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WELCOME

TRIPP KAISER

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

PAPER SESSION 4: FISCAL RISKS

MODERATOR: DANIEL BERGSTRESSER

Associate Professor of Finance, Rosenberg Institute of Global Finance,
Brandeis School of Business and Economics

AUTHOR: YUNJOO AN, Indiana University

DISCUSSANT: JESS CORNAGGIA, Penn State University

AUTHOR: RAHUL SINGH CHAUHAN, University of Chicago

DISCUSSANT: JEAN-PIERRE AUBRY, Center for Retirement Research

PAPER SESSION 5: SALT AND DEBT RELIEF

MODERATOR: CHRISTINE CURRY

Associate Professor of Accounting
New York University Stern School of Business

AUTHOR: FRANCESCO BRUNAMONTI, University of Lausanne

DISCUSSANT: YE TIAN, J.P. Morgan

AUTHOR: THOMAS LEE, University of Texas at Austin

DISCUSSANT: HOWARD CURE, Evercore Wealth Management

PANEL: USE OF AI BY STATE AND LOCAL GOVERNMENTS

MODERATOR: LAUREN LARSON

Nonresident Fellow, Hutchins Center on Fiscal and Monetary Policy, Brookings

NEIL KLEIMAN

The Governance Lab

RYAN MINNICK

Federation of Tax Administrators

ANDREW NGUI

Kansas City, Mo.

AMANDA RENTERIA

Code for America

CLOSING THOUGHTS

DANIEL BERGSTRESSER

Associate Professor of Finance, Rosenberg Institute of Global Finance,
Brandeis School of Business and Economics

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KAISER: Morning, everyone. Thank you so much for being here. My name's Tripp Kaiser with the University of Texas. I'm just gonna make a few opening remarks and then we're gonna get right to it. There is about four different papers that are due to be discussed. Similar format as yesterday. We have the authors, we have a discussant a moderator, and then there's actually a panel on how state and local governments are using AI at the end.

I'm not gonna say much more. Thank you all for coming to the second day of the conference. I know it's a lot and we really appreciate it. Just personally, , you know, representing the University of Texas now and coming from the industry and only being in academia for six months, I had never been to a Brookings conference before, and having sat through a day and through today as well I really am impressed that, you know, it's bringing bringing the industry together with higher education and academia is important.

And it's I think unique in the financial services broadly, but most certainly unique in the municipal bond space. And so I have a new appreciation for that platform and Rich and David and Dan and everyone else that that's made this conference happen over so many years. Kudos to you because it's really a great success and I hope it continues in the future.

So that's all I'll say today. Thank you all so much. Have a great day. And thanks again for being here

BERGSTRESSER: I'll quickly introduce the, the first panel, but also I want to echo the gratitude that Tripp expressed. And I want to say one thing that's particularly meaningful about this conference is the way in which it has been a platform for younger scholars, sort of, or people at the starts of their careers producing research to present and get useful feedback on research.

And so we have two papers in this panel that are both authored by current PhD students. The first paper is by Yunjoo Ahn, who's a, a candidate at the University of Indiana's Kelley School of Business. This paper will be discussed by Jess Cornaggia. So I will get out of the way now and turn it over to Yunjoo

AN: Hi everyone. Thank you for coming. This paper is titled Property Tax Protection and Municipal Bond Valuation. This is actually my job market paper, and I'll be on the market this fall. And thank you all for your feedback.

So we all agree that muni bonds are important. That's why we're here. The municipal bond market, which is worth four trillion dollars, like, supports local vital infrastructure such as, like public schools, water systems and hospitals.

So property tax is the biggest source of tax revenue for local governments. So for in perspective of municipal bond holders, it is important to keep property tax revenue, like, stable, especially during local recessions, so that local governments can use those revenue to repay the debt to these bond holders.

But however, local governments may not have the ability or incentives to raise property tax revenue, especially when they need to, because, like, we have, like, county cook assessor and a lot of experts in this area in this room, but they do face political resistance from the taxpayer, like Chris Berry, who was cited yesterday.

And some states just legally restrict the increase in the property taxes. So in this circumstance local governments face commitment problems to the municipal bond holders because they are limited to raise funding and invest in public projects. So in this paper, I ask, how does the downside protection on the local tax revenue affect local government's borrowing costs and in turn, their investment in human capital?

And the reason that I'm focusing on downside protection is because municipal bonds are about downside risk, and their credit risk is pronounced in downturns. This is different from stock markets, like stocks are about upside potential, whereas bonds, including the muni bonds, are about the downside risk.

So statewide regulations limit the decline in property tax revenue of the certain types of local governments. Okay. So ex ante, it is unclear how the downside protection affects the local borrowing costs. So this remains an empirical question because the protection can decrease local borrowing costs if local governments can credibly commit to their bondholders to repay the debt.

But on the other hand, the revenue protection can generate moral hazard problems because local governments can internalize the revenue protection and like debt is like tax revenue minus spending. So if the government had internalized the tax revenue protection and increased the wasteful spending, then that would in turn increase the municipal bond yields.

Okay. Also revenue protection can have limited effects if it is not a first-order determinant of the municipal bonds. So many people in this room had written papers on the economic risks of muni bond yields, including like recalibration and credit ratings to the liquidity risk and a lot more that is not cited here, but the-- are cited in the paper like political partisanship and so on.

