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WELCOME

RICHARD RYFFEL

Professor of Practice & Executive Director of Business Leadership
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PAPER SESSION 1: MUNI MARKET STRUCTURE AND PRICING

MODERATOR: TRIPP KAISER

Executive Director, Center on Municipal Capital Markets
University of Texas at Austin

AUTHOR: CASEY DOUGAL, Florida State University

DISCUSSANT: BRAD WENDT, Charles River Associates

AUTHOR: VIET-DUNG DOAN, Hong Kong Baptist University

DISCUSSANT: MARK SCHMIDT, Morgan Stanley

PANEL: ADDRESSING THE HOUSING AFFORDABILITY CHALLENGE: POLICY,
MARKETS, AND INNOVATION

MODERATOR: RICHARD RYFFEL

Professor of Practice & Executive Director of Business Leadership
Mitch Daniels School of Business, Purdue University

MICHAEL ERIKSEN, Purdue University

EMILY HAMILTON, Mercatus Center

AARON HEDLUND, Council of Economic Advisers

TOM HEINMANN, MH Advisors

PAPER SESSION 2: MUNI MARKET FUNCTIONING

MODERATOR: JESS CORNAGGIA

Professor of Finance, Penn State University

AUTHOR: YU HE, University of Nebraska-Lincoln

DISCUSSANT: SIMON WU, Municipal Securities Rulemaking Board

AUTHOR: ANDREW KALOTAY, Kalotay Advisors

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San Francisco Public Utilities Commission

PAPER SESSION 3: REFERENDA AND BANKERS

MODERATOR: MARTIN LUBY
Director, Center on Municipal Capital Markets, University of Texas at Austin

AUTHOR: JUNE HUANG, University of Texas at Dallas

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AUTHOR: NATASHA BOREYKO, University of Michigan

DISCUSSANT: IVAN IVANOV, Federal Reserve Bank of Chicago

PANEL: PERSPECTIVES FROM ELECTED OFFICIALS

MODERATOR: DAVID WESSEL
Senior Fellow and Director, Hutchins Center on Fiscal and Monetary Policy
Brookings

ARUNAN ARULAMPALAM, Mayor of Hartford, Conn.

FRITZ KAEGLI, Assessor, Cook County, Ill.

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RYFFEL: Go ahead and get started right on time, 9:30:01. So, welcome everybody. Thanks for being here. I'm Rich Ryffel. I'm a professor of practice at the Purdue Daniels School of Business and one of the chairs of this, our 15th Municipal Finance Conference. Can't believe it's been 15 years now. Thanks to Brookings for hosting us in this wonderful renovated facility. We were over at CFR last year. We're glad to be back here. And thanks to my co-chairs for putting together what is gonna be an awesome conference today and tomorrow.

We have a lot of great papers and a lot of great discussants, so looking forward to a robust discussion, a lot of questions from you all in the audience. We also have a couple of really great timely panels. You'll see me on a housing affordability panel here in a little bit. Looking forward to that. We also have on the agenda some lunch breakout sessions. So if you look at online at the agenda, you'll see a few different sessions. So you get to pick a topic and go to that session.

I wanna put a plug in for the session that I'm curating, the MSRB session. Thank you John Bagley for being here and turning out your team to talk with you all about how to encourage more research in this space and how to work collaboratively with the MSRB. So looking forward to that. Quick question, quick poll for everybody.

How many people are here for the first time? Okay. So a great mix. Really good. And you may have trouble with this one. How many are academics? Okay. How are, how many are, I'll say, policymakers? And how many are practitioners? Awesome. So good. A great mix. So, our first session is gonna be moderated by Tripp Kaiser.

We have a couple of great papers there. So, Trip, you can come on up and do your thing. And look forward to having a great conference with you all. I'm excited to meet those of you that I don't know already. Thanks a lot. Tripp?

KAISER: Okay. Good morning, everyone. Thank you, Rich, for that lovely introduction. My name is Tripp Kaiser. I'm the executive director of the Center on Municipal Capital Markets at the LBJ School of Public Affairs at the University of Texas. And the first paper we have this morning is Municipal Bond Smitherings: Institutional Retail Distribution and Markups. There are four authors of this paper, one of which is Rich. But the, the presenter of this paper today is Casey Dougal. Casey, you are in the room, correct? Yep, there you are. Just a quick... you all probably have the speaker bios, but just quickly: Casey, associate professor and dean's emerging scholar in the Department of Finance at Florida State University Florida State's business school. Teaches courses in venture capital, private equity, and portfolio management, and his research includes behavioral finance which is actually one of my favorite subjects and the intersection of urban and economics and finance. Prior to coming to FSU Casey also served on the faculty at Drexel and was a visiting professor at UT Austin. So we're gonna have Casey come up and present the paper, and then I'm going to I think you have about 15 minutes, and I'm gonna step aside and introduce the discussant. He'll have about 10 minutes, and then I'll come back up, and we'll open up the floor to Q&A for about 10 minutes. So that's that.

Casey, come on up

DOUGAL: All right. Well, good morning and thank you for having me today. So the name of the paper is Municipal Bond Smithereening, and like, like you mentioned, our co-authors are Daniel Rettl and Vasya Yakimenko from the University of Georgia, myself as Casey Dougal from Florida State University, and this is also Rich from Purdue.

And so with this paper, what we're interested in looking at is how large allocations of municipal bonds move from the large allocation to smaller customer positions, what we term smithereening. Just like a bomb is blown to smithereens we have these large allocations which are then cut up and then spread out in small pieces to individuals.

And so what we're interested in is how this process affects the, the markups of these bonds, what they trade at, and ultimately how retail investor demand who captures that value. All right, so we'll start off with kind of a puzzle. So, individual investors, retail investors tend to be the largest holders of municipal bonds, so they hold about forty-nine percent of municipal bonds directly.

But they're largely absent from the primary market. So only about four percent of municipal bonds purchases in the primary market are from retail investors. So ninety-six percent goes to institutional investors and then this is then transmitted later as the bonds are cut up and then redistributed to retail in the secondary market.

So we call this, like I said, this process smithereening. Here's an example of kind of how it works. So for example, you have an issuer he'll pay about five and a quarter yield or he'll issue the bond of about five and a quarter yield. The institutional investor will then buy the bonds from the underwriter at the original offering yield.

He'll then flip it to the retail firm, who then immediately turns around and flips it to the retail investors at a five percent yield. You know, yields and prices are inversely related, so this means the retail investor pays more. And obviously the issuer probably would've liked to capture that.

And so what we find is that bonds are not always well-placed during the initial sale, and that there's a significant unfilled retail demand that exists. And the issuer is not being able to capture the benefit of this retail demand. And it, What we're interested in is how common is this and what is the money that is being left on the table?

So here's a concrete example. So this is from some bonds issued by Peace River, Florida. And so this issuance was about sixteen point two million in amount. The initial offering price was ninety-seven seventy-one, and the initial offering yield was five point fifteen. That's a five percent coupon.

And so what we see is that when this bond initially started trading, there was two large initial trades one for a million dollars and another for fifteen point two million.

They were both bought at the original offering price. And then immediately after, what happens is the bond is cut up and then redistributed to customers.

And so, for example the next trade after this, the bond is bought by another dealer at a-- ninety-nine, and then immediately flipped at the same moment at a hundred to a customer. Okay, so the, the price markup relative to the offering price in the inter-dealer trade was about one and a third percent, and then two and a third percent to the ultimate customer.

And so what we're gonna do is we're going to call these inter-dealer trades Smith trades. So basically trades that occur at the same par, the same timestamp at and the same amount. And then we're gonna classify bonds as smithereened bonds if they have one of these Smith trades. So we're gonna treat this as kind of a bond characteristic, and this is indicative of kind of the distribution that was used to place the bond in retail.

And so what we're curious is this common and what kind of markups these types of bonds carry. And so the data we're gonna use is the MSRB transaction data. We have a dataset from two thousand and fourteen to two thousand and eighteen. We just got new data to extend it f- to the twenty twenty-two period.

But this data allows us to observe most of the trades that occur in minis- missable bond market, and so we can see the customer inter-dealer trades, the prices they trade at, the yields they trade at, the par amounts. And our primary variables of interest are gonna be a Smith trade. Like I said, this is a customer sale that exactly matches an inter-dealer trade in CUSIP, timestamp, and par amount, so in the same bond at the same time for the same amount.

And then we're gonna classify bonds as smithereened or not by whether or not they have one of these pre-arranged trades. And what we're interested in is the offering markups across, you know, s- bonds that are smithereened and bonds that aren't. And so the question is do Smith bonds, do smithereened bonds carry higher customer markups in the early aftermarket?

Now you might wonder, why don't we just specifically just look at retail trades? And part of the problem is that retail trades are hard to identify in the trade data. So what we don't observe is the customer type. So we don't know if these customers are in fact retail investors or institutional investors.

It used to be the case that what you could do is you could classify investors by the size of the ticket size, by the trade size. And so typically you'd classify, you know, any trade size under a hundred thousand dollars as retail and larger as institutional. But the advent of SMAs and the increase of ETFs and bond funds have made this a fairly noisy proxy.

And so MSRB research kinda suggests that this doesn't work particularly well. Additionally there's a paper by John Hund Chris Lundblad and co-authors that similarly come to the same conclusion. And so rather than trying to classify the the

customers by trade type, we're gonna classify the bonds by whether or not they were Smithereened according to our pre-discussed metric Okay, so the first result is to show that these Smith trades and Smith bonds are quite common.

So within the first twenty to thirty days after in-- issuance twelve percent of the customer trades are these Smith trades, they're these pre-arranged trades, and about forty percent of bonds have been Smithereened. So a fairly sizable portion. Most of these trades occur kind of where you would think they would occur.

So the share of trades occurring in ticket sizes under twenty-five thousand. So if you look at all the trades under twenty-five thousand, sixty-six percent of those are in Smith bonds. If you look at trade sizes from twenty-five to a hundred thousand forty-eight percent of trades, hundred to two hundred and fifty thousand, twenty percent, twenty-seven percent of trades.

And so kind of if this is a, a retail phenomena, it occurs strongest in areas where you would kind of expect small ticket sizes. To kind of further validate the measure we show that in addition to just being more prevalent in small ticket sizes, it's also more prevalent in bonds that have characteristics that tend to be retail-facing.

So for example, if you look at discount versus premium bonds, sixty percent of discount bonds are Smithereened, whereas only thirty-three percent are premium bonds. Long-dated bonds, about fifty-six percent are Smithereened versus fifteen percent for short-dated bonds. ATS-traded bonds or trades, fifty-seven percent of them are from Smithereen bonds versus twenty-seven percent for non-ATS.

And for callable forty-eight percent are Smithereen bonds versus twenty-seven percent, twenty-eight percent for callable bonds. Not that ins-- not that retail likes callable bonds, but that institutions would kinda shy away from that. And so what we can show is there's some validity for our measure.

It tends to be precisely where you'd expect it to be with bonds that have characteristics that look like they're attractive to retail investors and trade size that we think are, you know, commonly correlated with retail investors. Okay, so the next thing we look at is the difference in markups between the Smith bonds and the non-Smith bonds.

So the unconditional gap starts out at about sixty basis points and then rises to about one percent over time. So it's a fairly large gap and fairly persistent. So that gap is there on trades from these bonds over the first year of the life of the bond after issuance. Next, we look at the markup gap by trade size.

Once again, it's concentrated primarily in ticket sizes under a million. And so, you know, once again, ticket sizes that are most attractive to retail investors Next, we put this in a regression setting. So our dependent variable here is the markup relative to the offering price, and we regress this on our Smith Bond dummy, whether or not a bond is a Smith Bond or not trade size controls, dealer controls, bond controls, and then a variety of fixed effects.

What we see is if you control for the bond rating, this doesn't do much to affect the the difference in the markup gap. So, it doesn't seem to be due to credit risk. If you controlled for trade size, it also doesn't attenuate that much. If you control for bond controls, you get a bit more attenuation but that's a little bit expected because these controls are also you can think rough proxies for whether or not these bonds are retail-facing and whether or not they're distributed in the, the smithereening manner.

But, you know, if we throw everything at it, the premium is still about twenty-three basis points. In terms of dollar amounts on a-- on a hundred thousand dollar trade, that's about six hundred to two hundred and thirty dollars, not massive. In terms of yield, for all you practitioners out there, it's somewhere between three to seven basis points lower customer yields per trade, assuming a duration of about nine years.

If we interact that Smith bond w-with the ticket size, once again, we see that it's primarily concentrated in these smaller ticket sizes that are, you know, more attractive to retail investors. Next, we try to figure out, you know, what's driving this gap. One of the things we look at is kind of pricing power of these intermediaries.

So it could be the case that maybe the gap is due to just higher intermediation costs, or it could be the case that it has something to do with the market power of these intermediaries and them extracting rents from retail investors. So one of the things we look at is whether or not Smith bonds are correlated with more coarse pricing.

So this is pricing at odd eighths or quarter increments something which prior research has shown has been correlated with market power and higher markups. And so what we do find is that there is a higher incidence of using coarse or setting coarse prices on these bond trades. But this is kinda more observational.

We look at it also in kind of a, a diff-in-diff setting. So, in May two-- May 14, 2018, there was an amendment to Rule G-15, and what this said is that dealers had to now disclose dealer markups on retail principal trades. And so now what we have is that dealers have to disclose how big these markets markups are to these investors.

And so what this didn't do is it didn't vary any of the intermediation costs, right? And so those are all the same. All we did was say whether or not we have to disclose this information to investors. And what we find is after this disclosure is made mandatory, that the markups on the, the Smith bond differential markup actually decreases somewhere between ten and twenty basis points.

And so it suggests that at least part of this markup is due to kind of the market power of these intermediaries. All right. So, I mean, what do we just kinda say about the, the mechanism? Well, once again, there's very little inventory risk here that would be driving this markup. The Smith trades are basically s-- you know, simultaneously or they're pre-arranged trades, so you're immediately flipping the bonds.

So th--there's no inventory risk. Controlling for credit risk doesn't seem to have any effect on this. So it does seem to have something to do with the market power of

intermediaries, and it does seem like it's these intermediaries that are capturing this additional value from retail investors.

And so why does this matter? Well, from the issuer's perspective, it's money left on the table. Obviously they'd prefer to sell directly to retail investors at a higher price and make more money for their debt. And so in conclusion we think this is an important issue. We think that potentially, you know, there's could be more efficient ways to design the market so that retail investors have more access to the primary market.

This is gonna be more beneficial to retail investors who are less at the pricing power of intermediaries and better off make it better off for issuers as well. And as far as going forward, I think the direction we'd like to kinda take this is looking at how over time, we've seen the takedown that the underwriters have received has come down drastically.

And so the question that I think we can answer with our design is, well, how much of that has just shifted to the secondary market? All right. But that's it. Thank you very much. Look forward to your comments.

KAISER: Okay, thank you, Casey. I I've written down some of my own questions, but but we're gonna ask the, the crowd after Brad comes up here to discuss. Just quickly: Brad Wendt, senior consultant, Charles River Associates or CRA leads the firm's financial dispute engagements for fixed income capital markets, muni securities, new issues, broker-dealer, regulatory compliance, rating agencies, bankruptcies and credit work.

He he had positions prior to Charles River as an MD at a multinational financial services company, which is Tra- what is it? Goldman Sachs. Oh, Goldman. Okay. Sorry. This is what was Knight Bompont. Was that part of your history as well? Yeah. Never mind. We'll talk about that later. Co-founded co-founder and president of the leading wealth management trading platform and also senior advisor to the undersecretary of the United States Treasury. And is also a business fellow for financial markets at Purdue. So Brad without further ado please come on up here and discuss this paper

WENDT: Hello, good morning. When I saw this paper among all the papers that g-get distributed to the advisory board, I immediately jumped on this one just because this is really sort of something I spent seven years of my life on in terms of electronic trading in the old days when the internet was new and novel.

And the one thing which electronic trading did was create unprecedented transparency. And that is just the key to everything that Casey's talking about today and what we're gonna be discussing also. The more transparency you have in the marketplace, by definition your rates are gonna be lower, and there's gonna be incremental value obviously for the issuing entities.

So I have a couple... I guess I've used the term disagreements with Casey. It's an outstanding paper, and I see our two representatives from the MSRB in the back, and I just want to give them a huge shout-out. It's outstanding paper because it actually comes up with the results that we all expect, but it really quantifies it by, you know, millions of trades.

And if anyone has ever used the MSRB data, it is getting more and more user-friendly. And these two guys are gonna kill me, but they also tell me that they are very kind to academics to use at relative price points. So it's just a wonderful tool. I would characterize Ca- Casey's paper as, a- and the other three authors, you know, capturing rent versus lowering borrowing costs.

And I, I have sort of a s- fundamental disagreement. You know, what rents are we really capturing? And are we really leaving money on the table? We're looking at Institutional versus retail selling. I'm sure we have maybe a third of this room has been involved in both. If you've ever been in retail selling, and I was involved seven years as I was rolling out bond desk to the trading community, it is a laborious process.

And it's a process which there is ultimate disclosure working with the customer so he and she are comfortable w-with the instrument. But it is much more costly than to just do an institutional trade, which obviously has lower hurdles in terms of need to know information to educate your clients.

So one thing I'd say is on a future pa-paper, I'm just saying I think this is an outstanding foundation. I think we should actually think of the cost of the retail distribution. The various tables which are all outstanding, I didn't quite get all the regression analysis, but the, the tables that show the markup, markdowns, that sort of thing I caught on real quick, illustrates that the retail trades are at maybe, you know, in the worst case a, a 10-bond trade is at one- 1.1%, and you go to institutional trades above a million dollars and it's actually 0.1%.

So that looks like, you know, the Holy Grail would be to bring all that money over To the issuer side. But I don't think that's the reality because, A, we wanna get those bonds in the hands of individual investors. As you know, individuals own approximately, either directly or indirectly, 70% of all muni bonds out there.

And as a result, the distribution and the education of the clients is very necessary. So but what I'm saying there is, I think another paper could... or round two of this excellent paper, is we look at the rents. One thing that we need to do is look at the size of the rents. The number of trades in the retail sector versus institutional sector, you know, the numbers are out there.

Obviously, look on the MSRB website, and it's, like, 50 to 1. But the trades are all \$10, \$25, \$100 trades. You know, Mr. and Mrs. Jones are buying the bonds. So first, I'd be curious to know is how much rent are we actually giving up in the retail market? And one thing well, I should say another thing that they've done excellently is they focused on the delta be- between the institutions and the retail.

So if you saw an institution just for round numbers charging a half point for distribution, and you see the retail is charging a full point, it's very easy to say, "Oh, we're getting ripped off," or not ripped off. We're getting overcharged, and that 1% should all be mine." But, you know, the real baseline, which is one thing they do a nice job of pointing out in the paper, is that delta between the two, and I think the delta c- came out to m- anywhere from 38 to 45 basis points.

So that's, that, that's what we're really talking about, the retail rents. The... he mentioned strategic rounding, which is a... May- maybe other people have written about that, but that's the first time I've seen it in a, a very recently in academic paper. And we all remember the New York Stock Exchange when all, all the stocks trade, trading in eights.

And as a result, the when they went to decimals to penny it became much more efficient. One thing that does occur is you tend to always see you know, bonds priced at, you know 95 and three quarters. It almost clicks that way. But so that's something we should keep our eye on. And finally the ability, which is the holy grail, to remove that rent.

And I talked to all the authors in the process of them writing this paper, and I think we're all still kinda stymied at that. But I would love to you know, s-see the same group explore, you know, how you can actually capture this rent in the future. So just in summary, it did a incredible job of using MSRB data to prove once and for all these are the trading costs.

A- and they break it out between retail at various levels, institutions above, above a million, and then, you know, identifying them. I think our next job here is to see why this is occurring. And it might actually be occurring because of the cost of the broker-dealers, but that -- I've never seen any paper on that in terms of relevant cost, institutional versus relative.

So thank you.

KAISER: Okay. Thank you, Brad. I'm gonna open it up to the floor for questions. We have about 10 minutes or so. There's two folks in the back with microphones, so if you have a question, please raise your hand

AUDIENCE QUESTION: Thanks, Casey. Oh, first, I think we're supposed to do introductions. So I'm Dan Garrett from Wharton. Casey, great paper. Brad, really appreciate the discussion. I think this is really helpful. It seemed one of the things you shied away from in the paper is saying something about the primary market that leads to these smithereen trades.

Are these by certain types of issuers? Are these with certain underwriters? Are these negotiated or private placement? How are they funded? I think it would be really interesting to know a little bit more about what is the process that generated these smithereen trades.

KAISER: Yes, please.

DOUGAL: Yeah. Thanks, Daniel. Yeah, that's a fantastic suggestion. We could definitely do this. We're a little limited in the sense that I didn't really touch on this, but with the academic data for the MSRB with the anonymized broker-dealers, we actually don't see the first primary placement with the institutional dealer.

We only see where it goes to the retail dealer then flips to the customer. So they actually exclude that from the academic data set. But maybe we could combine the academic with the public one to figure that out.

AUDIENCE QUESTION: Bonnie Wachtel. I-- my family owns a small broker-dealer and have some experience on the bond side. One thing I would be interested in is the following. F-first of all, you have to not only show the basis point trade, you have to show the adjusted yield, which is something that retail investors are more responsive to and which they understand.

I'd be curious whether full-service broker-dealers price differently than a-- Can you go to a place like a Schwab? I've never bought a municipal bond at a Schwab or a Fidelity or those, but I'd be interested to see the compare in terms of the value of the hand-holding for the customer. In ter-- It was my experience, by the way, that customers very much value the fact that someone is taking time with them and are willing for whatever reason, they're less price-sensitive with respect to buying fixed income than they are with respect to buying equities.

I would be interested, you could get a handle on this perhaps in terms of other vehicles in which customers pay for service managed accounts, annuities other different kinds of products to see whether this is actually a rent or something that the customer is ready to absorb and is widely done.

Just suggestions.

DOUGAL: Yeah. I think we would love to do that too. One shortcoming of our data is the dealers' identities are anonymized. So we can have some rough controls for dealer centrality in the dealer network, or maybe, you know, inventory or the size of the dealer, but we don't exactly know who they are to-- so to kinda differentiate between dealer types is a little difficult for us.

But I agree. It's not necessarily the case that the difference between the Smith Bond is, is-- and the regular bond is all just rent. It's very possible that this is compensation for additional services from the dealers. And I think part of why I think in the future what I'd like to do is see how this is correlated with the reduction in takedown is the takedown is explicit and you imagine if you know, it, if it is more costly to get to, to retail investors when it was explicit in takedown you could see that now it's kind of more implicit and moved to the secondary market, so it's kind of more unclear.

But I will say too though that our result with the MSRB rule change does kinda suggest at least some of the the, the markup difference is due to market power. Since, you know, all that really changed there is whether or not they disclosed the markup.

WENDT: If I could just add one thing to the issues with the small broker-dealer, just so everyone in the room is on the same page. In electronic trading, what happens is there's something called a quote montage. So if the woman who asked the question is a New York broker-dealer and she wants to start selling New York City bonds, there will be probably 15 different firms offering those bonds for sale into a, a electronic funnel, and the bond with the best price shows through.

So I'm sorry, I don't know your name. I'll just say the woman who asked the question. But in, in her example, at the broker-dealer level she is getting the same price on that bond if, for example, she can take down a million dollars a- and hedge that over the days as she sells it off to retail. The point being, everyone is starting with the same baseline due to the transparency of electronic trading.

Now the next piece which, which has been you know, certainly just detailed to the nth degree using the MSRB EMMA data is showing what happens to it and the cost. And I would submit that, you know, your comments about service, et cetera, you know, you obviously are at liberty to be paid for those services, and then you in turn are the one who is controlling the markup, for lack of a better term, to the clients.

And sometimes it's fully disclosed obviously to the MSRB, and other times it's disclosed on the end-of-month statement. So it's just you know, I think, you know, I'd love to work with Casey and the crew o- on this piece maybe for a paper next year on it's fascinating to see is, you know, are the rents all taken by your services or none of it taken by your s-- You know, I just don't know the answer.

And I don't think-- I think it's a fascinating question they've raised in their paper.

AUDIENCE QUESTION: Hi. Great paper. Seth Goldstein from Carnegie Mellon and Zeus Lab. So the data suggests that after G fifteen, the, the rents were decreased, and so there's a-- could be lots of reasons for that. It could be just market pressure, it could be less market power, but it could just be that the market works.

Once the price is exposed, then people compete on the price. So my question is do you think that's true? And what other transparencies could be enacted that would further compress the price? Because we don't know. There's lots of other things that are opaque in the market. And so the question is can we just have the market take care of the problem?

DOUGAL: That's a novel idea. Yeah, I mean, I don't know precisely but it does seem like, yeah, once you disclose what the markups are, you can have competition on markups, so that does kind of make sense. But we'd have to explore that further. As far as what could be done additionally, I mean, from my perspective, you could just putting data online is so cheap these days. I mean, we could non- anonymize all the

data, and you could let us all know who all the dealers are in every trade and give all the data publicly to everyone. I think that would be what I would like to see.

You're right.

KAISER: Okay, anybody else? We got about a minute and a half. Any other questions? Okay. I, I- I'm curious about one thing, actually. What is... We talked about this the old school thinking where institutional size trades were over a million and retail trades were under 100,000. And I haven't seen any of the MSRB research on that, and I apologize, John, for that.

I do owe you pieces to read. But what is the new accepted... And I assume this is because of this sort of transition to SMAs being more of a dominant buyer in the municipal bond business and, you know, categorizing them as kinda retail, but also institutional as a packaged product. What is the new accepted institutional versus retail threshold?

Do we know? Do we have an answer to that, or do, do we not know? Is it still evolving?

WENDT: I would just throw a curve just one, one thing that Casey might not be aware of. Just what has, at least from my perspective, has evolved is retail is definitely from one to 100 bonds. The call it the family offices.

You know, the-- They're not institutional trades at a million plus, but from 250 to a million you actually have a s- new clientele. And I misspoke when I said Casey's not aware of it. It's shown in his data that this exists. I think it's table five or six. And so it's definitely there.

So it's just another thing, you know, to highlight about the paper. I don't think he wrote about it, was what I meant to say. But there is the family offices that are buying 750. Is that an institutional trade? It's close. 500, eh, it's close. 350, eh. 250, no. So that, that's where it is. So you have a spectrum, but you have a different clientele. It's not retail when someone's buying 500 bonds.

KAISER: Right. Okay.

DOUGAL: Yeah. And I would say, at least from the data, yeah, it does seem like the million-dollar point is kind of where, below a million dollars, everything looked pretty much the same, and above a million dollars, it looked pretty different. So maybe a million might be the-

KAISER: Okay. Thank you, everyone. Appreciate it, guys. Thank you.

Okay. So onto paper number two, The Fragility Tax: How Mutual Fund Ownership Links Segmented Markets. Please forgive me with name pronunciation. But the author from Hong Kong Baptist University, Viet-Dung Doan who also co-authored

with some other professors at Purdue and the discussant is Mark Schmidt at Morgan Stanley.

Both of you guys are in the room, correct? Mark, you are here? There you are. Okay. So, quick intro Viet-Dung Doan, assistant professor of finance at Hong Kong Baptist University, got his PhD in finance from Purdue and his research spans financial intermediation OTC markets, and information asymmetry, and his current research centers around mutual funds and ETF trading in the municipal market, which I'm sure we'll touch on a lot in this paper.

So, Viet, why don't you come on up here and present, and then we'll have Mark come up here and discuss and do the Q&A similar to last time. Thanks.

DOAN: Good morning, everyone. It was a long flight from Hong Kong, but I'm very glad to, to be here for this conference. So just to correct the pronunciation here, so you can call me Dave, but my pronunc-- the pronunciation is Viet Dung Xuan. And I am from the Hong Kong Baptist University. This is a joint work with Huseyin Gulen from Purdue University.

