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Takeout: Then, Now and in the Future

MODERATOR/Speaker:
Steve May, Vice President and Business Manager, The Association of Racing Commissioners International

SPEAKER:
Dr. Caroline Betts, Associate Professor, Department of Economics, University of Southern California

Mr. Paul Fontaine: We are several minutes behind schedule but I guess it's time where we could start our morning's work. I am the president of Harness Tracks of America. My function this morning is simply to welcome you and to hope you will have a couple of interesting panels to listen to. These panels presented by Harness Tracks of America. Our executive vice president, Paul Estok, will introduce the panels and prepare you for what you are about to hear.

I did wanna just say a couple of words with regard to normally this function had been exercised by our long-time executive vice president, Stan Bergstein. All of you probably know that he passed on a few months ago and where his relationship to which I alluded yesterday during the presentation of an award that HTA made to the Race Track Industry Program, the ties between Harness Tracks of America and this particular symposium have always been very close and they were guarded zealously by our former executive, Stan Bergstein. Having said that, I welcome you again and I will let you be entertained and instructed and I will give the microphone to our executive vice president, Paul Estok. Thank you.

[Applause]

Mr. Paul Estok: If he can get there. I'd like to add my welcome to everyone. Sorry about that. Didn't want to drop 'em. Before we start, Doug Reed asked me to make an announcement. The two veterinary panels this afternoon have been merged into one panel which will begin at 12:45 p.m. in the grand ballroom, so if you wanna make a note of that in your programs, the two vet panels for this afternoon have been merged into one starting at 12:45 p.m.

Our morning of content that Doug's graciously allowed us to provide, I'm gonna work in reverse order and then I'm gonna leave this stage and not hobble up here again. I'm gonna rely on Steve May to do some work on the second panel. I'll start with that one. The second panel is a social media panel that we had worked on for a while and Delight

Craddock in my office was doing a lot of research on it and trying to figure out who to have and how it should go. I think you'll find it interesting hands-on sort of what's out there, what you can do from different perspectives, from outside of racing. Hopefully that'll be interesting and entertaining.

The one speaker who's not on there that was a last-minute cancel, interestingly enough, was — we had been pursuing someone from Groupon to talk because some tracks have been doing some Groupon projects and with some success, although that's based primarily on the data that I've seen for the few harness tracks that have done efforts with them.

As I 'm sure you know if you read the business pages, Groupon is a little controversial these days in terms of how they're gonna make, whether they're gonna make it, whether they're worth what they think they're worth, that sort of thing. At any rate, they decided to take a pass on talking on that panel, so they're not gonna be there. However, our two panelists I expect will touch on them anyhow. This first panel came about after a lot of conversations as you can imagine, I'm sure.

If you follow the news you know this, too, that the takeout is in the news a lot. Whether it's a good thing, whether lower takeout's good, whether it should remain what it is, and as a trade association of race tracks we get calls all the time from members wanting to know what's going on here, what's going on there, didn't I see something about this, can you guys give us numbers on this and that? All for their own reasons.

What's happened is people have begun to look at the issue of takeout and whether it makes sense to raise or lower it, and the pricing issues involved with the product we sell and look at it in different ways. If you ask the simple question, does it make business sense to do it, it's not a particularly easy question to answer because it's really a lot of questions. Does it make public relations sense? Yeah.

Does it make marketing sense? A lot of times the answer is yes. Does it make business sense in the sort of if you look at your bottom line kind of sense? That's sort of up in the air and there are tracks that are beginning to want answers to those questions and they look for tools to try to find out whether that works or not.

I naturally called one of my predecessors at HTA, Maury Wolff, who always seems to come up when the subject of takeout comes up, and talked to him about it. Maury, who had originally wanted to be on this panel, his input was this. He wanted to say basically to repudiate the stuff that he had done in the early and mid and late '80s that he did before he came to HTA and then after he came to HTA in the sense that his stuff is dated.

His stuff is from a time when there was only on-track betting and you could talk about churn and you could look at it based on what was happening in one place. He would have told you that that's no longer the case. You can't look at churn the same way because if they cash a bet on a live race there's a pretty good chance they may take that money and bet on a simulcast race and that changes things completely.

He was looking forward to saying that he shouldn't be part of the conversation anymore because of two things. One, he's doing other things these days for a living and, two, that he's an antique in a sense and that he doesn't even understand the econometric tools that are available and that go into what you'd need to do to make a business decision on takeout. That was the genesis of the panel and he actually is the one who told me that I should contact Dr. Betts.

Steve May is a former HTA employee who did his master's thesis looking at takeout issues and I watched him. If he'd had hair he'd have been pulling it out I'm pretty sure because he had a very difficult time trying to set up any sort of economic models. So they came to me, the two people that were obvious for this panel. At any rate, having said that, I'm gonna introduce Steve May, a former HTA employee, currently employed by Racing Commissioners International. He's gonna moderate this session as well as speak on this session, and then he's gonna moderate the social media panel as well. So thank you for being here and I hope you enjoy the panels.

[Applause]

Mr. Steve May: The only thing Paul didn't mention is he's also a very good friend. I barely think of Paul as an ex — one of my best friends, I really have to say that. I'd like to start out by thanking Doug Reed and the Race Track Industry Program for allowing me to speak today. I'd like to thank Harness Tracks of America for being part of the Symposium on Racing and Gaming, and I'd also like to thank International Sound for sponsoring this session.

I'm not here to make a sales pitch for them, but I did see their product in action this year and to say I was impressed is a definite understatement. They've got a phenomenal product and also been very good to the Race Track Industry Program and the symposium every year, as well as HTA, so they're a very important part.

Just as a brief introduction, I'm from a very, very, very small town in the Texas panhandle. This is — I don't know if you can see the city limit sign, 588 people in my little hometown. I was through there last week and didn't get a picture, but that population's actually increased to 597 so it's actually had a little bit of an increase there.

My education background, I went to the Ohio State University. I live in Lexington now and SEC country is not a place for an Ohio State buckeye, but that's kind of the cards I'm dealt right now. I did graduate from the Race Track Industry Program, a year ago in May, through the master's program there.

The takeout subject was what I did my graduate project research on. I learned a lot from that. I'm still very passionate about that and I'm glad I get to kind of continue a little bit on today.

As far as employment, I have to point out that I worked at Rillito Park. I learned so much at that little track here in Tucson. Probably the only place in the world that you could actually study takeout on the old model with churn because no simulcasting in or out. It'd be a very good research opportunity to do that, not that it would make any difference because they will be the only place that would be applicable, but did work there.

I also worked at Harness Tracks of America as Paul said. It was a great opportunity for me and helped me get really into the racing industry.