So in my paper, I find that the revenue protection decreases local borrowing costs using statewide regulations that limit the decline in the property tax revenue of school districts. S-so I refer to these regulations as floors because they impose floors that limit the decline in the property tax revenue of school districts, but not of counties.

The goal of this policy was to guarantee minimum financial resources for schools and teachers and to enhance public school education. So fifteen states had independently enacted floors between two thousand to two thousand twenty-one. And in my study I'm interested in how the protection affects borrowing costs and school district is a setting to do that.

The states impose floors on schools only and not on counties, so it kinds of like provides a natural comparison between the schools and counties across states that have this regulation and those that do not. And also, school districts' ability to repay the debt is directly link, linked to the property taxes because it's the biggest own source revenue.

And lastly, it provides a setting to test if this protection had enhanced human capital investment or if it had just led to wasteful spending and generated the moral hazard problem referred to earlier. So student participation and the instruction compensation are the variables that I use to test whether the protection had been used efficiently or led to wasteful spending.

So, there are some people who have like public policy background in this room as well, and there is an extensive literature in the public policy department that examines how the school finance reforms had affected the real educational outcomes. And there is like

an active debate there, whether the money was spent efficiently or wastefully, and how much or whether it had improved student achievement.

But the missing piece in that literature is the borrowing channel through the municipal bond market and how the floor, which is the own source revenue protection, affects the borrowing costs and student participation. So my studies my paper studies that margin ex-explicitly and how the borrowing channel through the floor, which is the own source revenue protection, affects the educational outcomes.

So I first find that school districts in floor states face lower borrowing costs compared to the school districts in non-floor states and also compared to the counties and compared to before and after the enactment of the floor. So school district bond yield spreads had decreased by thirteen bps, which is around nine percent compared to the average.

And school districts issue bond by four percent more, which in dollar terms is around nine hundred k dollars for each school district. And because the floor prevents the property tax level from declining, the level did not decline, but I find that the volatility had declined by nine percent. So without a decline in the level, the volatility had declined, which shows that the property tax revenue was stable for these municipalities.

I then show that the floor improves educational outcomes rather than spending wastefully. So the floor had decreased the student dropout rates and the average class size, and also increased instruction compensation per student compared to the school districts in non-floor states. So that's a decline in the dropout rate by nine percent compared to the mean.

The class size decreased by four percent, and like teacher salaries and students sorry, teacher salaries and employee benefits had increased per student. But like all these benefits of school districts come at the expense of counties because school district and county overlap geographically. So they share the local real estate market.

So when the total local property tax revenue declines, the floor protected schools but did not protect counties. So the larger share of the decline is borne by counties itself. So I find that the county borrowing costs get worsened as the county property tax revenue declines in floor states compared to the non-floor states, and county bond yield spreads increasing and the bond issuance decreasing.

So I contribute to the muni bond literature by showing that property tax is the first order determinant of the municipal bond yields. And there are particular like muni bond studies that talk about education including like Jess and June's paper on North Carolina in political participation. But I show the fiscal determinant of the school borrowing cost, the revenue and the spending needs, and examine the real educational outcomes as well.

So fifteen states had enacted floors between 2000 and 2021. It provides a great setting for staggered DID. So for example, in Georgia, the local property tax revenue cannot decline by more than 0.5 percent for school districts. In Kentucky, that number would be 0.3 percent.

And in Nevada, it's split between the assessment value and the mill rate, which is just the tax rate, where assessment value no more than two percent decline and tax rates declining by no more than zero point seven five percent compared to the previous year. To establish causality, this assumption holds only if all these educational outcomes and municipal bonds had changed because of the floor, not because of anything else.

And this is the first piece of evidence to speak that the statewide enactment of the floor was not predicted by the statewide economic and demographic variables. So all the coefficients are statistically insignificant, showing that like house prices, income, all down until poverty rate were not the material characteristics that had predicted the statewide enactment of the floor.

And also the statewide spending and the proportion of the residential of the total property tax revenue all down to the state transfers also did not predict the enactment of the floor. So I used 2279 counties and 3606 school districts in all fifty states from 2000 to 2022.

And thank you to the census data that all has this wonderful information about the revenue and spending needs. So the floor applies to the school districts but does not apply to counties, and the floor was adopted by the state. So I compare school districts in floor states before and after the floor enactment to the school districts in non-floor states and to the counties. That's why it's a staggered triple difference approach where floor ST is one if the state S has a floor in year T.

And there are two types of issuers I, the school district and county. Yeah, so it's like this triple difference approach going on there because school I is one if the issuer is a school and zero if it is a county.

So school districts in floor states face lower bond yield spreads by thirteen bps, which is around nine percent compared to the average, and increases the bond issuance by four percent, about 900 K dollar for each school district. And the parallel trend assumption holds, meaning prior to the treatment of the floor, the bond yield spreads and bond issuance did not materially differ between the treated and the control bonds.

So this is the second evidence that speaks to the causality. And one more thing from this figure is that the decline in the yield spreads and the increase in the issuance was persistent until like five years after the treatment. So it was like not a short-term effect. It was like a long-term effect after the treatment.

Also, protection helps in places that need protection. So school districts with low income and school districts with low transfers actually decreased by more in borrowing costs because that's also the policy implication of the floor because it had protected places that need to be protected, like low income and low transfers.