In this paper, we document a phenomena which we call the fragility tax. So this is a tax implicitly imposed on the on, on the local governments that originates from the fragility of investors, and in this case, of open-end mutual funds. First, let me explain to you the why we started this project and wrote this paper.

So from the literature, we know that the standard asset pricing models predict the segmented markets between municipal bonds and equities due to their many differences. Muni bonds tend to be held by long-term buy-and-hold investors who do not want much exposure to short-term volatility. However, there is a puzzle here, as you can see on the slide.

Municipal yields actually spike when the S&P 500 falls even for issuers with very stable fundamentals. So in this paper, we try to recognize that by identifying a demand-side friction. Because many investors have exposure to both markets, liquidity shocks to equity investors can actually transmit to the muni market through their investment, indirect investment in open-end muni funds.

And that is because these funds, on one hand, invest in very illiquid muni bonds, and on the other hand, they promise daily liquidity to investors. On this slide, let me give you a brief previews of the main results in the paper. We show in the paper that the ownership risk translates into a direct cost of capital for local governments.

In the, in the secondary markets, bonds held by fossil funds traded higher yield spreads by fourteen to twenty-five basis points which is equivalent to a multi-notch credit rating downgrade. Similarly in the primary markets, the fragility tax is associated with higher borrowing costs which amounts to about two point five billion dollars in the aggregate annually.

Because of this higher cost of financing many local governments have to cut their issuance which ultimately translates into lower investment expenditure in the long run. The underlying mechanism behind these results is the fragility of open-end money funds. When retail investors redeem their mutual fund shares during equity declines, it forces these funds to liquidate their underlying bonds, which are typically very illiquid, potentially at a steep discount.

The market recognizes that risk, so as the market participants price in this expected fire sale risk into yields even before any actual sale occurs. Very quickly about the related literature. Our paper points to different strands of the literature, but importantly we highlight the importance of understanding the ownership structure, ownership risks of municipal debt, and the real economic consequence for local government financing and the long-term prospect of the local economy.

In this session, let me explain to you the setting of our analysis. So the main variable of interest here is fund beta. And as the name suggests, we are measuring the sensitivity of the mutual fund's excess return to the return of the broad market. But the novelty here is that we are looking at two different markets.

On the left-hand side, we have the return of municipal bond mutual fund, and on the right-hand side, we have the return of the stock market. Because of this mismatch, we can further decompose this fund beta into smaller components to better isolate out the direct co-movement the direct effect of stock market on individual muni funds.

So if you look at this decomposition, you can see that the first component here, direct fund beta captures the direct sensitivity of muni fund return to stock market return. Whereas the second component captures the indirect exposure via the broad muni markets. I know that there are many notations on this slide, but as long as we follow this decomposition equation, it is very straightforward to estimate fund beta and its components from the data.

To give you a better visualization of this decomposition I have prepared this diagram. So let's say that we have a shock originating from the stock market. It can transmit to an individual muni fund via the direct channel captured by direct fund beta, or it can also transmit to the broad muni market first and then goes to a specific muni fund.

So that is the indirect channel, and that-- this is the whole idea of our decomposition from the paper the data sample is a sample from several different datasets, including MSRB Morningstar Direct and Mergent for muni funds and muni bond characteristics. This is the main regression specification we use throughout the paper.

The dependent variable is yield spread which is the difference between trading yield adjusted for federal and state taxes and the maturity matched treasury yield on the same day. The main explanatory variable is bond-level fund beta. So essentially, we are taking the weighted average of fund beta across all open-end muni funds holding

the bond as of the previous month now let's move on to look at the main results of our analysis starting with the secondary market analysis.

So this is a baseline table on yield spread and fund beta. But before diving into the detail, I just want to highlight here that in not only is-- in this table, but also in many other analysis we include issuer by debt-fixed effects. So we are effectively comparing different bonds from the same issuer trading on the same day.

So that allows us to control for any issuer-level fundamentals and characteristics that may determine bond yield. Going back to the table we find in the first column that when fund beta increased by one standard deviation trading yield spread is higher by twenty-five basis points. This is very large estimate given that the sample standard deviation is around two hundred basis points.

And we know that like there are many other beta measures in other papers, so in the next three columns, we replicate some, and we similarly document a significant co-- and positive coefficients on those measures. But importantly, in the last column when we include all four measures simultaneously, the coefficient on our measure of fund beta retains its statistical significance.

So this suggests that this new measure of fund beta captures something new beyond what has been captured by other measures in the literature. In the next table, we first examine different components of fund beta. And as highlighted here, as the result from the previous slide is driven entirely by direct fund beta or the direct sensitivity to the stock market return.

Whereas the coefficient on indirect fund beta equals small, and it is even negative in column three. The reason for that is going back to the decomposition we know that f- - indirect fund beta can actually be decomposed into two smaller subcomponents, and the loading on the second subcomponent, aggregate muni beta, is actually negative.

The reason for that is when the two broad markets declines together municipal bonds become more attractive, so their prices become higher than in other scenarios. That is why we have this negative coefficient here, and that also explains why we have a, a very small loading on indirect fund beta in equilibrium.

So those are the baseline results. But the more important question for us to answer is, what is the underlying mechanism here? Our analysis points to the fragility of open-end muni funds. So it stems from the mismatch between the illiquidity of muni bonds that this fund invests in and the promise to provide daily liquidity to investors.

Let me walk you through some results to show this channel more clearly. In this table, we find that higher beta funds tend to experience larger future net outflows. It holds whether we look at realized outflows as of the next month or when we decompose that into expected versus un-expected outflows.

So because of the higher net outflows here, these funds may be forced to sell the illiquid underlying bonds at steep discounts as the market anticipates this. So this expected fire sale cost is priced into bond price or bond yield even without any actual selling occurs. Consistent with this idea, we further show that the fragility tax is larger when flow pressure is larger.

We define flow pressure as the weighted average net outflows across all funds holding the bond as of the previous month. As expected, the coefficient on the interaction between fund beta and flow pressure is positive. And furthermore because according to the fire sale risk channel we expect that customer sales should be affected most strongly because of the urgency of selling.

And that is exactly what we document in columns three and six in this table with the triple interaction between fund beta flow pressure, and indicator for sales versus purchase. So, so, so our paper is pretty long paper and actually we have many other results supporting this channel, but because of the time constraint today, let me skip some.

In the next session, I would like to hopefully convince you that there is a causal relationship between fund beta and yield spread. So this is not just a correlation here. We have implemented many different identification strategies in the paper. But again, we do not have much time today, so let me just focus on the last one, a quasi-experiment around the Puerto Rico government debt crisis back to 2013.

So to give you some background this is actually the largest default in the history of the US municipal bond markets. But a nice detail about it is that even though the market for Puerto Rico debt was not very large, actually many open-end funds invested heavily in these bonds because of the triple taxation exemption status.

So we can actually use this as a shock to-- as the non-Puerto Rico bonds held by the same funds to test this potential causality. In the first figure on this slide you can see at a fund level when a fund has a larger exposure to Puerto Rico debt ex-ante, it tends to have higher net outflows starting from the second half of 2013.

Similarly, at the bond level non-Puerto Rico bonds held by these affected funds also experience a rise in their trading yield spreads by five to up to 15 basis points around in, in the same time frame. So we want to use this quasi-experiment to show that the fund-level risk originating from the exposure to Puerto Rico debt crisis can constantly increase the trading yield of non-Puerto Rico bonds, even though their fundamentals do not change at all around this period.

So those are the main results in the secondary market analysis. And in the last part of the paper, we also want to point to some real economic consequences of the fragility tax in the primary market of muni issuance. We know that one issuer may have different outstanding bonds at the same time and the pricing of one bond may have implications for the pricing of other bonds from the same issuer.

Consistent with that idea, we show in this table that when an issuer has other outstanding bonds held by high beta funds its newly issued bonds tend to have higher offering yield spreads by six to fourteen basis points. And again, this result is driven entirely by direct fund beta perfectly consistent with the secondary market analysis.

In our back-of-the-envelope estimation the estimate here translates into a higher borrowing cost by two point five billion dollars in the aggregate annually

Because of higher cost of borrowing, many local governments need to reduce their issuing propensity. In this table we show that when the average fund beta increased by one standard deviation, the issuing amount declines by \$34 per capita at the county level per year. So in the end, as the fragility tax affects local government financing, not only in terms of price, but also in terms of quantity.

And that is pretty much everything in the paper. To summarize, this paper documents a phenomenon which we named the fragili- fragility tax. So this is an implicit tax on the local governments. It does not come from the fundamentals of the issuers, but it comes from the fragility of holders or investors and open-end muni funds in this case.

So the root cause of this fragility or fragility tax is from the mismatch between the illiquidity of muni funds invested by these the illiquidity of muni bonds invested by these funds and their promise to provide daily liquidity to investors. And this friction is even more severe during stress periods notably during COVID-19 pan- pandemic back to 2020.

So this is the whole idea of our paper. Thank you so much, and I very look forward to the discussion and comments.

KAISER: Okay. Th-thank you so much Mark. Just a quick intro. Mark Schmidt also a CFA executive director at Morgan Stanley leads Morgan Stanley's municipal strategy research. Actually began his career as a broader fixed income specialist at the wealth management group at Morgan Stanley.

He's MBA from Columbia, a BS international economics from right here in Washington, D.C. at Georgetown. And so with that Mark, please take us away, and then you have about ten minutes, and then we'll do Q&A when you're done.

SCHMIDT: Great.

KAISER: Thank you.

SCHMIDT: Thank you so much. Thank you to Professor Doan for his interesting and thought-provoking paper.

Many thanks also to the Brookings team, including David and Haowen in particular for hosting and organizing this wonderful event. A well-functioning municipal market provides a vital public service. It finances America's infrastructure. And in particular, the tax-exempt muni market has evolved to provide smaller borrowers with a remarkable degree of borrowing flexibility when compared to corporate markets.

Given the very long useful life of public infrastructure improvements, a wide variety of local governments prioritize the long and flexible amortization terms that the muni market offers and offers affordably. So Professor Doan's paper is extremely important in informing especially for small borrowers, how this market can function as efficiently as possible.

It's also interesting to note that for all we talk about things like fragility from time to time, the municipal market has worked well for two hundred years. Local governments have regularly issued municipal bonds for over a hundred and fifty years. So today, I'm happy to offer a practitioner's take on the very interesting topic that Professor Duan has explored for us in really excellent detail.

I'd like to focus on three topics, two of which are major and one of which is minor. First, market structure. Second correlation. And then one just minor topic on active management. First, let's focus on market structure. It is evolving, and it's interesting to consider as a group here whether a future area of research for all of us, and perhaps even a solution to the issue that Dave has identified in his paper, is the growth of separately managed accounts.

At Morgan Stanley Research we argue that separately managed accounts are the new Bond King. We estimate at least two trillion in retail fixed income SMA and ten trillion in institutional SMA assets under management. That's more than double mutual fund AUM. We estimate that retail municipal SMAs finished twenty-twenty-five at one trillion in assets and will end twenty-twenty-six at one point one trillion in assets.

We estimate that municipal SMAs will grow by ten percent for the second consecutive year. Municipal SMAs are already larger than mutual funds, and we think they will continue to take share from mutual funds in the years ahead. So just a, you know, quick definition, right? A separately managed account's a tailored, customized investment vehicle.

It's professionally managed by a third party that predominantly holds individual securities. Both households and institutions invest via SMAs. In municipals and elsewhere, SMAs dominate asset classes where the liquidity transformation offered by a mutual fund is not crucial because the underlying assets, like municipals, are themselves sufficiently liquid.

SMAs offer several advantages over mutual funds, including lower fees, a high level of tax efficiency and I think, you know, the last two are pretty important unlimited product customization and continuity in ownership. SMAs are customized to the investor's specific needs. So that means that SMA growth is creating an environment

in which mutual fund and ETF flows, fund flows in general, are becoming a less reliable and less relevant market signal.

But this need not be a negative signal for market liquidity. Indeed, because of SMA growth, total trade volumes have risen even as average ticket size has fallen. The crucial point here also is that SMAs suffer less from outflow cycles than do mutual funds. The mix of data available to us points to remarkable steadiness in SMA AUM.

Simply put, there is little evidence of a knee-jerk inflow and outflow cycle that is common to mutual funds as Dave has identified in his research, and that has market-wide impacts, as Dave has also so expertly detailed. And that's because SMAs do offer this continuity of ownership. Because SMA investors own the underlying securities they can terminate a manager without disrupting their portfolio.

So because fixed income SMAs do not have discernible flow cycles in the fashion of traditional mutual funds then, you know, I think that has some implications for market structure that are relevant to the conversation today. We also find that most SMAs have lower turnover than similar actively managed mutual funds.

The structure of the SMA itself also contributes to buffering volatility in a way that's appealing for overall market design. Most retail SMA fixed income strategies are ladders, and bond ladders are a kind of duration-targeted portfolio. And as Martin Leibowitz and Anthony Bova have noted in a series of research reports, to quote, "Bond portfolios tend to converge back to their initial yield values over a specific time horizon, and this convergence horizon depends primarily on the target duration and is largely independent of the intervening movements of interest rates."

So ladder returns converge to the top-run bond yield under a variety of circumstances, which is an attractive property for a bond portfolio. Not only are they simple to understand, but bond ladders and SMAs actually offer, again, useful volatility buffering properties across a variety of yield curve shapes and shifts.

Second, let's turn to the next major theme that's explored in Dave's research, and that is fund flows and asset class correlations. And your report obviously goes through the extensive body of research to which I cannot do it full justice. I would note that, you know, munis are mostly held by households who trade infrequently, and that muni returns in general are less volatile than corporates or treasuries.

There are fundamental reasons, right, for this lower volatility, the taxing power of munis being more dependable than the pricing power of any private company. Although practitioners talk about flow cycles, it might be better to think about flows as though we were thinking of the weather. And the idea or degree to which the forecast calls for rain is less meaningful than how much rain you would expect and how long you would expect rain to last.

Consecutive outflow cycles of more than a week are relatively rare. In prior research, we estimated that they constituted less than ten percent of all flow periods. So what Dave's research is talking about is not every single instance of outflows but periods

where correlations shift. So examining the equity and corporate bonds beta to the muni market over time does show that correlations cycle through different regimes and that these can be impacted by different macroeconomic factors.

That's one reason why we've argued that muni investors in some ways are more macro investors than you would think. And Dave's conclusions can be best understood in the context of this existing knowledge around how muni correlations do change in response to different macroeconomic factors over time.

For example, global growth concerns and energy volatility have caused betas to shift between muni returns and equities before. To quote my colleagues across Morgan Stanley's global research teams, "A challenge for investors thinking through hedges and downside risks is the potential for the stock-bond correlation to break down.

The negative correlation between stock and bond returns that investors are familiar with is underpinned by a traditional relationship of growth and inflation traveling in the same direction." Of course, there are four pillars of bond diversification, as my colleagues discuss: yield, volatility, correlation, and downside beta.

Too much emphasis arguably may be placed on which assets are negatively correlated with equities, whereas diversification also is a question of volatility and correlation together. In the muni market, I would note that flows follow returns. Based on our research, we find that there is flows momentum.

Investors add money to the muni market in response to positive returns, and formally, flows can be modeled along autoregressive lines. However, momentum does decay over time. Additionally, it's important to note that negative returns must be sustained and substantial to overpower an inflow cycle. In both daily and monthly regressions in our prior research, we found that near-term flows momentum was a more powerful predictor than trailing returns.

Trailing returns being significant but on a much smaller magnitude. So it takes more than a bad week or a bad month to change investor attitudes about munis. Finally I would just like to make one minor point on active portfolio management. Three features of the municipal bond market uniquely suit it to active management, and the overwhelming majority of municipal mutual funds are actively managed.

First, the municipal market has steeper yield curves than other rates markets. Second, it has high credit spread variation despite exceptionally low default risk versus investment-grade or securitized credit, and this high degree of credit spread variation persists even when controlling for credit ratings.

And third, the buyer base is risk-averse and largely more segmented compared to equities, as prior panels today have mentioned. So how do active managers add alpha in the muni market? Well, two things that they do is that they invest beyond the benchmark. Second, they take a risk-neutral approach to credit balanced by technicals.

Better-performing investment-grade funds have historically had higher exposure to sectors with wider credit spreads. So to put it simply, active managers tend to buy wider spread bonds. But overall, Dave's research does an excellent job outlining the degree to which outflows and outflow cycles can contribute to market fragility, as you mentioned, even though overall I'm not sure fragile is the word that I would use to describe the muni market.

So with that, I'll hand it back to Trip and Professor Doan to open the floor for discussion.

KAISER: Okay. Thank you, Mark. Super interesting stuff. We covered a lot of ground there. Market structure, liquidity, volatility, active versus passive management all fascinating subjects. I have a lot of questions, and I feel like we could talk about this topic for for hours, but I'm gonna open up to the floor.

Any questions from the crowd? Right here.

AUDIENCE QUESTION: Well, I really enjoyed that discussion of SMAs from Morgan Stanley. But just to put a pin in it, and perhaps looking back to our prior discussion, when you say SMAs have lower fees compared to what? The average mutual fund bond fund, a discount fund like Vanguard, a general SMA holding equity and debt. What was your reference point?

SCHMIDT: Sure. So I would reference Morgan Stanley Research. So take a look at our reports and I need to say also for important research disclosures, please go to morganstanley.com/researchdisclosures. The, the key theme is electronification, as was brought up in the prior panel.

So active SMA manager fees do tend to be lower than those of actively managed mutual funds. 20 years ago the lack of automation in odd-lot trading would have made that impractical uneconomical. But electronification has made odd-lot trading remarkably more efficient and continues to make odd-lot trading more efficient, you know, call it every quarter still.

KAISER: Yes, sir. We have one in the back of the room. Maybe we'll start there. Thank you.

AUDIENCE QUESTION: Yes. Hi. So I-- I'm sorry if I missed this but I assume you had a generated regressors problem in your setup. Did you try any robustness test? I imagine it was quite sensitive to things.

DOAN: Oh, well, actually, like, we have very extensive robustness tests in the papers, which you can find, like, in the appendix.

So we try, like, maybe over, like, twenty dif- twenty different specifications with very different range of fixed effects and controls. So we really want to ensure, like, the audience that this is really robust to different set of specifications in the paper.

KAISER: Yeah.

Okay, you got it.

AUDIENCE QUESTION: Marty Luby, LBJ School. I just have a question about the policy implications. The two point five billion dollar cost and the four billion, I think, rationing of issuance. Can you give a little more detail in terms of are you talking about the, for the whole market? Is it annual? Where-- Can you give a little bit more detail on just how you quant- how you actually computed those numbers?

DOAN: So basically, like, we rely on the average, like, bond duration at the offerings. So you know, so we can estimate, like, the, the diff- the change in bond price based on the duration and the change in yield. So we get the coefficient estimate for yield difference from the regression, and we multiply that with the bo- average bond duration and the total quantity of offerings for the whole market in a given year to get that two point five billion dollars higher borrowing cost per year for the whole US market.

KAISER: Anyone else? Okay. So I-let I guess, there's a lot of different things we could talk about. I'm kinda curious... Oh, so the the main theme is the fragility tax, correct? Okay. So, so fragility tax is a essentially a liquidity tax. But Mark, to your points about the, the growth of the SMA business I assume over the last decade, the SMAs have had a higher growth rate than the open-end actively managed mutual funds, and we presume that's gonna be the case going forward.

SCHMIDT: Yep.

KAISER: So if that has been the case over the last decade, and we presume it'll be the case going forward is the fragility tax shrinking then? Do we expect it to shrink?

DOAN: So actually, like in our paper, we also show the time series of the fragility tax, and it is not shrinking, but it depends on market conditions.

So for example, it spikes, tends to spike during market distress, like around the taper tantrum in 2013 and also COVID-19 in the first half of 2020. So it really depends on the lack of liquidity in the market and the propensity that like investors are willing to like withdraw money from their mutual fund investment.

Okay. But there's no clear pattern for the declining effect of fragility tax over time.

KAISER: Okay. Mark, what do you think? Do you think we'll see a smaller fragility tax?

SCHMIDT: I think that's fair to say, yes.

KAISER: Okay. You mentioned too the outperformance or relative performance of active management, and this is your minor point, right?

It's part of your minor point. So what is-- what do we think the reasons are for active managers, if we're talking about just mutual funds why do the active managers, Well, to what extent do active managers outperform? Do we know? Versus versus the passive managers. Do we know like on a percentage basis?

And then if not maybe talk a little bit more about why we think active managers outperform their benchmarks. And I think it- Yeah ... I think there is a connection to liquidity and to outflows and to having to force, you know, raise cash through secondary sales into the secondary market at adverse times, and that can affect kind of relative performance of active managers.

So I'd curious to your thoughts on all that.

SCHMIDT: Yeah. On the the numerical degree, I don't have the, the report in front of me so I'd have to get back to you on that. Active managers invest beyond the benchmark. Municipal benchmarks are relatively narrow versus the total universe of bonds.

Active managers have careful credit selection and careful credit selection goes hand in hand with, selectively investing in less liquid securities. You know, I think over the course of these two days we'll be talking about sort of interlocking concepts. Trip, you brought up liquidity with fragility.

Liquidity is also in some ways overlapping with perceptions of credit spread risk and credit spread volatility.

KAISER: Yeah. Okay. And I guess the other part I think we would regret not addressing here is just the ETF business. The ETFs, similar to a mutual fund but, you know, hold a larger basket.

In theory they're more diversified. They're argued as having lower cost. They do have lower cost, I guess, if you at least look at the, some of the larger ones owned by Vanguard and BlackRock. Well, how does that... if you could address this question w- how does the, the... Does the ETFs have a similar fragility tax problem as the open-end mutual funds or is it different?

DOAN: I would say that would be very interesting to look at, like, mini-ETFs as well, but I think that the, like the mechanism would be a bit different. Like in our paper when we focus on open-end funds, like we want to highlight the daily redemption risks. But for mini-ETFs or ETFs more generally, it is more about the intraday trading on the exchange and the role of, like, authorized participants.

So, so, so, so the daily redemption rate is le- less relevant for, for ETFs. But that may be the topic for another paper.

KAISER: Yeah. Yeah, it might be a good idea just given the growth of the ETF business. Yeah. And so, yeah we have another minute and a half, correct? So the, back to Marty's policy question, actually. So the solution is really cash, greater cash buffers at the mutual funds. Is that kind of the main solution? And I ask because is the solution to this problem really having to be undertaken by the mutual fund complex, or is there something that a borrower can do?

Is there something a dealer can do? Is there a structural change in the market to make it maybe more efficient in some way? How do you address the problem?

DOAN: First of all, to set the stage, so in this paper, we look at a, a negative side of, like, mutual fund industry, but like, overall, like, mutual funds also help a lot with the local financing.

So, so to to mitigate the concerns about this fragility I would say that, like, we can have some regulations in terms of mandatory liquidity buffers or even, like, swing pricing. So that could really help, like, reduce the adverse effect of, like, investor redemptions on the forced selling for sellings by open-end funds.

KAISER: Okay. Okay, Mark, anything else?

SCHMIDT: I would say structuring new issue deals to be more suitable for SMA demand. Again, to underscore our research SMAs have never had an outflow cycle. They are remarkably stable. And so to us at least, that would be one simple solution. Got it.

KAISER: Okay.

Thank you so much, everyone.

WESSEL: I want to thank all the moderators and speakers. That was really interesting. We'll have the SMA versus mutual fund smackdown will be over drinks. We're gonna take a 15-minute break now. There's some coffee and pastries outside, and then return here for a panel that Rich has organized on housing affordability.

Just want to explain how the lunch situation will work after that. We have box lunches. You're welcome to eat them there or here, but we really encourage you to go to one of the three breakout lunches we've organized. These are informal, but with one person being the moderator. Rich mentioned one that he's hosting with the MSRB that's meant to help figure out what topics that the industry would find useful to have academics on.

We're gonna have another one that's on sort of the issues of inflation in general, both on the market and on state and local governments. And then my colleague Louise Sha-- Dan Bergerstrom is gonna moderate that one. And my colleague Louise Shaner is gonna moderate a, a, a lunch that looks at broadly on state and local fiscal and economic issues broadly defined.

So we encourage you to go to one of those three places, and we'll put the room numbers up here, and one of my colleagues outside will help direct people to where they're gonna go. So with that, have some coffee so you can stay awake for another session.

RYFFEL: All right, we'll get started back up again. You're stuck with me again for the next hour. We have a great panel entitled Addressing the Housing Affordability Challenge: Policy, Markets, and Innovation, and we've assembled a great group of panelists that kinda will give us a 360 view of the housing market and what's going on.

So I'm gonna refer you in the interest of time, to the website that has detailed biographies of my panelists here. But just briefly, you'll be hearing from actually my colleague at Purdue, Mike Eriksen, who runs the Dean White Real Estate Finance program there. Mike's gonna talk about the definition of affordability and some great data.

And then Aaron Hedlund, purely coincidentally, also a colleague at Purdue, but he is on loan to the White House now where he's economist at the Council of Economic Advisors. And then we also have Emily Hamilton from the Mercatus Center. She'll be talking about state and local options and some issues around zoning, et cetera. And then Tom Heinemann, who is with MH Advisors and Tom represents the industry angle of things. So we're gonna, we're gonna start with Mike, then go to Aaron, and then Emily, and then Tom for some opening comments. I'll chime in with a couple of questions, and then we'll leave plenty of time for audience questions, 'cause I'm sure there'll be many, 'cause this is a topic that is most pressing.

So, Mike, you wanna get us started with a little bit of data around what do we- Yeah ... what do we really mean when we talk about affordability?

ERIKSEN: No, for sure. So, thank you very much. So, you know, Rich and I have been talking a couple years. I've been trying to say, "Hey, you know, it'd be great to, you know, have a panel with this."

And, it, you know, I think three things are kinda coming up and I think this is where we saw the first kinda bipartisan kinda, you know, bill in maybe 30 years of, you know, on the topic, is kinda what does affordability mean? And people always say something, you know, it's like it's not the same for everyone.

So kinda just to start with, I mean, I think first and foremost, right, there's kinda three things and when you see that, first is the homelessness, right? So, you know, right off the bat when we see kind of it's unaffordable, obviously people that don't have any is a good example. It's really about 700,000 people right now, about 1.7% of as far as renters don't have any, right? So really the highest ever, 18%. There's some questions if it's going down or not, if it's, you know, more like a... but first and foremost, when we start thinking about affordability, I think that's the first one.

Now, that's the hardest one. I think the other thing, I think, you know, 20 years, you know, which I've been working on this topic, it kinda ebbed and flowed. When I, you know, about 2001 when I first kinda looked at this, really it was about seven cities in the United States were kinda unaffordable. What do I mean? If somebody was, you know, which was as far as like a median, like a renter, could they afford a median like a which is at a median, as far as, like a, I guess as far as, like a housing unit. So, kinda where do we go that, like as far as the 30% rule. So it really dates back from like Depression, someone who, you know, which as far as like a week's work for, as far as like a month's rent. And only, you know, it, so it increased to 30%. It's really not a hard rule, but if you look at the data kinda historically, it's pretty good. And kinda as we look at that, and I think thinking about that, you know, about half of all renters right now, you know, just exceed like the 30% rule.

Now, like my father you know, the 30% rule, he's retired, no commuting costs. You know, he's not really in trouble versus there's a whole group on the bottom end. And I think when people exceed the 50% rule which is about a, which is about, you know, which about as far as like, you know, about half of that that's when we know that they're bad. I still don't think that would get us to the point where we're at, where, you know, like we're talking about it, like we're in this room. You know, I think this map kinda shows it though. And what this shows is what percent of income kinda has gone towards rent over the last 24 years. So, and it's a lot of rent.

And what the red shows is basically kinda holding a you know, which as far as like a median household, as far as the rent, how much has to go towards, like the rent? And what you see is about up to 25% on average. Most importantly, it's not on the coasts. It's in the middle of the country.