Last summer I took a job at Tioga Downs. It's very coincidental that they're one of the main tracks that are being talked about as far as takeout goes. I worked in the race office, didn't really have anything to do with the takeout, but I really enjoyed my time there.

Last August Ed Martin called and offered me a job at Racing Commissioners International. It's been an awesome opportunity there. Really love the regulatory side of it so it's been a very good point.

Now, I do have a disclaimer. This is Billy Mays as everyone knows, the late Billy Mays. I'm Steve May. Different, not even the same name but I point this out because I don't want to sound like an infomercial when I say this.

Everything I'm talking about today is based on my own research. It's not anything to do with Racing Commissioners International. I have a feeling that a lot of our members might disagree with certain points or maybe all of what I have to say today, but I do feel like I need to say that the views I express today are my own views. They're based on the research I did here and they're not associated with RCI.

The graduate project that I worked on last year was trying to develop a simulation model to observe increases, decreases, different scenarios with takeout changes, kind of based loosely on some Monte Carlo simulation which is a widely used tool in the economic world. I wanted to do this because it was such a hot topic.

That was one of the things that the staff at the RTIP always encouraged was to take hot button issues and do research on them because that would be the most applicable and, of course, everyone knows HANA has been so adamant about lowering takeout. They believe that nine or ten percent takeout rate is the optimal pricing. It's hard to say that.

There's been several different ways that that's been tried, but in doing the initial research on my project I really didn't think that all of the attempts to change takeout had really been studied in a sound economic way.

The first thing I did was a literature review and I mostly wanted to study the papers that were being expressed by groups like HANA as their basis. The main paper on this that they always love to cite is Arthur Gruen's paper from 1976. It's over 20 years ago. I mean, it was a long, long time ago on that paper. It's still, I'd say, a widely cited paper. For better or worse, it is.

What Arthur Gruen was doing was looking at the expected monetary value. What he was doing was taking the probability of winning as determined by each individual player, multiplying that by the payoff and that's what he would get his EVM or his expected monetary value.

I'm not gonna go into a lot of detail on this cuz I'm gonna shoot all of it down in just a minute, but he basically said that if you take the expected monetary value at one takeout rate and you lower that takeout rate, then the expected monetary value is going to increase and therefore wagering would increase.

They studied this by looking at races from Aqueduct and Belmont Park between 1940 and 1969. They found that — they believed, anyway, that lowering the takeout would increase the handle. They determined that their optimal pricing would be about 14.88 percent.

Now, I really wanna point out this was from 1940 to 1969 which, as everyone knows, that was before simulcasting OTBs, ADWs, everything came into play, so that paper's really not even relevant at all anymore but it's still cited off and so I wanted to at least point that out.

Gruen specifically stated in the paper, and this is a direct quote from the paper that — this was before OTBs came into existence. This was before exotic wagering came into existence. It was before anything that's even remotely similar to our current environment was in play, but this is something that's always left out when people cite the paper.

This is very important. It's a direct quote from the paper. To quickly look at some of the other papers that followed up, there were several papers written in the following years to support or put down Gruen's paper.

Daniel Suits did one. Started to look and tried to take into account off-track wagering, but this was when the off-track wagering was always has different surcharges on the wagers. Really, when New York City OTB shut down last year it was one of the few places that still had a significant track fee — or, I'm sorry, a fee for placing those wagers there. Even this paper is not really applicable anymore.

Donn Pescatrice of Tulane University who I actually met at a weird scenario last year, but I met him and he was very impressed that I actually knew of his paper, but he also did another one. He tried to put down all the other papers that said that it was in the last — the relationship between takeout and handle was very inelastic and he cited that New York actually lost revenue when they lowered the takeout. This paper has also been put down, supported in different ways.

Again, all these papers are so different, though, and they're still cited so often, it's kind of a travesty that they're used to support business decisions today.

Ultimately what all these papers were trying to prove or disprove is the Laffer Curve and this is a very common economic principle. It's really related to taxation which, I think, is very similar to handle takeout.

Really what you're looking for is that ultimate pricing point and where is that? Is that made of ten percent takeout rate, would be a 15 percent? Would that be a 20 percent? And that's what I wanted to study and to see if this principle does apply to pari-mutuel handle.

Now, if there's any literature that everyone can agree on, it would be from some of the philosophers from the 1700s, 1800s, and utilitarianism, that's the only thing that I could really find that everyone can agree on and that's because what this is stating is that we want the greatest good for the greatest number.

I think there's no industry group that'll deny you want handle to increase. You want purses to increase. You want race track revenues to increase. Everyone's going to agree on that, but it's how you get to that point that becomes a very hot topic. No, I didn't take those pictures from an OTB recently.

[Laughter]

Those were some historic pictures on these guys.

Anyway, the only other thing I can find that anyone really agrees on is where you stand all depends — I'm sorry. Where you stand on takeout depends on where you sit. If you're a horse player you want the takeout lower.

If you're wanting purses to increase you probably want the take out to be higher. That's the only thing I can really find that I think everyone should agree on because I think it does play into this very importantly.

The only other thing, if you put it into terms of Facebook today, if handle has a Facebook account and takeout has a Facebook account their relationship status is that it's complicated

because it's very complicated. It's being oversimplified by many people in the industry and that's what I wanted to start to look at. The project plan that I had was to try to develop a simple, probably oversimplified simulation of the effects of changing takeout.

What I was trying to do was say that if player A put a wager on a race their next wager was probably not gonna be on that same race track because that's the current model that we have.

With OTBs, with ADWs, all forms of simulcast wagering, wagers are placed a lot more frequently and they're not placed at the same race track so churn is very different. What I was trying to do was develop a gambler's ruin scenario. I think that's a good way to start to look at the actual effects of changing takeout and it's something that I really haven't seen any good research done.

Now, the research basis that I had for this was a paper that was done by some problem gambling researchers at the University of Waterloo in Canada. What they were looking at was if you have two slot machines side by side they have a different takeout rate. How long can a player last? What they were trying to make a connection to was if you had a more fair machine so the takeout rate was like 98 — or the return rate was 98 percent of the player, would that lead to problem gambling issues down the road?

Sadly, most of the research I can find on pari-mutuel wagering comes from the problem gambling side of this. It's unfortunate, but that's really true. I used their model to begin to develop my plan on this.

Again, they were really trying to say that if you return more to the player, especially first-time player, if they have a big jackpot early, there has been research to show that they have a higher incidence of problem gambling issues down the road. They were trying to make some connections to that.

I wasn't really interested in the problem gambling side of this, but I really liked the model that they used to study this.

As far as the gamblers ruin goes, what the idea is, is to see how many times a player can make wagers until they're broke. I think it's a decent way to study takeout because if you can — the entire idea is that if you lower takeout you're gonna increase churn. If you lower the takeout in these economic models and you can increase the number of times a player is playing, then I think it's a decent way to at least start to look at changes in takeout. I'm not saying that I only was gonna study lowering takeout because I actually looked at increasing takeout.