And I further show the effects of flow on student participation because school districts in flow states, and I compare that with the school districts in non-flow states, and I show that student participation improves. So for example, student dropout rate had declined by zero point four percentage point, which is around like nine percent compared to the mean because the mean was four point four percent.

And this, and naturally, the student completion rate had increased as well and the average class... And I further find that the average class size has declined. And like, there are like 25 students per each teacher in this classroom, which hopefully speaks to the higher student engagement And again, like I also have the real effects by heterogeneity because I do still believe that the protection would be helpful in the areas that need protection.

So in, for school districts with low income, I find that twice the reduction in the dropout rate of the students. In school districts with low state transfers, there's like a 30 percent larger reduction in the dropout rates. And the same holds for the student-teacher ratio as well. Like, for the, the magnitude itself is like not super big, but compared to the high-income school districts, the low-income school districts also have a larger decline in the class size. And because I still remember, like, when I was like a freshman in an, in undergrad, like taking intro to econ class.

There're like 150 students, and like time had passed. I am teaching financial management classes, like 150 students as well. It is like very difficult to get engaged. I mean, that's university, and this is public school district. So like the smaller the class size is, more likely it is for the students to get engaged.

And the instruction outcome had improved as well because the total salaries include instruction salaries, teacher salaries, and staff salaries. Especially if we focus on the teacher salaries, it would be around three percent increase, and the employee benefits had increased by four percent. So all of these benefits for school districts talk to the fact that the protection had real effects and improved the educational outcomes.

So I use these results to interpret that the lower borrowing costs had led to efficient spending and had improved learning environment. These two graphs again speak to the parallel trend because there was no meaningful difference prior to the treatment for the dropout rate and the instruction salaries.

And it takes a little bit long time for dropout rate to get materialized. It takes like around five years, four to five years for it to become statistically significant because like

students-- effects on students are a long-term effect. And lastly, I talk about how the counties had all been suffering while these benefits had been provided to the schools.

Because the counties are the ones that are absorbing the larger share of the decline in the local property tax revenue. So by comparing counties in floor states to the counties in non-floor states, I find that the county borrowing costs go up, which is a bad news for the counties. So county bond yield spreads increased by five bps, and the issuance had declined by two point five percent.

So in this paper, I show that property tax revenue protection is the first-order pricing in the municipal bond yields, and then the then the school districts had used those financial resources available to them to be efficiently used and to improve human capital investment. Yep. Thank you for listening.

CORNAGGIA: Check. Good? Okay, great All right. Thanks very much for the conference organizers for inviting me to discuss this great paper. Thanks to Yunju for doing a great job presenting it. I'm really happy to be here. I love participating in this conference. It's such a wonderful conference. Echoing all the-- I know we sound like everybody else that gets up here, but it really is a great conference, so I'm glad to be here.

And thanks to Yunjoo for writing such a great paper. This is a very thorough, very thoughtful, well-done paper. It is Property Tax Protection and Municipal Bond Valuation. So the the big picture question that we're after in the paper is whether property taxes are capitalized into municipal cost of capital, okay?

And so, the big answer the headline answer is yes. The paper, it's-- what it's looking at are floors on the decline in property tax receipts that are instituted for school districts. So the law comes in and says, "Okay, if property taxes decline by more than such and such amount, that has to be made up to the school district by the county."

So what we see is that yields on school bonds go down, meaning prices rise, after states implement these floors. Now there's a whole bunch of other nice outcomes that the paper looks at. So things like well, first of all, it's not just a price effect, right? It's not just the yields on the bonds, it's also the quantities.

They're able to issue more. There are a bunch of other outcomes that have a nice ring to them like you know, lower dropout rates teachers are getting paid more, class sizes are getting smaller, that kind of stuff. And so we see this yield effect. Yields go down for schools. We see an opposite, a mirrored effect for the counties that are essentially providing the subsidy.

So once these floors go in, the market thinks schools are doing better at the expense of the counties. Okay, so this-- the way I think about this, this is essentially a zero-sum

subsidy coming from the counties to the schools when needed. All right, so my first comment is sort of a sanity check, which is do the numbers add up if you buy that this is a zero-sum subsidy?

Are the savings for the counties equal to the cost-- excuse me, are the savings for the schools equal to the cost for the counties? So, what you're looking at here on the left, this is a diff-in-diff comparing treated schools from control schools. What you see is that the treated schools in the states that get the floors there, borrowing costs go down by about seven basis points, and the treated counties relative to control counties, their yields go up by about five.

Okay, so these numbers are not exactly the same, but they're pretty close. They're pretty close. If you go into the appendix and you look at reliance on property taxes, what you see is that counties generate about three times as much property tax revenue per year. So what that says is that a dollar of county property tax revenue for a county is worth about three dollars to a school district.

So, you know, you wouldn't necessarily expect this multiplier to be one-to-one. You can imagine re- Reasons why there are exacerbating or mitigating effects that would move that multiplier off of exactly one point zero infinity. But I think the paper would be improved if it talked a little bit about the comparability of these magnitudes and whether or not they make economic sense.

Are the dollars going from counties to schools, are those numbers that you're seeing roughly equivalent? One way that can-- this can be done, and I'm asking for data work here, is to look in the primary market. This is a, a technique that Dan and Yvonne have used in their work that I rip off shamelessly in my own, which is to compute the present value of interest savings in the primary market.

