened routes for changes in incumbent concentration would obviously miss all of those routes.

So, the interesting economic possibility, one certainly that lots of theory and common sense have suggested, is that the elimination of a constraining potential entrant relaxes the pricing discretion available to the incumbent. And the question is whether, in fact, that was true.

We did a study on about 20,000 routes for each quarter over a one-year period before and after an interval during which the merger was being consummated and implemented. Of those 22,000 routes, we had about 1,400 where, as I said, either one of the two carriers was the incumbent and another served the end point but

not the route itself.

What we found was that, with the elimination of the potential entrant, there was a price increase on those routes of about 5 or 6 percent. That was despite the fact that there was no change in concentration, due to the merger at least, and that would seem to establish the proposition that the elimination of a potential entrant can representative of competitive harm. It's not in some sense a surprising proposition, but one which I think has not really been tested before.

We also looked, of course, for the price increases on routes where the two were incumbents and that was about twice as large, as one might well expect.

I want to conclude by saying that it's been my hope, and certainly I've been pushing my students to do more studies of this sort, to reexamine past mergers with better methodology and perhaps additional data or to reexamine mergers looking at new questions that haven't really been addressed before.

I think the retrospective looking at potential competition is one such possibility, and my hope is that in doing that, there will be advances in our understanding that will feed into merger policy.

I was gratified that in the new merger guidelines, there was mention again of mergers eliminating a potential competitor as a possible competitive concern since that language has been in the guidelines for nearly 20 years.

To pick up on a comment that Lanier had made, it's also been both my hope and my practice -- and in some of my consulting, I've been involved in a number of recent mergers for the State Attorneys General - to try to urge them to insist on data requirements from the merging parties post-merger. We, in fact, secured that in at least one instance.

I've urged that during the merger guidelines workshop as well as in the DOJ/FTC guidelines, and I believe that that it doesn't quite answer the question of what you do with it. It requires resources to do anything with post- merger data, but I think it's a healthy discipline on the parties and on the process to have that available as a retrospective analysis.

I have a greater hope than I think some of the preceding speakers that these retrospective studies, with proper extension to some product on the firms and industries and some further measure of agency actions on these mergers, will allow us some insight into improvements in merger policy.

Thank you.

DR. NEVO: Thank you. Our final speaker is Chris Taylor.

DR. TAYLOR: Okay. I'm Deputy Assistant Director here in the Antitrust I division of the Bureau of Economics. The standard disclaimer applies; I don't think we need to repeat it again.

I'm going to mainly talk about some of the merger retrospectives we've done here at the FTC with a special emphasis on some petroleum retrospectives, which I've been very involved with. We have completed four consummated merger retrospectives in the petroleum industry, which are working papers, and also have been published or are forthcoming. We have a couple more in the works.

We have also spent considerable time reviewing and replicating petroleum studies done by others, primarily the Government Accountability Office. They have two studies, but we also replicate some of the works that have been published by, for example, Professor Hastings and Chouinard and Perloff.

As others have mentioned, the Bureau of Economics has spent considerable time and resources doing hospital studies, which have come out as working papers; there's going to be a special issue of the

International Journal of the Economics of Business which will include those and some related papers. There are also papers either by staff here or involving staff here that look at divestitures and mergers primarily in consumer products industries.

I want to concentrate this morning on some of the petroleum studies, and generally these are all difference-in-difference type studies and look at the price of gasoline or diesel fuel in an area or a market affected by a merger and compare them to arguably areas that are unaffected by the merger.

We estimate the price changes in the study, so the change in price in the affected area typically less the change in the price in an arguably unaffected area. This is all done with data purchased from a third-party source, and in general, the studies do not find retail price effects.

In at least one instance, we found a negative price effect. There are more mixed results on wholesale data, but wholesale data in this industry is particularly complicated, and we can talk about that more if you would like. We spent a great deal of time in these studies both reported in the working papers, though sometimes cut out of the finished papers, doing robustness checks.

I want to spend at least a minute emphasizing that, because I have to be ready to defend these studies in almost a litigation type context, and so I want to make sure that the results are particularly robust.

So, what do I think we've learned in general? I want to make this a little more general than just petroleum retrospectives, but things I think we've learned that doing retrospectives, by doing these petroleum retrospectives, and others have referred to this first point already, that merger retrospectives sound easy, and they especially sound easy to policy makers and attorneys.

Let me tell you, take the price, the price change, measure it to some base period, and away we go. One of the problems in this industry in particular but, I think others as well, is large numbers of cost changes, cost shocks, which you have to net out. And even in this industry, crude oil is obviously a large part of the cost base of gasoline and diesel fuel, and that's somewhat easy to control for.