I really feel that I'm agnostic on the issue. I don't really have a dog in a fight at this point. I'm not pro horse player. I'm not pro race track. I'm not pro horseman's group. I really feel that I'm pretty agnostic on the entire issue.

Just as a very simple explanation of the gambler's ruin, this is two different scenarios. Basically where player A gives his entire bankroll to player B. He takes part of that out and gives the rest of it back and they continue this on. I mean, it's the most simple form of a gambler's ruin I can show. First one would be at a 75 percent takeout rate.

These are just examples. I'm not supporting 75 percent takeout rate so don't send the HANA guys after me or anything like that. This just shows if you had a 75 percent takeout rate versus a 50 percent takeout rate, you go from four or five times being played up to

nine or ten if you change that, so that's really the basis of a gambler's ruin scenario. That's what I was trying to look at.

It's very easy to design a model like this with a random number generator. It's very simple. I did it in Excel. I mean, I was not using super sophisticated tools. I was using tools that most everyone has on their computer right now. What it does, it takes into account the probabilities of hitting mega jackpots, small jackpots, small wins, and anything else it shows up as a loss. That's what I was really trying to develop in this.

The problem is, with a slot machine it's extremely simple to do this because it's just a random number generator. That's all the slot machine is, and the backbone of it is a random number generator. I can design a random number generator to look at the effects of changing takeout. With a slot machine it's very simple. The problem with games of skill which is pari-mutuel wagering is, is that the different players have completely different outcomes on the system, so that makes this a lot more difficult to try to design.

Games of chance are totally games of chance, so they're easy. Pari-mutuel wagering is not. That showed up a pretty significant obstacle to try to overcome in this. When I was trying to build a model on this, the first thing I wanted to do was I wanted actual pool data. I wanted to try to use realistic data in this. That became extremely hard to get. It's very unfortunate, especially that an academic research institute like the University of Arizona Race Track Industry Program was nearly impossible to get any kind of actual pool data.

I eventually got that and I'll explain that a little bit later, but even more important to this is the actual player data. I mean, I can come up with any type of scenario to say that this player wagers between this much and this much on average and he wins this percentage. It's all antidotal.

Unless you actually have player data to put into a system like this, it's impossible to get. Trying to get any kind of player data like that, like I say, was next to impossible. I'm gonna show eventually how important this is gonna be to getting even a basic model like this built. We're making very big business decisions without any kind of real data in this and it becomes a very big problem.

Again, getting the actual pool data was very difficult. I went through a lot of different avenues to try to get that. I eventually went to what I call the black market. I went to a handicapper that had data — that had an immense amount of data. It was very frustrating to know that different industry groups said we can't give you that data. That data is super top secret. You can't get it out there, but it is out there. If you think it's not then you're just fooling yourself.

Now, I made one phone call to a handicapper. An hour later I had every race from 2009 to use in this. Not what I wanted to do, but what I had to do in this. That only had the one play show pool and trying to calculate when wagers and their outcomes, you need actual win data and you need the amount that was bet on the winning horse. It becomes very important. I was able to get past this by using estimations and different formulas. I think it was a very good way to do it.

That's really not the important part of this, though, but it is a key but it's not ultimately the most important part because you can estimate data well enough to build a model like this to get some kind of a result on this. The player profiles, though, were extremely, extremely difficult to get. I mean, it was next to impossible.

I made phone call after phone call, email after email, different race tracks, different racing organizations, had no data. Finally had one race track that I had always said would be anonymous and they will be still. They gave me four days of player data.

What they did was they gave me the player awards program data from like say four days of data. I want to point that out because it by no means that the models that I built were realistic and I openly admit that. I mean, it was an extremely small sample, but I had to have something to work with and that's what I did. I was able to break it down into these different player types.

This is really the basis for the gambler's ruin that I had built. Just looked at the different wager amounts that the players would make, different ranges. The frequency that they made those wagers because that becomes important because what I was trying to look at was if a player wagers a lot of money but only a few — there's a very small percentage of those and that needs to factor into this.

You can kinda see in this, player E is one of your big player ties but they only make up 3.9 percent or 3.1 percent of the population and they win at a 35 percent rate. They're gonna have a very different outcome when they start making wagers and especially in a gambler's ruin scenario.

Then your first player which is playing $2.00 to $5.00 winning at a 14 percent rate and making up 47 percent of this. I often hear this, the 80 percent of the wagers are made by 20 percent of the players. That's all antidotal evidence, though. I've never seen a study that really shows that.

Until we get some studies like that it's gonna be hard to really build models. I had something to work with, at least get a model built, and get out of Arizona, basically, by graduating. So got something on this anyway.

As far as the simulation model that I had, I just used thoroughbred races because that's the only data that I reliably had. Could not get any sort of standardbred data so limited to just thoroughbred races.

Again, a single race track provided the little bit of data that I had and I did group those players into those percentages. Then I was able to use random number generators to randomly select those different players.

I used what I called the weighted random to determine the race. What that means is that a race from Saratoga was gonna come up a lot more frequently than a race from Delaware Park because that's where the majority of the handle is and I think the way I did it was probably a sound way to do it.

Then after that wager was made if it fell into their win percentage they would win — it would recalculate the pari-mutuel payout that would go to their bankroll and then they'd make another one based on a random number generator to determine the next race.

I used a six minute period, just arbitrarily used six minutes, said that basically a player was gonna make a wager every six minutes until they went broke. I don't know what the actual rate that a player can make wagers is. It probably varies a lot, but I had something. At least it gave me something to work with on this and again I used random number generators to make this somewhat realistic to determine their outcomes of those wagers.

This is an example of the model. Now, the old models would say if their first race was at Del Mar, their second race would be bet at Del Mar, their third race would be bet at Del Mar, and throughout the day. Well, this I think, is a lot more realistic than what we're looking at. The first race they wagered on was Del Mar, raced three. This player, in particular, wagered $16.00. That random number to win was what I used to determine their win.

I know a lot of other factors come into this, but like I say, I was trying to build a very basic model. Then their next race they bet on was Arlington Park because that was the next race that went off at six minutes past the next one. Then their next race was Ellis. There were small tracks that would come up into this, large tracks come up into this. There would — I feel like it was a lot more realistic in the environment we're looking at today.

This is another example from the model. Player bet at Indiana Downs, raced five, put $5.00 on it. They did not win so their bankroll goes from $50.00 to $45.00. Then it continues. Presque Isle, bet at Penn National. Eventually they do win. On that fifth race they won $5.00 so it goes back into that. Then what I was able to do was run that scenario but base it on different takeout rates to see how much more or less they would win by changing the takeout rate.