So are the interest savings in the primary market for the school districts, are those roughly equivalent to the interest costs of the counties in the primary market? Okay. So, a clarifying question here. I'm wondering how the data are sourced for early years in the sample. So the paper sample runs from two thousand to twenty twenty-two.

The yield measures are secondary market yields from the MSRB, which goes online in words in two thousand and five. Now I'm aware that Michael Schwert and others have been able to source data from earlier time periods going back to two thousand. So, is that what happened in the paper? I think it's important to figure it out or to at least state in the paper why.

Because of the fifteen treated states, four of them were treated in the year two thousand. So if the data don't kick in until two thousand and five, those early adopting states, these will be always treated states. They won't be able to contribute any

variation to the results. Okay, so kind of the way we do statistical analysis, we say, "Okay, this thing over here moved, and then this thing over here moved as well.

Maybe there's a relationship." Well, if this thing over here never moves, then we don't have an opportunity to do a statistical test. So I think this is worth clarifying. Yeah, just let me know which of these states are doing the heavy lifting here. Okay. So, the next suggestion is to look at situations where the floors actually matter.

Okay, so on the left here, you can imagine you've got a law comes in that says that when property values and property taxes decline by fifty basis points or five mills, that's where the floor binds. And so the red arrow here, let's say you find yourself in a year where property taxes go down by more than that, I don't know, one point five percent, something like that.

This is a situation where the school district is gonna have a property tax revenue shortfall, and the county is gonna have to come up with some cash to compensate them. Now, on the right, if you have a situation where property tax receipts don't go down by five mills, or maybe they stay flat or even they go up a little bit, which is the green arrow, in this case, the floor doesn't matter, right?

It doesn't bind, so the county is not on the hook to come up with any cash for the school district. So the simple idea here is, first of all, just look in the data. When do the floors bind? And then use these binding events as events. So this is when it should matter. This is when you should see the yield reactions when the floor actually binds.

Okay. So, Yunjoo did a great job. She showed you some plots, and I'm going to show you the same plots here in a moment of all of the other things that you might be worried about affecting the enactment of these floor policies. So as I was reading the paper, I had a number of what I would might call political economy questions, which is, you know, we're looking at these floor regulation events, but why were these the policies that schools picked at these times?

There are other things they could be doing, like grants, equalization plans. We only have fifteen out of fifty treated states. So what are the other thirty-five doing? Why didn't they like this idea? And why was adoption generally done in the early 2000s? Just sort of, you know, what was going on? Why-- What was going on with these policies?

And, you know, as I say, Yeonjun does a nice job showing the things that you might be worried about predicting policy adoption actually don't predict policy adoption, right? So, so the the value of this exercise here is, again, as, as people that do research, what we're worried about is the researcher says, "Okay, I think X affects Y."

And then some jerk like me comes along and says, "No, I think it's Z that affects X and Y." And so it's the researcher's job to say, "No, it's not Z, it's X. I've got it right. You've

got it wrong." This is how we spend most of our days, actually, as researchers fighting these fights. And so what she's doing here is essentially she's fighting a whole lot of fights, and she's winning every time.

But the thing is, these didn't happen by random, right? Like, for some reason, at certain points in time these were picked up. And so I'd like just to know what were the actual state factors then that, that drove this adoption? And then we can talk about whether those are, you know, serious threats to the causal inference of the paper's estimates.

All right one more thing I noticed in the data. If you spend enough time in the appendix, you notice some patterns, if you will, in the the incidence of property taxes going down and going up. So this is on the left here in panel B. This is from A3. You have the incidence of a property tax decline, conditional on a decline, and the probability of an increase.

And so what jumps out to you here are the spikes in the years that end in two and seven, which if you've worked with these data sources, you know that's probably due to some governments are sampled every five years, whereas fewer governments are sampled every year. And so I'm curious about this because some of the paper's analysis looks at property tax volatility, and my concern here is that perhaps some of the volatility that's being measured is not what you might think of as natural volatility in property tax, but more about shifting sample composition.

So the idea here is pretty straightforward. You can either interpolate between the, the five-year intervals to impute missing observations, or you can work with a constant sample that, that doesn't shift over the sample period. Okay, so overall, great paper. I really enjoyed the paper. She's done a lot of work.

You know, it's really an impressive paper. It's really well developed. There's a lot of stuff going on here, really heavy data lift. My comments again, are just to make sure that the numbers make sense. Are we seeing a zero-sum game here in a way that, you know, roughly makes sense in terms of magnitudes being shared between the counties and school districts?

I'd like to know which states are really responsible for the results. I think focusing on situations where the regulation actually binds and has teeth, I think that's probably where you'll get your sharpest results, and you can maybe build event studies around those incidents. I'd like to know more about the political economy, the underlying state factors that really do actually drive adoption here.

And finally, you know, I think the sample can be cleaned up a little bit so that we don't have to worry about this, this issue with volatility affecting volatility. Okay. Thank you.

BERGSTRESSER: Okay. Before-- I, I will open up to the audience with some questions, for questions, but I wanna start by giving you the opportunity to say anything if you'd like. You don't have to, but if you'd like to offer any response to Jess's comments.

AN: Yeah. Thanks so much for reading my paper so thoroughly, even like looking at the appendix.

Yeah, so, so, so one of the comments I do have a robustness check of the gap between the current mill rate and the minimum mill rate. So that could somehow, to a certain extent, speak to how the flow is binding. And yes, like all of your comments are like really great. I would, like, definitely incorporate them into my paper.