There are lots of other cost factors, for example formulation changes, refinery pipeline disruptions, diesel effects not being constant, that you have to spend a great deal of time worrying about.

And something others have brought up already this morning, is that identifying good controls is difficult. You would like the markets or areas to have similar demand and supply conditions, but at the same time not be so linked as to be affected by the transaction.

Something else I would like to expand upon if we have time and one of the areas for future work -- and we've done some already -- is validating the controls, thinking about how you could look at how the controls do in the pre-merger period, testing for false positive or false negative effects. This was one of the things we got into in some of the replication studies we were going into.

For example, an earlier version of one of the published studies that looked at -- this goes into my next point -- a panel of petroleum mergers. In an early version of the paper, they actually had mergers assigned to the wrong states and found effects, and they found effects of mergers of lubricating oil refineries on the price of gasoline, which shouldn't be possible, at least not in an obvious way.

So, when we're talking about the panel approach, there are at least a couple of studies that have tried to do for petroleum what I think is much

more common in banking, which is look at large number of mergers in one study. My opinion is in having tried to replicate some of those studies, at least in this industry and I assume a number of industries, that it's doomed to failure.

You find random effects because it's hard to figure out what the controls actually are. For example, if you look at a panel of petroleum mergers across the entire country, on any given merger, the control group is changing because the mergers effect some parts of the country and not other parts of the country. Trying to do these types of merger retrospectives in a panel approach, I think, is difficult in most cases, for that reason alone, if not for others.

Briefly, ways to, I think, improve and work on maybe being able to generalize retrospectives studies: We need to be very clear about what assets are involved in the transaction and how those assets are linked to your anticompetitive theory. So, for example, describing what assets were involved in the merger, what are the markets of interest. and how you're coming up with the but-for price will really at least begin to get at some of the issues that I think we were raising earlier about how to generalize these

studies.

One of the studies that we just finished up this spring was looking at refinery mergers in the Northeast, and I spent a lot of time describing the markets, what the refineries looked like in the Northeast, what were the potential sources of supply coming into that market. And in this case, we actually had a statement by the Commission describing why it did not take an enforcement action.

While it was certainly not a merger simulation per se, we had some information on, at least the stated rationale for, why the Commission did or didn't do what they ultimately did. So this allowed us to go back in and talk about what we saw retrospectively relative to what the Commission was saying prospectively.

Another issue I want to talk about is -- and we raised it earlier -- looking at the identification strategy and how well it performs out of sample or at least within the control markets. One of the things we did in replicating the GAO study was look at essentially false mergers and see what the effects were.

One other issue I wanted to make in terms of improving retrospectives is actually making the data

available for replication and giving enough description within the studies so replication is possible. We've done this in at least three petroleum cases. In one case, the data were not available, and so we were forced to ultimately go out and build our own data set from other sources.

In another case, the data were available. At least we could purchase it, but it required multiple conversations with the author to begin to replicate their results. There was not enough information in the published study to really start you off on a replication exercise.

So, the last point I want to bring up in terms of improving the studies is going back to linking the anticompetitive theory so that the results can be generalized. Certainly every merger has some unique aspects, but I think at least within an industry, there's some fair amount of commonality.

One of the reasons that I was originally drawn to doing some more work on the Arco/Thrifty merger that Hastings had looked at in her AER paper was that her empirical design allowed you to distinguish between a horizontal anticompetitive effect and potentially other competitive effects.

The way she designed her empirics, you could

reject that the price effects were coming from horizontal concentration, but that left open the question of whether it was some sort of vertical effect or a re-branding. Once we looked more at the actual pre-merger state, Thrifty had some Arco branded stations before they were purchased by Arco.

Thrifty also had stations that were being supplied by Arco, so you actually could have divided the treatment effects into horizontal, vertical and re-branding. So we had some possibility going back and replicating those results and decomposing it, and had we been able to do that, we would have had more information about generalizing that study.

We could have potentially said, "Look, does it come from re-branding, is it a vertical story?" As it was, we ultimately were not able to replicate the results, but the fact was that we spent some time in the beginning trying to look more at the actual history of that transaction and understand where the market was coming from.

So those are some of my thoughts, maybe micro thoughts, on how to improve retrospective studies.

DR. NEVO: I think we have ten minutes for questions.

UNIDENTIFIED SPEAKER: I think it was

important that Chris talked about checking the robustness of these retrospectives and a number of panelists discussed the Peters' paper. And one thing I noticed when reading the Peters' paper was that he had a footnote saying that published estimates of the actual price impact of the mergers he was looking at varied substantially.