Ultimately, what I was really trying to look at was this bottom line that's highlighted. That's ultimately what we're looking at because we wanna see if their bankroll can stay up higher by lowering the takeout, their churn should last more. If a player gets enough money to make two or three more wagers that's one thing. If they get enough money to make 15 more wagers, that's another thing. That's what we're really looking at here.

So as you can see, this is base. This was whatever the track takeout rate was on win wagers in 2009. These are two percent, five percent. Basically just a reduction from whatever they were at those rates. This model can also be used to look at every track, you know, if utopia for horse players, if every track had the same takeout rate, what the effects on the whole system would be. That's ultimately what I was looking at. That's the real basis for the project.

Why are the player profiles so important? This was the key to this project and it was the hardest information to get, nearly impossible to get, but it's really key to building any kind of a very, very, very basic and simplistic model on this. You have to have reliable data. Anecdotal evidence and assumptions on player profiles and skill levels alone does not work because different skill levels are gonna be impacted so differently in this. I can't stress that enough. It's the main thing in this.

Now, the conclusions, it's blank. I did not have enough data. I don't even wanna — it would be unethical to even try to say you should try to do this because it's — I know that the model was not there. But I think it's a good basis for this. I think there's something there to start to look at. I used very rudimentary skills on this. I used very, very basic tools, but I think it's something that we need to start looking at. The onus is really gonna be on different groups in the industry to try to provide some of this data. It's gonna be essential.

With that being said, that was kind of the very basic model and something that we could potentially do today. I don't — it's far from — it doesn't have any results and I totally admit that. I know there were major flaws in this but that was what I had to work with and unfortunately I really think that this was more of a research project than what's being used to make business decisions. I can't stress enough the importance of not using correlation as a causation. I mean, that's gonna be a very important part of this.

These are some of the flaws that I know exist. They're all based on antidotal evidence but I know that they most likely do exist. Regional bias, I tried to take that into account a little bit. I know that that's — everyone knows that there's some kind of a regional bias. If you're a wagerer in Texas you're more likely to bet on a race from Louisiana Downs or any — Oaklawn Park than you are one of the mid-Atlantic tracks. Everyone at least believes that's there but until you really do the research on it, it's hard to say.

The model that I built did not have what I have walk-away or reload. The end of the gambler's ruin, the player, if they're broke they could very well reload their bankroll and start over again. You can't take that into account with the model that I built. They also, this does not take into account that they could walk away at any point. This says that they're gonna play until they're broke and that's not the case. I understand that with most players you're gonna have players that hit a big jackpot and go home and enjoy it. You can't take that into account, but that's something that could be studied more with a model like this.

That's really what I like about this model is that you can continue to add more data to it and make this even more and more realistic. May not ever get the final answer, but you have at least something to work off of. This did not take into account anything with exotic wagers and that was — or even place show wagers. It did not take into account any of that. I understand that. That was the limitations that I had to put on this to make it realistic, but those are things that could be studied. I put etcetera, etcetera, and etcetera. There are a lot of other things that could be taken into account in this and that should be taken into account in this, but at least to have something to work off of.

Main point is that there's a lot of work that needs to be done on this, so there's a lot more research. It's very complicated and to cite studies from 1976 is not a good business practice. I mean, it just simply is not. Causation versus correlation, it's just as bad as using 1976 data, is to say that handle was X in 2010. Handle was Y in 2011 because we changed one thing, and to say that that caused it. Like I say earlier, I worked at Tioga Downs and they're a good example of this. Tioga Downs, they had a takeout rate of whatever, I can't remember what it was, in 2009. They dropped that to 15 percent in 2010. Their handle went up. That does not tell me anything. Maybe I'm over-skeptical, but that doesn't tell me anything.

How was the track condition throughout the year? If they had more good, fast track condition in 2010 than they did in 2009 that's gonna play a big impact into that. Was their race number held constant throughout that time? Were there more wager types available? There's so much more to that than just saying that we changed one thing. It had this effect and so that's the end of the story. There's a lot more to it and, unfortunately, a lot of our business decisions are being made on what's probably correlation instead of causation. There are sources of player data out there that could be used in this.

I know that the rewards programs are not perfect because not every player signs up for it and not every player uses it every time. It's a good source of data to start to look at. Even better would be ADW data, but I know getting that's gonna be next to impossible. That would be an even better source of this because that player data is tracked on every single wager and you have such a huge sample there that you could actually get some pretty decent data to use into a gambler's ruin scenario like this. It's gonna take a major investment.

That's all there is to it. It's gonna take a lot of time and a lot of money by the industry to really look at this. I really think it's something that needs to be done. Again, we're making very big business decisions based on very small sample sizes, based on correlation, based on very, very dated data. There's just a lot of problems in the way we're looking at takeout right now and I don't know. It's very troublesome to me. That was kind of the history of takeout. That shows a simple model, the sample model that could be used today.

Then I'm gonna turn it over to Dr. Betts who can show us some of the future that we could have. Dr. Betts is from the University of Southern California. She's an economics professor there and her real specialty is product pricing which, ultimately, that's what takeout is. It's a product pricing question. Dr. Betts, I really think, is gonna show us a good overview of some different research methods that could be used. Are they perfect? No, and I think she would agree that they're not perfect, but they are a lot better than using 1976 research papers or using one year over another and making your business decisions on that, so I'm gonna go ahead and turn it over to Dr. Betts.

[Applause]

Dr. Caroline Betts: Great. Thank you for inviting me here to speak today. I'm gonna say, basically, the same thing in a different way is the bottom line. I may — I don't know, I like walking around so I may get down. Economists have been studying pari-mutuel wagering, race track wagering in particular, since the 1950s. They've studied it theoretically so they've developed mathematical models, behavioral models of betting behavior under alternative scenarios.

Then they've tested those models empirically, so I wanna be very careful to distinguish between what we do as theorists, that is develop behavioral models that we hope can try to explain why betting handle responds to various factors in different ways, and then empirical testing of those models which might involve statistical or econometric techniques, some of which Steve talked about. The 1976 paper, for example, calibration of those theoretical models, and simulation, and I'll try to give you an idea what I mean by that. Obviously Steven has talked about a simulation in his own research.

Laboratory experimental techniques, that is testing theories in the context of a very, very controlled environment where you're asking subjects who — because we're academics our subjects are typically undergraduate students to play artificial pari-mutuel games and respond to various stimuli including, for example, changes in takeout. Finally, field experimental techniques. This last one is actually — I guess I sort of want to emphasize my recommendation.

My belief is that all of these techniques together can generate a serious body of knowledge if they're applied appropriately.