BERGSTRESSER: Okay. We have folks with mics in the back. Can you raise your hands in the back with mics? All right. And if you have questions, Okay, so down here first. And if you could introduce yourself before you start the question.

AUDIENCE QUESTION: I'm Patrick Early. I've my career has mostly been in retail -- is this on now? So my career has mostly been in retail municipal bond analysis. And what I'm curious about is how you're controlling for, like, general interest rate environment when you measure yield savings. Are you measuring versus other bond issuances credit ratings, you know, some of the actual market dynamics?

AN: Oh, yes. Thanks for your question. So the-- just to be clear, the yield spread is the muni bond yield minus the maturity matched Treasury rate, where Treasury rate is the risk-free rate. And for the controls, I do have, like, credit ratings and the price -- sorry, the credit ratings and the income of the local issuer, the local GDP, and also, like, the liquidity risk of the muni bonds.

AUDIENCE QUESTION: Hi, Kim Ru-- I don't know whether it was me or the person in front of me. I'm Kim Rubin. Thank you for your paper. It seems really interesting. I was wondering if you've done anything looking at if different types of states have different patterns. Mostly, I'm curious about places that have dependent versus independent school districts and in places where counties overlap school district boundaries versus places like New England where counties aren't really part of the game.

It's more cities or towns. And so wondering if your results hold up if you sort of look at different levels of government or look across different types of states and school district structures.

AN: Yes, that's a great question. So counties and schools overlap geographically, and the level of that overlapness is not equal across all states.

So what I had shown you in my presentation was just including all the counties that have different overlaps of the school districts. So I did not look into how that can be different across how much it had overlapped, but the reason that I didn't look into was because counties and schools, like, make spending decisions and issue bonds separately and levy property taxes separately.

AUDIENCE QUESTION: Thank you, Bonnie Wachtel. Very interesting paper. I'm most interested in your measures of educational attainment because there does, there seems to be a little disagreement in the literature over that. So the first question would be, when you say money went into improving teacher salaries, are you also including administrators?

That's something that's a little bit of concern when you look at the edu- how education money is spent. And also with respect to the dropout rate, which is very impressive, I thought, could you derive something along the lines of dollars spent per pupil not dropping out?

AN: Yes. So like the total salaries include teachers and staffs and administrative staffs.

The teacher salary that I had shown includes like teacher salaries only. And sorry for rushing it, but at one of the last tables, it was also spending per pupil that I had shown, and that spending is like the instruction spending, infrastructure spending, and like the total spending. So I do have those results in my paper.

AUDIENCE QUESTION: Nick Winters, retired political science professor. I just want to encourage the comment having to do with the looking at the states as, as determinants here of adoption. Because as I'm looking at your map, this is not a random agglomeration of states. There's something else at work driving here.

Pick out Missouri as an example. You know, this has to do with rural versus urban districts and so on. But I guess what I'm particularly interested in, because I am a political scientist, is why did this all come about? That is, one of, one of the parts of your story has to be the origin of the passage of the statute that put this into place.

That entails a very different strategy, but one that I would encourage you to adopt if you're thinking about a book-length treatment, for example. Call the chair and minority member of the education committees in the chambers of those adopting states. What's the story here? Why was this adopted? What did you have in mind?

Who did you expect to advantage, or were there some places that were likely to be disadvantaged? So it's a very interesting political question as well as a menace finance question.

AN: Thank you for your suggestion. I was, like, too much into causality and, like, putting all those exogenous, exogeneity. I didn't... yeah. So, so for some of the states, it was done through voting, like in Alabama and Nevada and, like, Florida. For other states, it was just done through the legislature. But I do completely agree that it is not a random process. There had been, like, citizens and, like, residents' awareness of improving the public school education.

So I'll dig into that more.

BERGSTRESSER: JP

AUDIENCE QUESTION: Hi JP Aubrey, Center for Retirement Research. I wanted to pick up on something Kim had mentioned about dependent school districts. I'm just not quite sure you can separate the levy for dependent districts versus counties. So you said that, but I just wanna double-check how easy that is to untangle.

Also, you know, you point out very clearly there's no free lunch, right? If the schools get more money, the counties don't. I wonder about what happens to county spending. Like, what are the things that they usually spend their money on that they're not spending their money on now because they don't have as much tax revenue, right?

It's shifting. So there's gains obviously happening in education, but there's losses happening somewhere else, right? So what are those? You know, or like some suggestion of what those might be. Like what do counties usually spend their money on? So where generally might this be falling?

AN: Yeah, that's a great question. So like counties usually spend money on like parks and libraries. So counties do not spend it on education in most states. And like one of the results that I do have but was just not ready to present yet was because the county decreases the spending. So there are some real effects on counties as well, 'cause counties spend less on parks and spend less on libraries and where that's primarily because of the less property tax revenue they have and the higher borrowing costs that they have.

So yeah, that would be the real effects of the county side.

BERGSTRESSER: Okay. I wanna, I'll take a moment. We have a, just a, another minute. And so I want to amplify one of the comments and ask my own question, which is I think there's a lot of value in talking to people who were around for this contemporaneously.