That's really where some of the biggest gains have been or really like the sort of like the losses, I guess, really. You know, so I think when we talk about the affordability, and I think kinda as we look at these maps, it's no longer just a few states issue. It's no longer just, you know, which is sort of like a democratic issue. It's really affecting everybody. And again, we could talk about some of the reasons why but I think the first part just to look at this is kind of the sum this growth, right? This 90, you know, which is sort of like a 92% of metros across the United States have really like lost that.

So, kind of what I still think really changed everything you know, was basically about 2001 or 2000 2000, like the May or April 2000, as far as like the-- so if we look at that as you know, we've had about 59 months really over about a, you know, which is about 14 years of really the 30% rule for just owning.

And really when it comes down to the principal interest, taxes, and insurance if we look at this all together, you know, we've seen basically 61% increase in, which as far as like the median house price. But when you know, you know, just combine the interest, taxes, and insurance, it's really a 94% increase.

So, you know, a big showing obviously is about a third of that is the principal and interest. You know, houses are more expensive. We're also about 200 basis points

increase in the which as far as like mortgage rates. So that's important. What I think is important for this room is the property like the, you know, to, to tax base.

And a lot of people chat about this. It's really about 11% increase you know, if we look at this 1,500. And I think that's important. That's less than inflation actually. So it'd be about, you know, as far as like a 30% increase but only about property tax has gone up, which is 11% but that as far as with hazard insurance makes up the majority for the existing kind of homeowners as well. So we kind of have the homelessness, you have the renters, but now you not only have first-time, like, homeowners, but you have the existing homeowners being impacted as well. This is where, you know, I think you got kind of the bipartisan support.

And ultimately, kind of, where do we go from here? I, you know, I think the big question, which I hope to talk about, is kind of the property tax, which is sort of like the limitations. I think these are, you know, which are for sure going to be you know, like in the next year how does like, you know, with as far as the property taxes, how do we go? And more importantly from the, which is far like mobility as well. Households respond to these. Do they respond less or do they respond more? And I think, you know, kind of, we'll talk about it just on this panel. But thanks. Rich.

RYFFEL: Great. Thanks, Mike. Aaron, you've been on the at the White House now. We're making some sausage there, working on policy and studying the effectiveness of various policies and the housing bill limped over the finish line, I suppose, a couple of weeks ago.

Could you talk a little bit about some of the policies that are in that bill, s- maybe some of the things you didn't include in that and how likely that is to find its way into the market and really address the problem that Mike's describing here?

HEDLUND: Yeah. Thanks, Rich. To, not to rehash what Mike said, but the Council of Economic Advisers in our annual economic report of the president, which came out in April this year, we had a chapter dedicated to housing, and that's because it's been a huge priority, and it's been something that, you know, a handful of us within the council have worked on very diligently for b- basically the entire term.

There was work that went into it during the One Big Beautiful Bill process. You know, many of the housing things did not make it into that bill but then have spilled over into executive orders and to the Road to Housing Act. But that was even a component of opportunity zones, you know, which were in One Big Beautiful Bill.

And what the report does, first of all, is it identifies kind of the problems that, that Mike is talking about, which is that we found median home values since the year 2000 have gone up at like six times the rate of median incomes. And if you look at the homeownership rate, in the aggregate, it looks pretty stable over the past decade or so, but we have an aging population.

So when you control for the and older people have higher homeownership rates. So when you control for that, homeownership rates have actually fallen significantly for

people in their 30s and in their late 20s and even early 40s. So it's a major problem. And, you know, the issue as we see it is primarily one of constrained supply combined with some kind of artificial sources of demand that we can pull back on as well.

When it comes to the supply story, if you look at for decades, I mean, from the 1960s all the way until the financial crisis. On the single-family home front, we built about six thousand single-family homes per million people per year. It was somewhat higher than that during the 2000s boom, although not dramatically higher.

So when I say that number, that's not a 2000s bubble number, that's literally a decades long kind of typical. Post-financial crisis, it fell by about two-thirds. Since then, it's rebounded somewhat, but it's still down about forty percent from what that level was. So when you kind of accumulate that shortfall, it's many millions of homes short of where we would be if we had just stayed on trend.

And so then the remainder of the report identifies, like, what is the reason for this and what can we do about it? And then I-- and then I'll mention kind of the executive orders and the legislation. So we identify-- we look at kind of the, the causes of this lack of supply, and we attribute it to, you know, what we call essentially a, a six-figure bureaucrat tax, which is all the... it's like the whole mess of things that happen at every stage of development. There's all the things that happen before development the approval delays and the uncertainty and the hurdles you have to jump through, some of which don't even make any logical sense. The fees associated with development that, you know, if they were just about compensating the community for costs that they genuinely face, like extending a sewer line, that'd make sense.

But so many of these fees are completely disproportionate to any of those sorts of costs, and it's just kinda like a piggy bank to extract money, which really just means fewer homes built. And then there's the construction process itself, which has gotten many layers of mandates that add to cost that are unrelated to safety.

And some of those, you know, we attribute to, you know, green energy types of things, but there's many other things as well. And then post-development you know, there's also restrictions that, that impinge supply, like, you know, excessive rent control and squatters' rights and things like that. And also, you know, it used to be the case in 2019 that one out of every two new homes was sold for under three hundred thousand dollars.

Now it's one in six. Now, there's been some inflation since then, but that's a pretty steep decline. So there's been three executive orders that the president issued earlier this year. The lion's share of the attention went to the institutional investor ban stuff, but there were two others. One of them was on addressing the banking side and making it easier for banks to get back in the mortgage game, particularly for small dollar loans.

And then the other one was removing regulatory barriers to supply. And that was-- that one in particular was something that the council worked quite extensively on. And there's one section of that I'll draw your attention to, section four, which is basically issuing and incentivizing best practices for states and localities.

And we bucket those into three kinda main categories. One is best practices meant to encourage innovation Right. The economy has gotten way more productive over the p-last several decades, except in construction, where productivity growth has been literally negative. And there's one study that found that deficit in construction productivity growth, which has spillovers to the rest of the economy, is, creates a \$1 trillion kind of GDP growth that doesn't occur every five years.

So it's a pretty significant thing. And some of that is think about how we build cars. We have very advanced factories that build cars, and there's, like, national safety standards and things like that. We can't really do that with housing because there's a patchwork of different standards all across the country.

And this is something that probably Mike can speak to even better than I can. He's studied this very extensively. So there's issuing kind of best practices to enable e-economies of scale and to scale up those kind of new construction technologies. The second bucket is incentivizing the removal of mandates that are unrelated to, like, genuine safety and kind of wellness concerns.

And then, yeah, and then, again, the financing things. In terms of the Road to Housing Act, it is also a very holistic approach. It looks at every stage of development and how can we incentivize kind of more of it. So at the front end, there's provisions like listing where the public lands are and kind of available land.

There are kind of streamlining environmental reviews, particularly for infill. I mean, if there's already a building there, you know, why go through this exact same process of review as if there were nothing there, when in fact there actually is something there? There's the Build Now Act, which is very innovative.

This is something that directly I think for the first time, puts money behind performance, right? If you are an expensive community that doesn't build, why should you get the same dollars for community development block grants, which are in part meant to help communities grow, compared to places that are actively doing things to cooperate with growth, right?

It's sort of like the communities that take money with one hand, which is designed for a purpose, and then with their other hand, they impede that purpose. Like, that, that's very bad federal stewardship to, to not fix that. So what the community-- So what the Build Now Act does is it says, you know, for those communities that are kind of expensive but not building, we're gonna take away 10% of the funding.

And then for communities that build a lot, we're gonna allocate that pool to them in proportion to how they're increasing their supply. So it's really rewarding for performance. And there's also Housing Supply Frameworks Act, which is part of the

bill, which puts out best practices for states and localities, you know, among many other provisions, and, you know, we can certainly go into those details.

But it's a major approach. You know, the goal here, and this is something the president's been very clear about, the goal is not to tank house prices. That's not a good scenario, right? The goal is to I hate to use the, the, the pandemic language, but, like, flatten the curve, like where house prices stop growing at this excessive pace.

Because if you can flatten house prices, you're preserving people's existing equity, but you're allowing income growth to catch up so that everyone else can get in the game as well.

RYFFEL: Great. Thank you. So Emily, on the state and local level and you know, Mike or Aaron did a great job of talking about federal policies, but there's obviously a lot state and local governments can do, and it seems to me it also greatly impacts community stability and the tax base and all of that. Could you talk about some of what's going on and maybe some ideas that you might have additionally that haven't been acted on?

HAMILTON: Yeah. Thanks so much, Rich. In my work, I spend about half of my time working on policy education, especially with policymakers at the state level, and the other half I spend on research that I try to make as policy relevant as possible.

And from that research, I'll give just two quick examples of the immense difference that local policy choices can make in the ability of the housing stock to expand in response to demand increases and how that affects affordability. So the first one that I'll mention is the differences that we can see if we look across what are sometimes called the superstar cities.

So these are the most productive metros in the country. That's Seattle, the Bay Area, Los Angeles, Boston, New York, and DC. These are generally the metros that have struggled with housing affordability, not just since the pandemic, but for decades. But if we look across these metros, we can see that things really vary.

In DC and Seattle, policymakers have been much more open to transit-oriented development than the, than relative to those in the other superstar cities. We can see this in new neighborhoods in DC, like Navy Yard or NoMa, and this has really made a big difference in housing supply and rents. DC and Seattle have allowed about two to three times as much a- housing stock growth since 2000 relative to the other superstar metros, and this shows up in rents that are meaningfully lower in those two regions relative to their peers.

And more importantly, they have flattened the curve, to use Aaron's language relative to their peers again. If we zoom in on Arlington, Virginia, we can see a real connection between this approach to housing affordability and municipal finance. Arlington has really been a leader in this transit-oriented development approach, and their reason for adopting this, going all the way back to the 1960s and '70s, was local

policymakers looked at the contribution of multifamily housing to their tax base relative to single-family housing, and they found that multifamily housing was more than paying its own way in terms of property taxes generated relative to public services, while single-family housing requires a, a cross-subsidy from commercial and multifamily development.

So they leaned into that approach to shore up the county's finances, really improving housing supply and affordability along the way. The other example that I'll mention is the city of Houston. Houston famously is the only US city without use-based zoning. This means that you can build housing across the city, not just in zones that are dedicated to residential uses.

But they do have a lot of regulations that would show up in a typical zoning ordinance in other cities, like minimum lot size requirements, for example. But since 1998, Houston policymakers have reduced their minimum lot size requirement across the city from 5,000 square feet, which is already relatively small, down to 1,400 square feet, which is a townhouse size.

And they've seen, in response to this change, 80,000 small lot homes built across the city over about a 25-year period. Clearly, it's something that the market can deliver and that homebuyers are looking for. And if we look at median home prices in Houston relative to median incomes compared to other large Sun Belt metros, they come out the most affordable in, in no small part because of their openness to housing construction.

I'll leave it there. Thanks, Rich.

RYFFEL: Great. Well, I wanna turn to Tom now. So Tom, you're actually on the ground. You're building housing. You do a lot of work in the affordable LIHTC space, and you're interacting with well, federal policies kind of by default, but state and local policies very actively.

What are you seeing on the ground? What do you hope for will come from some of these changes? And how likely is this to be effective to actually address the affordability crisis in the short run?

HEINEMANN: So just to give a little background, yeah, my work I do a mix of for sale housing. We have a project in Hagerstown, Maryland. It was a single family single family development, sort of a green infill. So we took 62... roughly 60 s- some odd acres and subdivided it into 5,000 square foot lots for... And the idea was we were gonna use manufactured housing to keep costs down and build about 240 of those as sort of a green urban infill as it were.

Then we have in Petersburg, Virginia we bought 46 vacant lots from the city which we're converting into a LIHTC rental using manufactured homes as single family rental housing. And we had an additional 10 lots that we were doing as homeownership using manufactured homes. And then we have a project in Harrisonburg, Virginia which would be about 900 and some odd units 140 of which

would be manufactured homes and the balance would be townhomes and LIHTC apartments and so forth.

Really a mixed generational, mixed income community. And the reason why we used manufactured homes was cost, right? So the cost per square foot to develop was a lot less than site built. Both Fannie Mae and Freddie Mac have through their Duty to Serve programs, have collateral standards that allow them to be eligible for conventional financing.

So usually your garden variety third year, 30-year fixed rate mortgage. In the LIHTC space, we use the manufactured homes to really meet all the QAP standards. In Petersburg they have a 15-year affordable homeownership option at the end of the period. So what we found in Petersburg most particularly, that it was indeed a very much a catalyst to driving economic growth.

When we put our homes in, when we provide affordable rental, we saw the after effects as, as communities, as homes, vacant homes, dilapidated homes, and vacant lots started being renovated around us. That being said, I think the most important thing that that comes out of the federal activity and the state-level activity is that it pushes down a lot of these incentives for best practices us- leveraged with CDBG dollars, incredibly important zoning changes encouraging the use of pre-approved designs.

And I say that it's in a way to mitigate the political risk of going into a community, getting zoning approvals, getting planning approvals, and the like, because that is sort of your number one risk area, is getting caught up in sort of the bureau- local bureaucracy. I will tell you that in, for example, in Harrisonburg, Virginia, we expended a lot of capital getting zoning variances to build manufactured homes.

It was a very painful process through the planning through the councils, and obviously, when you comply with everything that the zoning folks want you to do, and you know this, right? You do everything that's in the book. You do your, civil engineering designs. You do all of those things. You comply with density regulations, you desi- comply with your proposed variants.

You go to the planning and usually these are just appointed people, probably good folks, maybe they got political connections, and you're just at the whim of whatever they think, right? And then after that, if you get through that, then you're in a public hearing with a board of supervisors or the city council, and again, they're not looking at all the work that you did.

They're like, "Well, okay, I... There's like couple of hundred people who are very angry, who complaining about transportation and traffic and schools and what have you, and walkability," and, you know, some people are, you know, some elected officials are swayed by that, right? So that's sort of like the NIMBY.

What I see coming down through that is a concerted effort to pressure localities to take the teeth out of that, that NIMBY power, right? By having the pre-approved

plans, by tying CDBG dollars, all those things are incredibly important. Just as important for, from my perspective, is the efforts from, I think Virginia did it, Maryland did it California did it, Oregon did it.

A number of states have looked at manufactured housing and said, "Thou shalt not sort of like discriminate by building code," right? So a manufactured home should be allowed into your residential zones by right. And I think those, in the long run, will have a positive impact. Now all the other things that are in the Road to Housing bill, it's gonna take time, right?

But the message is clear, and the message needs to sort of filter down through all the layers of government to hit the local side of things. But there's a lot of powerful tools in there to incentivize just that. So, i- it's all a good thing, and I will say one of the most powerful things that can be done, In the next Congress or the next time a tax bill comes up, is they have the Neighborhood Homes Investment Act.

And now what that one does, it's kinda LIHTC, but for home ownership. And it's real simple, that it creates a tax credit that will cover the, the cost of developing... Let's say you're in Syracuse or you're in Petersburg, or you're in a you know, in a, a opportunity zone or whatnot in, like, Kansas City, where your property values are lower than the cost to build new construction, and you get a credit making up for that difference.

I think that's gonna be a powerful tool that will drive investment into lower income communities. So that's where I think... Overall, I think these are all good things. It's gonna take time to play out. Hopefully, a lower interest rate environment will come around soon, and that's probably the most, that's probably the strongest driver.

RYFFEL: Ask the audience to be thinking about their question, and we'll open it up here in a second. But I have a couple of questions. So I was at a lecture the other day at the St. Louis Fed, and the discussion was about the, the sentiment of people about the economy versus the data, and the sentiment seems to be worse than the data suggests.

So I imagine there's some aspect of that's finding its way into this affordability with housing. So we talk about all the impediments to building the cost, et cetera, interest rates, Tom, as you just mentioned. If I'm a municipal official and I wanna try to have my community to have this superstar city reputation and people start looking there as a low-cost city to relocate in the short run, am I better off focusing on multifamily, single family, both?

Like, how do I get some quick wins so that the message gets out there like, "Hey, you wanna leave downtown Chicago and move to, you know, some other neighborhood"? And I imagine crime also figures into all of these strategies around housing as well. So that's a jump-all question for any and all of you that wish to make some brief comments on that.

HAMILTON: Sure, I'll jump on that one. I think that the answer is really both. It's very much necessary to expand the supply of rental housing. That's a huge market that is bearing the brunt of housing affordability challenges. But owner-occupied housing is very important as well, and I think there are two relatively politically easy approaches to each one.

On the multifamily front, I think allowing apartments to be built in commercial zones has proven to be something that many communities can get across the political finish line much more easily than changing zoning in existing single-family neighborhoods. And to that point, I also think opening up opportunities for small lot construction in new neighborhoods, so for larger subdivisions, not talking about replacing an existing single-family house with a few townhouses, so much as identifying large sites and allowing small lot construction there.

Those are two ways that maybe balance the need for more housing supply with the controversy of affecting existing built-out neighborhoods as much as I would like to see opportunities for new construction in both.

HEDLUND: Yeah, and I would just say, or to add to that, I mean, there's no one-size-fits-all answer.

And I think there's also kind of a life cycle effect, which is when people are younger, they're generally gonna be in a rental, and then eventually at some point, then they start a family and have kids, probably they're gonna wanna have more space. And the, the two markets are related, right? If there's very few rentals and therefore rent is high, it's hard to save up money for a down payment to then eventually get a home.

So you kind of have to tackle it from both angles. But I would say, you know, our focus in the White House has been to say, like, so much attention and so much controversy on this issue is because the focus has been s- almost exclusively or at least most loudly on zoning. And that's the thing that's gonna drive people to their local city council to oppose things the most.

"I don't want this high-rise next to my neighborhood," all that kind of stuff. What we've tried to point out is that there are so many other cost drivers that you can tackle that are outside of just pure, quote-unquote, zoning, and and therefore you can get a lot more supply without as much controversy over it.

You know, even again, when it comes to, like, the mandates y- in terms of construction methods and construction materials, I don't know many regular people who are gonna come storm into city council because, oh, they changed what kind of cement you have to use, right? Like, but that kind of stuff can affect construction costs.

Well, maybe some people, I don't know. Anyway.

ERIKSEN: No, I mean, I think that's great. So, I mean, I think we've always sort of had this, you know, idea of, as far as height limitations, you know, and the density and I think what Aaron touched on, which I really agree, is it really comes down to cost.

So there's always gonna be kind of, you know, coastal constrained, you know, as far as hills and waters. But what's remarkable, I think, in the last really seven years, is it's really not the spots that's constrained, it's becoming less affordable, right? So what do those areas have? And, we're inside of, you know, as far as like the Indiana area, we have an affordable housing crisis. You know, I think to the point there was you know, like the two big issues for the election this year are inflation and housing affordability. And if you live in DC, you're like, well, Indiana's very affordable, but we don't have those infrastructure, right?

So, so some of these things that drive up costs, so like as you know, which as far as like sprinklers. And we like like, you know, as far as like sprinklers, but do we need like the, you know, like the latest, like the generation? And I think those are the things, they're at the state level, but kind of enforced at the local level that I think really add up to cost and really make a developer kinda go somewhere else.

So kinda thinking about that. And then ultimately just investing and at least kind of meeting like developers halfway in those fixed costs. I think, you know, as far as parking restrictions, but then the sewer hookups I think can go far? Thank you.

HEINEMANN: Yeah. I, I would echo, like if you're in a municipality, is really to dig down and see what fees you're charging, what your regulatory environment looks like, what your permitting timelines are, if you're doing it in 10 days or six months.

In Petersburg, we had permit approvals take six months, and for homes that should be in a pre-approved plan book, right? So like six months. And we were looking at water and sewer tap fees of like \$18,000 per lot on a home that we would want to sell for, you know, 230 or 240,000. That's a lot, right?

So, getting municipalities to really look at what they're charging like, and say, "Hey, maybe the problem is inside the house," as it were. So I think that's a real important thing. And yeah, you know, when we went into the manufactured housing piece, I remember you know, it was probably like 2:00 in the morning in one of the you know, council hearings where some guy got up and said, "You know, it's by building code, and the HUD building code is not as robust as the IRC."

And literally, we, it got into a discussion on HUD code versus IRC, and yeah, people argue about this stuff. But, you know, you have environments that depends on municipality, and it'll change because of the legislation that will argue about building code. I think the restrictions of manufactured homes or alternative construction in a residential district really boils down to the esoterics of what building code you used.

And the bill does an important thing, right? It literally upends the definition of manufactured homes by removing the chassis, which over time will sort of blur the

distinctions of what used to be modular construction versus manufactured homes. And that's, over in the long term, that's a really good thing because you'll move to a more uniform application of building codes, reduce compliance costs, reduce uncertainty, and then hopefully get to a spot where your compliance costs go down.

You know, I'll say that a lot of the localities, their building inspectors don't like it. A lot of counties will not like it, but if you're going to reduce local complexities it's a step in the right direction.

HEDLUND: I'll just add, my... That is one of probably the number one favorite thing for me personally in the Road to Housing Act, is the removal of the permanent chassis.

Because it does open the door to having all construct- construction technologies compete each, compete against each other on a level playing field without kind of a stigma attached to it. Because, you know, many places may not want to have a you know, have trailers, essentially. But now you'll be able to, in principle, build a house using advanced technologies that look like, that looks like any other house.

So there's no reason from an appearance perspective to, to be against it. One other anecdote on, in terms of fees is there's, let's say, an unnamed northern Virginia county who was negotiating with a builder who's gonna build a bunch of townhomes, and it took it two years to negotiate, which is already insane.

And then at the end, when they were, like, right at the finish line of agreeing, the county went to the developer and said, "Well, we'll sign the paperwork if you also build this fire station." And the fire station they wanted to build was on the other side of the county, like 20 miles away, so there's no way it was gonna service that development.

And it would've cost \$18 million. Like, that's an example of an insane fee that has nothing to do with the cost the development's actually imposing on the community. It's just a way to tax. And then ultimately, the, the deal fell through. So, so you didn't have supply because of that.

RYFFEL: Well, why don't we open it up to the audience? We've got some roaming mics. First hand up there. Can we get a microphone up to this young lady?

AUDIENCE QUESTION: Thank you.

RYFFEL: Could you tell us who you are?

AUDIENCE QUESTION: Sure. I'm Mariana Trujillo with the Reason Foundation. I have the impression, and it could be survivor bias, but that new housing that is being put in the market is of significantly lower quality than what was being put in the market a long time ago.

And this could be a simple, you know, factor of the fact that you know, housing costs have gone up and consumers would rather have a lower quality home than no home at all. But I wonder, one, if that's the case, if the quality of new builds has gone down over time, and two, if we have taken that into account when looking at changes in affordability or just homeowner price, if consumers are now getting less bang for their buck.

And I think there's value in having homes of all qualities in the market for different consumers, but I do wonder if the median house is of lower quality and if that's accounted in analysis of prices.

ERIKSEN: I mean, we're at an interesting point. So the building codes right now are at an all time, really since 2000, which is the first year are quite strict, both from residential and kind of there. So from a quality perspective of, like, safety, right, you can make an argument that says we're the highest and, you know, the best ever. I think what's interesting is the building codes, we've really regulated, like, fire, which is more the fire safety or, you know, wind resistant.

And I think what's been interesting there is developers are, have had to go on other margins to try to cut that, right? So the, you know, like, the, like the cost per square foot's actually quite higher, and it's more expensive, but then I think the big question is that what you want, right? Do you need two parking spaces?

Maybe you give that up. I think the building code doesn't let them do that. It says, "You must give this amount of X." And then the stuff you care about, you can't really pay for. So, like at least to that point I think that's... It's kind of this weird trade-off, I think, right now.

RYFFEL: What do you think on that topic, Tom? You're actually building this stuff. You're paying subs and buying materials.

HEINEMANN: You know, that's I, I'm not gonna sort of go on the quality, but right, the cost savings have to come from somewhere when you're building new homes, right? Because I think when, in a market like this especially now, I would say that when you're building affordable homes you generally have a weaker market.

I think higher priced homes sell a little more easily than homes geared towards moderate income, you know, between 80 and 120 AMI. And you have to achieve economies of scale. You have to be able to, like, earn a little bit of profit and pay back your higher interest rate construction loans. You know what we did in manufactured homes is what we built to you know, the Energy Star standards.

We built to the collateral standards of Freddie Mac and Fannie Mae. We build a single family home, and generally because of that, because of the building code we save probably ten to fifteen percent just on, on the vertical. All else is equal, right? So if we're gonna drive savings, we have to sort of manage that.

I think the building code that we worked with really helps. But again, you know, you're in an environment where you're faced with ever-rising costs, like cost of concrete, cost of supplies, cost of steel, cost of lumber. Everything rises against a market as, as I think the previous slide shows, where income's not rising as fast as home prices.

So you gotta do the best you can.

HEDLUND: One other thing I would say is nine in ten, almost nine in ten, eighty-eight percent of homeowners live in homes built before the year twenty ten. And in much of the country, those homes are, would be illegal to build now. So the question is, do ninety percent of homeowners wake up every morning fearful for their life because their house is gonna kill them?

Now, there's a you know, there's a share of homes that genuinely are dangerous, but I would venture to bet it doesn't even get remotely close to ninety percent. So there is a, I think, very important need to reexamine what building codes are doing, which is they've massively inflated costs, right?

What we should be thinking about from an economic efficiency of production standpoint is pick a given quality, and then what's the cost minimizing mix of inputs to produce that quality? The building codes right now massively distort that and inflate costs and are instead banning people from buying homes at all for reasons that have nothing, again, nothing to do with safety in many cases.

RYFFEL: I just have this is an observation anecdotal N of one to your point about diminished quality. You know, when I grew up in the 60s and 70s, you know, there were six of us in a twelve hundred square foot house. We didn't have a dishwasher or washer dryer. We didn't have a yard with a crazy jungle gym or anything like that.

We went down to the street to the park. And now, like a minimally acceptable house is multiple thousands of feet with, you know, granite and a, a wine cooler and a this and a that and the other thing, you know. So I think similar with cars, I just think the expectation that homeowners have, whether new first time homeowners or not, is just so much higher.

So, maybe that's gotta come from somewhere as well. David Wessel has a question

WESSEL: David Wessel from Brookings. I grew up in a house with one bathroom, four kids, no air conditioning, no dishwasher.

RYFFEL: I forgot about the air conditioning. Yeah, no air conditioning.

WESSEL: So, I know that Aaron has made a number of remarks about unnecessary green things in the building codes and stuff. But we've been doing some work on how do we deal with the rising cost of homeowners insurance and shrinking availability due to the increase in incidents and severity of extreme weather. And I've

been wrestling with the question about how do we think about making homes more resilient, which often requires an increased upfront cost that will be paid for over 20 or 30 years 'cause the roof won't blow off in Louisiana or something.

How do we weigh that, the obvious need to make homes more resilient against extreme weather in a number of parts of the country in order to reduce insurance costs and reduce damage, while also keeping in mind the affordability thing? How do we think about that trade-off?

HEDLUND: I'd say, first of all, I mean, you know, if homeowner insurance is actuarially fair, then there's a natural economic incentive to make those sort of investments, you know, again, because you'd have reduced risk and therefore reduced premiums.

Sure. No, I understand. I'm just saying like that's one thing is making sure that homeowner insurance is actuarially fair, that would therefore reward someone for making those kind of investments properly. If it's not actuarially fair, then it may not incentivize them in the same way. And then beyond that you know, it's an, it's a classic issue of, yeah, there's credit constraints up front.

Now, I I would say when it comes to down payment constraints and things like that, I would argue they're ve- they're real, like down payments and upfront costs are real. But most of the time, the reason that people are denied loans isn't because of the down payment, because people can make very small loans, or sorry, very small down payments, you know, single, small single-digit percentage.