This last one, field experimentation, is the one that if you could ever get access, if you could ever put a bunch of economists that are specialists in field experimental techniques into your field and allow them to play with takeout and wagering menus, I think that would be far and away the most efficient way to determine optimal business decisions. I'll try to persuade you of that.

The actual research that's been done in the field in the pari-mutuel context is very, very limited because of course, I don't know, no access. I'll tell you about the one experiment that I am aware of in any case.

In general this is what economists do. They develop theoretical models, mathematical models, behavioral, so let me give you an example from my own research which isn't necessarily closely related to this, but I tried to explain why I observe very different prices for the same product in different markets, in different locations.

Why is that? Plenty of theory would tell me that there should be arbitrage opportunities that eliminate those price differences, that consumers should arbitrage away those price differences. Why can't they or why don't they? I sort of developed mathematical models of monopolistically competitive firms.

Clearly, this is not a perfectly competitive environment because otherwise you would observe a unified price and consumers would be able to arbitrage away your price differences.

That's not the case, so we think about a lot of these price differences for very specific products as being a function of the industrial organization, the failure of perfect competition in the environment.

I would write down a model of an imperfectly competitive firm that produces a brand, a specific brand of the product which appeals to consumers relative to other brands according to functions of consumer preferences in many ways, and derive within the theoretical model in a very abstract environment what the optimal price of that product should be depending on where the location of the consumer and the consumer's preferences and how the consumer responds to the prices of other brands of that product.

The theoretical model gives me a prediction, a very clean prediction because of overseen theory, the whole point of theory is that you abstract from all of the noise that we observe in the real world in order to derive a relationship from A to B, causal relationship.

In the theoretical model, I can okay, if there's an increase in the consumer's income how does that effect his demand for products A, B, and C in that environment? The model gives me a shop prediction. Then I have to take it to the data somehow. There are a variety of ways in which I can do that. In this context, I might write down a model of optimal pari-mutuel pricing.

It can be quite a complicated model, but then there are a variety of techniques I would use in testing and evaluating that model. When the tests tell you that your model's wrong, because the model is always wrong, okay?

There is always — because the model is an abstract object it's always gonna be wrong to some degree, but when you can see how wrong your model is through appropriate testing, then you know how to progress with the research.

How do I adjust this model to bring me closer to what I actually observe in the data? That's kind of very abstract, but the bottom line of all scientific research, including economic research, is something that Steve referred to several times, is I want to isolate the impact of a treatment for the economic variable under study.

I'm not interested in what a correlation tells me. I want to know how a change in takeout directly affects handle. All of the research methods and not just in economics, the statistical and the econometric research methods, the experimental research methods, simulation and calibration, all of those methods are designed to isolate the impact of takeout for handle, for example.

I can't even see my own slides, so I might have to walk around. Why are economists interested in pari-mutuel markets? Actually they're interested in the pari-mutuel mechanism. Just to give you some background on why economists have — because they really have, there's a vast body of research out there. Why have economists been interested? Even though the pari-mutuel mechanism was designed just for gaming — I mean, we don't observe it, really, in other business environments.

It's a mechanism for aggregating a bunch of really diverse (a) information and (b) beliefs about that information. It's a very simple, very beautiful mechanism for aggregating diverse beliefs or subjective probabilities into a single measure, market odds.

Why is it interesting to economists since it is really just employed in the gaming environment? Because that is a reflection of how we think about asset prices.

The price of a stock among all stocks of all different companies reflects very diverse beliefs about how that company is gonna perform over time. You might have a great deal more information than I have about that company along various dimensions.

We both trade in the stock and both of our information sets are basically aggregated in the price of that stock that you actually observe in the market, and economists think of asset markets how we would like them to behave in ideal circumstances is efficiently.

In other words, even though you have way more information than I do so that we have very different information sets about the behavior of a company and what it's gonna do over time, when you trade on the basis of your superior information, the price reveals that information to me so that even though I'm a very uninformed investor, the market efficiently reveals all information to everyone.

What that should mean is that there are no systematic profit opportunities in asset markets. It's violated all the time, right? The theory is, the sort of benchmark is asset markets, and we would love them to be efficient. Economists are very fond of efficiency.

Why pari-mutuel? Why are we so interested in pari-mutuel games? Well, because it's a fantastic environment for testing asset market efficiency.

Why is it so interesting, so fantastic? Because every 30 minutes the actual outcome, the true outcome is known in horse racing. You don't get that in the stock market. Firms live forever. We may never know what the true outcome is so we have to estimate true outcomes in order to test market efficiency.

In pari-mutuel games I can take the subjective odds, reflected in the pari-mutuel odds on the board, collect a very large sample of ex-post outcomes and then compare the actual ex-post outcomes for horses of specific odds from 100 to 1 down to 1 to 9 or whatever.

I can take a very large sample of ex-post outcomes for those horses. How often did they actually win? And compare them with the implied subjective probabilities of them winning.

If the pari-mutuel game is efficient, if all information is being reflected in the subjective probabilities measured by pari-mutuel odds, then the frequency with which horses of those odds win should reflect the market odds. Of course, that's not true, but there's been a vast literature on this.

Economists taking field data and testing market efficiency. The market odds reflect ex-post frequencies of winning.

Actually, remarkably, relative to many other asset market environments, in particular my field in international finance replete with examples of market inefficiency, your market is actually relatively efficient. There's a very high correlation between observed subjective probabilities measured by market odds and ex-post frequencies. The correlation is very, very high.

There are anomalies, right? We all have heard of the long shot or the favorite long shot bias, so favorites actually win, in general, in large samples with higher frequency than odds reflect and long shots win less frequently than their odds suggest.

There are anomalies, also evidence of the gambler's fallacy shows up in some of the field data. That is, the assessment that an event which has just occurred recently is less likely to occur again soon. There's evidence of that in the data.

There are various anomalies in the data relative to an efficient market. What that leads to is, as I suggested earlier, economists have developed theories to try to explain those anomalies. These theories in the pari-mutuel context reflect theories of anomalies of inefficiencies in asset markets more generally.

Are these inefficiencies due to, for example, specific characteristics of bettor's attitudes towards risk? Do we demand risk premier or are there risk discounts, whatever? How risk averse are they? Are they locally risk averse? Are they locally risk loving? What are the preferences of bettors look like that could explain those inefficiencies, those deviations of market odds from ex-post frequencies of winning?

Very interesting models and very common is to develop — and there's a large literature, theoretical literature of modeling bettors with different information sets and different skill sets and different strategies for handicapping races.

The economic theoretical literature is replete with examples of models where bettors have different types. They respond to stimuli in different ways. In particular, in those models, the takeout rate which is always part of the expected return for a bettor, reflected in the market odds, how bettors of different types respond to takeout is an integral part of those mathematical models.