So, the first question is for John: When you found multiple papers that looked at the same merger, how close were the estimates to one another? And then the more general question, maybe more to Lanier or Aviv, is: If it's not the case that we could select from the multiple estimates of the effect of the merger and we can't decide that one of them is the best, how can we possibly look at and judge merger simulation models to figure out whether they're doing a good job when we have multiple candidates for the actual price effect of the merger?

DR. NEVO: Do the speakers want to come up front so we don't have to run around with a mic?

DR. KWOKA: So it's a common feature of the airline merger studies that you find price increases. It is quite remarkable that it's a certain consistency.

There are three airline mergers that have been looked at multiple times. Republic/Northwest was

reviewed four times. Three studies found price increases. One we classified as uncertain. Mind you, there is some arbitrariness to this, but that would be a fair description of the study.

TBA was also looked at four times with the same results, three finding price increases and one ambiguous result. And the three U.S./Piedmont merger studies all found price increases, so there is a fair amount of consistency.

The magnitudes are also different, and I don't have all that data with me. As I'm sure you know, when you start to look at these studies, there are different specifications. People don't just do a single regression, and so as a result, trying to characterize the range of estimates is a little bit tricky as well, but there's a fair amount of consistency at least in the multiple evaluations of the airline mergers.

DR. BENKARD: To answer the second question, you might have a different view of this, but my view is every industry is different in terms of data availability and data quality and ability to find controls and such. I think you can get pretty clear answers where there's general agreement, and sometimes you can't.

My view is if you can't, then it's going to be pretty hard to evaluate how you did, but I think that pretty much sums it up. I think there are a lot of cases -- and you just gave an example of one, airlines -- where pretty much no matter how you cut the data, you find that the loss of a competitor raises prices. We have general agreement as to what it is when you go from two to one or three to two, which are kind of the important ones, but there are cases where it's very hard because there's too much that's not observed or not enough data.

DR. NEVO: I generally agree and I think you raised an important point that I think we all tried to touch on in the presentation, which is intuitively, I think, merger retrospectives are almost borderline. It was almost implicit actually in David's question of: Who would ever publish this?

I don't mean that this is so trivial that any undergraduate can do it, and I think once you get to the nuts and bolts, it's not that simple. There are a lot of issues that go into it, and even if you apply the best that you can, you're still going to get potentially a wide range of estimates.

I think we have to be careful when we walk away saying there isn't just a single number, but

there's a range, and the same actually can be said for the merger simulation part, so we're going to try to put the two together. A lot of times you'll walk away and say, "We don't know." We don't necessarily; it's very hard to measure exactly what the effects are, so it's a whole range, and I think it's important that we're clear about that when we're producing numbers.

UNIDENTIFIED SPEAKER: It's my sense of the literature that people try to do a good job, and I would like to ask whether that's a good idea? More pointedly I think what tends to happen, almost uniformly, is people take one, or a handful, of mergers and work pretty hard and put a lot of time into finding good controls and addressing measurement issues and so on.

So, you get a relatively small number of data points that have been relatively thoroughly cleaned and optimized. I would like to ask if you have any general wisdom on whether that's really the right strategy? What are the trade-offs between doing a merger retrospective well versus doing more merger retrospectives? Both on the supply side, how much easier it is to do a less careful job, and on the demand or usefulness side, how much less useful is it if you do a less careful job?

DR. KWOKA: I'm not sure any of us wants to stand here and endorse that work.

DR. NEVO: I'm only going to endorse bad work by others.

DR. BENKARD: I don't even know how to answer that. I can't imagine that value of a large number of crappy studies.

DR. NEVO: I believe the only potential, and maybe that's in the background what you were asking, is that the idea that there is a lot of noise in each of these observations. And one way is to try to clean it out. The other is try to average it out over a whole bunch of observations. That's the way I'm rationalizing it. Instead of calling it crappy work, it's called noisy work.

DR. KWOKA: If I could just interject, if you do that, which may answer some questions, it won't answer all questions. It won't answer the questions, that at least as I said in my presentation, interest us; that is: specific merger policy or policy towards specific mergers. There are such studies, which look at 14 airline mergers and tons of banking mergers and the like.

I have to say that I don't find those very informative to me about how to implement merger policy.

DR. BENKARD: One more follow-up on that: If you were to develop a methodology that you thought worked in an industry and then run it on all the mergers that ever happened in that industry, that might not be so bad, right? So there might be returns to scale, I guess is what I'm saying.