It's oftentimes that monthly payment to income ratio that's really the bigger issue. So, you know, I think if we can do other things to make costs go down, then that also leaves room in the budget to make those sort of investments. But I think the key thing is having it be consumer choice driven rather than something that's regulatorily imposed on them.

ERIKSEN: And I think, you know, you know, sort of the evidence, and I think the... When we take a step back, and I think, you know, what you said is very reasonable. There is no cost-benefit test currently, right? We think about building codes you know, like our own, so, so how they're passed, if you don't know, they do a voice vote, and if nobody says no, they pass it.

So what I argue is we should have this, like, you know, what's the trade-off of energy? What's the trade-off of this? And there's some spots that do have the flooding risk, and the code should reflect that. But I think there's all other spots that adopt the latest and the, you know, without having that kinda cost and, like, the benefit, like, scenario.

And I think that's sort of important. There is research, National Institution of Building Science, which really showed there was a return. What's important though is that's a treatment on treated effect. They didn't show the whole national stock and said,

"Hey, look, if you're hit by a hurricane," right, what's the odds of being hit by a hurricane?

They showed if you're hit by a hurricane, you're glad you did those sort of code improvements. They didn't control for the other 99% of housing that's not hit by a hurricane, and I think that's a conversation we have to have. And again, I just don't think we're having it currently, at least at a national which I've kind of applaud, you know, this administration of starting that conversation.

RYFFEL: Sorry, back there

AUDIENCE QUESTION: Mike Evsik at Bancroft Capital. One of the fascinating things, Mike, was your map that showed, you know, we think of housing issues in large urban cities. And Emily, you kind of articulated that, but the map showed a bunch of different places. I live in suburban Philadelphia and right now all that's being built are townhomes and million-plus homes, right?

The, the, the bifurcated ends of the spectrum. And so, Emily, when you look at what Mike's map shows, how would you-- what are some of the difficulties you see in working with, say, a downtown DC compared to a suburban Philadelphia compared to a Boise, Idaho, all of which are suffering through a housing crisis?

HAMILTON: Great question. Thank you. I think I, I mentioned this, but I think the importance of minimum lot size requirements cannot be overstated because that's the starting point that drives the math of what ultimately gets built. And I'm guessing in your part of suburban Philadelphia, there's a big difference in the minimum lot size that's allowed where townhouses are allowed versus where single-family houses are allowed, probably 10X, I'm guessing.

And that means that it's not just the land price that drives what ultimately gets built. Developers usually use a rule of thumb that the final sale price of a house should be 3X the land value because there's no market for a relatively small, relatively basic starter house on a really expensive piece of land.

So once you have that minimum lot size in place, it's going to lead to a, a larger house, fancier house with every bell and whistle and that's what leads to the bifurcated markets that we see in many parts of the US today.

RYFFEL: Other questions? Yes, sir. Back here

AUDIENCE QUESTION: Hi Rahul Chauhan from University of Chicago. There was some mention about housing wealth ownership across demographics, and there's some evidence where the current older generations are holding onto current housing stock longer. So do you think this reduced turnover has any impact on, like, housing affordability for the younger generations?

Thank you.

ERIKSEN: Yeah, I mean, one of the things which I think is really interesting right now, and we think about it, is property taxes, right? So I think everyone in this room somewhat, you know, it's what kind of pays our bonds, I guess. And, you know, what's really remarkable and I actually think is a good thing, is property taxes should go up.

And, you know, that's one of the many reasons what's the carrying costs of why my own, like, the dad is not in the you know, as far as the four-bedroom house, was the property taxes, you know, like in Seattle were just too high. And with that said, you know, something which I think is great is, and which I'm really scared of for the Floridas and the Texas and a lot of other states, is we're, we're basically gonna cap the property taxes, which is no longer incentive for that to transfer, right?

So at least that was kind of one of my first thoughts of thinking about this transfer. You know, there's... Which is sort of like the capital gains exclusion, I don't know, like, if Aaron can talk about. But, you know, there's this kinda tsunami kinda thinking about kinda what's gonna happen to these houses.

I think the reality is a lot of the homeowners we don't see at the 20 or, like, the, the 30s right now, they're waiting for their parents to pass on. And, you know, I think that's gonna be a big difference of what happens, I think, in the next ten years. It's about, what? Thirty-one trillion dollars, I think, or something, of the housing wealth will pass now, so.

HEDLUND: Yeah, I am somewhat aware of some of that evidence, and in fact, I think there was a Wall Street Journal article that highlighted it as well I think maybe even this week. And, you know, one of the things that we studied, you can imagine there's many policies we've studied that have not been put out there.

So let's just assume we studied all of them. And, you know, one of those that people talk about is the capital gains kinda cap. My understanding of the latest evidence is that older people, when they do downsize, they don't even really downsize that much, and they're downsizing later.

And if you were to lift that cap, the average home value that would, you know, would be sold and benefit from that is, like, a million dollars. You know, so the, so if the issue is people getting into the home ownership market from renting, like, if some people are incentivized to sell the \$1 million home, like, is that really gonna filter down such that a renter can get into a \$350,000 home?

I mean, maybe, but that's very speculative at best. And frankly, then the question is what happens to the person who just sold the million-dollar home? If they then go buy another home, then it's just a big musical chairs exercise. So that's why, I, you know, a lot of our focus has been on, like, actually expanding the net supply and not just kind of creating more churn.

Not to say that, you know, in, in general, does it make sense to have investments taxed based on nominal gains? Like, no, there's reasons why that doesn't make any

sense. But from a housing affordability standpoint, I think that's why you see the priorities that have been pursued. We have time for one more question.

RYFFEL: Way in the back there. Is that Casey? Yes.

DOUGAL: Yeah. So I was just looking at some quick statistics, and so I was looking at the net margins, or average net margins of, like, the top five builders over the last ten years. And they've risen net profit margins, so they've risen quite a bit to the point that, you know, the 2022 margin was, like, almost double what the 2016 margin is, and we're still about 40% higher than kind of what it was ten years ago.

So costs have risen a lot, but so have, so has profitability. Can you say anything about that?

ERIKSEN: I mean, my point is as far as, like, regulation, there's a fixed cost. I think there's one person that really, like, the benefits, or one group, it's a local contractor or, like, the... You know, they know how to get something built in Arlington, right?

And you don't... And there's a few, you know, D.R. Horton, which spend a lot of time, and they like these barriers to construction because they have the infrastructure to specialize in all these places. And I think what you... W-what I think the cost is the manufactured of, like, interstate trade of modular housing.

Like, I think that's what was really trying to be solved. That's gonna cut into those, b-you know, like, the margins, but right now it's the city council member, you know, you know, do you support their campaign and do they patch your, you know, like, your lot, you know, as far as amendments. And I think that's a lot of the build, and I think there's a few groups that are really good at figuring that out and, like, lobbying for that, which is the middle and the smaller people just can't

RYFFEL: I'm gonna make another editorial comment.

I do worry whenever I see very broad legislation that there are gonna be unintended consequences. And I know certainly, Mike, you would a- agree with this. In the Greater Lafayette area, you see a lot of cranes, and you hear a lot of builders complaining about labor shortages and supply chain and cost.

And I, as we're trying to you know, churn up demand here, I worry that we might be also making the problem that much worse in some other areas. So, I wanna thank my panelists. I wanna thank the audience for the great questions. We can give everyone a round of applause here.

And David Wessel is gonna make some housekeeping comments.

WESSEL: Just wanna explain where the breakout sessions are. They're not there. All right, so Rich is gonna moderate the way to help get some brainstorming from the MSRB research staff, and that's gonna be in the Somers Room, which is literally just

across the hall here that way. Dan's gonna do the inflation thing on the impact of inflation on muni market and state and local budgets, and that's gonna be in the room over here.

The people who are gonna have to take a hike are the ones with Louise because we're doing some renovation here. That's to talk about issues involving state and local budgets, affordability, OBBA, et cetera.

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HE: Good afternoon. Thank you so much for the invitation. My name is Yu. I will join James Madison University in the following months. So today, I will present my paper, Stress Tested: Municipal Bond ETFs During Market Turmoil.

So it's a very liquid vehicle built on a illiquid assets. So ETF provide intraday liquidity transparent pricing and the asset actually grow a lot in, since its first inception in the market, so 2008. Research shows that from 2008 to 2016, it grow a annual rate of 35 percent. And I looked at data from 2019 to 2023, they grow more than a 150 percent. And I compare that to municipal bond mutual fund market size, they actually decline a little bit from 2019 to 2023.

So I, in this paper, we look at how municipal bond ETF function during the market turmoil period. So as we all know, those online bonds they are over-the-counter markets. They are still in gaps and weak in the mediations. So I'm curious how they perform during the market stressful time period. Here, I look at the COVID turmoil.

So in the panel A here, you can see the return volatility happened to municipal bond ETF. The volatility highs during that time period, and also in panel B, you can see the price deviation. The ETF price traded way below compared to the net asset value. And for some ETF funds, the price is five to ten percent lower compared to the net asset value.

So my, my question here, would muni ETF liquidity is still credible under the stressful time period? So specifically, I look into why did muni ETF trade at larger persistent price discounts. And when we observe such large and persistent price discounts, did APR arbitrage during the process? So did those authorized participants arbitrage during the process to close the price gap between the ETF price and net asset value?

And the second question I try to understand is, did those selling pressure from the ETF layer reach the underlying bonds? Whether those fire sale spill over into the underlying bonds market. So here are the preview of results. I found that arbitrage was limited when it was needed most. And also, ETF held tra-- held trading did rise during that time period, but mainly in small trades, not institutional-sized block trades.

And the broker-dealer, they pull back from supporting those trades. And another thing is that much of selling pressure, they remain in the ETF layer instead of transmit into the underlying bonds market. And finally, I examine the Fed intervention Fed support during that time. The municipal liquidity facility turns out a meaningful tool to restore the mar-market confidence.

So here, what this paper-- where does this paper sit in the literature? We know that from equity ETF and corporate bond ETF from the flash crash event in 2010 and the taper tantrum event in 2017, those ETFs they transmit some selling pressure into the underlying bonds underlying assets market, no matter it's in equity or corporate bond.

And they also have something to do with price efficiency. And in the muni ETF sector two MSiB study, 2018, 2020, documented growth, and they also documented the price dislocation during the COVID time period. And model 2020 used a, used data from 2010 to 2020 and find that ETF-held bond actually traded more often compared to the Muni mutual fund. So those bonds held by mutual fund.

So in this paper, I look at those bond level evidence on ETF behavior during the COVID. I trace the bond trading, their behavior and trading cost and finally, how do we recover from those intervention. So before we look at data, let's take a minute to look at how ETF arbitrage is supposed to work.

So it's quite different from how mutual fund work. When mutual fund face a investor redemptions, they must sell the underlying asset to meet the redemption needs. They must sell underlying bonds to meet redemption needs. But here in, in ETF world, ETF fund sponsors, they do not really sell their underlying bonds directly.

They rely on the author participants or require to the creation redemption process. So what happened during the process is that re- when the ETF price is lower compared to the net asset value, those AP, they buy ETF shares, and then they do in-kind transaction with the ETF sponsor. They give the ETF share to those ETF funds, and i-in turn, ETF funds give those redemption basket, which is typically a portion of bonds they're holding in their portfolio to to those author participants.

And those author participants are basically large broker in the market, and their motivation to do those transaction is that they can earn the profit between the purchase price of the ETF share and the selling price of the underlying bonds. So th-th-there's the motivation. And actually, there are several barriers that m-might not work well in the, in, in the muni market.

So first redemption basket contains hun-hundreds of CUSIPs. It might take time to value those bonds and offload those bonds, especially though in those stressful time period. And more importantly, those APs, they are not obligated to do, to participate in the creation of that redemption process.

Although they have a agreement with the ETF funds they only do so when they feel comfortable, when they feel the inventory cost is make sense to them, when the

trading cost make sense to them they do those transactions. They are not obligated to do the-- all those transactions.

And muni ETF might be the easier asset for the investor to run for cash during the crisis time period So I have the data from Chris for the fund holdings, and I have the trading data for mutual bond. I have the bond characteristic data. And I look at time period around the COVID turmoil, but specifically it's a two-week window during the COVID turmoil.

I compare that to the two week before the COVID turmoil. And I categorize all my bond into one of the four categories here. It, whether they are held by ETF fund, whether they're only held by mutual fund, or they're held by both ETF and mutual fund, or they are not held by any fund at all. So in that way, I can see how bonds held by ETF could be de- differentiated from other bond holding status.

So here's a quick look at the what are those muni ETFs look like in my sample. They're relatively young. Their fund age on average is five years old, and the expense ratio is around 26 basis points. So in general, that, that's a little bit high compared to the ETF expense ratio overall, but it's way lower compared to the expense ratio we have in muni mutual fund.

And the turnover ratio is 34 percent. That's relatively low compared to the muni mutual fund, so that shows efficiency of the ETFs, efficiency of the ETF. And regarding their holdings, ETF tend to hold plainer or more standardized and a shorter maturity bond compared to the holdings of the mutual funds So my empirical design mainly a difference in design and the variable of interest is the interaction term between the bond ownership status and the crisis binary variable.

And the first dependent variable I look at to the trading volume. So here the first piece of result. So in, in this table, the dependent variable is the trading volume. And I find that those bonds only held by ETFs, their trading volume did rise during the COVID time period.

And also, in the meantime, we also see those trading volume for bonds only held by Mu-- bond, bonds only held by mutual fund, they also increase the trading volume. But the increase in the trading volume is way higher compared to the trading volume increase compared to for the bonds only held by ETF.

So ETF-held bonds, their volume rise about-- ro-rose about seven percent, and mutual fund-held bonds, their trading volume increased about thir-thi-thirty-three percent. So that somehow shows that when we face the in-investor redemption, the selling pressure transmit into the underlying bonds market for municipal bond mu-mutual fund.

So the next natural question to ask is whether the ETF-held trading volume increase really tell the story that the se-selling pressure transmit into underlying bonds market, or do we see the arbitrage activities being involved in the process to close the price gap between the ETF price and the net asset value?

So next, I separate my sample into large trade size s-and small trade size. Those large trade size are more likely to reflect the institutional side trades or AP, including the AP arbitrage, and small trade size would be more fra-fragmented small trades or retail-driven activities. So after separating the sample into large trades and small trades, I find that those ETF-held bonds, the, the trade size did not increase d-dramatically during the COVID turmoil.

While we do see those trade size are mainly rise from small trades for ETF-held bond. But on, on the other hand, when we look at the mutual fund-related trades, we find those large trade size volume did in-increase during that time period. That's mainly due to the investor redemption during that time period and the mutual fund managers, they are forced to sell the underlying bonds to meet redemption needs.

So here we see the arbitrage activity did not operate at scale. And next, I look into whether the trading volume really was driven from the fund selling pressure. So, so I have the bond level measure of fund pressure that basically, if a fund-- if the fund holding the bond is-- have a lot of outflows, the bond will have higher fund pressure.

So if the in-investor selling pressure, they transmit into the underlying bonds market, we can use the fund pressure variable to measure the trading volume. So the answer is that the ETF selling pressure did not transmit into the underlying bonds market. But from the columns three and four, we can see that result.

And, but for mutual fund-held bonds, the selling pressure from the fund layer did transmit into the underlying bonds market. So that tells the story. The ETF serves as insulation between the ETF selling pressure and the underlying bonds market. They in-insulate un-underlying bonds market from the huge selling pressure, but it comes with a cost of the large price deviation between the ETF price and the net asset value.

So what else could be some reasons that pull, or what could be some reasons that we see the results here? One factor could be the broker-dealer behavior. So I found that dealer pull back from supporting those ETF-held bonds. A study by Bagley et al. 2021, I believe they find that from 2018 to 2020, the broker-dealer's inventory for municipal bond actually decreased for over sixty percent during that time period.

So with the limited balance sheet capacity, and during the stressful time period, those broker-dealers, they navigated the balance sheet capacity to those mutual funds. They support more trades related to mutual funds. So here the result here tells us. So they raised the net purchase for mutual fund-held bonds.

They absorbed forced redemption, and they shied away from those trading related to ETF-held bonds. So dealer pull back from ETF-held bonds. Another factor, the trading costs. So broker-dealer only do so when they feel compelled. They are not obligated to do those transactions. So when the trading costs are higher for ETF-held bonds they choose not to support those, those trading.

So here I find the ETF-held bonds, their trading costs wide about thirteen to fifteen basis points. That's around a hundred fifty dollar per a hundred k round trip. While mutual fund-held bonds, their trading costs de-decreased during that time period, about the same size. That's fourteen basis points. So in that way, that's also another reason that broker-dealer, those author participants feel hard to offload those bonds.

If they feel hard to offload those bonds or they face limited profit margins, they choose not to support those ETF creation redemption process to close the price gap. And finally I look at the recovery after the COVID turmoil. So there are mainly two Fed policy that related to the municipal bond market.

The first one happened on March 23rd. That's the money market liquidity facility. They... at the end phase of that they... The Fed, yeah, expand the policy to include certain short-term bond. And another more direct one related to muni market is the municipal liquidity facility, which provide a certain funding for -- provide funding for certain short-term municipal bond. So I find that only after the April 9th, the municipal liquidity facility, which is a more direct way to support the market, that r-only after that the market restore the confidence and the trading cost de- decrease and the price deviation the, the price gap between the ETF price and net asset value decreased after the April 9th municipal liquidity facility.

So overall, I find that muni ETF experienced a large and persistent price deviation, and that's not for days, that last for weeks. And the arbitrage did not operate at scale. Did a pullback trading cost increase? And the selling pressure mainly contained the, i- in the ETF layer instead of transmit into the underlying bond market, which is different from the finding in corporate bond market for the taper tantrum event.

And, And also the, when we look at the illiquid market like muni bond, I want to see whether it's not only, it's not only whether liquidity, whether we have liquidity in the market, but more importantly, maybe we should look at where do we have those liquidities. So that's all I have for this paper. Thank you so much for your attention, and I look forward to the discussion. Thank you.

WU: Hi, thank you. First I want to thank Brookings for inviting me to be the discussant this-- for this you know, very nice paper. And second, I want to thank you for doing this paper. As, as you mentioned, like, during the COVID 2020, March 2020 we wrote a short piece, you know, it, it talked exactly about how ETF misalignment pricing with the tracking index or the, you know, net asset pricing.

And I always want to do another deep dive paper looking to, you know, maybe bond level, you know, ETF holding data but never had a chance to do it. I'm really glad you pick up the torch and really did it. So, Just skip to the main findings quickly. The main findings from the paper is, as I summarize here you know, first, the price deviated significantly from the net asset value.

Basically, you know, we're talking about the index the ETF meant to track. But during the period March 2020, it deviates significantly. Authorized participants, you know,

you had a very nice chart, you know, in the-- in his presentation showing who these people are which I'll talk a little bit more in a few minutes.

But they were meant to arbitrage the difference and to quickly bridge the gap between the two two products, ETF pricing and the net asset value, but they were not able to. And you find like couple reason. One, liquidity for ETF held bonds likely thin out, e-even relative to mutual fund held bonds.

And two, trading costs during the March 2020 zoomed up and, you know, become very costly for arbitrage to do anything. And author or, author or participants, probably because those two very difficult sell or buy bonds and, you know, high cost, so they never quite did anything with it. Then you also find, you know, more trading for ETF bonds, but they are, you know, predominantly by small-sized trades.

And Fed's MLF program had a positive impact on the recovery of liquidity sometime, you know, after March, in April 2020. So here are my comments. Again, you know, very good paper, and I think it's a great topic. You know, I think ETF as a new product, especially for fixed income ETF. You know, for muting ETF, it start 2007, you know, almost twenty years.

But I think by now the market becoming more mature. And, you know, we like to see more study in this area, you know, how things work and how they perform relative, you know, to mutual funds. And also even more interesting is, you know, when we have a period like March 2020, what I call a stress period, you know, it doesn't happen very often, right?

I mean, happen once every few years once every four or five years when extraordinary events happen. And, you know, economists always like to study those you know, event study for those great events. So I think that's a good topic to pick up on. A few, you know, first, a few notes I wanna talk about.

You know, the-- not all ETF had AP, authorized participants. You know, you ask who are these people? Well, they are really what I call like primary market maker for ETFs. You familiar with the secondary market makers, right? They, you know, they buy and sell bonds off a bid and ask. But AP is more like primary market maker for ETF.

They interact between the market and the ETF issuers, you know, by a process called creation redemption. And again, you had a very nice graphic chart in the-- his slides. They only take action when there's a price misalignment between the two, between ETF and underlying assets. The job is to arbitrage and to make profit and also to bridge the price gap.

But not all ETF have-- has an active AP, and AP is not required to do anything, right? I mean, even though I sign up as AP, that doesn't mean you have to take action. You know, it all depends on, you know, pro-profitability of doing this. The second thing I wanna point out, you know, even though it may or may not be the reason that

caused March 2020's price gap is unlike corporate bonds or equity, you know, it's very difficult to short sell a muni bonds.

And being a market maker, you know, you buy and sell, you don't have to worry about if you know, make a market in Microsoft. You short it, then you kinda cover shorts easily. But muni, because of tax exemption for almost, you know, most of muni bonds, you know, IRS does not allow, you know, leverage, you know, sh-- you know, tax advantage, you know, for short position.

So therefore, shorting a muni is almost very difficult or very costly. Then the other thing, you know, a couple of thing you mentioned, I think, you know, you know, uncertainty about execution price is also probably a factor, which I kinda go over a little bit more in the next slide. In addition to wider bid-ask spreads, that might have caused them to sorta hesitate to jump in during March 2020.

And again, the minor points, small trades, you know, they-- yeah, I think you kinda agree with me on that. So they're not necessarily buy APs. We saw a lot of retail action during the March 2020, perhaps because the first month people working from home, a lot of people sorta took advantage, you know. I'm sitting in front of computer, what else to do?

I'm gonna start trading stocks. I could trade ETF too. You know, anything you think you can play with it. Now the main comment about this paper the paper, you know, walked through, you know, a lot of things, right? All the findings I just mentioned. One thing I was wondering that would be nice to talk about is, you know, we saw price you know, dislocation between ETF and underlying assets.

But, you know, what really, who caused the dislocation? Is it because, you know, ETF is just causing a lot of volatility? If you're talking to a traditional bond dealer, they almost always say, "Yeah, ETF, look at those new products, really they cause a lot of, you know, market volatility." But then the other side, if you talk about, you know, a lot of ETF, you know, experts or market makers or APs, they think, well, ETFs are great products.

You trade real time, lots of liquidity. You know, why dislocation? Because during the crisis, you know, those bonds are not traded, right? A lot of muni bonds on any given day, half of them probably don't trade in the index. So therefore, they only capture stale prices. And when you calculate NAV, the NAV may not reflect the fast-moving market, so therefore, there's price dis-dislocation.

So y- you know, it's not an easy, you know, not e-- not an easy question to answer. But I think it would be nice to, you know, paper to discuss that, you know, aspect a little bit. In my opinion, I mean, since I look a little bit, which I show the next graph. And in this case, I think many ETF may have overshot the decline during COVID-19 during March 2020.

And if that was the case, you know, if you're arbitrageur, whether you're AP or non-AP, you really need to buy ETF in the second market to close the gap. Let me just

flip to the chart so you probably see what I'm talking about. So I just picked the two most active traded ETF, muni bond ETF, MUB, which is a ETF by BlackRock, VTEB, that's a ETF by Vanguard. Those are, those two ETF, until recently, they are 60 percent of total muni bond ETF volume. That just shows how dominant the top two are. And back in March 2020, both of them are tracking the same index, S&P five hundred... no, sorry, S&P muni tax-exempt index. Okay? The black line is the index, the orange line is the MUB, and the, the blue line is VTEB.

You can see that starting from March 10th, 2020, you know, they start misalign. And they all drop, but to the you know, to the ETF drop much more than the index itself. Okay, then you say, "Well, there's a difference of six percent, but who's really the problem?" Well, in this case, they all probably all overshoot a little bit, but I can tell right away that ETF overshoot more than the index itself.

Why is that? Because by the late March when the Fed announced some policy rescuing plan right around March 20th, they, you know, equity market start bouncing back, and obviously bond market, ETF all bounce back. But by late March, you can tell, if I draw a red line here, you know, they kinda got caught up. You know, if you think the red line is the new settled down price or new equilibrium price, then you say, "Wow, you know, what happened to the previous two weeks? They all kinda dropped too much." And just by this graphic illustration, I lean towards the argument that at least during March 2020 ETF overshoot the declines. And, you know, if that was the case, sure, you can buy underlying bonds, but you really arbitrage, you really need to buy the ETF, you know, secondary market to bridge the gap quickly, right?

A few other thing to say, you know, the... and I think during the lunchtime, some of this at the lunch, we talked about MLF, but we also think Federal Reserve had a lot of policy angle. Not for use paper, but if you interested in doing more paper, we're welcome to look into the, you know, second market support for corporate bonds, you know, investment grade and the, and not supporting the high-yield bonds. We did a study a few years ago that looking through the trading costs. In fact, there's some impact from the Federal Reserve policy when you compare corporate bond support versus immunity bonds versus, you know, high-yield corporate bonds.

My next suggestion is, okay, I'm not trying to, you know, obviously, I'm a big fan of ETF, even though I have to admit, during COVID time, ETF did sort of overshoot a decline. But what happened to April 2025, a year ago when the tariff news were announced? That was another volatile month, a period. And we did a sh- again, a quick study last year.

You know, this one I don't see nearly as sort of-- First, I don't see nearly as a price dislocation, but during the few days in April seventh through April 11th, that week, when you remember AP, one day the tariff news was reversed around 2:00 PM. And, you know, I have to say that blue line for VT, the Vanguard ETF, they perform much less volatile than the index itself. So I would say for April 2025, I draw a slightly different conclusion that in the sense that ETF actually did pretty well. You know, maybe because liquidity was never a problem. You know, AP doesn't have to step in too much, and the second market doing very well. And if you look at the MUB, it's

similar story. The inside the circle, that one week the orange line seem a lot vol- less volatile than the in-index itself, which they're meant to track.

So that was it, and you know, thank you again for my discussion to hearing my discussion.

CORNAGGIA: Thank you very much, Simon, for that excellent discussion. Before we open the floor to questions from the audience, Yue, would you like to take a moment and respond?

HE: Yeah. Thank you for the great discussion and actually one, one of the, you know, comments is the how do we define the net asset value. It's really a comment I get a lot when I present this paper. It's, I am very glad you agree. It's a hard question to answer. Like, I really hope I can have more data on that. But from what I understand is that the ETF, they publish their net asset value every day. They publish their holdings, their, every bond.

Most ETF, they publish their, all their holdings and with their price on their website, and they value the bond either through a valuation model or if they s-see some trades, observe some trades in the market, they use the transaction price or into the other price to value that. So my feeling is that for the net asset value, though we have the valuation model, but for the ETF price, they are also-- Like, we have the price based on the market reactions.

They have their own logic in those number we see. For the E-ETF net asset value, we have the logic behind that. And for the ETF price, we do see the market efficiency. That's how investor react, react to those market events. So I don't have a solid answer here to what-- but we do see the price deviation, and I hope I can have more data to look into the-- or more institutional detail how ETF really define those or find those price for those bonds during those period, or through, through their normal activities, normal operations.

CORNAGGIA: All right. Are there any, are there any questions from the audience? Maybe while we gather questions and circulate mics, one question for you, Yu, to get started. I'm wondering about the scale of your setting. So March 2020 was obviously a big event and the muni ETF market was sizable. But one thing you mentioned at the beginning of your presentation was how much it has grown over time.

And so the question that I'm wondering is, if you had another March 2020 scale event, given that the scale of the muni ETF market has changed so much, do you think you'd continue to see what you saw in this episode?