Then finally, there's been some very interesting, in my opinion coming from an academic, work on mechanism design, i.e. could you modify or extend the pari-mutuel market mechanism itself in such a way to ameliorate the inefficiencies that we see, the failure of all information to get reflected in market odds?

Anyway, that's where the literatures come from. How can you test these models? You can't, really, with data because as Steve has recorded, it's just about impossible to get a large or any sample, let alone a sufficiently large sample statistically to assess — you can't get player data, okay? What have economists done?

A lot of the message here isn't necessarily — look, economists haven't sat around worrying about how to maximize your revenue is the bottom line here, right?

They have found inherently interesting research projects within the pari-mutuel context which have broader applicability to other asset markets and they've studied those.

A lot of my message is, what could they do with the techniques they've been using if they had access and if they were being asked to study the issues that are of interest to the industry? What have they done?

There's this long tradition of all this research thinking about inefficiencies in the pari-mutuel context and they've moved to experimental evidence, okay?

So can't get access to data, what do you do instead? You create your own data, right? Lab environments using undergrad students oversee in and of themselves, especially Caltech students which are very special, and a lot of experimental work on this has been done at Caltech, but honestly undergraduate population itself is not broadly representative of horse players more generally.

However, there is an interesting question which is, are they representative of the young people that the horse racing industry might like to attract? We've taken young people, undergrad students in very controlled environments, and asked how they respond to various stimuli.

Almost none of that research to date has asked them to respond to different transactions costs, i.e. different takeout rates or different information acquisition costs, very little.

What's out there is so sparse that I wouldn't even want to characterize it. Almost all of this lab research has asked, if you take a group of students and you give them, you construct a very simple pari-mutuel game and you give group A this information and group B perhaps the true probabilities of outcomes, and you ask them to independently choose how to bet on a set of possible outcomes, how will that information get aggregated through the mechanism into market odds?

That's been the crux of that research, basically, is to see how efficiently — and there is evidence that the students with superior information, that information does over time get reflected pretty well in the market odds but you observe bluffing in the lab. You actually observe things in the lab that occur in the field.

You observe bluffing, you observe waiting by some of the bettors in the labs which improves efficiency because by waiting people learn. You observe also in the lab environment, which is sort of reassuring, you observe the same biases.

Long shot favorite biases is the classic example that we see in the field. Even though this is a very abstract, very controlled environment it actually, when you get these kids and give them information and ask them to play the pari-mutuel game (a) they learn very, very quickly how to do this, and you actually observe a lot of the same phenomena that we believe we would observe in the field.

I guess, to some extent, I sort of would encourage you to think about what's been going on in these experimental labs and what economists have learned may not be of direct interest to you, but what could be learned from that?

Oh, and there was just — I put that in red cuz I just found that really interesting. One of the Caltech experiments Charlie Plott conducted in a 2002 paper was, if you allow secondary trading within the 30 minute or whatever period time that you're conducting this pari-mutuel game, you allow people to resell their tickets in a centralized manner, how does that affect ticket sales and efficiency?

It didn't take the Caltech students very long to learn how to use the secondary market in order to extract more information from market prices in that environment. Gross and net ticket sales increased. I thought that was kinda interesting.

That's an example of mechanism redesign, how you could adapt the pari-mutuel mechanism to improve efficiency and maybe increase ticket sales. Those subjects enjoyed it.

Okay, field experiments. Obviously, nothing has been done here as far as I know systematically by experimental experts in the field. Nobody to my knowledge has been given access so there's only really one experiment that I'm aware of in the field which was again trying to test market efficiency by a guy called Colin Camerer, and this was published in the *Journal of Political Economy* in the 1990s, who I believe his local race track was Santa Anita, but he went and actually conducted a field experiment, a minimally invasive field experiment.

Nobody out there, none of the human subjects actually were aware that he was experimenting with them, but he made a repeatedly — obviously any experiment you have to establish a sufficiently large sample just like you do with actual data to repeatedly place significant bets and then cancel them in an effort to manipulate market odds. That's a very famous paper.

Do the temporary bets, do they affect prices appreciably? Not at the end of the day, no. His little test of whether he could manipulate market odds came out negative.

That's the only field experiment I can think of and that's a shame because — in the pari-mutuel context — because in other industries field experimentation has been used extensively by companies and industry groups in order to figure out what revenue maximizing pricing looks like.

Basically, the idea is they bring in experimental economists — and there are some very, very good ones these days around — to conduct directly using field subjects actually play directly with pricing in the field.

For example, my department chairman at USC was involved. He's an expert in auction pricing mechanisms, and he was in the early days when search engines and advertising through search engines was sort of getting off the ground.

He and some colleagues were called in to try to figure out what the revenue maximizing auction pricing mechanism—I don't know how many of you have used — I use them on Facebook to advertise my little non-profit, but auction pricing mechanisms for ads were.

They went in and they allowed them to actually experiment directly with field subjects, that's you and I out here in the world of Google and Yahoo buying advertisement, and after three months of systematic experimentation with that auction pricing mechanism they raised their revenue by 27 percent. That's an example of how economists have been brought into the field and allowed to experiment with the field in order to assist companies and industries in figuring out how to maximize revenue. It's the most efficient method I could think of, quite frankly.

We've talked a bit about how complicated the environment is today in racing. My honest opinion is, and coming from a background where I use theory and I use simulation and calibration techniques. I've used econometric techniques, is the field experimentation

conducted appropriately with the — and obviously the key to any experiment is you have to have a control, right?

You have to be able to figure out that it's (a) say, changes in takeout variations and the takeout rate that is affecting handle. So no matter what's going on out there in the environment you always need a way to control, a control group basically. I think the possibilities there are pretty endless including blind experiments.

You wanna know how churn gets affected by changes in takeout rate, there's a big methodological literature in experimental economics saying well, does it matter if the subjects know they're being experimented with? Does that affect their behavior? Does it matter whether the subjects know what the goal of the experiment is?

If I tell the subjects, if I tell the horse players we're trying to figure out how to maximize revenue. We're gonna play with the takeout rate to do that, does that affect how they will bet into the markets if you're playing with the takeout rate? Lots of interesting stuff, but the experimental economists, that's what they think about is how to ultimately design field and lab experiments so that you figure out how A affects B.

I'm gonna just touch a little bit. That's sort of my feeling and, by the way, a lot of field experimental economists take that field data, though in this example you could take out as much as you wanted. You're not limited by what's in the sample and I'll talk about that in a second.

They often combine that, take that field data back to the lab and analyze it cuz you gotta run statistical tests to figure out whether there's any statistical significance in your results. You're always combining statistics and other methods. Some combination of laboratory and field experimentation could teach you an enormous amount, provided those experiments are conducted methodologic — well, with methodological soundness.