And one, one additional set of folks maybe to talk to would be the rating agencies. To talk to folks at the rating agencies, say, "Does- is this something that you, if you're S&P rating the bonds of a school district or county, is this something that you pay attention

to?" Because the evidence in the paper suggests that the market is paying attention to it, and so I'm curious what the... you know, it'd be interesting if at the time that one of these has passed, you have sort of a note from S&P saying, "This is credit positive for school district issuers in this state. It's credit negative." And so, And I also think that it might be worth exploring results both with and without controlling for credit ratings.

AN: Yeah. So S&P does, S&P credit, the credit rating agency does have a line, a couple of lines of explanation about this. So according to them, they do take this into account. So all the results that I had shown you include credit ratings as controls. And like as expected, when I excluded the credit ratings from the controls, the decline in the yield spreads become bigger because, like, statistically, that would be looking at the accountability of the credit ratings for the municipal bond yield spreads.

And just like many economists and some of you sitting in this room had pointed out, that can also lead to bad controls for the credit ratings. So I do have a robustness check excluding that, and the yield spreads become larger decline. Yeah.

BERGSTRESSER: Okay. I think we have hit the end of this time, so I hope you'll join me in thanking Jess and Yunjoo.

We're gonna move now to the second paper. We have a change in the schedule. So, Rahul Chauhan will present the paper. He's a PhD student at the University of Chicago. And from the Center for Retirement Research we have not Laura Quinby, but we have JP Aubry, who will be the discussant and is here with us today.

So I will get off the stage, and Rahul--

CHAUHAN: So hi everyone. I'm Rahul Chauhan. I thank the organizers for having me. This paper is a bit of a pivot from municipal bonds to public pensions. And what I look at is the, you know, large public pension. This is defined benefit state and local employee public pension underfunding which now by some accounts is the largest off-balance-sheet liability of state and local governments.

Josh Rauh and coauthors put that number at about 5.1 trillion in 2023. What's also remarkable is over two decades there's been a remarkable dispersion in this underfunding. So if you look at the graph from 2002, where states were relatively better funded there's been a lot of states in red, and this, this-- there's also been a heterogeneity in some states suffering more than the others. And this is what I try to explore in this paper.

Now resolving these shortfalls itself is a monumental task. By some accounts, it requires higher contribution rates in terms of higher taxes or cutting spending on other public services or earning higher returns. The core tension in a very Tiebout sense is that households can move if local taxes were to rise or services were to worsen.

So this paper asks, how do local public pension deficits sustain with a mobile tax base? And within that, I ask two sub-questions, which is, first of all, whether persistent underfunding passes through to household migration and whether states facing high migration risk, which is a higher net migration response to taxes, manage their pensions differently.

So since I'm from the Ken Griffin Department of Economics, let me motivate this example from a migration choice from Chicago to Miami. Now think about what exactly goes into that migrant decision. You're, you know, comparing variables from, you know, how much income I earn in Miami versus Chicago, how much rents I pay, what is my housing cost. And then I have the local public finance part, such as local taxes and amenities, public services that goes into that.

Now, this has been widely used as a framework in spatial economics, and Moretti and Wilson has a classic paper on that. What I argue is that local public finance aspect could be proxied by the public pension funding status of the destination and the origin. So what this suggests is that the public pensions are-- the underfunding itself is a marker, fiscal marker of these intermediate outcomes moving one way or the other, especially not in absolute terms, but in relative terms from the destination and origins. Now, there's a problem in using them directly in a reduced form way, which is funding itself is endogenous to a lot of the local variation.

And so I need an instrument to do that. What I do is I try to do an year-by-year variance decomposition of what really drives the the variation in public pension underfunding. And what I find in the graph on the right is the investment performance of these public pensions, the relative investment performance explains a lot of this variation in pension funding status.

And so one can leverage this fact to sort of, look at an exogenous driver of funding status, which is probably uncorrelated to other parts of the migration decision itself. There's another problem with that. By using returns itself, you're incorporating the portfolio choices that these pensions have made intermediately.

So what I do is I freeze the... I take-- I fix the allocation decisions in public equity and fixed income as of 2001, and I then compare the relative performance of a synthetic portfolio of the destinations and all the permutations of destinations and origins, and create an instrument which is basically synthetic cumulative investment performance over time.

So my claim is that this is proxying the cumulative performance and is probably also orthogonal to bilateral migration drivers conditional on a rich set of fixed effects and control. And for data, I use Center for Retirement Research's public pensions data, and I merge it with IRS's migration data, which gives you an account of county to county you know, annual tax returns moving as well as the you know, census and other public sources.

So here's my baseline finding, where on the first row you see the first stage of that instrumental variable. And you see there's a, you know, strong correlation between the synthetic investment performance and the relative funding gap between the destination and origin. So what this does is-- does then it enables me to then look at the reduced form impact of changes in funding status between two destination and origins and look at its impact on migrant returns.

And I find that a standard deviation higher funding gap, which is about twenty percentage points, leads to a ten percentage higher odds of migration between origin and destinations. And in dollar terms, that's about two hundred and eighty million annually for a county the size of Cook County. Now, in that long chain of causality, there is, you know, an intermediate stage, which is that funding itself does not sit in the decision of the household.

There's something that moves intermediately. And I confirm that by looking at outcomes such as the share of capital expenditures in the total state budget the share of taxes you know, state income taxes, corporate taxes. And what you see in the different columns is trying to look at all the different fixed effects permutations, which is what is the fixed amount of you know, migration, taking away-- absorbing away the fixed amount of migration that happens between a destination-origin pair, and then controlling for all the push and pull factors you can think of through origin times year and destination times year fixed effects, or even the regional business cycles outcomes between two destinations and regions.