HE: I would love to do more, do, do more research into the, maybe the April 2025. At the, the COVID event, the COVID turmoil, really the-- it's very broad through the whole market. Maybe we can look into the April 2025 five. But the tariff could be only related to the-- more related to muni market yields than of the whole panic in the whole system.

But I think the, the reason I choose COVID turmoil is because that before the COVID turmoil from two thousand and eight, we have the -- first the muni ETF in the market. And through twenty twenty, we don't have really tons of market event or the ETF size. ETF market size is not that big for to war-warrant a good research product.

So I use the COVID turmoil, but I'm interested to look into other event in recent years when the ETF grow much bigger.

WU: Yeah, I just add, I think the current ETF market for muni bonds, probably about between one and two percent of the whole market, still small, but they are growing fast.

We're talking about growing 40 percent a year, maybe asset. But they trade a lot more too, you know. So, you know, they're trading probably about ten to twenty percent of total volume compared to muni bonds. But in, in terms of predict future, you know, as they continue to grow, how they, you know, will impact in those stress period it's hard to say, but I do know that during March twenty twenty, the similar dislocation also happened for corporate bonds ETF and treasury ETF.

So it's not just muni. And they were much bigger piece, I think already between ten and twenty percent of market, so.

CORNAGGIA: Okay, great. Do we have any questions? And before you ask, could you please give us your name and tell us a little bit about where you're from, please?

AUDIENCE QUESTION: Hi. My name is Tripp Kaiser. I'm with the University of Texas.

My question is related to one of those last charts where you had MEB and VTEB versus the index and how they declined-- their net asset values declined more quickly than the index. And that, was it March 2020 period was what you guys looked at? Three-- I guess three questions.

One, did you also look at-- Well, first of all, why do you think that the ETFs declined more quickly than the index? And you might have covered that, but I might have missed that. I apologize if I did. The second one is, did you look at an open-end mutual fund versus its index? And did the same thing occur between the open-end mutual fund and that fund's respective index? Did the same thing occur there as it did with the ETFs? And then I'm curious, the third part, I guess, is I'm curious if you guys think that maybe the, one of the the reasons why the fund declined more quickly than the index is because of an outflow period where the funds had to raise capital by selling bonds into the secondary into a down market, so therefore having to concede on price relatively more than the index because the index didn't have that kind of selling pressure.

WU: Are you talking about that chart I did a couple of slides ago? Yeah for your first question, why? I mean, the ETF is fast reacting, right? It's a real-time traded... I mean, sometimes I guess you could have just overshoot because you thought when COVID happened, you know, that, you know, it's really gonna be very stressful.

I mean, you did not know Fed-- You know, between March tenth and March twentieth, you have no idea Feds come, you know, Fed's gonna do anything or what they can do. So you did not know anything. You think the system just crashed. So, you know, people probably selling, thinking, betting the market would go further down.

But sometimes bets are wrong. Most of the time they're probably good, but sometimes they bet it wrong. That, that's just my simple observation. Well, I forgot... Your second question, I don't have answer. Mutual funds, how they compare to ETF. Maybe you has a better answer on that. I forgot what your third question again is Oh, yeah, cashing out.

Yeah. Possible. I mean, I mean, you talk about liquidity constraint maybe within the system, right? Some people had to, you know, redeem ETF, sell off ETF to, I don't know, pay for something else. But, you know, again, I don't have evidence. That would be my speculative. But my, my best answer probably is, they, you know, before news came out, I mean, some, you know, ETF does attract a lot of speculative activity, right? Because a liquid asset and sometimes speculator just got run, I guess so.

HE: So for the comparison between the mutual fund and ETF, I want to say, like, the author participants, they are not obligated to those transactions. When they see those price dislocation, if they see the price is lower compared to the net asset value, they might think it can close, close themselves, realign them after several days by itself.

And a lot of ETF they have deal with maybe twenty or thirty different broker dealers as serve as also participants. And not-- in normal times, they don't-- those APs, they do not step in, or only three to five AP step into the market to close, to realign the price. And it-- they are also-- it could be also possible those APs think the price can realign by itself, so they do not step in, and we see the price dislocation.

AUDIENCE QUESTION: Hi, I'm Dan Bergstresser, Brandeis. Thanks very much for a great paper and a great discussion. Simon, you just said something that I wanna pick up on and go from. You said, and I hear this a lot the money in ETFs is speculative or it's speculators. I'm wondering what is the best research, whether it comes from academia or from a, a white paper or practice, like who are the investors in muni ETFs?

What are their aspirations? What are their holding periods? Is it institutional, retail? And how does that compare to the... Think about the matrix of other related products. How does it compare to other types of ETFs? How does it compare to

muni open-end, closed-end bond funds and SMAs? Is there a good reference for that?

WU: Yeah. So it's funny. We, at lunchtime, we had a MSRB research-- you know, people ask question, you know, even for muni bonds, how do you know what customer, right? Are they retail, institutional? Instead, you only see a data point C, it doesn't tell you anything. So ETF kinda same way. You know, MSRB does not have a muni bond ETF. ETF will come from FINRA trade data, right? So it... And, you know, so we, you know, FIN-- trade data has the same problem. They don't tell you what customer they are. So, you know, you're not gonna have dealer information either. So that doesn't help. Just by my sorta observation or maybe anecdotal evidence, I feel like over time-- When it first came out, lots of retail investors jump into ETF, right?

You think, okay, that's one way to get something that we don't have to buy everything, so I just, you know, much better than mutual funds. But I have a feeling that over time, institutional manage- fund managers or even the SMA, I don't know, they all invest in ETFs and whatnot over time. So I have a sense that over time, the institutional proportion increase. So that, that's just my anecdotal observation.

CORNAGGIA: Okay. Thank you both very much. Yu and Simon, thank you for your time. We'll move on

to our next paper. Thank you, Jess.

Okay. Our next paper will be presented by Andrew Kalotay from Kalotay Advisors and our discussant Nikolai. Very good. The floor is yours. I want to keep track of time.

KALOTAY: Can I have my presentation? Yeah. Okay, just thank you, and thank you, Brookings, for the invitation. I've co-authored this paper with Marty Luby, and Marty and I have actually written several papers, but this was, this morning was the first time we actually in person, so I'm delighted to meet, to have met Marty.

Okay. So the topic is refunding 5% bonds prior to the call date. And how many of you know that 5% bonds are the most popular structure in municipal market? Okay. So not everybody knows it, but 5% bonds have been callable bonds, callable at par after 10 years. That has been the dominant structure.

The recalling of these bonds after 10 years is not a very interesting idea because all of them are called after 10 years. I make this statement after talking to some muni experts. And then Garrett corrected me this morning and he said no. I said, "I found one after 10 years, which is-- which-- found two, which hasn't been called." So it's a good research topic for you to search for 5% bonds more than 10 years old. And it also raises some question, why are we issuing all these bonds if they're all called after 10 years? I'll try to talk about that later on.

But there's some activity in refunding these bonds prior to the call date. And there have been some well-known transactions. First of all, the advanced refunding, which went on big way until about 2017 when it was eliminated. And then we had some refunding these taxable bonds. And Martin Lee-- Martin and I actually gave a paper on that. These all turned out to be horrible transactions.

Every one of them would have been better off to have waited until the call date. The total cost to taxpayers, the savings lost, as we call them, was literally in billions of dollars. Every one of the transactions turned out to be a loser. The transaction that I'll be discussing today is tendering and for bonds and the refunding them.

It's going on right now as we speak, and it's not a very fortunate transaction. It is just as wasteful as the taxable refunding. And what's happening here, this churning is helping everybody who is issuing bonds and taxpayers are paying for it, but they don't know how much it costs. That's one of the problems.

So just to give you a very quick view of what has happened historically if you go back to the year 2000, you can see around there the activity, the refunding activity was actually higher than it is today. And why was that? Because of the advanced refundings, which are no longer allowed. What happened in 2017 after the advanced refunding was eliminated, you can see that initially refundings dropped, and then people came up with the taxable refunding idea, and it went up, and now it's down.

But it's still not as high as it was twenty years ago, even though, as we have just discussed, the volume of of municipal bonds today is much higher than it was twenty years ago. The question is, how does this refunding, this tender refunding work? Very simple. The issuer makes a tender offer in the open market to buy back not yet callable, typically 5% bonds, and then just refunds them with new 5% bonds.

That's it. That's it. Same maturity typically. And why do they do it? That's the interesting part. And I advise you, if you haven't seen, read Jessica Lerner's piece in the Bond Buyer a couple of weeks ago, where basically issuers admit it because they wanna show savings. Savings. Some issuers are obsessed with showing savings.

The excuse they gave, again, I'm citing from Jessica's article, is that, oh, they think that interest rates will go higher. Well, I've been in this business for many years, and treasurers always believe that interest rates will go higher. If you think rates are going higher, you can hedge it.

But the way they are doing it in these tender offers, where they are paying four points premium in, over market price, and then there are also transaction costs, is a very foolish way of hedging interest rates. So let's admit it, they are doing it to show interest savings. That's it. Now, this... and that presentation is about call options and just in a very high level, even if you're not a quant.

Bonds are callable. Why are they -- why do they come with a call option? So that you can reduce interest if the interest rate is below the coupon rate of the bond. That's

the reason for it. Well understood. Typically, you do it when interest rates decline. But I just had an insight as I was preparing this paper, the presentation.

You often hear munis are different. I'm sure many of you heard this. Munis are different. And I could never get a cogent explanation of what's different about munis. And finally, I have one. Munis are different because they are refunded this five percent, but even if rates go higher. So what happens is they issue the bond where rates were three percent, rates went up to five-- issued a five percent bond, rates go up to four percent.

They issue a refund that reports huge savings and everybody's cheering, even though if you understand what has happened, you realize this was a very poor transaction

Anyway, if you want to issue a callable bond, you have to pay for the call option. And in a five percent bond, this call option is very expensive. And i-i-in the paper, we show one example where on a twenty-year bond, it costs eleven points upfront. And that's the beginning, and that's a sunk cost. And then when you exercise the option in some form, when you refund, you forfeit the call option.

And presumably, the transaction of refunding makes sense if you get adequate compensation for the forfeited option value. Makes sense, but you never hear about the forfeited option value. Are you getting paid enough in savings for what you give up? And that's what I would like to discuss very briefly.

How should you do it? How do you decide? Well, there's something called refunding efficiency that unfortunately very few muni people have heard of, even though it has been around for a long time. So what is the efficiency? You compare the savings And divide the savings by the option value, and that's it. A complication arises if the refunding each bond itself is callable.

You have to recognize that you're getting more option value, so you subtract that value from the value of the of the option of the the option value of the bond that you are retiring. So it's-- here's the formula. Very simple. Savings divided by net loss of option value. Now, the point I wanna make about it is that this has been around since 1976.

It has been used very widely in the corporate wide world in the '70s, in the '80s, and today. This is not new. However, for some reason, it is not known, not widely known in the in, in the municipal market. And it's applicable to all kinds of transactions and in particular, I want to mention to you not only for tendering and refunding or advanced refunding or calling, you can use that.

It's applicable to refunding your residential mortgage. When should you refinance? You get some savings, you give up options, and you have a trade-off. So that's what it is. It can never be more than 100%, but you shouldn't do it if you get only half of the value, clearly, because what happened to the other half?

So I'll give you an example, just one example from this paper for a Massachusetts Water Resource Authority bond, 5% bond. It was repurchased in 2023. It was callable in, five years before the call date. And without getting into details you notice the tender premium in this case was three-and-a-half points. I'm not sure the issuer even knew how much it was because most people wouldn't know how to calculate the tender premium. That's one of the problems.

But it was about three-and-a-half points. And when you calculate the efficiency, it was 57 percent, disregarding, as you see the footnote, disregarding transaction costs. If you look at transaction cost it's even worse. So that's a typical tender refunding transaction. I won't get into details about these re- transactions.

This is typical. It's roughly-- the efficiency is roughly 50%. And so half of the money is-- half of the option value is left on the table. It's just wasted, basically. But I do want to make one point about the last bullet point. There was a, an award last year by the bond buyer for the most innovative municipal transaction last year, and this was a transaction by the state of Wisconsin, one of these tenders, where they used what's called fixed spread tender.

It's a good, sensible way of buying back bonds. Most innovative transaction, it was done... I have known about this since 1984, which is the most innovative muni transaction of 2025. Enough said here. Calculating the refunding efficiency, I won't get into it. It's straightforward. There's just one interesting point.

To do it, you need interest rates, optionless interest rates beyond 10 pr- 10 years. What's the current 20-year AAA municipal rate? There's nobody here who knows what it is. You have to somehow calculate it. Why? Because every 5% muni which defies the benchmark is callable, and you have to know how to convert callable rates into optionless rates, but I won't get into it.

You can read the paper. We published-- Marty and I published a paper in the Journal of Fixed Income last year about the intrigue of municipal bonds. Couple of points about what's the problem here. The basic problem is the 5% bonds callable at par. They never survive beyond the 10 year-- beyond 10 years.

The 5% makes sense because there is something called the, the minimis treatment of the munis, so you don't want-- you, you want to avoid bonds that go to a discount. The 5% will do it, but there is no excuse for making them callable at par. They should be callable at declining prices after they are issued so that refunding makes sense only if rates actually decline, not if they go up as what's happening today.

They go up and everybody refunds and celebrates. Another possibility, probably nobody heard about it, is called floating rate ratchet bonds. Tennessee Valley Authority issued these. They float, but they can only float down. 30-year bonds, you can look it up, the TVA PARS. They started at six seventy five back in in the 90s, and they kept on fl- coming down, and today the coupon is two point one percent.

There is no transaction cost, not a penny. That's it. So all these things, and of course, you could issue optionalized bonds. I didn't even want to mention that, and I don't understand why municipalities don't issue optionalized bonds. Anyway, just to summarize, what's the basic problem? The basic problem, as I see it, is the lack of education.

The municipal treasurers and the-- they just don't seem to know enough about standard fixed income. It's in the books. You can just pick it up and read it if you like. And so they implement these very wasteful transactions. They report savings. They don't understand what the option value that they are forfeiting, even though that information is readily available.

And why is the situation like this? I'm not sure, but I'll mention to you two things. So you have the GFOA, and if you look at their-- they provide best practice. So if you look at, for example, their best practice for tender refunding, they don't even mention option value. There is no mention of option value.

Lots about savings. And then they have something, a more-- GFOA has a more general document about refunding municipal bonds. It does mention savings 35 times, and it mentions option value once, and I let you figure out how that one got into that thing. So, that's enough about the GFOA. And then as you-- most of you know, municipalities use. Most of them use advisors, municipal advisors, and those advisors are certified by the MSRB.

And if I was a municipal advisor and knew anything about finance, I would not let my clients do these silly transactions that I described. But the municipal advisors don't know enough because the municipal, the MSRB gives the certification, and they don't require a command of option valuation. So that's the stage. That's where we are. Thank you very much.

SKLAROFF: Well, thank you very much. First of all I'd like to thank David and the Hutchins Institute for the honor of being able to speak today. And I truly find myself humbled before an audience of so many distinguished members of our municipal finance community. Especially humbled after s- what I would term such a combative presentation.

And let me first thank Dr. Kalotay and Professor Luby for the work that they've done in providing analysis of refundings and a critical assessment of those refundings. I truly embrace that as somebody who is very focused on educating issuers as a commissioner on the California Debt and Investment Advisory Commission, as a member of the GFOA Debt Committee.

I welcome tools and would love to learn better ways to do my job, and I know my peers do as well. And I hope you will embrace my comments in the same spirit because there's a lot to unpack in this paper. As you've... I've enjoyed having the chance to speak to Dr. Luby Professor Luby and Dr. Kalotay and spent time in New York last month together. We've in fact had multiple conversations about a, a seminar we, we are doing in California this fall, where we are gonna be assessing

the critique of refundings with a broader range of market participants and hopefully having a more balanced discussion of these, these topics. I would hope in future versions of this paper and successors to this paper that the authors would take a more sympathetic view to the practicalities of what issuers are dealing with.

As I say, there's a lot to unpack here. This is a critique of tender refundings. It's to be seen as a critique of 5% coupons. It can be seen as an expression of the value of the call option and a critique of using the call option. It's also a critique of how issuers write their press releases about savings. And I think I'd like to convey some of the practicality of what issuers face. Tender refundings are not a first choice of any issuer.

The tender refundings are a response to the inability to use other refundings. Specifically, in the past, they've been used in various phases of the history of our marketplace, but this recent surge is specifically because of the taxable tax exemption being revoked in 2017.

And I dare say it was not an issuer who invented the 5% coupon. No issuer borrowing at a 3% yield wanted to explain why the coupon was 5%. It's based on what the market will offer, and we don't see sufficient demand for the 5% coupon. But as we look at the marketplace and the information that issuers deal with I love this chart from JPMorgan.

I've used it extensively. I've spent my entire career as either an investment banker or as an issuer evaluating interest rates and making decisions about refundings. And yet, when I look at this, in reality, through the entire time I was an investment banker, long-term, long-term interest rates were going down.

And my entire time as an issuer, interest rates have been going up. And I s- I say that because, yes, in hindsight, we can see this and we can know this, but none of us have this chart when we're issuing bonds. We are looking at the spaghetti of information that is available to us each time we issue bonds.

And it's notable that if you look at, for example, the Bloomberg forecasts which is the chart on the left, you know, the experts don't get it right. The market itself doesn't get it right. And so there's a lot that the issuers need to contend with. The authors employ a few techniques in their paper that I'd also suggest would be better taken out.

The, the presentation we just saw is a little bit different than the paper. I find the criticism, for example, the GFOA, which identified the need for information pretty unusual because it was the GFOA that took the lead in providing information to the marketplace. Our marketplace is very good at educating people about transactions that we see year after year.

But we have these episodes of transactions that emerge, like tender refundings, the current wave of renewable energy prepaids, the taxable refundings, the JPA workforce housing. These things that emerge very quickly, issuers are deluged with marketing material, and there's not a lot of independent information.

And so I welcome independent information from academics and our associations to provide that information. But it's particularly ironic to criticize the transactions and employ some of the techniques in this paper, like listing seven transactions. The only way that information is used in the paper is to show the diversity of issuers, and those issuers don't need me to defend them.

They're all very capable issuers. But we have issuers across the country, whether it's New York, Los Angeles County, Montgomery County, Maryland, Bay Area Toll Authority, who are all former investment bankers, former municipal advisors who understand well the value of the call option. This current wave of tender refundings is specifically about that call value.

These are all triggered by taking otherwise-- bonds that were otherwise qualified to be tax-exempt and had been refunded on a taxable basis and converting them back to tax-exempt and reintroducing call value. This may just be a brief episode in the market. It already seems to be waning.

But all those transactions have reintroduced a call value for folks. And then many of them were accompanied as well with some tax-exempt refundings. So we are an issuer that chose to do two of these. The one that's listed in paper in two thousand twenty-three for our water enterprise.

And I value-- I wish I had an easy tool to deploy to make what were difficult decisions about each of those individual CUSIPs and the pricing in the marketplace and weighing MMD pricing versus BVAL pricing. But at the end of the day we were able to produce nine point five percent net present value savings.

And that represented over eighty-five million dollars of savings that we could then plan for immediately. Our rate payer-payers had an immediate benefit from that refunding because the tenders from those investors we are an agency that does ten-year public plans. We model twenty years out.

We do multi-year rate increases. That had a very substantial value by accelerating those savings and impacts for our rate payers. I'll just close out very briefly by pointing out that, yes, the GFOA has very comprehensive best practices both for the tender refunding of municipal bonds that Dr.

Kalatooy mentioned. I would recommend s- reading that as a very practical tool that issuers can implement and the more basic refunding analysis, which has an extensive discussion notwithstanding word counts of the value of the call option and how to measure it over time. And I wasn't on the debt committee when this was written but in rereading it after reading the critique, it's a very compelling document.

And then as I mentioned, CDAC will also be carefully evaluating this critique of refundings with multiple folks on the panel. So with that, let me thank you very much, and I'll look forward to the discussion.

CORNAGGIA: Nikolai, thank you very much for your discussion. Before we go to the audience for questions, Andrew, would you like to take a moment to respond?

KALOTAY: Just a, a brief comment about, nikolai's slide about interest rates. Unfortunately, many municipal treasurers and treasurers elsewhere, they have been led to believe that their job is to pr- project, to predict where interest rates are going instead of using accepted, well-understood analytical tools

CORNAGGIA: Okay. Do we have any questions from the audience? Got Dan here and then Dan.

AUDIENCE QUESTION: Okay, and this is for Nikolai. I just wanna make sure I understand, like what is the kinda two-sentence takeaway pitch for what Kalotay and Luby got wrong? You said there was complexity that they didn't sort of account for, but what is... What should I take away as sort of the two-sentence pitch for what exactly is that complexity that they don't consider?

SKLAROFF: Basically, that yes, it is easy to measure in hindsight whether something is, has achieved the optimal result or not. But in the meantime, for an issuer, those savings that we locked in can just as easily disappear if we had waited to do a current refunding. In fact, even though they were listed in there, the bonds, our bonds haven't even reached the original call date.

So Dr. Kalotay nor I know whether ultimately we got the best possible rate, but we know that we got very substantial savings, and we locked those savings in, and our rate payers have been benefiting from that since 2023 when, in fact, those savings could easily go away. We know that we are potentially a tweet away from very different interest rate environments.

KALOTAY: Well, if I may just comment. Again, you don't mention option value, and I made a point at the beginning of my talk. You pay dearly for these options. You don't even know how much you're paying for it. Issuers have no idea that they are on a new 30-year callable bond. They are paying 10, 15, 20 points upfront.

They could sell these bonds for that much more And then they say, "Oh, I wanna lock in some savings." Now look, again, you mentioned savings, but you haven't mentioned option value a single time. And it's all ... If you talk to fixed income professionals, they understand that this is all about buying and exercising options.

SKLAROFF: If I'm, if I may. I certainly don't wanna turn this into a debate. But, you know, my job as a capital finance director is actually not about refunding bonds. It's about delivering capital at the lowest possible rate to our rate payers. We have four highly rated entities, three of which issue bonds, and three w- of which issue commercial paper.

And my job is to make sure that the engines keep running efficiently on the construction program. We're delivering infrastructure across- across seven counties in

Northern California, and delivering service to four of ... four counties. So that is my primary job. But to dismiss reducing the interest cost of our bonds does a great disservice to our issuers and taxpayers.

We should be trying to achieve the lowest possible costs for our transactions. And one of those differences between our market and the municipal market our market and the corporate market, is that most of our bonds are being issued over 30 years. And as good as our teams are and our advisors and everyone none of us know for certain over 30 years.

That value that we extol here of being able to call those bonds is incredibly valuable and has saved rate payers and taxpayers across country a lot of money.

KALOTAY: Can I just make one ... Well, just a quick comment. It's not related to- oh, okay.

AUDIENCE QUESTION: This is a related question, which is, it, it is kind of the same thing.

And so, so coming from a finance academic background, many of us are very sympathetic to the idea that you are paying a lot and no one knows how much we're paying for these options. So when you-- so I guess this is a question for Nikolai, which is, when you are thinking of structuring a bond and you are comparing, say, the i- the idea of issuing a 30-year callable at ten, or you're thinking of maybe we could have a shorter capital schedule and just issue a 10-year non-callable, no options.

How do you actually kind of model the value of those two different things? The 10-year fixed rate would clearly be cheaper. And so I wonder how much do you kind of-- how you actually do that trade-off calculation if you're not kind of thinking about the option value in the same way that Andy is.

SKLAROFF: Yeah, I-- again I think there's a misconception in this discussion that because a basic algebra book didn't do advanced trigonometry calculations, that we weren't doing math. I mean, the, the fact is that as GFOA has recommended in those policies after an extensive discussion of the call option, there's specific advice that these calculations are complex and that issuers should work with their in-- muni-- that, their municipal advisers on that.

I think it is a lot to ask after reading this paper that every issuer in the country would now be able to proceed with calculations, especially since there need to be so many assumptions to make those calculations work.

AUDIENCE QUESTION: Thank you. Mr. Sklaroff Am I correct that basically the reason to do a refunding or not a refunding still comes down to a bet on the direction of interest rates? Because I wasn't quite sure if you were saying that isn't what you're

doing, whereas now it sounds like it, it is. And if in -- and that is the source of the savings.

If that is true, I know you did not respond to the original suggestion that if you're concerned about interest rates going up, you can hedge them. And I also wonder if you would support the observation that the municipal advisors are not regularly using this option value test just in advising, even if their advice is not dispositive.

If you would support actually that they should use this tool because that was the whole purpose, my understanding, of having municipal advisors is to advise municipalities that are not so well-constructed in the math as perhaps you are.

SKLAROFF: Yep. There's a lot to unpack in that question. But first of all I think it's unfortunate to have this discussion be an attack on issuers and attack on municipal advisors.

It would be much more productive to provide a useful tool that people could deploy, and a lot of this becomes distraction that makes it difficult for people to embrace the potential tool. Municipal advisors are advising clients on their option value. We're an unusual issuer. We, as I say, we have three entities, two of which issue debt.

We have five municipal advisors under contract and I can tell you that they regularly advise on call options. What's interesting about this, this argument is that when people decide not to do a tender that's not measured. It hasn't been measured in this paper, for example. Last year we did an RFP for underwriters.

We had a number of responses that propose tax-exempt tender refundings. We didn't do that. But we did do the taxable tenders taxable to tax-exempt tenders so that we could reintroduce a, a call option. But I can assure you that as I said, we have many sophisticated issuers but also a very sophisticated base of advisors across the country advising issuers.

CORNAGGIA: Okay,

KALOTAY: May I say something?

CORNAGGIA: We are over time.

KALOTAY: Okay.

CORNAGGIA: Thanks everyone for your comments, for a lively discussion. Thank you, Andrew, for presenting your paper, Nikolai for discussing it. If we could please get a round of applause for all of our presenters and especially our discussants. Thank you.

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LUBY: All right, I think we're gonna get started everybody. Good afternoon, everyone. Great to be here. Marty Luby, I am the faculty director from the, for the Center of Municipal Capital Markets at the University of Texas at Austin. And we've got a great panel today. I think this is panel session three, so referenda and bankers.

Two papers. I'll describe the second paper in the second half here, but our first paper is from June Huang, who is an assistant professor of accounting at University of Texas at Dallas. Her paper is Debt by Democracy: Bond Referendum Requirements and Municipal Borrowing. And this paper looks at state-level referendum laws and its impact on local government debt decisions and local government financing costs.

Our, our discussant for this will be Lauren Larson, who's a very distinguished non-resident fellow here at Brookings, who was former budget director for Colorado. Lauren, what else? You were also president of National Association of State Budget Officers and worked in Department of Treasury with the TARP program, so look forward to seeing, hearing your comments as well.

So we'll abide by the normal rules here. I think we've got 15 minutes for the presenter. We got 10 minutes for the remarks by our discussant, and then we'll have 10 minutes Q&A. So with that, I turn it over to June.

HUANG: Thank you, Marty. Hi, everyone. I wanna first thank the conference organizers for including our paper in the program. We are really excited to share it with you and hear your feedback, and especially the discussion from someone who I esteem and respect so much. So super excited, Lauren. Okay.

So this paper, the seed of this idea started when I moved from Chicago to Dallas in 2023 to start at UT Dallas. And when I got there, I very soon after started to see news about the city of Dallas putting together a bond package to go on the ballot in May 2024. As part of this effort, the city put together a website that had a bunch of information on it.

This included a voter information packet a list of frequently asked questions an Excel of specific projects with pretty granular detail on how much they were estimated to cost and where they were gonna be located, and this whole buildup was covered pretty heavily by the local news media. Now, as a recent transplant from Chicago at that time, this whole process was surprising to me because despite living in Chicago for nine years up until then, I could not think of a single specific debt issuance I had ever heard about, let alone heard about so much.