This old econometric literature, it's not just old, by the way. I think that's a little bit unfair. There are econometrics studies coming right up to the present time which — and what do these do? We don't have access to all of the interesting detailed data on player types and so on that, actually, many economists would be interested in accessing.

All we have, what we have access to, is a lot of gross handle data. There's only so much you can do with that. What do econometric studies do? This is important, too.

Econometrics is designed to establish the conditional correlation between takeout and handle. Not an unconditional correlation, a correlation, an estimate of how the impact of takeout for handle controlling for all other factors.

The reason that the studies from the 1970s and '80s are so limited is that you actually didn't have to control for many other factors. When the systems closed and the race track's a monopoly and you've only got one place show and one takeout rate you really don't have to control for very much to figure out how A affects B, all right?

It's not that the studies are invalid, it's that the environment has changed so much we now need a much larger set of controls. I don't wanna say that that hasn't been done.

Why do people talk about this so much? And Steve alluded to the Laffer Curve. Okay, so I'm gonna go to my data whether it's from the 1990s, from the last decade, wherever, and

I'm gonna try to estimate taking whatever the appropriate set of controls is, the impact of changes in takeout for handle.

I'll often take that estimate, that response, and compute what is known as an elasticity from it. This is really the only way in which economists have ever touched your need to maximize revenue is right here.

I'll take my estimate of how handle responds to a change in takeout with all of the other controls in place and I'll compute something called an elasticity. All it is, is a unit-free measure of that response of handle to takeout. It's unit-free.

I compute the percentage change in handle for a given percentage change in takeout. Not the percentage point change in takeout, the percentage change in the price that's actually confronted by gamblers. That's an elasticity. It's unit-free. It's one percentage divided by another. Why is that so interesting? Well, because of these Laffer Curve things.

What is a Laffer Curve? It is — and why do we talk about them? These are tax rates. Because tax rates are assessed as a proportion of total demand or supply. In the case of — in fact, the Laffer Curves became famous in the 1980s when Reagan wanted to cut labor income tax rates on the belief that the revenue labor, tax revenue would increase as you reduced the labor income tax rate.

Why is the elasticity of demand important? Okay, so is this gonna work? Yes, if I hold it the right way around it will. Okay. This is the Laffer Curve. Zero percent tax rate, doesn't matter how big handle is, you get zero revenue. 100 percent tax rate, we always assume pretty much that tax revenue goes to zero, if only because of tax evasion.

Then there's some — in between those two there's some maximum because in between those two, as long as you have — you have so much of a tax base, here handle is positive. As you increase — there's just gonna be some way in which revenue increases as you increase the tax rate or decreases.

What does it depend on? It depends on the elasticity of demand. On this side of the Laffer Curve as you increase the price there's a relatively large percentage decline in demand. Sorry. Small decline in demand. A percentage increase in price is bigger than the percentage decline in demand and so revenue, which is the product of price and demand, increases.

On this side as you increase price further the percentage change in demand exceeds the percentage change in price. Demand falls by a larger percentage than price increases so revenue falls and at the top is the point where the percentage change in demand fall is exactly equal to the percentage change in price. That is your revenue maximization point.

The thing is, we don't actually know what the Laffer Curve looks like. This is what we believe, economists believe after years of figuring it out, what the labor income Laffer Curve looks like. It's slightly skewed and its maximum is right around 70 percent, tax rate of 70 percent, maximizes labor income revenue from taxation.

For all we know, the Laffer Curve could look like that where, in fact, there's a maximum and it's unique, but there's the elasticity of demand is so flat that revenue doesn't change very much along a broad set of prices.

Tax rates, does everyone understand what this is saying? I mean — so what does the econometric literature do? It estimates the elasticity of demand and I'm gonna come back here. It says is it greater than, less than, or equal to one? If it's less than one you're on this side of the Laffer Curve.

The percentage decline in demand is smaller than a given percentage increase in price. If it's equal to one you're at the top at the revenue maximum. If it's greater than one you're on this side so that the decline in demand more than outweighs the increase in price and your revenue falls.

It is true, just a fact that all of these econometric studies, with a couple of exceptions, have basically said we're on that side of the Laffer Curve.

Now, does it mean that by reducing takeout, if we're on this side of the Laffer Curve, does it mean by reducing takeout we're necessarily gonna increase revenue a whole bunch? No. We don't — the elasticity estimates don't tell you where this is.

They just tell you what side you're on. Nor do they tell you what the shape of it is.

When we estimate the response of handle to takeout in the data, it's giving you a point on the Laffer Curve, effectively. It's actually a point on the demand curve. It's a point estimate. It doesn't tell you, for example, in and of itself, that estimate, where you are relative to in this case point A.

You might be really, really close to it. You might be really far away from it. Without additional information you don't know where you are relative to A. When tracks change takeout rates and not much happens, it's possible, although we don't know, that it's because the Laffer Curve is very flat. With just a little bit of randomness you can't tell the difference.

How do you figure out what the whole Laffer Curve looks like and where your revenue maximizing point is? You can — there's a bunch of different ways, but here's what I think. I think the simplest and the most efficient way to do it is to experiment in the field, where all of the controls are out there and you figure out how to assess a control group which isn't subject to the change in takeout, and a treatment group which is. Y

ou don't do it by dividing up bettors in the field. You would do it by some kind of judicious choice of dates or races in which to experiment. It would be a big, big project but, in my opinion, if you wanna figure out what the whole Laffer Curve looks like and what maximizes your revenue that would be the most efficient way to do it. It's not that the econometric studies can't be used.

I wanna show you one more thing very quickly. This thing. This is a study from 2007. In the latter part of the — the econometric data in the 1970s, the reason it's so nice just methodologically is partly because it's a closed system but also because from 1940 to 1970 takeout changes numerous times so you have enough variation in the sample to be able to get a tight estimate of the demand elasticity. In the latter years there just hasn't been that change over time in takeout rates that we saw historically. The way that we have to—the only variation we observe in a lot of samples is cross-track variation.

What this study did, for example, was to take a large sample of races, handle by race, broken down by pool when play show exacta trifecta and then there were like 30 odd

control variables in there where the econometricians are trying to control for cross-track variation.

This — and they show that the elasticity of handle with respect to its own takeout rate is greater than one. The demand is elastic, substantially greater than one. What does that say? It doesn't say oh, Tampa should have higher handle than Santa Anita. It says that if Tampa had, given the way that you control in the statistical analysis, if Tampa had all of the same race characteristics and economic characteristics confronted by Santa Anita, but Tampa had a takeout rate of 14 percent and Santa Anita has a takeout rate of 16 percent, Tampa's handle's gonna be ton higher.