And I find that there's this consistent, you know, pattern which emerges where funding status is predicting better fiscal outcomes in you know, destination states and in turn that influences those migration flows. So then you think about who actually is moving, right? Who actually is responding to these changes in funding status.

And I look at state level data where you can disaggregate IRS's data by the age of the filer as well as the income bracket of the filer. And then I find that it's the older and richer parts of the taxpayers which are responding more towards you know, these changes in funding ratios, and this selection is driving that fiscal magnitude that we saw earlier, the two hundred and eighty million dollar number.

So given that we have this you know, funding status influencing migration flows, what do states do then? Do states invest differently if their residents are flightier? Now, as we talked about before, fully funding needs would require higher contributions. And that itself creates a second-order problem that those higher contributions in terms of higher taxes or cutting spending could further drive out migration, so you have a feedback loop.

And therefore, a state's hands are tied. So you need to try to measure a, a way to figure out a way to measure the migration risk that each state faces relative to other states. And what I show here is I look at the state and local tax deduction cap that was

introduced under the Tax Cuts and Jobs Act of 2017 which mechanically increased the state and federal tax liability for states heterogeneously.

And I then track what happens to the net migration flows from these states for a given increase in you know, state and local tax liability. Now, if you notice, your usual suspects would be on the highest, higher end. But I want to focus on Illinois and Georgia. They have roughly- you know, roughly the same level of increase in state and local federal tax liability, but they lie on the opposite side of the flows, where Illinois loses people but Georgia gains people after this you know, enactment.

And so this kind of underscores this migration risk aspect, which is not just the level of taxes, but the propensity of states to lose people following these tax increases. And then turns out, if you look at how these states behave on their pension portfolios, high migration risk states are more likely to under-contribute and run underfunded pensions relative to the low migration risk pension funds.

And therefore what you can see is you can look at what happens to the way they invest in their public pensions assets. So these are defined benefit pensions, and they take on the investment risk on behalf of their employees. And I look at the allocation decision of these public pensions, and I find that consistently across the three measures of migration risk the pensions which are in high migration risk states are more likely to allocate towards alternative asset classes, which are private equity, hedge funds and other alternatives classes which are either high yielding or opaque.

So this signifies the reach for yield propensity or like reach for opacity propensity amongst states which are constrained, and that's the punchline, which is, you know, when your hands are bound by taxation due to this migration risk measure, you turn to gambling on your pension portfolios.

So, I kind of rationalize this with a two-period spatial model, and the mechanism that I underline is that, you know, you have an agency problem between politicians setting the contribution policy and fiduciaries taking the investment decision. And so since politicians face this you know, re-election constraints they systematically under contribute to you know, the, their pension funds.

And that leads to a higher risky share than, you know, a, a social planner benchmark which then could lead to the question, how does one signify or estimate what's rational or what's optimal in, in this sense? So to do that, I created a consolidated government problem where I combine that politician and fiduciary together and I say that, okay if you have an agent that internalizes the migration risk measure as well as does not face all of these re-election constraints, how does one invest?

And you can calibrate that to data in twenty twenty-threes. So you can calibrate data from you know, taxes and funding status, growth and expenditures to track the

model implied optimum relative to what in the data in the allocations of these state and local pensions.

And this is what I find broadly. So, I find that you know, the graph on the right shows you, On the y-axis, the allocation decision towards the risky asset share of the model-implied optimum. On the x-axis, you have the allocation share on-- w-which is observed in data. And then you have these red dots and blue dots.

So the red dots signify allocation to equity itself, and there you see that some states do lie on the forty-five degree line. But once you include allocation towards these alternative assets, there you see that deviation even larger which signifies this excess risk-taking that one signified in, you know, that one-- that I showed in the, in the regressions.

Which could either be interpreted as reach-for-yield behavior or volatility smoothing a reach-for-opacity behavior. And that itself underscores the wedge that you see in the portfolio allocation decisions of public pensions. So just to conclude here pension underfunding passes through to migration.

Households out-migrate from worse-funded to better-funded states. Older and richer taxpayers are more likely to respond to this margin, and higher migration state states-- higher migration risk states allocate more towards alternative, presumably riskier or opaque asset classes. The insight here is that migration risk is a non-trivial factor in pension performance and debt sustainability.

Thank you so much.

AUBRY: Testing. Hey. Hello everybody. I'm JP Aubry from Center for Retirement Research. I'm not Laura Quinby, as you can tell. I'm happy to be here in her stead. She got caught in the weather coming down from Boston, so. I can't promise I read the paper quite as closely as she did, but I did read it. And so, I'm happy to make comment.

I think it's a great topic. And it's important to keep asking these questions as pension funds continue to do their reforms and evolve. Thank you for having this conference. It's, I was not here yesterday, but I was really excited to be able to make it this afternoon, so thank you.

So I always like to start with a little bit of history in particular, 'cause there have been papers that have shown in terms of the allocation decision that some of it has to do potentially with plans experience pre-2001. So the story in this paper kind of starts from 2001 and moves forward. So I wanna give a little background.

Public plans were not always fully funded, so they did not start in 2001. They were-- many of them were PAYGO systems up until the mid 80s or 90s. And so-- but it

improved. There was the crisis in 2002 and then again, global financial crisis in 2009, excuse me.