Like, Axios was sending me news about the Dallas bond every day for months. And this difference was interesting to us because it turns out that in Texas, all cities have to get voter approval for general obligation bonds, whereas in other places, like in Chicago, they can issue GO debt without going directly to the voters.

This happened early last year when the city approved eight thirty million in GO bonds just city council and mayor and doing their normal process. This led to some

grumblings where, for example, one Redditor talked about, you know, "How about not allowing a mayor and council to vote on this without a vote from the public?"

Apparently, not all cities do it this way. But eventually these bonds were issued mid last year. Now, if you grew up in Texas your whole life, which may be true of some of you, you might think it's normal for cities to have to get voter approval before issuing this big category of debt. On the other hand, if you grew up in a place like Chicago your whole life, you would've thought it was normal for this process to just happen without, you know, any direct input from the local voters.

So we looked at these differences, and we think that they highlight the importance of bond referendum requirements because they give citizens the power to directly determine a municipality's access to a big category of public debt. So motivated by these differences around the country, we have a few goals in this paper.

The first one is to document the extent of these requirements around the country and how different they are. What are these state-by-state differences that cities are facing? Then using this variation, we study how these requirements shape public borrowing. Here we're gonna focus on how the voter approval requirement can shape cities' incentives in two ways.

The first is through disclosure. When the city has to get voter approval, does that change what the city is talking about on their websites? Does it change media coverage? And what does this mean for voters and for bond investors? And then in, in the second half of the paper, we think about when cities have to get voter approval, and they know that this you know, extra step is there, does that feed into choices around types of bonds levels of debt, or types of projects?

So that is where we are going. So first, just to give you a brief overview of the variation we see, I'm not gonna go deep into this for time, but basically, we hand-collected the laws across states, and there is a lot of variation. We're focusing just on US cities, just on unlimited tax GO, limited tax GO, and revenue bonds.

And states fall into roughly five categories. First, we have seven states here in white where cities don't have to get voter approval for GO or revenue bonds. Then we have these light green states where cities have to get voter approval for GO bonds, but not for revenue. Our we have-- Out of these, we have three with stripes on them.

I don't know if you can see them. But here, the voter approval requirement just applies to unlimited tax GO. In the dark green states, these are places where cities have to get the GO vote, and sometimes or always also have to get voter approval for revenue bonds. And then finally, we have these gray dotted states where the GO vote requirement varies within the state.

This can look like places like Illinois, where after thinking about these differences and doing more research we learned that in Illinois, for example, if a city has home rule, they can issue GO bonds without voter approval. These tend to be your larger cities,

partly by definition. If a city does not have home rule, your smaller cities they have to get voter approval before issuing GO bonds.

So there are a lot of, you know, super interesting differences in the setting that I cannot talk about for time. But after finding out what are these rules, we look at the information environment, and we look at this for voters and investors. For voters, we think it's intuitive that when the city has to get voter approval to pass this bond proposal, they may use disclosure to try to inform voters about the project costs and benefits.

We think that this might also spill over into bond investors. We've heard today about the high proportion of retail investors in the muni market. Because of the tax advantages that many states have for local residents holding local bonds, we think it's plausible that voters and bond investors can overlap.

On the other hand, maybe we don't see anything in bond investor behavior because we have evidence that, you know, even for formal financial disclosure through EMMA investor response is often muted or weak. So we first start by looking at what cities say about bonds and general financial information on their websites.

To get website data, we're use- we're using the WayBack Machine to s- do annual scraping of snapshots. This takes a bit of time, and so we did this only for a smaller sample of cities. Here we use what we call our border city design, where we're comparing our green and white states, and we're looking at cities just within you know, a short distance from that border.

And we're hoping that these cities are relatively similar in aspects besides the fact that they have this difference in whether they have to get voter approval for GO bonds. What do we collect? We collect whether bond and fiscal related words are in the URLs of city websites. For example, if you have a sub URL, like a dedicated page for bonds, we feel pretty confident we're picking up bond related information.

We also are looking at the count of bond or fiscal or the number of financial documents that have things like budget in the title. So we're collecting this in terms of what cities are putting out to the public. Here we see that when we regress these measures of disclosure about bonds or fiscal information on having to get this vote requirement, getting the vote requirement is associated with putting out more bond related disclosure to your local residents.

So it seems like there is more information the city is putting out. Next, we look at media coverage. We think it makes sense that if there's a bond referendum that's required, there's gonna be high reader interest. The media is gonna cover the bond, like in the Dallas example. Also in Sun Valley, Idaho in 2017, they passed a 17 million roads bond, and the local Idaho Mountain Express covered this pretty heavily throughout that process.

When we look at the media data, we're able to get news articles for a broader sample of states. So here we're expanding beyond the small sample in the website

test, and we're able to look at that full set of green versus white states from the map. We look at unlimited tax GO bond issuances from 2000 to 2020, and we're looking at when you have to get the vote requirement, are you more likely to see bond related articles in the year leading up to issuance?

This year leading up to issuance is a proxy for what we think of as the bond campaign period. And we do see, yes, controlling for things like economic conditions, the purpose of the project, time trends. We do see that the vote requirement is positively associated with the media coverage of bonds.

Now we look at Texas data because in our prior tests, one caveat is that we don't actually have good nationwide data on bond elections. So we're assuming that the bond election contributes to, you know, more website disclosure and more newspaper coverage, but we don't actually have those dates. In Texas, we actually have pretty good bond election data.

And so we can see and kind of corroborate our prior results, and we see that where we have the bond election dates, we see higher website disclosure during bond elections. We also see more bond-related media coverage during elections. So it seems like, yes, there is this richer environment about information for voters.

Do voters seem to use this? Is there any association with the actual bond election outcomes? Across the board for bond websites and bond-related media coverage, we see that these are both associated with a bond being less likely to fail and with greater voter agreement. So whichever way the bond goes, pass or fail, we see bigger vote margins.

Next, we look at bond investors. Again, it's possible that because of the tax exemptions on holding local bonds, our voters and investors might overlap. On the other hand, this information put out during bond campaigns about, say, your capital budget forecast for your parks department or the exact roads that are gonna be constructed for the pros- w- with the proceeds.

This isn't standardized information, and it's not disseminated through centralized platforms like EMMA. So what we see when we look at the secondary market with bond investors is that when voter approval is required, bonds are slightly more likely to trade, and we see this result being more concentrated in retail trades with the caveat that we are using the old/maybe outdated a hundred thousand dollar trade size ca- classification that we talked about earlier today.

So overall on the information environment seems like, yes, there's more information, and it seems like it's associated with voter outcomes and bond investor behavior. Next we look at, well, what does this mean for cities' debt choices? I'm gonna show you some graphs, and I'm not gonna talk about the tables for time.

But we just think descriptively, let's look at what happens when there's no vote requirement. In our seven white states, what types of bonds do cities choose? They choose about two-thirds unlimited tax GO bonds, and the remaining third is split

evenly between limited tax GO and revenue bonds. What about those light green states?

We layer on one layer of voter approval. When you need to get the GO vote, we see that proportion of unlimited tax GO fall by about half. What expands to take up that space? Three times more revenue bonds. When we look at the three states that only have the voter approval requirement for unlimited tax GO, we see again a sh- big shrink in unlimited tax GO, and in this case, more limited tax GO because they can issue those without voter approval.

So overall, compared to the no vote benchmark, it seems like cities gravitate towards types of bonds where they have more control over the issuance process. Now, we're not suggesting that this is nefarious or, you know, strategic in an agency problem sense. What we've heard from issuers is that often it's easier to have more control over the process because you have more control over timing and project execution costs.

Whereas if you have to wait for the referendum, maybe construction costs go up, maybe contractor estimates go up, and you lose more control over that timing. But we-- it is interesting that we see this-- these strong results in the types of bonds that cities choose. I'm gonna skip through the results on the tables.

They they basically formalize this pattern with regressions and controls. One interesting thing is for cities that have to get voter approval, there are differences by state in terms of whether you need to get, say, majority or sixty percent or two-thirds. When we see a stricter supermajority requirement, we see incremental substitution, so even more substitution towards unlimited tax GO.

Now, we were wondering, and we've gotten some questions about this in the past, well, what does this mean for projects? It seems intuitive that certain types of projects, like utilities versus parks, are easier or harder to use revenue bonds for if cities are doing all of this substituting. What this table shows is when we look at purposes, in the no vote benchmark in the top row, we see that most revenue bonds are going towards utilities.

For other purposes like recreation, public safety, cities typically aren't using a ton of revenue bonds if they don't have to get voter approval. On the bottom, when they do have to get voter approval, we see a big jump in revenue bonds for utilities, but we also see pretty big proportions of revenue bonds across the board.

So it seems like cities are finding ways to substitute to this. And when we look at overall debt levels, we actually don't see a difference. We don't see that if you have to get voter approval, that you have lower debt levels on aggregate. More systematically in the project purposes, when we started this, we thought, well, maybe if you have to get a lot of revenue bonds or if you have to get the GO vote, maybe you have less financing of projects that would typically use more GO bonds.

We don't really see that. We see by par amounts of outstanding bonds. We don't see differences in terms of cities financing different types of projects at different rates. And we think back to the pie charts that this is likely because they are able to substitute towards revenue bonds across a bunch of purposes.

So the bottom table says when you have to get the vote, you're more likely to use revenue bonds, not only for utilities, but also transportation, recreation, public safety, and so on. In our last test, we look at borrowing cost. We know that on average, revenue bonds tend to be more costly. We see that when you have to get the vote for GO bonds, your weighted average yield spreads for a city are higher by twenty-seven to thirty-five basis points.

So there is a borrowing cost implication here. We do this robustness in a couple of ways that I will skip for time, but it seems like there's A, substitution across bond types, and there's B, an im- an implication for aggregate borrowing costs. In conclusion, our paper, we view it as descriptive and as one of the first to document these differences in bond referendum requirements across the country.

We find richer information environments, but also the substitution towards more referendum-exempt, costlier bonds. But, you know, we can't really interpret this as in terms of the city's intent, and it could be that this allows them to do their projects in a more timely way that maybe ends up being less costly from a project ex- execution perspective.

So on that, we can't say. But thank you so much, and looking forward to Lauren's discussion.

LARSON: Greetings. Thanks, June, to you and your colleagues for developing this paper. I was really interested to discuss it from a policy perspective. I think it raises a lot of intriguing issues. So first, like the smithereening paper this morning, it confirms something that felt right in my gut, which is that officials, when they can, will avoid going to voters to raise funds.

So she's-- the paper confirms that and you know, and you were-- you commented on it's not nefarious reasons, there's more control. I'd agree with that, but there's definitely a political factor here. The paper quotes statistics a statistic from the state of Washington where forty-eight percent of the bond referenda fail.

If I were a new elected mayor in Washington, I'd think awful hard before I wanted to go out and put my campaign promise on a, a bond vote. So, so but in a-in addition to confirming the the magnitude of the substitution effect, she's also quantified the spread, that there really is a fiscal impact, so twenty-five or twenty-seven to thirty-five basis points.

So there's a real fiscal cost to this decision that I think is something that policymakers, if you're living in one of those seven white states on the map that has no restrictions, and you're thinking you wanna run a ballot initiative to introduce this

debt restriction, you might think harder because it's likely to lead to some behavior that would drive up your cost of borrowing.

Secondly I really appreciated the data set, the new data set on state-level bond referendum laws because it, it's combining what, as practitioners, we see every day, that you can't just look at the fiscal without looking at the policy and legal aspects. They really go hand in hand and have deep consequences for each other.

So that's why we know at NASBO you can't pick up a best practice in one jurisdiction and immediately adopt it in another and expect it to have the same effect. And I June threw up her map, but I really think it's an elegant way of looking at a very complex system. It's figure one in the paper if you wanna take a closer look.

But it's a poster for why it's so difficult. Intergovernmental finance is so difficult. You can't change one mechanism for, say, the Fed money flowing to the states and ex- and to-- and localities and expect it to have the same effect.

So the, the last point I'll make is the primary -- well, most of the states, all but seven of the states have some restrictions. So this is, you know, a really common thing that the voters are have called for over time. And presumably, the primary reason for those initiatives in the in the beginning was to constrain the size of government, to restrict the size of government in some way.

And this is a question that the paper leaves unanswered, and I think is a great area for further research. It's not just does it impact the cost and type of debt issued, but the levels. So are is this a tool that can shrink government or keep it smaller over time? And to look at that you'd probably also have to look at not just what cities are issuing, but their corresponding counties or, you know, surrounding counties or special districts, obviously.

And then the, adding more layer of complexity, if there's a PhD student listening or in the audience thinking, what would be a great dissertation that I think would have a lot of policy appetite, that would be, what is the interaction with tax and expenditure limits? So you, yes, you you know, most states are constraining the debt issuance.

What states are constraining new taxes? Which straits which states are constraining expenditures? I live in Colorado, where we have the Taxpayer Bill of Rights, and we're constraining all three. So it's there's a, a lot of natural experiments playing out in the country where I think some, there's really interesting research potential.

So thank you, and I look forward to your questions.

LUBY: Thank you. Okay. Outstanding paper. Already have, It's deeply applicable to some Texas stuff that's going on right now that I'm writing about, so look forward to talking with you later about this, and thanks, Lauren, for the insightful comments. I think, so we got 10 minutes. I'll open it up to the audience and for questions. The gentleman in the middle.

AUDIENCE QUESTION: Hi, Rob Mayer. When you were looking at the vote results, were you also looking at voter turnout? Was there a correlation between districts that had higher voter turnout and projects that would be for those districts versus those districts that oftentimes have underrepresentation in voter turnout and projects that weren't necessarily directed toward those local council mag districts in the cities you looked at?

HUANG: Thank you. That's a great question. I do think we have the turnout data in the Texas Bond Review Board data. We have not looked at voter turnout in that way, but that's a great idea. Thank you.

AUDIENCE QUESTION: Hi. Wonderful paper. My name is Karla Naranjo. I am from Arizona, but now I work at the city of New York, so very familiar on both sides of the coin on this issue. My question is also on voter turnout, but I'm also curious on how... I know the paper only looked at really what kind of explicit website information is available on bonds, but I'm curious if there was any variation by states that might do more direct outreach over mail or phone, or even if they have a better, like, user interface on their websites.

We know some, like, state and municipal websites can be a little difficult for lack of a better word. So I'm curious if the- if you notice any variations in your research in regards to public-facing information.

HUANG: Thank you. That is a great point. The short answer is no. We were not able to collect measures on that, but I totally agree with you that we do see this kind of variation in the real world.

One idea that we have been thinking about is, you know, is there a way to kind of use bond link usage as a proxy for sophistication of the website? Don't have that data. If anybody is close with Colin and wants to help, sure, that would be great. But I think something that speaks a little bit to your question is that one thing we did notice is that in pretty much all of these states with these requirements, there are also mandatory requirements that cities put out some kind of public notice.

This happens because pretty much all of these, pretty much all, all the states in general have a requirement for public notice before any election, and the bond election just happens to fall, you know, into that bucket. So in that sense, there is not much variation in terms of this mandatory amount of disclosure.

Pretty much everybody has to put something in the newspaper at some point. A couple of those say you have to mail something to the voters, but whether that really captures the level of persuasion or the level of voluntary material the city's putting out there it probably does not speak to that.

But I think that's a great point.

AUDIENCE QUESTION: Okay. As a journalist, I know that the local newspapers and news outlets in general is dying. So what's the effect of this in your study? Have you studied this?

HUANG: So I would strongly point you to an amazing paper, if you haven't seen it by Dermot Murphy, Paul Gao, and Chong Lee.

They have this I think 2020 paper in the Journal of Financial Economics that looks at when newspapers close, they find higher yields, higher borrowing costs for local governments. And the story, the mechanism that they tell there is about monitoring where there's less monitoring when a local newspaper closes.

So I personally and through my work, I really do feel this, you know, general weakening of the media environment in many ways. In terms of how it enters this paper, we kind of control for it out because in our media tests, we're controlling for the number of newspapers talking about the city.

So whether you have one newspaper or whether you have 10, that's-- we're trying to strip that out. But it's a super important point, and I would point you to that paper

AUDIENCE QUESTION: Matthew Zachary, city of Baltimore. My question is about if you looked at vote success by election type, special versus primary versus general in a, a presidential year or midterm.

HUANG: Excellent question. We are a little constrained in terms of sample size right now, like number of observations, because we only have the Texas election data.

I can tell you that 90% of the Texas bonds are put on the ballot in May and November. In May, a lot of Texas cities have their local municipal elections then. In November, I think we know what happens then. Whether there's enough variation to see something in May versus November, versus November, we could look at, but it's a little harder to disentangle because we don't have the data on what else was on the ballot at that time.

But I could definitely see that having implications for, you know, things like turnout, things like which way the vote goes.

AUDIENCE QUESTION: Hi. Tim Little. I just had a question. I was wondering in the study how much you're differentiating between pledge risk versus project risk 'cause most cities, you don't just swap a revenue bond for a GO, a water bond's not gonna fund a school. And so I'm wondering really if there's overlap there, if that's sort of explaining the difference for how many basis points you were showing.

HUANG: Yeah. This is a great question. We have new stuff we're working on right now that didn't make it into the paper or the presentation. But we are looking at, you know, how much of this is just a plain switch from GO to revenue? How much of it is

the fact that in the city switching, those revenue bonds are being used not just for water, but also for, like, parks, public safety, public buildings?

And how do those streams of revenue differ in terms of their riskiness? As a non-expert compared to many of you in the room, my intuitive sense is that utility revenue streams are probably easier to forecast, probably viewed as safer compared to revenue streams, like in parks bonds we s- like, when we look at revenue bonds for parks, for public safety, things like that, these are revenue streams that are things like transfers from the state, or they are things like any non-tax revenue that Dublin, Ohio can use.

Or things like investment earnings. Like, they're kind of broad and less dedicated. So to the extent that those revenue streams are inherently more riskier than, say, a utility or a water system revenue stream, that could partially explain the yield result that we're seeing in aggregate.

LUBY: Other questions. David.

WESSEL: I want to pick up on something June said, but apparently it's not in the paper, that there is no difference in the debt levels of the two sets of states. And I wonder, June, if you could just talk about that a little bit.

HUANG: Yes. So I'm sorry, Lauren. This is something else new that we had worked on but not been able to put into the paper.

But we thought about it partly because when Lauren and I talked in May, Lauren said, "I would love to hear more about this." And we were like, "Yes, that does seem intuitive to look at debt levels." So there, what we're doing is we're using data from the census, the five-year annual survey of gov- of local governments, and we're looking at twenty seventeen point in time because it's like 2012, 2017 or I suppose 2022.

So we're looking at the middle, and we are basically regressing the total outstanding debt for the issuer based on census data on the vote requirement and trying to control for things like city population, county GDP these other local economic conditions that you would think about. Right now, we're not seeing any differences in the aggregate levels of debt for the city, depending on the vote requirement.

And one great point that Lauren made in the discussion that we are also controlling for is the amount of debt raised in the issuer's county that didn't come from the issuer itself. So we're also controlling for, like, how much the the school district next to you raises or how much the special district next to you raises.

To, to the extent that's in the census data, we are trying to control for those things.

LUBY: I think we've got thirty seconds. I just have one question. So you, June you correctly identified the pushback on referendum, which is the ability of issuers to have flexibility to go and sell debt when they need to sell debt.

And there's clearly benefits associated with that, and you didn't quantify them because you can't really quantify them. But you can quantify the cost, which you do, and it's twenty-seven to thirty-five basis points. And I can't remember if you have this in the paper or not, but did you, what's, what does that turn into in terms of dollars so people have a sense of what the cost is?

HUANG: This is a great point that Lauren also brought up. As we've been adjusting or re-revising the paper and trying to bring in some of these new details we have not gotten to that quantification yet. But we definitely would like to try to do, like, a back of the envelope figure, so- kind of like we saw in some of the earlier papers.

Yeah. Thank you. Thank you.

LARSON: I came up with between one and two billion, so let me know when you do a more sophisticated look.

LUBY: Okay, great. Thank you everyone. Great paper, great comments.

Okay, so I think we have our second paper now. This is a paper authored by Natasha Boreyko from the University of Michigan. It's entitled Breaking the Bond: The Effect of Banker Turnover on Municipal Bonds and it looks at the impact of banker mobility on the cost for issuers that actually follow their bankers. So for the bankers and ex-bankers in this class, or in this, I say class every time. I feel like I'm teaching. In this room I think the findings you'll find very interesting. So without further ado, Natasha.

BOREYKO: I would like to thank the organizers for including the paper in the program. Just a small note, even though today I represent University of Michigan, starting next week, I will represent University of Virginia, where I will work as a postdoc. All right. In financial markets, we usually think of relationships as belonging to financial institutions.

Today, I will argue that people inside those institutions matter at least as much. My focus is the bond market, which is the main way to get external finance for companies, countries, and municipal borrowers. The access to bond market is mediated by banks or underwriters. I will use these terms interchangeably.

Their main function is to connect issuers with investors for which they obtain a fee. From existing literature, we know that the reputation of the bank plays an important role in placing bonds with investors and certifying borrower. What we don't know is how much of this effect comes from the banker.

So in this paper, I ask whether individual bankers add value to borrowers above and beyond the effect of the bank, what type of bankers add value, and how they add value to borrowers. The answer to this question is important because we don't know to what extent bankers' human capital is portable. With frequent banker mobility, we don't know how it affects borrowers and what value, what information is lost when banker leaves the bank.

In this paper, I study this question in the context of municipal bonds that is bonds issued by city states and public universities. And then the question is, do we expect bankers to matter in this setting? Well, we know that in other areas of financial intermediation, such as lending and M&A, human capital of bankers helps gather soft information about the borrower and reduce information asymmetry.

A similar thing might be happening in the bond underwriting market. However, municipal bond underwriting is different. Municipal bond issuers are public entities with regular audits and public disclosure. Moreover, the default rate on municipal bonds is significantly lower than that on corporate bonds or loans.

So there is very limited scope for information production. Given that, you might think that bankers cannot really affect the outcome, and bank's platform is all that matters. Well, in this paper, I show that individual bankers still have a big impact on municipal bond underwriting. In particular, I show that when bankers move to another bank, the decision to keep relationship with a banker keeps you a significant advantage of about nineteen basis points, and it is equivalent to about four hundred thousand dollars in savings per issuer.

I then explore two channels through which bankers can add value. I find some evidence for borrower certification, mainly concentrated among non-rated borrowers. But more importantly, I find evidence for investor network channel. When bankers move, they bring their investor connections with them to a new bank.

So the main takeaway from this paper is that human capital of bankers is very important in bond underwriting because market knowledge and investor connections travel with the banker. So why wasn't the question of the role of human capital in bond underwriting why it wasn't asked before? There are certain challenges.

First, while in lending we know the name of loan officer who prepares the contract, in bond underwriting, this information is private. Second, and this is true for both lending and bond underwriting, relationships in this market are endogenous. In this paper, I overcome these challenges. First, I collect novel data on individual banker career moves from public finance newspaper.

Second, I rely on an exogenous shock that disturbs relationships in this market.

So how are municipal bonds brought to market? When a municipal issuer wants to issue a bond, they typically work with a bank who underwrites the bond and sells bond to investors. A key feature of this market is that more than 90% of deals involve

a single lead underwriter. Moreover, more than 60% of municipalities work with the same bank over a period of three years.

So overall, relationships in this market are very important. Typically, municipality will work with the same with a banker of the same specialization as the issuer. If municipality is a school, banker specialization will be education. If municipality is a hospital, banker specialization will be health care.

Here is an example. We have a red banker who is of the same specialization as the issuer A, and I ask you to remember this red guy as it will be important for our story. All right. After working for some time in PNC Bank, our red banker decides to move to another bank, let's say Wells Fargo. In this case, issuer A has usually two options.

They can either stay with an old bank or follow banker to Wells Fargo. Staying with old bank avoids switching costs and allows keeping relationship capital with the bank, such as history of transactions, hard information. Following banker to Wells Fargo involves switching costs, but allows keeping relationship capital with the banker, such as soft information and personal connection.

And the question is, what value and what borrower-specific information is lost when the banker moves to another bank? To answer this question, I collect novel data. The data that I collect comes from the bond buyer which this audience is probably very much familiar with. It was previously used in other studies, mostly on government auctions.

My novel piece here is to use their section called People on the Move in Public Finance. This section reports in detail how banker switches bank and provides information on bank-- a banker's professional background. Here, as an example, we have Lee White, who is joining D.R. Davidson as a managing director.

And from this article, we learn that he has expertise on student housing and education. I then verify each banker transition using individual banker LinkedIn account, and then complement it with the data on banker's education, salary, and other skills. I construct a unique dataset, set of about three hundred senior banker transitions, and I use this data to track how bankers switch banks and whether borrowers follow bankers or not.

At this point, you might worry that the decision to follow the banker is endogenous. Indeed, poor performance of the old bank can both push the municipality to leave and affect subsequent price improvements. The decision to follow might also reflect the unobserved quality of the borrower or even the banker-borrower mutual decision.

I need an identification strategy that creates exogenous variation in whether borrower follows the banker. An ideal experiment would be to randomly move bankers and then randomly assign borrowers into following the banker or not. Such an ideal experiment doesn't seem feasible. Instead, I suggest using an instrument that exogenously eliminates the option of staying with an old bank.

And this elimination happens exogenously and is unrelated to the quality of the bank or of the borrower. As an instrument, I use the Texas underwriter ban implemented in Texas in September two thousand twenty-one. The tax this state of Texas Senate passed two laws that restricted government agencies from working with banks that boycott fossil fuel and firearms industries.

So these banks, including JPMorgan Chase, Bank of America, Goldman Sachs, they were prohibited from working with municipalities. This was a sudden and policy-driven disruption of relationships in this market. And then what does this ban do to us? It eliminates the option of staying with an old bank. Coming back to our example with Issuer A.

Issuer A, pre-shock, assume they worked with PNC Bank. When they see that their banker moves to another bank, they will follow the banker with some probability. In a similar way, Issuer B, who always worked with JPMorgan Chase, after seeing their banker moving, they will follow the banker with some probability, maybe similar.

Post-shock, however, Issuer B doesn't have an option of staying with an old bank. Instead, they must find a new one. If their bank move into another bank, they have an ability to keep this relationship and follow the banker. So I use the fact of being affected by the ban as an instrument that incentivizes some borrowers to follow their banker at a higher rate, and I directly test whether the propensity to follow increases with my first stage.

This diagram defi- describes how I define the event of following the banker. I-- During the sample period, I identify bank-borrower relationships. Then, using information bankers specialization, I link bankers to municipalities. In the data, I observe whether banker moves from one bank to another, let's say Wells Fargo.

I know that Issuer A never worked with Wells Fargo before, but now I see that Issuer A issues a bond with a bank that just hired their relationship banker. Identify-- I define affected issuers as the ones who relied heavily on the banned underwriters. The approach that I use is the instrumental variables approach that allows me to estimate what's the value of following the banker relative to losing the banker, so it's a marginal decision to follow the banker.

The instrument or the intent to treat is the exposure to the ban. The treatment is the event of following the banker. In the first stage, I instrument the decision to follow with the exposure to the ban. In the second stage, I investigate how instrumented decision to follow affects the borrowing costs Let's move to the results.

I checked the relevance condition by running the first-stage OLS regression. And here, as we see, the propensity to follow the banker increases, and the increase is economically significant, as it is about 70% more. Now let me give you the headline result. Again, the main question I ask is whether relationships with banker matter or whether all the value comes from the bank.

If all the value was coming from the bank, we would see no significant effect after banker's transition. By contrast, column two here shows that the marginal decision to follow your banker brings you a significant advantage of about nineteen basis point, which is equivalent to roughly \$400,000 in savings per issue.

And this finding is consistent with value being portable with a banker rather than being locked at the institutional level. Let me skip this in the interest of time and move to the economic mechanisms. So how do bankers add value to borrowers in the municipal bond market? The first channel that I explore is the information channel.