The set of controls here, when you're using cross-track variation, you're trying to actually control for all the differences across race tracks that affect the levels of the handle. You can do it. They look at the impact of how many simul-races there are in a card.

This is from the demand perspective. It doesn't help you figure out revenue. What can you do with it? The only thing I can think is that if you got an econometric model that you were explaining a large portion of variation with the model, it seemed like everything was going well, you could actually sort of, given all of the estimates how the number of races, how the type of race, how the number of horses in a race, and how the competitiveness of those horses affects handle.

Given all of those estimates, you could sort of use your econometric model to forecast. You could vary the takeout rate in the model and see how handle responded. You could use it as a forecasting instrument, basically.

There are just huge issues with that because you don't know — behavior of agents changes when policies change so you don't know that the estimates I have of how handle responds to, I don't know, the type of race or the purse of the race, you don't know that those estimates aren't gonna change when you alter policy.

I just think there's a ton of trouble in using — if you really wanna figure out how to maximize revenue, I think econometrics has its limitations. It has some input but it doesn't tell you how the heck to figure out what your revenue curve looks like.

Experimentation can. I guess that's what I have to say. That was a lot. I don't know how much of that made sense to people, but okay.

[Applause]

Mr. Steve May: All right, I'm gonna open the floor up for questions. I only ask that you use the microphones cuz they are recording this, and please state your name and the organization you're with cuz I think it is an important part of this.

Mr. Vincent Vitale: I'm not with an organization. I'm one of those bettors that you're trying to keep at the track. The question I have, is there any data indicating that bettors' knowledge of the difference in takeout between tracks affects their betting decisions? In other words, if a better knows that Hawthorne is 15 percent and Santa Anita's 20 percent, is that going to be a factor? If it's not, then how do the tracks allow for competition on the takeout rates?

Dr. Caroline Betts: That last study I talked about, there's no direct evidence because all we have to look at is the — we don't have player data so I can't — there's no sense in which

economists have gotten together with a bunch of players and said okay, what do you know? What's your information set? What information are you using to make betting choices? All we have is the revealed preference of bettors displayed in the data.

That last study tells me that betting handle on a race in a conditional and wager type may win place show, whatever, is higher at a track that has a lower takeout rate when I control for everything else, when I control for all other differences across race tracks.

That's what the — and that's just an example study. There's a bunch of them that use that cross-sectional data. It says literally that if Tampa — and this is the way to think about it, of controls, is if Tampa had all of the same characteristics in a given race that Santa Anita has, if I control for those characteristics and then I allow Tampa to have a lower takeout on that wager than Santa Anita, that Tampa will have higher handle than Santa Anita. Does that make sense?

Audience Member: But, does the bettor know that?

Dr. Caroline Betts: And that is what we don't know. That is why I would love to see this industry invest in some experimentation, actually asking bettors what they know and experimenting in the lab.

One thing to say is that even though lab experimentation has been conducted primarily with undergraduate students which seems, in some senses it may be an unrepresentative sample, that in other environments I'm not aware of in the pari-mutuel research literature, but in other environments you take field subjects and you put them in the lab.

You would take a bunch of horse players and put them in an experimental lab and then ask them to conduct various experiments to see, maybe, how much they know and how they respond to what they know. That's the only way to do it as far as I, really get to it, as far as I can see.

Mr. Steve May: I'd just like to add that it's hard to even group all players together because everyone has different incentives in it, and especially with rebate players.

It's maybe the elephant in the room at times, but if you know you're gonna get half of the takeout rate back in a rebate then you may want that takeout rate higher, whereas a casual player may not know about it and may want it lower, so I think that really does — that has to factor into it at some point, that all players are not gonna think of takeout in the same way.

Dr. Caroline Betts: Absolutely. All of the theoretical literature, all of the experimental literature says there's enormous heterogenetic differences among bettors.

That rebate issue, by the way, is the other reason that econometric methods have become so difficult to use because we actually don't observe — we can observe the aggregate impact for handle over change in takeout but we don't know what price some of those bettors are responding to because we can't observe rebates.

Mr. Will Cummings: From Cummings Associates, and I, too have studied the takeout issues and, like you, are disappointed and been struggling with the availability and utility of the data that is available. There are entities out there that do have extensive data.

Steve, you referred to the ADW companies know exactly what each of their players is doing and Dr. Betts, you emphasized the need for field experimentation. I believe the ADWs have been doing, perhaps somewhat inartistically, but nonetheless very energetically, field experiments and trying to cultivate those bettors.

There are entities out there that have such data and have been working with it and what we see as Steve just — you both discussed rebates rather than surcharges on their bettors.

This would indicate, to me, that either the overall levels of takeout are for certain classes of bettors who are customers of these companies too high and they are responding to the rebates of the lower price of the wagering, or it may simply be a response of the market to the transition from a monopolistic pricing model in local monopolies to a more competitive pricing model. What are your thoughts on that?

Mr. Steve May: Do you wanna —

Dr. Caroline Betts: I think there's evidence to suggest both. I can't imagine why the need for rebates if there aren't classes of bettor that would not enter the market. Some of the experimental evidence tells you that, that for certain classes of bettor, informed bettors, professional bettors, that the higher our transactions cost in the form of takeout and information acquisition costs, the fewer such bettors will enter the market.

They make a strategic — or the pool, actually, but they make a strategic decision on whether or not to enter and there's — if rebates may be what's needed in order to get them to enter the pools at all, contingent on current takeout rates. I think there's evidence to suggest that.

Audience Member: I understand that and I think a parallel is with the casino gaming companies and the explosion of player rewards systems in the great evolution of those over the past 20 years.

Casino companies have found their classes and types of bettors by observing patterns of behavior among their customers. They can target rewards to cultivate play.

Not only bring new people into the market, but increase the play of the customers that they do have, and I would hope that ADW companies and hopefully some of the rest of the participants in the pari-mutuel industries would have the opportunity to do the same type of thing.

Mr. Steve May: I think that's what makes the topic so difficult to understand is that if a track drops their takeout and their handle goes up, it's hard to attribute that just to the takeout because if other things improved that year, if the weather improved, if the track surface improve, if the quality of horses improved, who's to say that increase in the handle — or increase in the takeout would not have grown the handle because more rebate players got into the game?

I mean, it's hard — it's very difficult to, without controlling for a lot of other things and at least observing it and respecting those other elements of it, it's very difficult to make any kind of conclusions on that. It's just very complex and you know better than anybody how complex it is. I mean, there are things that need to at least be taken into consideration.

Anyone else? Well, with that I'd like to thank Dr. Betts and again thank Paul and the Harness Tracks of America for letting us speak today.

[Applause]

What time is it? You went way long.

[Laughter]

Dr. Caroline Betts: I need coffee.

Mr. Steve May: We went about 15 minutes over.