DR. KWOKA: Let me chip in with ten more seconds, which is to say that since we have four observations on two different specific airline mergers done over time, and another one with three, we are intending actually to look at those.

One can't really perform much of the analytical exercise, but it is worth reexamining each of them to see what it was that gave them different magnitudes and maybe more or less certain outcomes.

There is a progression, particularly in the airline industry and a couple of others, of studies that date well back, and we can look at all of them in a single industry, if not a single merger, and see how they evolved, whether the private conditions pre-merger are different so as to make outcomes and judgments different at the end or whether the methodologies have changed over time.

We can do all of that and actually intend to. Like I said, we're running short of observations to

answer all of these questions very systematically, but it seems to me that's consistent with your question and the answers we've heard so far.

DR. WHITE: The fact that seems to come from a lot of what you were saying is that, at least from the IO literature, we should take it that merger policy is too permissive in the sense that prices on average seem to rise after merger, the ones that have been studied in these different studies. Some are mixed, but we don't see very many where our prices are falling.

I'm just wondering how I reconcile that with the stylized fact that comes out of the finance literature, which is mergers generally aren't profitable. Is there a selection effect going on for these types of studies -- in the type of mergers that the IO literature is studying versus the types of mergers that the finance literature is studying?

So, the implication we would take from the IO literature is that these things are anticompetitive and firms should be earning more profits because they're raising prices because we're increasing monopoly power, but you just don't seem to see that on the profit side, either from the accounting point of view or from the shared price point of view.

I'm wondering how I understand these sort of stylized facts in these two different literatures?

DR. TAYLOR: I want to make one clarifying point. I think it depends on the industry in terms of whether the mergers are generally viewed as anticompetitive or not. Most of our work on petroleum mergers has essentially shown no effects. Our work on airlines, shows more positive effects, and in hospitals, we have a number of positive observations.

It's interesting and, I'll just throw it out there, the airline industry has been one that's been consistently unprofitable for a long time, and that's the industry where we're seeing price effects. So it makes it even more complicated to reconcile those effects.

DR. BENKARD: I have two comments. First of all, there is most definitely a selection effect on the industries that IO people study. 99 percent of mergers we're not interested in. We're only interested in the ones where we think there might have been a problem, so that's definitely true.

The other thing about airlines specifically is that those are accounting profits. I think economic profits have never really been studied. It's just not clear. That's the amount of profit that shareholders

make, which may not be a correct measure of profits for airlines. Isn't the answer to that just if they're unprofitable because there's some agency problem and the CEO wants to be king of a bigger empire or something, then the mergers are cost increasing, so they're unprofitable and they go up?

DR. WHITE: (Speaking without a mic). Then they focus on things that are just irrelevant?

DR. NEVO: I think the answer is we don't know the answer. It might be worth exploring.

DR. WHITE: It may be useful to have studies that are not just focusing on prices, even though that's what we as IO economists care about, but also if we think these things are anti-competitive, there should also be some kind of effect on profits.

Then that would help to strengthen the story.

DR NEVO: I think we're out of time. I think we're also out of questions which is good.

I want to, on behalf of the participants and speakers, to thank the organizers. I know Chris had to leave, but I thank Paul and Laura for doing such a great job. Thank you.

(Applause.)

DR. CHESNES: On behalf of Chris Adams and Paul Rothstein, I'd like to thank our excellent

Scientific Committee: Roman Inderst, Aviv Nevo, Fiona Scott Morton, and David Laibson. We were very lucky to have their help. I'd also like to thank all the presenters, discussants, and panelists for making this conference so interesting. Finally, within the FTC, the following people have worked very hard on the Third Annual Federal Trade Commission and Northwestern University and deserve our thanks: Chris Adams and Paul Rothstein, our conference organizers, Loren Smith, Dan Becker, Matthew Chesnes, Laura Kmitch, Chris Diloreto, the RAs, and Maria Villaflor and her entire team. We are also grateful to the Northwestern University's Searle Center on Law, Regulation, and Economic Growth and the Center for the Study of Industrial Organization, for their co-sponsorship and support. So, thank you all for coming and we hope to see you again next year.

(Applause.)

(Whereupon, at 1:05 p.m. the conference was concluded.)

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I HEREBY CERTIFY that the transcript contained herein is a full and accurate transcript of the steno notes transcribed by me on the above cause before the FEDERAL TRADE COMMISSION to the best of my knowledge and belief.

DATED: DECEMBER 7, 2010

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DEBRA L. MAHEUX

CERTIFICATION OF PROOFREADER

I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation and format.

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ELIZABETH M. FARRELL