It is well-established in the lending literature that bankers acquire soft information about the borrower and improve terms of the loan. To see whether a similar effect happening in the municipal bond market, I look at the sub-sample of borrowers without credit ratings. And here I find that effect is larger, though less significant.

So overall, information channel exists but is limited to borrowers without credit rating, for whom information asymmetry is probably the largest problem. I then move to the second channel, which is a more interesting channel, the investor network.

And it is a very exciting part of the analysis because I have very detailed data on the identity of investors. That is, for each bond, I know the name of the fund and how much they own of a specific bond. To study the investor network channel, I ask whether bankers bring their investor connections with them to a new bank.

First, I explore whether investors establish new relationship with the bank that hires their relationship banker. And here, I find no significant effect, possibly because investors already have a very dense network of banks. But second, I explore whether investors reallocate more capital into banks that hire their relationship banker.

And here, I find that indeed, hiring a relationship banker brings an additional one million dollars in additional bond purchases from related investors. So overall, investor connections do travel with the banker. Let me now take a step back and ask what this paper shows. The big-picture question I ask is whether it is the bank or the banker.

To answer this question, I collect novel data on individual bankers and rely on an exogenous shock that disrupts relationships in this market. The main takeaway from this paper is that bankers' human capital is portable because market knowledge and investor connections belong to the banker. Let me conclude by stating the contribution of this paper.

So this paper makes a novel contribution to the literature on the role of human capital in financial intermediation. In particular, I show that human capital in bond underwriting matters a lot, and moreover, human capital shows up not only through information channel, but also through investor network, which is similar to private equity literature.

The second important contribution is to show that bankers' human capital helps alleviate information frictions and search friction that exist in municipal bond market. So if there is one thing I want you to remember from this talk, is that even in the bond underwriting industry dominated by large financial institutions, human capital still plays an important role because bankers have their own knowledge and personal connections to investors.

And these are very good news for bankers and, because they create value, but possibly less good news for banks because this value is portable. Thank you very much.

LUBY: I forgot to actually introduce our discussant, Ivan Ivanov, senior economist, Federal Reserve vast expertise in capital markets, municipal market regulation, ESG, banking, shadow banking, et cetera

IVANOV: Thank you, Martin. Thank you very much. So first of all, I just wanna say these are my views and not those of the Fed.

With that, I can get started here. Let's see. So, so I guess I should be right here, right? Yeah. Okay. So I'm not going to spend too much time on this here since the other did a great job. But I think this paper is is very neat. And so let me go straight to why I think it's neat, right? So basically the paper does something that other, like, studies have tried in the past.

So there's, like, lots of banking work out there who has tried to, like, assess, you know, the value of loan officers the value of bankers for you know, other settings, like, you know. But their settings are not as clean as what we see here. And I think in my view, I think why this is so clean is because the author is able to, like, observe when the banker leaves the bank, when they leave-- when the, the, like, banker switches the bank, and then when local entities, like, work with the same, like, banker at two, two, like, different banks.

So this is, I think, what's going for it in terms of, like, the, like, identification portion. And I think the second part is, you know, the Hexa shock which we used also in our paper with Dan where I think these banks were forced to leave the market. And so these two, like, combined, I think makes for a very nice setting.

Okay. So, basically, I think where the paper should push a little bit more here is basically what she finds, or at least how I view these, like, view these results on net, is that in this setting, at least in this shock right here, most of the value add that's added by the underwriting r - relationship is the banker.

Most, if not all, right? So I think this is the part where the paper has to do a little bit more right? Because it seems like a very strong, like, finding, but I wanna see a little bit more on this, okay? So, like, you know, but what does the bank really add? I mean, there's all these other studies that basically argue that maybe only up to anywhere from fifteen to forty percent of human capital you can move, and then the rest is at the bank, right?

But so I have a little bit more on that in a few slides. So- Okay, the part that you maybe need a little need to work a little bit more on is the following, right? So I think you show that in the full sample spreads increase after the shock, which is exactly what we find as well. You don't use the same exact- how measure, so you use the spreads, right, relative to the MMA or like curve, which is not exactly the same as what we do, but like close enough.

So basically, the costs go up, which makes sense. And then, but then you find that the savings are just very large. So basically, the spreads go up of by four basis points in this full sample. But then, like, being able to keep your banker though saves you a lot more than this cost increase, right?

So I just wanna know why that's the case, you know. Can you reconcile? And the first thing that came to mind here, so this paper by Sharpe from 1990, which is a very highly cited papers, Steve Sharpe Steve Sharpe and I worked at the board. He was just amazing. So basically, Steve has this paper about low- lowballing right?

And so how the first time as a bank when you start to work with a company or state or local entity, you're likely to offer them a lower rate just to get them to work with you, and then over time these rates increase, right? Because you have locked in the firm or the, like, entity and so on, right?

So, I wanna know if that is happening, and I know your paper has this, that, that reference there that you try to do something, but I didn't see it in the, like, results section. So, so I think that would be like really good to check out. I think what's going for you here is that you have some more data now relative to where we stopped with Dan.

So you can pretty much have five years after the shock, so you can observe a lot more than what we could observe at the time. And I think the, the big part here is that this type of result is everywhere, right? The triple diffs show like exactly the same thing. So basically, the cost for everybody would go up by five, five base points as far as I remember, and then the savings were 15 or 10.

So I so I wanna know more why that's the case. Okay. So, I think for lowballing you can test like in a very straightforward manner. I mean, it might be hard because the data are sparse, you know. But I think you, you just absorb some of that story though because you include these bank by year fixed effects.

I think I would like to like relax them a little bit maybe and see what happens. And then if you have a five-year sample after the shock, like you can probably do do this for a good chunk of the state and local entities out there. So your findings for the risky borrowers and the ones that are opaque that are non-like-rated are very large very large.

I think there you find 40 basis points, so I would like to know more, right? Because that's a giant effect. But yeah, I think you can like reconcile it. You just need to

carefully slice the samples, start from the like beginning and start like, you know, adding these these like filters.

Okay. So, so, so this quibble that they have about the IV I think, So basically in our paper we find that the shock affects a lot of things, right? Like it affects basically competition. It affects like the likelihood that you go like the, the negotiated route. So, so I think the IV here has to affect spreads only through you following your like banker.

And if there's other channels that is happening, that's an issue here for the setting. I need to think more about how you can deal with this. Fixed effects maybe, but maybe that there won't be enough either. But I need to like think about it. I think this should be okay if you have a more clear story of how that happens, like, you know.

Okay. So, the switching, right? For-- The switching for the banker. Well, I really would like to learn more about this, right? Because let's say J.P. Morgan left the state of Texas. Well, I mean, at that point you know, the other banks that are left in the market would try to hire the best like, of the folks who worked for like J.P.

Morgan. And they would try to hire the people who actually have worked with the most state and local governments, right, f- who can generate fee like income for the new bank. So I think that could be an issue for you with the like identification. So I think you need to look into this more.

Are there any non-competes, like, you know, for these bankers? Because I know some banks ask you to do those, some others don't. But yeah, I think this would be good to check, right? Because they could also affect, you know, who is left in the sample. There could actually be another channel for you to argue that this shock is quasi-random, right?

Because if if like prior to the shock, like some bankers for like whatever reason had non-competes and some, some others don't and these two groups look similar, then you could use this like to like help your tests. Okay. So I have a few like quibbles here, minor quibbles that I think you can address.

So Dan and I worried a lot about what happens when banks reenter the, the state, and we found a bunch of cool things. It was messy, but you know, there was a lot going on. So, you can see here-- Okay, so is the banker going to go back to their old bank for something or maybe not? I think my, my like answer right now would be probably not, right?

Because it's a big move to like just like switch back. But so Okay, so bankers. Okay, you use VPs, MDs. I think that's like a quibble I have with everybody who uses loan officers. So basically, some other work has been calling loan officers these VPs and MDs, and like, are they really the loan officer?

They're not. There's just like people under who actually are doing the loan officer work. So I think you, you gotta look into this. I do agree that ultimately they sign off on every deal, but I think y- you need to just say more about, okay, what's their role, right? Is it the, like, rank and file, like, banker, or is it the loan officer, the, like, MD who is, like, over them?

Okay, so are you able to observe lower-level bankers? My, like, answer here would be no, right? I mean, it's hard to see that. Portable human capital you know, I think prior work has found that's a very small amount. You find that's very large. So I think it's good to talk about why, right?

Because this could be, like, another way for you to say, right, this is the value I add here. Okay. So, I feel like some of the statements in the paper are too strong. For example, you're saying bankers are the relationship holders with funds. I don't buy that. I think this seems, like, just too far-fetched.

I think you need to show us some, like, evidence. So, Dan and I actually found, like, on this end, that when these guys switch, they tend to place with more, like, local, like, investors rather than funds. Okay, so that's all I have. This is a great paper. You should all read this paper.

It's really nice, and we learned something new. Thank you.

LUBY: Can you hear me? Okay. Great paper, great comments, Ivan. A lot of your comments actually comport with some of the things I was thinking I was gonna ask, so that's great. We'll open it up now to questions or comments. I assume there'll be some bankers that wanna talk about this.

AUDIENCE QUESTION: Mike Yevisik, Bancroft Capital. I grew up on an underwriting desk, but now I've moonlighted as a banker for a while. So, I will tell you that most of the bankers that I've worked with can barely spell Vanguard, let alone know how many bonds they own. So I definitely think it's the underwriting desk and the salespeople that are gonna have the fund relationships on that side.

But the one question I had was wondering if you had taken into consideration the relative size and kind of, stature of the underwriting teams and banks that people move to. In your example, PNC moving to Wells Fargo it's probably a, a bump up barely, you know, based on looking at the rankings.

If someone were to go come from JPMorgan to work at my firm, it would be a complete other direction, right? So did you account for kind of the, the overall stature of the investment bank, and did that maybe impact some of the results that you saw with how many basis points got saved on those deals?

BOREYKO: Thank you very much for the question. It's a reasonable question. The only way I control for this right now is by introducing bank fixed effects. In ideal

world, I would love to have data on all bankers who work at this, at the team and control for the number of bankers in the underwriting desk.

So this is something that I would love to do and maybe with new data availability, I will be able to do that.

AUDIENCE QUESTION: Thank you. I just-- I would love to learn more about the controls. So it seems to me, and I know you mentioned that in the beginning, but it seems to me that it's still a concern that the best banks are able to attract the best clients and also the best bankers, right? If you have a bank that is doing really well, aren't they more likely to get new clients?

And also the banks that end up in Bond Buyer. That's another part of my question is if you accounted for protection-- potential selection effects in the bankers that do end up in Bond Buyer, because this is a very selective high end of the spectrum. Perhaps it's also selecting for banks that are moving into firms that have big PR departments that are willing to get them in Bond Buyer, and are-- those are also firms that are more likely to be doing better in general.

So just different selection effects as, and how, how-- If you could expand how you went about controlling for those.

BOREYKO: This is also a very valid question. In terms of the selection of bankers, indeed, Bond Buyer focuses on senior bankers. These are mainly managing directors with an average experience of more than ten years.

So I would say that the interpretation of the results changes so that the role of human capital of senior bankers plays an important-- Senior bankers play an important role. Coming back to your question on the banks, it is it is an interesting point because most of the banks that were banned they were the largest banks that worked with probably... yeah, it was the largest banks. And now all the other banks that hire bankers, they are slightly lower in rankings. So possibly it is a good idea to control for the quality of the bank, and for this, I will need to add more data to the analysis.

AUDIENCE QUESTION: Thank you. Interesting paper. I missed the question of-- I understand that when you had a situation in Texas where, say, J.P. Morgan is leaving the state. So now, if the relevant municipality wants to stay with someone they know, their only choice is to go with the banker. Did you develop any data as to in cases where the banker was leaving, left J.P.

Morgan, but J.P. Morgan still was in the state, and there the issuer has the choice of staying with the bank they know or staying with the banker they know?

BOREYKO: Yes, I do have the analysis pre and post-shock, and what I see is that the propensity to follow your banker significantly increases after the shock. So

unconditionally, only one out of five borrowers follow their banker when their banker moves.

But with the shock, it's about three out of five borrowers follow their banker.

AUDIENCE QUESTION

[off-mic]

BOREYKO: No, relationships with banker become more valuable after the shock because you lose your bank and the only capital you can keep is the relationship capital with the banker

AUDIENCE QUESTION: Just a question on the controls. How did you control for market conditions? Maybe they got lucky, they left the bank, and then the issuers made a decision to go out at a particular time and market conditions were more favorable. I'm trying to figure out what your baseline was for savings.

BOREYKO: Yes. So my sample runs from two thousand nineteen to two thousand twenty-four.

The conditions are more or less-- So I control for time-fixed effects. So for borrowers in the same timeframe, the effect should be the conditions are the same basically.

LUBY: Questions?

AUDIENCE QUESTION: Yeah. So I just had a question about the methodology. So you use instrumental variables approach, and you mentioned that the-- So, like, you have the Texas experiment or shock and that in order to work, is gonna need to be correlated with people following their banker into a different bank.

But it can't affect your outcomes through any other channels- ... in order for it to work as an instrument. And I apologize if I missed this, but I'm sort of curious, like, what are some of the other channels that you're concerned about that would sort of be a, a barrier to this as, like, a causal analysis?

BOREYKO: Yeah, excellent question, and it corresponds to one of the comments that Ivan made about the exclusion restriction. I-in fact, one of the other channels that can affect the result is the change in market competition, and this is what Ivan and Daniel show in their paper. The way I control for this is I include the HHI index, the market competition index, and I also incorporate bank-time-quarter fixed effects.

As I learned today, there are many more things I can do to fix this issue.

IVANOV: Maybe I was unfair. I, I- Sorry to think about this.

BOREYKO: But- Yeah. ... I will definitely work more on that.

LUBY: Any other questions? I have one question. Did you-- there's research out there, it's more in kind of the public administration literature, I think, where there's been studies that show actually that familiarity and using the same underwriters and s- using the same municipal advisors on transactions actually leads to higher borrowing costs.

Did you conte- can you contextualize this with that and what's, you know, what's kinda going on here differently would you kind of, hypothesize in terms of what was shown in that research?

BOREYKO: Yes, indeed the hold up problem exists in other areas of financial intermediation. I find no evidence of a hold up problem in the municipal bond underwriting. Yes, I just don't find evidence on this.

LUBY: Okay. And then one, one suggestion, I think Ivan made a really good one, and I - probably the, the bankers in this room would agree, is coding for you know, MDs perhaps and above would be probably the best way to think about following a banker.

A VP is probably not the person that's gonna be leading on those transactions. And then, of course these firms have different, you know, terms too, executive directors and directors, et cetera. So y- I think you need to be probably-- There probably needs to be a little more precision there in terms of your coding to be able to capture what you're trying to capture and test what you're trying to test.

BOREYKO: Indeed. It is a very interesting thing that across banks, the hierarchy of bankers differ a lot. And so what-- one thing that I try to do is to have this standardized hierarchy of bankers inside the bank. One thing that I can do is to also cont- control for the experience of the banker, because sometimes in the data, I see the VP with a fifteen-year experience working in the industry.

LUBY: Right. And you did that actually with the MBO stuff or the-

BOREYKO: I started- Yeah ... doing some tests, but I can do more on that.

LUBY: Okay, great. Well, it was great paper. Great comments, Ivan. Let's give a round applause to the participants here.

WESSEL: It's nice to see you all again. I'm David Wessel from the Hutchins Center. And our tradition at this conference is always at some point to have a panel with elected officials who actually have to execute the policies that academics think up and municipal bond markets demand. So on my left, I have Arunan Arulampalam, who's the mayor of Hartford, Connecticut. He's been the mayor since January 1st, 2024. He's a lawyer, but he says he's a recovering lawyer, which is good. My wife's a lawyer. I get in trouble every time I make jokes about lawyers. He spent some time

practicing law. He was the deputy commissioner of Department of Consumer Protection for the state, and before he was mayor, he was the CEO of the Hartford Land Bank.

And to his left is Fritz Kaegi, who has been the assessor, elected assessor in Cook County, Illinois since 2018. A job he's quite proud of because I ran into him on an airplane, and he was sitting there with this polo shirt that says, "Fritz Kaegi, Assessor, Cook County." And I thought, "Boy, that takes some guts." It's only because he's a big guy you could do that. Unfortunately, Fritz recently lost a very close campaign for re-election. Turns out you can run against the Chicago Democratic machine and win, but they get revenge. He's been in the financial market. He was at Columbia Wanger Asset Management before he went into the government.

And so, I wanna start by talking about something which... Oh, and I should mention, as you know, Hartford is slightly smaller than Cook County, Illinois. It's a population of about \$125,000. And the median household income- People. People, sorry. Median income is about a little less than \$50,000, median household income.

Cook County, Illinois is 5.2 million people, median income of about 83,500. But of course both these cities have a wide distribution of income and stuff. Cook County includes the city of Chicago and its suburbs. Connecticut has 100, 188 towns, I think. 169 towns, and so it's, each of them is pretty small.

I wanna start by talking a little bit about property taxes and assessments because it's relevant to the conversations we've been having, and both these guys have been working on it. And Mayor, I wonder if you could start. Hartford did a reevaluation, a reassessment of houses in 2021, and they were due to do another one this year, and they've delayed it.

So can you talk a little bit about the politics of... And I should mention that both of these municipalities get a lot of their revenue from the property tax. This is not an insignificant part. Can you talk a little bit about what the issue is with reassessment and why isn't it a good idea to just keep doing this as housing prices go up?

ARULAMPALAM: Sure, yeah. Thank you, David, for having me. Thank you all for being here. You know, you've listened to smart people all day, so at some point, a politician had to come up and dumb down the crowd. I, I really appreciate you having me here. Yeah that, I think that's a good place to start. Hartford is a city of a little over 120,000 people but center of a metro area of 1.2 million people. And for that me- we have no county government and for that metro area, what that means is that we carry so much of the challenges and burdens of that metro area. There's 1.2 million people who probably think of themselves, at least a majority of them, as part of Hartford or Greater Hartford area. We carry-- we have 90% of the homeless beds for that 1.2 million people.

We've got the methadone clinics and the two major hospitals and 52% of our property is untaxable, and we rely so heavily on this property tax base.

WESSEL: It's not taxable because it's government or university.

ARULAMPALAM: Because-- Yeah, or non-profit. And and we don't, you know, receive... We, we receive for some pilot payments, but they are a small portion of what the total value of that property would be.

And you know, there's only two real taxing mechanisms, property taxes and car taxes, you know, some form of property taxes, and then some personal property taxes. But I mean, our real estate property taxes are the vast majority of our revenue generation potential, and we struggle year after year to meet just the rising cost of you know, the workforce the rising cost of maintaining city buildings and to meet that with stagnating revenue.

And actually, this year, we had a very modest property tax increase, but we've got also the largest, property the highest property tax rate in the state. And and then we've got this large commercial corridor core, which we can talk about in a moment. But we've got, you know, for those of you who know Connecticut, we've got kind of five bigger cities moderate-sized cities depending on where you live.

But, you know, we've got more commercial square footage than Bridgeport, New Haven, Waterbury combined. And of our commercial square footage in our downtown, we think about 40% of it is actually vacant. And so property values have really bottomed out for a number of commercial properties because a number of them are largely vacant.

And so we really rely on these property taxes and from a purely financial standpoint revaluation would help us. At the same time, we've got the lowest homeownership rate in the state of Connecticut. We've got a 23% homeownership rate, and the neighborhood that I live in Hartford has a 7% homeownership rate.

We are struggling, we are fighting to try to create more homeownership and you know, if we talk about housing, I'd I- happy to talk about sort of how we're looking at it, but we're trying to build homes in vacant lots. We're trying to make it possible we're creating a system for Section 8 voucher holders to be able to put those dollars towards homeownership.

We've got to be able to try to build wealth that's sustainable in the city, and at the same time not lose the few homeowners that we have. And there are neighborhoods where families have been holding on to this house. Black families that were at one point the first Black families on their street and now have seen the demographics completely shift and are holding onto that last house that's the last bit of generational wealth they have in their family and will be unable to afford it if property taxes rise steeply on them.

And what we know is that given the value of our commercial property, given how reliant we are on our downtown commercial base this-- the moment we undergo revaluation, that will have a really negative impact. And, you know Hundreds of

people are likely to sell their houses move out. It will destabilize communities and neighborhoods and have impacts on families that are long-reaching.

And so, you know, we are trying our very best to keep our foot on our pedal to build housing at a steady enough rate to be able to address the challenges we're facing before we can go through a revaluation that we know... You know, to mitigate the impacts of a revaluation that we know is going to have a huge and devastating impact on so many families.

WESSEL: So the, a revaluation, the commercial properties would all be marked down, and that would change, and the commercial property owners aren't appealing up the wazoo? They're they're -

ARULAMPALAM: Yeah. They have they have undergone a number of we have undergone a number of property tax appeals. Most of them came soon after that revaluation. We've-

WESSEL: So 25 year ago.

ARULAMPALAM: We set aside, you know, in my first budget we set aside a in, in 2024 a, about \$7.5 million just to address property tax appeals. And it's sort of stabilized, and we're actively investing in some of those commercial properties as well, trying to convert a number of them into residential properties.

Working with the state on a larger scale plan to k- to right-size our downtown to convert a number of our commercial properties into residential. And I think my... I'm hopeful that five years from now we'll be looking at a very different outlook. But right now it means that people are you know, people are hurting and a, a reval would, will be the thing that pushes many people over the edge.

WESSEL: So Fritz, can you talk a little bit about the history of assessments in Cook County and what you found when you got there and what you've done since then?

KAEGI: Sure. So, Cook County is a place that is very economically diverse. So you have very wealthy communities, you have poor communities. We have 133 municipalities in Cook County.

We have nearly 1,000 units of government in Cook County alone, and we, in our many of our units of government, especially school districts, are overwhelmingly dependent on property taxes. There's a total of about \$19 billion of property taxes paid every year in Cook County, and we have a zero-sum system So basically levies are allowed to rise by a certain percentage every year for every one of those nearly 1,000 units of governments.

And every property owner's share of that levy burden where they're living is shared with other taxpayers in their community. So if you're, for example, a big commercial building like one that might be in a Roonan's jurisdiction, and you appeal your value

lower, then that means a little bit of burden is shifted onto everyone else automatically.

We're all basically sharing a dinner bill in our system. The historical context, for those of you who don't know, is that Chicago and Cook County is kind of like the urexample of an urban political machine. And assessments in the assessor's office, the office that I run, was sort of the platform for using patronage and favors and punishments on people in the community.

So the person I defeated in 2018 was literally the boss of the Cook County Democratic Party. And previous assessors got elected to office by taking campaign donations from property tax appeals lawyers. The most notable which was a moonlighting speaker of the House in Illinois, Michael Madigan. The most powerful alderman in Chicago, Ed Burke, was also maybe the number two property tax appeals lawyer, for example, handling Trump Tower. Both of these guys are in jail now, for context.

And in Chicago, there's, like, a long folklore of frustration about this, that this whole system was not on the level and that you had to appeal to-- and my father, who's a professor of history you know, broke it down and he said, "Fritz, you know, you're gonna get an assessment in the mail. You're gonna think you're pulling one over on the assessor, but you're not 'cause everyone's assessed artificially low, and you're gonna be overpaying your share unless you appeal by hiring this guy who has some association with the assessor. And if you don't do that, you're a sucker 'cause everyone else is doing it." That was the folklore that was brought into, and I ran to, to try to reform this, to change it, to use better data science, eliminate favoritism, don't take donations from those property tax lawyers, and it would generate more equitable outcome and a better economic environment

WESSEL: And what's happening with the commercial residential mix in Chicago? And Cook?

KAEGI: So it, basically in Chicago itself about half of property taxes are paid by commercial, about half by residential. Residential pays a little bit more. In the suburbs, it's about two-thirds residential, one-third commercial. And about two-thirds of overall property taxes are going to our school system.

So schools especially depend on property taxes. They don't have really any other lever to raise revenue. And so they overwhelmingly depend on it. And what we've seen in the last few years in Chicago is that in general, we've seen rising house values since the pandemic. A typical house value in Chicago is about four hundred thousand dollars.

We've seen the greatest uplift in prices actually on the lowest price points in, you know, recovering after years of being in the doldrums from the housing crisis. But then on the commercial side, we've seen, you know, an implosion in value in office buildings in the wake of the pandemic, but also a rise in in success for industrial data centers, hotels other kinds of commercial properties.

These commercial properties were very under-assessed before I came into office. And we'll talk more about how the, our property tax system is sort of a, a very notable instance of you have highly concentrated benefit and very powerful actors, and then you have lots of other small actors. And the way property taxes play out is sort of a tug of war between what is a highly dispersed disadvantage versus a relative advantage for big property owners and how they try to exercise that power in the property tax system.

WESSEL: Does that resonate with you? Is that the way you think you feel?

ARULAMPALAM: Yeah. I, look I think that just to put it a little more simply we've got these large property tax owners in our commercial court who have a team of lawyers, and we've got our city's corporation council who are small but mighty fighting against them. And then we've got these old families in, in our neighborhoods who are trying to hold onto their properties and may not know about a property tax appeal system may not even know...

I mean, we've got a tax appeal commission that can look at those individual cases and sometimes are really good at advising those who come before them "Hey, send me, you know, pictures of your kitchen. Send me pictures of your back porch so we can get a better sense of what this property looks like."

May not know that even exists. And, you know, the massive gap in the a- ability to appeal a valuation I think further exacerbates just the general real estate environment in which residential properties are valued in Hartford and a lot of other places around the country so much higher than commercial properties because of the impacts of COVID and the impacts on commercial properties.

WESSEL: So you mentioned that very small, an unusually small percentage of homeowners, homes are owned by occupants. And are, are they owned by-- Are these single family homes that are owned by some absentee landlord, or are these multifamily? Just trying to get a feel for that.

ARULAMPALAM: The, the ones that aren't owned by owner occupants? Yeah. Both. It's a mixture of single family, multifamily, and we've got, you know, we're one of those old New England cities. It's got a lot of duplexes and three units and the vast majority of them are owned by landlords, and many of them out of state.

WESSEL: I see. Okay. Let's talk a little bit, you mentioned, Mayor what you're doing on housing.

We had a panel on housing earlier. There's a lot of talk about what things seem to work if we wanna increase the supply of housing. And I'm just curious, what are you trying? What's working? What isn't?

ARULAMPALAM: We're trying a bit of everything. So it depends on how much time you have.

WESSEL: Well, that was the advice of the earlier panel, I think.

ARULAMPALAM: But you know, I just, you know, broadly the way we've approached this is there's been a lot of conversation on sort of the demand side and home ownership programs for individuals and to be able to afford home ownership. What we have nationwide is a supply side issue. It... We have not built housing quickly enough to keep up with our population. That's all kinds of housing. That's home ownership, that is rental housing, that is low income, moderate income, higher income housing. We just have not kept up with the demand that we need. Probably need to build about 7 million more units nationally.

We're trying to build about 5,000 units of housing in Hartford over the next five years. And that's gonna mean a whole range of housing. And so we've, you know, we've done a study together with the state and w- a quasi-governmental economic development arm the CRDA in Hartford, to take a look at all the downtown commercial property look at the real vacancy rates and come up with a plan and a number, a real figure, to put behind what it would take to convert enough of that property into residential.

Looking at all the floor plates, trying to figure out which of those properties are most convertible to residential and what the cost would be to convert enough to push the remaining commercial properties into fewer buildings. And both hold keep those, you know, buildings afloat, but also residential rental properties appraise so much higher than commercial properties, and that'll be a huge boost in the arm both for housing and for our economic bottom line.

We're looking at converting vacant lots into home ownership opportunities. We're looking at turning you know, almost every other, every kind of vacant building in our city that we can into housing. We're also working on strategic programs to both build our capacity for building housing by creating more folks in, within the community who can take on and develop smaller scale two to three unit housing projects and turn them into housing by, you know, incentivizing city employees to purchase housing within the city of Hartford. We're throwing everything we can at it.

WESSEL: Have you had any success with actually turning a commercial property into residential?

ARULAMPALAM: Yeah, we've had a few. There's a building right across from City Hall actually that opened up last year. We are turning a, a former office building where I actually once summered as an as an attorney at one of the law firms there into-

WESSEL: Is there gonna be a little plaque on the bathroom that the mayor used it.

ARULAMPALAM: I'm not worthy of a plaque at that building. But we're turning it into dorms for UConn that they're expanding. They've never had student housing in, within the city of Hartford, and they're expanding. And we've got three or four other

properties that we think within the next, two years or so will have will be underway in, in converting into housing.

WESSEL: So one hears a lot of complaints from builders about the permit process. Have you looked at all that? And have you changed anything in Hartford?

ARULAMPALAM: Yeah. You know, I came from a housing, a bit of a housing background. I ran our city's land bank, and I saw firsthand how difficult it was to get a permit in the city of Hartford.

So we made it something that we tackled within our first-- starting in our first month in office. Within our first year, we cut permit times in the city of Hartford by 57%. The average permit when I walked into office took about 40 days. It now takes about 17 days, and we did that within a year without any outside dollars spent on consultants or technology, just sort of trying to reconfigure systems in the ways in which our builders building inspectors, our fire marshals, our zoning kind of all communicated which-- with each other and how those were how those applications came together.

We're now working on AI solutions to try to speed up the plan review process and the permitting process even further. Our goal is to make it the easiest city in the state to get a permit.

WESSEL: Fritz, what do you think about the technology here in AI? Is it gonna help? Or what are the risks?

KAEGI: Well, what I can say is that we've used machine learning on valuing homes through our own home pricing models since 2021, and it's made a very big difference in making residential assessments more fair.

Some of the academics in the room may be familiar with the work of Chris Berry at the University of Chicago Harris School, which has found a pronounced tendency for as you go down the price scale in homes, you go to lower price points, assessors across the United States tend to overvalue them. And there are two big drivers of that.

One is that most assessors are using m- regression models to value houses, and that can be very dangerous because here we are in Washington. Imagine you're mixing in Capitol Hill with Anacostia. I know they're not next to each other, but imagine you have a poor neighborhood and a rich neighborhood right next to each other, and if you average the sales prices for the two, you're gonna overvalue the poorer neighborhood's homes and undervalue the wealthier neighborhood's homes.

And basically, that happens across the United States to the tune that the bottom ten percent is usually about forty percent overvalued relative to the top ten percent. There's another driver of that, which is that assessors generally don't have good enough information about condition and quality of the home.

And as you go down the price scale to lower price points, condition and quality tends to be lower, which again if the assessor is seeing everything as like an average condition and quality will tend to overvalue those homes. So what have we done? We replaced using multiple regression models with using binomial tree models, which is basically just using more sophisticated data sciences out there.

If you have cheaper-- cheapening compute, you can do a lot better, more accurate models, and we've eliminated about eighty percent of the disparity that was there in residential modeling. So that's something where AI can make a really big difference for people. But AI is only as good as the data that goes into it.

We don't have that good condition and quality information. We can't go into all one point nine million properties and see what's going on there. But there is a data set which does have this information The FHFA, the Federal Housing Finance Administration, oversees a database called the Uniform Appraisal Dataset.

Every time someone in America is refinancing a mortgage or buying new through a federally guaranteed mortgage through Fannie Freddie, FHA, or VA, the condition and quality of that home is measured in appraisal, it goes into a national database. So we're leading a group of the top 25 jurisdictions like ours, including Maricopa County in Arizona, Dallas, Philly, Detroit, LA, many other areas to get access to this UAD data.

And so we've been pushing for that. The FHFA, for any of you who's ever dealt with FHFA, is still kind of a relic of being a captured regulator of Fannie and Freddie, and hasn't thought about how they can affect affordability for people on the property tax side. And this is, like, an area where I think it's an interesting trend where we've had formerly separated silos that weren't used to thinking about other parts of the housing market.

And so the FHFA's always thought about the financial costs of buying a home. So, so much in policy about housing is focused on reducing financing costs, reducing purchase costs, reducing the, all the other costs of ownership that come from that side, while ignoring the property tax side of the cost of ownership.

And this could be reduced by having less regressivity in property tax systems across America. For someone who is buying a home at the bottom end of the price spectrum, their annual monthly... their annual cost is probably hundreds of dollars too high because they're being overassessed on a, on a entry-level home.

And that could be reduced by making this FHFA data available to homeowners and to assessors.

WESSEL: Okay, we'll get that. Come back next year, we'll have got that problem. All right.

KAEGI: Okay, cool. We're gonna work on it.

WESSEL: So, Mayor, I wonder if you could talk a little bit about being mayor of a, an American city, state capital, substantial-- not a huge metropolitan area. Had some pretty difficult financial situations over the decade. It was basically in close to whatever the equivalent of bankruptcy is in Connecticut. At a moment of a lot limited trust in government, a lot of polarization. So we know you were crazy enough to run for mayor, so I won't ask you why you did that. But, like, what... how is this working out, and how challenging is this, and how do you deal with those challenges?

ARULAMPALAM: Well, I think it's working out great. I, I love my job, I'll start with that. And there's... Being mayor is a challenging job but it's also I think the most rewarding job that I can think of because at the same time, I-- and I try not to watch the news, the national news on a daily basis but at the same time in which there just seems to be an almost stagnating level of dysfunction at the national level in DC. Mayors are charged with getting things done every single day.

And people will tell you, you know, they don't talk to you about your policy or what, you know, your, sorry, your party or what you think about national politics. They'll talk to you about the pothole that's on their street. They'll talk to you about whether trash is getting picked up and whether you're doing a better or worse job of snow clearance. You know, it is very practical and it is very you know, noticeable the impact that you make day to day.

And I think mayors as a group, and I have a great great relationships with mayors all across the country. Mayors as a group tend to be more apolitical in terms of sort of party politics. In fact, I'm still pretty new as a mayor and, you know, two and a half years in. For the first year and a half or so I didn't know most of my fellow mayors' party affiliations because they'll talk about housing and things that are working in their communities for housing.

They'll talk about, you know, what they're doing around violence prevention to make their community safer. They'll talk about how they're in, you know, helping create better schools or better, or, you know, early childhood programs. And they will take we will take from each other the best ideas.

It doesn't matter what your party affiliation is. It is ... you get judged not based on how, you know, you show up in a CNN debate. You get judged based on whether you are delivering for residents, and they can feel it. And I love that about this job. I think at a time when people feel so helpless and so frustrated with the world there's a reason that polls will show mayors are the most popular sort of political denomination of politicians in, in the country, because it's about whether or not you get the trash picked up.

WESSEL: Okay. So, that was a very good answer. I can see why you got elected mayor. So what... Tell me one or two things that have been really big challenges for you in the two years you've been mayor. Yeah. Like things that really were not easy to resolve.

ARULAMPALAM: Yeah, I think the two most structural challenges that we face as a city that will continue to be challenges for anybody who's mayor of Hartford or a similar size or, you know, similar similarly situated city, are one, you know, we consistently struggle financially, and we will never have the level of finances we need to address the level and scale of problems we have.

When it comes to housing issues, you know, the federal government just passed this build, big housing bill. Didn't actually put any new money yet into housing. Our state government has talked a lot about housing, hasn't put a ton of new money into housing creation. And so the little bits of hous- of dollars we have, we are trying to fix this immeasurably large challenge when it comes to housing, when it try- comes to trying to create universal pre-K, when it comes to trying to improve our public school system.

These challenges are so much bigger than the money you have. And then, you know, the second challenge is communities, especially in Hartford, communities, especially of color, who have been looked over and disinvested in for generations who, you know, I think are hesitant to believe that things could ever be different, are hesitant to believe that the investment will come and that I... you know, there's just an immense amount of potential within communities like the communities that I represent that is unrealized in this country. So much creativity, so much, you know, intellect, so much ingenuity that we are failing to tap into as a country because we fail to invest in things like public education, because we fail to invest in things like early childcare because we fail to make the investments in the communities that have been under-invested in for generations.

WESSEL: What's your relationship like with the state government and the state legislature? Good days and bad days ...

ARULAMPALAM: Yeah, depends on the day in which you ask me. It's, it is a good relationship overall. And I think that being a state capital forces every legislator in the state to come through Hartford and see how Hartford is doing. And and the state has contributed to... I will say, you know, the biggest chunk of our revenue outside of real property is our state contribution. And it's significant, and we would not... We would be in far worse shape if it weren't for direct funds, direct municipal aid from the state. And at the same time, I still think that the state has not realized the full vision of what is possible in the city of Hartford.

And we're getting there. You know, the state of-- I, I lead a group of capital city mayors across the country, and we talk about shared challenges and different ways in which we've approached state government. And we're a new group. We just, you know, just created this group last year. And I've learned something, you know, about other how other capital cities have been treated by their states.

And, you know, I'm in a better position than those capital cities that, in which the mayor and the governor or the party in, in, in charge are in different parties. But like, you know, Albany, New York, the state of New York in- just invested about half a

billion dollars into revitalization of Albany because they believed in having a strong, thriving capital city.

That's something that I hope every state does.

WESSEL: Yeah, we had a... I think it was last year, we had the mayor of Montgomery, Alabama, and his relationship with the state is not so great. And then we had the Republican mayor of, was it Omaha? And I asked him about his relationship with the state capital, and he said, "The state's not the problem, but I have five Native American tribes," and that's the one where they had a legislative decision- that the that they own the land or something. So everybody has their own challenges.

ARULAMPALAM: Omaha has a Democratic mayor now.

WESSEL: Yeah. So Fritz, talk a little bit about how you see politics in Chicago and polarization and lack of trust in government, and is it getting better or worse?

KAEGI: I would say it's probably getting marginally worse. You know-

WESSEL: Glad for the marginally.

KAEGI: There we go. So in my own particular lens you know, in the property tax system is an instance of where you see sort of concentrated potential benefit from favors or lower assessments that are given in assessments versus a very broad-based but small scale implications for everyone else.

And in our property tax system that plays out, and I can give you an example. I mentioned Chris Berry's research showing that we eliminated a lot of the disparities in residential assessments. His research showed that we saved the bottom 70% of homeowners about \$2 billion in levy that was shifted onto higher end homeowners and commercial property owners.

But in the election just, that just played out, you know, our political machine where campaign donations a lot come through building trades unions who are very close to real estate developers and, you know, large corporates and others who have a financial interest in moving our system back to where it was.

You know, they, you know, wanted to take back the office from an office that had been providing more broad-based benefits to lower end homeowners, and a lot of the lower end homeowners don't realize they got a benefit. So poor under-

WESSEL: You mean, they didn't understand the counterfactual. They would have had to pay more if not for you.

KAEGI: That's right, that's right. Especially, you know, talking about appeals that you mentioned in Connecticut. Higher level of appeals in Illinois tend to be controlled by the more old-fashioned kinds of folks in Illinois. So I think what is the read across to what we-- to what many of you might be concerned about is we see sort of a continuation of this theme and you know, narrow small scale benefits to lots of people, but very big benefits to a smaller group.

I think this is just gonna be getting worse across the country. We talked before we came out here that as we're seeing more concentration in companies, where now we have, you know, a dozen companies that are representing more than thirty percent of the S&P 500 potentially getting even more concentrated as AI grows.

That's gonna have more implications for our politics nationally just as it has in in Cook County. And it's very important to communicate with the public to understand the effects and implications of taxation in a very basic way. It is an uphill battle for all leaders, no matter where you are.

I think it's gonna get to be even more important in, you know, nationally, in other cities, in, you know, in the United States.

WESSEL: All right. I got a lot of questions, but people who've been loyal to staying all day, I wanna give you a chance. And if you don't have questions, I'll keep going. Let me have Okay, go ahead.

AUDIENCE QUESTION: The gentleman from Chicago.

WESSEL: Can you identify yourself for the benefit of-

AUDIENCE QUESTION: Yes. My name is Bonnie Wachtel. I'm in the securities brokerage business, and I went to school in Chicago, so, boy, good times. You know, many times when I hear about some problem with the downtrodden, and this is frequently lawsuits and causes I don't agree with. But nonetheless, they're being represented by public interest law firms and people who receive funding from the left in order to push back against this. Doesn't that work in Chicago? Can't there be... Can't the Ford Foundation or somebody take an interest in the property assessment system in, in your city?

KAEGI: Absolutely they could. And one of the things that we've found to be beneficial is that there was a lawsuit in Cook County for unfairness in our property assessment system that was outstanding before we came into office, and we signed a, a, an agreement. We made an agreement with with the litigants to make commitments, to lock in commitments for the assessment system into the future in terms of transparency, in terms of doing annual studies, making a whole bunch of other commitments.

And so we have locked that into place. But unfortunately, we are not the last word on assessments in Cook County. There are multiple other levels of appeal, and those

tend to be pretty much unchanged and less well understood. So really, we need to see more litigation go up against these other parts of a system like the appeals that still generates unfairness for homeowners, even as our own work has made it more fair.

So yeah, there is a role to play for these litigants, and I think it's particularly important in Illinois, which is kind of a one-party state, and there's not the typical balance that you see in having a two-party system. So I think that makes, you know, outside ways of bringing about change through referenda or petitions or lawsuits more important when you don't have the proper balance between different parties.

WESSEL: Yeah, there's two over here. Why don't you start with Natasha?

BOREYKO: My name is Natasha Boreyko from the University of Virginia. My question is about investor-owned properties. I don't know how large is the presence of institutional investors in Cook County or at Hartford, but do you feel the pressure that comes from investors, institutional investors, in terms of how aggressively they use tax appeals? Or by, vice versa, is it beneficial for local governments to have the stable tax base?

KAEGI: Natasha, I can start and then maybe Arun can-- first of all, I would say about three to five percent of single family homes in Cook County are owned by investors. Now, that's up pretty significantly from below one percent before the pandemic.

We've seen a real big growth in that. Generally we don't see... And they generally are buying homes at, with lower price points. We have not observed through our own data analysis that the areas with larger investor ownership affecting prices in a different way from other communities where there's less of that, but maybe, you know, we don't have enough data yet.

Where we still feel the greater impact of institutional investors affecting our property taxes is on the very largest properties. I just give you example of data centers. The most valuable property in Cook County is the Sears Tower, the Willis Tower. But data centers are ... there's several data centers that should be in the top 10. If you look at their 10-K filings with the SEC, with the representations that they've made in CMBS filings with the SEC. But when they appeal them before you know, bodies, not including us, they're able to wave away that value by saying it's not actually real estate, but it's personal property.

Even though many of these properties are owned by real estate investment trusts, and to be a REIT, you have, you're representing that it's 75% real estate. So we have to go in, and what I've been trying to do is bring forth more capital markets data. That's my background. So it wouldn't have occurred to people to look at CMBS filings or 10-K filings before I, I came in, and try to use Bloomberg and other sources like that so that people aren't using imaginary capitalization rates and say, "Hey, you know, here's the implied capitalization rate in publicly traded securities right here."

But that is hard to do when there's... Imagine there's half a million appeals or several hundred thousand appeals, and we have a staff of maybe, you know, half a dozen who can go up, you know, in those appeals forums with our own data. So that, that is the bigger institutional effect on the work that we do.

ARULAMPALAM: Yeah, I'll say, I mean, for Hartford, I think we see far fewer institutional investors, but far more individual investors, family investment real estate firms. And there's a, it has a huge impact on our housing stock and quality. I, I'm not sure that we-- there is direct correlation between sort of investor-owned properties and tax appeals, except that investors that have multiple properties across the city there, there's certainly an uptick in a-appeals across multiple properties.

AUDIENCE QUESTION: Matthew Zachary, City of Baltimore. I was wondering if you could both speak a little bit about transparency and technology. You know, Mr. Mayor, you mentioned using AI models in everyday processes like permitting. And Mr. Assessor, you spoke about using an ML model to to reduce disparities in assessment

KAEGI: I, I can start and then Aruna, you can go in. So, this has been one of the forefront commitments of our office that we thought that it would-- we would build trust in our system, and it was just the right thing to do to show our work. Because while our property tax system may be very hard to understand, what people can understand is if you're hiding your numbers or you're not showing your work, that's gonna build distrust.

So we show-- we have published the valuation models that we use on an open source platform. We have a, a GitLab you know, that's where we publish our code. It's completely open source. We show the choices that we're making and it's gotten a lot of acclaim, and we, we've tried to encourage other assessment officials in other places to do that.

And generally, the public loves that you're showing your work. Do they understand the model? Probably not. But having people who are in the world of data science vouch for us really helps. And then on commercial properties, we publish how we show and arrive at the value of every single commercial parcel.

So you could look up this building in our jurisdiction, see the rent we've assumed, the cap rates the occupancy, and so on. And we might be wrong, but that is so good for helping to have a basis of conversation and discussion for, "Okay, if you think our assessment's too high where are we going wrong? Let's just focus in on that." And we think that is probably one of the most important ways to build trust in a system that generally is pretty messed up. And there is, you know, th- these, these resources are available out there at lower cost. So a lot of places could do this.

ARULAMPALAM: Yeah, I think when we talk-- And I'll speak specifically to permitting, which I, you know, slightly more nuanced. I think when we talk about transparency it's important to remember, especially as government officials, that just because something is publicly available doesn't mean it's transparent. And so

building codes and fire codes are publicly available. Zoning codes for the city of Hartford are publicly available.

But that doesn't mean that, you know, the, the historic districts and historical overlays and the requirements that come with that are publicly available. That doesn't mean that the average property owner understands that or the, the person who wants to start a small business in our city understands that, or the person who wants to build housing in our city understands that.

And what I think the real opportunity is with AI is thinking about permitting more as permissioning, right? That this is the idea of permitting is that we are giving you permission under these circumstances to do what you wanna do. And it should be built around the system of how do I get to this end product of a coffee shop being created in my community, or a house being built on this vacant lot, or this parcel of land that has been abandoned for a while.

And, you know, I think those answers sometimes take a long time with city government especially, and may require you to hire an attorney or hire a lobbyist or hire somebody to help you navigate these city functions. And I will tell you personally, it requires many people to reach out directly to the mayor or to the mayor's p- chief of staff because of their frustration with it.

And, you know, if we could build a system in which you could type in, "Hey, I wanna start a coffee shop on 428 Washington Street." And and, you know, using machine learning, you can get an analysis of here's the zoning code, and here's what it'll mean, and here are the you know, accessibility requirements you're gonna have, and here is-- it's an historic district, and here's what that's gonna mean, and you know, here's, here are the building code requirements.

It would be a more transparent process than allowing people to try to figure out all of those layers of government by themselves.

KAEGI: But just to build on what Arunan was saying, I think state, local leaders, also corporate leaders as we're using, you know, machine learning tools, other instances of AI, we really have to train our executives to become critical.

Like, you automatically need to be critical of what are the deficiencies of these approaches. Where can they go wrong? How are we measuring them? And then, you know, what we do, what we've done with our residential assessments, you know, for the last five years is alwa- is run tests on, you know, the sort of final models that we're getting, see where they're, the results they're getting are acceptable in terms of disparities or accuracy.

And then we, then what we can do is say, "Okay, here's where the humans have to take over 'cause the, it's not getting us to the finish line. It's getting us to the 30-yard line, but in these neighborhoods it seems to be showing disparities or it's not accurate enough." And that's then where we're gonna concentrate our human effort and our dollars to make the assessments better.

So it... Executives everywhere are gonna have to learn how to train, basically be trained in not deferring to these models and knowing when to take over for themselves or to say, "Nope, I'm not gonna do that."

WESSEL: Louise?

AUDIENCE QUESTION: Can I just follow up on this question? Louise Sheiner, Brookings. Thank you. Can I follow up this question on technology? I have a broad question about thinking about state and local government and service delivery over time, and to what extent has technology enabled you to do more with less?

For example, you're talking about you don't have enough... You know, you never have enough financing. Some people think the public sector, you really just need as many people as you always had, and there's no productivity growth, and so it just becomes harder and harder. But we don't really know that, whether or not, you know, you can now... computerization takes over. You know, you can get rid of DMV lines. You can... i'm just wondering about the use of technology and saving money within government

ARULAMPALAM: Well, again, this might be an answer that's somewhat particular to Hartford, to the city of Hartford, but I don't know that it is -- we, as was mentioned, we almost went through bankruptcy 10 years ago. In fact, we would have if we didn't get a massive state bailout, and that came with some with a state oversight board and that we have been under from that time and we continue to remain under. And and even though there's been improved you know, fiscal outlooks it also has meant-- it meant 10 years ago and has continued to mean some really significant cuts within city services.

So we are far smaller in terms of staff than we were 10 years ago. And I don't know that and this has been, you know, my, my sales pitch internally to employees who are concerned about this. I don't know that w- there are efficiencies in terms of reductions of staff that at least we can find within the city of Hartford from better use of machine learning technology.

I do think that we could do more. We could make it a lot quicker to to, you know, get responses from city government. We could make it easier to do certain jobs. And I also think we could better utilize our staff. You know, I talked about sort of AI generated plan review. It's still gonna require somebody, a human being, to look over it to, you know, fix it, to to help the AI learn. But it's gonna cut out all of the stuff that the planners in our departments don't like doing. All of the busy work, all of the paperwork. You know, we've talked about AI-generated police reports. And in fact, there's some technology that going off body cam footage and and the initial 911 call can generate an initial police report that then police can you know, work on. Our police officers complain to me all the time that they're sitting there in their car working on police reports all day long and going back to their desk where they could be out on patrol. It could make the things that they like about their job better and cut down on the stuff that they don't wanna do.

In, in, in many ways you know, we've talked to our-- Hartford Hospital's our big hospital chain there, and they're building this huge tower in Hartford with these AI-powered rooms in which doctors walk in and you're gonna see this in hospitals all over the country. And instead of like you guys are used to in your appointments, instead of them looking down and typing the whole time they're talking to you, they can just have a conversation. No notes. You know, they don't bring anything in with them. They have a conversation with you. You're eye to eye and act like a doctor in the olden days when they were providing care to a human being, and the room is picking up everything and generates the notes when they walk out. Those sorts of things you know, can actually improve human connection.

It can actually improve service delivery. It can actually make people's jobs better and bring out the things that humans are best at. We have-- We as humans have become so automated, and I'm probably getting off on a tangent here, but that's how I think about AI in city government.

WESSEL: Do you have the resources to get the technology and the training to accomplish the goals you just enumerated?

ARULAMPALAM: We're working with a few large AI firms who are using Hartford as a guinea pig to try out these technologies that other cities haven't tried yet.

WESSEL: Cool.

KAEGI: Yeah. I, what I would say is that clearly the technology has made us better and has enhanced the possibilities and the effectiveness. It's been a multiplier for the effectiveness of our workers. Our models have gotten better. It's easier to deliver benefits. We're able to do all sorts of other ancillary functions better and more powerfully, and then we can focus our resources on the things where it makes the most difference. What I...

I've discovered two things. One, it is very good to have a couple data scientists on staff to work through problems to reap the benefits, but also to be able to do things internally when the world of software out there is not doing it and is too crappy. Because in the world of local and state government, there is so much crappy software that takes forever to procure and implement that by the time it's in place You know, technology is, you know, run-- at the core of Cook County's property tax system, we were running a mainframe that dated from the 1970s, you know, when the Blues Brothers was in the theater at the heart of our system until just, you know, a year ago. And we, that, that work that I mentioned on better modeling, what ... We created that outside of the default software that would've been available to us with you know, hiring a handful of good data scientists from University of Chicago's Harris School using open source software.

They were able to create models on its own, and we didn't even use that off-the-shelf software that was available for us that build in lots of bad habits, we thought. So I think a lot of local governments are gonna have to be nimble in hiring a few people that can know how to navigate this. I mean, I think a lot of localities have to be really

careful about what kinds of software they sign up for, 'cause you could get lo- locked into some really crappy contracts, as Cook County has been.

Cook County signed a contract to replace that mainframe in 2015. They paid all the money up front. There was no accountability if they missed deadlines or didn't provide enough resources at the contractor level. We're still grappling with this contract. And if you're talking about multiple different levels of government, where we're the

We were fast to implement that software in 2021, but there are other parts of our partners in government who were only implementing it last year. When you have these interdependencies built into software systems and procurement, that's where it gets really, can really bog down government, and you can't realize the benefits of technology.

AUDIENCE QUESTION: Again, as a journalist, do you guys feel like the effect of weakness of media industry, local media industry, or your social media is doing the job?

WESSEL: So Arun and I were talking about I used to work for the Hartford Courant, which has been sold twice and is now owned by one of these rapacious media companies that's completely sold their... there's no newsroom left. Everybody works, and the paper is a ghost of itself. And a couple of years ago, I'm gonna let them answer, but a couple years ago we had a paper, got a lot of attention about how the problems caused more fraud and higher interest rates in cities that had-- where the paper had died.

But you can...

ARULAMPALAM: Yeah I believe that. I was saying that people will tell me that back when David was at the Hartford Courant, there were five or six embedded City Hall reporters who would be at City Hall twenty-four seven, would report on the things coming out of City Hall. Now, if something big happens, we've gotta, we've gotta send out a press release. We've gotta talk to reporters. We've gotta get them to come in. And then we've gotta, I feel like we have to explain the entire context of it time and time again because they hire these, you know, twenty-two-year-olds and they are, like, are there for a year, and then they go on to try to do something else because the, the industry is dying. And then we've gotta, like, explain to some other twenty-two-year-old, like, "Here's what happened six weeks ago before you were on the job." It's brutal.

And I think in many ways, the the information overload but that's, I think, pushed from some of the national circus paired with just a hollowing out of our journalism you know, our our press corps, to me feels like a bigger problem than the polarization of our politics. Because the polarization of our politics has been emerging for a while. It is-- the issues in which they latch onto shift, you know, sometimes week to week, month to month. But when people feel overwhelmed and

they have a press corps that, that they don't rely on for news, then so much of the news comes from social media in which you can't deliver more.

You know, my videos, I've got, like, three seconds to hook somebody on what I'm talking about on social media, and then I lose their attention. So you can't have an in-depth policy conversation through social media. It's really hard to do. And the attention span has gotten so much quicker. And so to explain something like, "Hey, I implemented this great transparent system that has, you know, b- benefited you in your property tax valuations," is impossible.

There's no way that somebody like Fritz can convey his message And I think it's led to a worse politics, a a more base politics that's based on, you know, do you align on this side or this side on this specific issue, that, you know, we all know that there's a lot of nuance between those two. I, I think it is the biggest challenge we're facing as a democracy.

KAEGI: Yeah, I mean, we're kind of a test case for this. In 2017, so when I was just starting to run for assessor a series came out called The Tax Divide in the Chicago Tribune, which was written by Jason Grotto. It got runner-up for a Pulitzer Prize in local reporting in 2018, and it showed to the public, you know, the public knew the system was corrupt. There was lots of favoritism. But what it did was it showed the impact on average people. It showed the impact of corruption on people, on neighborhoods, in a way that was very vivid. So that's ... And that helped us win. That helped us really get attention for what we're doing. That's how I was able to beat the boss of the machine.

But since then, you know, Jason Grotto has gone on to Bloomberg. You know, a great reporter who would've covered this at Crain's Chicago Business, who knew his way around a Bloomberg and a CMBS, went and became a headhunter. We're very lucky that we still have press outlets in Cook County but it's much diminished. They don't have time. There's, for one of the papers didn't have a beat reporter for Cook County. And that makes it very hard to tell our story, and we had to spend a lot of time thinking about building up our outreach, building up social media. And social media is very fragment and getting more fragmented too.

So that makes it very hard to reach people, and I do think that made a big difference in this election.

WESSEL: Great. Well, please join me in thanking the mayor and the assessor.