But since then, they've been steadily improving, but the road ahead is long, right? They're not gonna get to fully funded anytime soon.

Now a large literature studies the implications of the funding gap. So, you know, how states and localities respond to rising costs impacts the municipal bond market. You know, Louise wrote a paper on maintaining PAYGO. How do you deal with UAL over time for state and local governments? So there just been a lot of research in this area, and so this adds to that that literature base.

This paper in particular points out that plan sponsors are constrained by taxpayer mobility. So it's really looking at that margin. How does that affect what the activities we're seeing among public pensions? So sponsors who try to improve their pension funding by raising taxes or reduce or reducing other spending, they experience out-migration. Those are particularly susceptible respond to shocks by doing anything but that, which is basically investing in alternatives, right? But our research and others have shown, I think pretty clearly at this point, that alternatives have not performed well for many public plans.

So while the basic case that is made in this paper is intuitive we did have a few questions about the aspects of the model. You know, as I said before, plans historically operated as PAYGO systems, and the pressure to fully fund them, in our view, comes mostly from the bond markets. Is there a point at which the improvement in bond ratings from better funding is not worth the loss of the tax base?

So we didn't see much about th-that kind of external pressure that's also pushing them. And then, you know, when you're thinking about modeling taxpayers, how do you think about them? Are they forward-looking? Are they well-informed? You know, why are they suddenly reacting to liabilities that have basically been on the books for decades, right?

If they've seen this coming, if they've seen the underfunding what's making them do something now? And then do they perceive the same risk of future shocks in other currently well-funded locations, right? How do they see that?

And then we were just surprised that the pension funding has such a large effect on migration. I think maybe this has something to do with the cumulative aspect of how you're measuring it. But just some studies find that higher taxes encourage migration, others find weak neg- negligible effects, but the, the magnitudes were just surprising for us.

Just anecdotally thinking about how people move, why they move just the it's hard to think that many people react to unfunded liabilities in practice.

And this was I think, you know, this is the-- He did a lot of work here, and it's really hard to do to find causal impact of pension shocks to kind of untangling it from everything else that's happening in the state, as you said. And so I I understand kind of why you were doing what you were doing.

And so your approach was to use quasi-random investment returns, right? And the paper tries to operationalize this approach by taking the cumulative average return on equities and fixed income, subtracting the state's assumed return, and then running a regression where this synthetic kind of return difference or shock is an instrument, and you control for years and state.

That's the best I could understand of it. I'm not an economist, but we're trying to untangle that a little bit. So the question for us is where exactly is the variation coming from? You know, what drives the differences across states over time after you control for both year and state? It seemed like it came from the joint interactions between the state's risk preference in 2001, basically its asset allocation, right?

And how they expected their specific stock and bond holdings to perform over that period, their expected return, and then the national trends in equity bond markets. So the exclusion restriction requires that joint interaction be uncorrelated with any other factors that could also affect state fiscal policy and migration.

Do we think that's true? That's kind of the, the question, and ultimately, you know, this paper raises very interesting and practical questions about what policymakers should do with it. You know, what do they do? They are in a really sticky situation. There's not that many good options. Most states have been slowly modernizing their systems by improving contribution policy changing the benefit structures but clearly investment approach could be improved.

We've written papers on it, others have as well. So it'd be interesting to know whether migration is sensitive to specific ways that they choose to close the gap. The gap is there. You can't really disappear it in any way. So, given that we're looking at the sensitivity to migration, are there any options that reduce that sensitivity that aren't just you know, putting it all in black and going-- or on red, excuse me, and going for alternatives?

And I always love when people use the PBD for anything, so I just like to plug it. It was great that you were able to kind of find it useful. And so if you have any other questions as you do the research, let us know. We're happy to help. Yeah. Thank you.

BERGSTRESSER: Okay. Thank you, Rahul, and thank you, JP for a great presentation and discussion. Before, before I turn it to the audience Rahul, would you like to-- No pressure, but if you'd like--

CHAUHAN: So, thank you so much for the discussion. Couple of things with the magnitude, I think so the baseline average of, like, odds of migration is about four basis points. So, like, it'll be an eight basis point increase. It'll be like, if you think about number of people moving, it'll be relatively small.

And you know, the state itself so the fiscal magnitude is what I was focusing on, and that's towards the, like, heavier side of the distribution. And I think the, yeah, the exclusion restriction is, like, a very you know, complicated argument which I'm making, which is conditional on all of the different push and pull f-factors that one can think of and control for.

That synthetic performance, which is, you know, -- which gets rid of a lot of the local variation and internal portfolio choices will be relatively, you know, exogenous than, you know, any other drivers of pension funding status. So I think this is my attempt at the exclusion restriction.

And thank you so much for the response.

BERGSTRESSER: Okay. We have people with microphones in the back, if you have any-- if you have questions. Does-- Dan, are you raising your hand or?

AUDIENCE QUESTION: Oh, I can't.

BERGSTRESSER: Well-

You should introduce yourself too.

AUDIENCE QUESTION: Dan Garrett from Wharton. Rahul and JP, thanks again for the paper, the discussion. I think this is really cool. I wanted to zoom in on this point that you just brought up here in your your response to JP's discussion, which is the number of people is small, but the people are very wealthy.

I think it matters for thinking about what taxes are gonna be raised or what amenities are gonna be cut. I think just, again, that came up in the, in JP's discussion. But what does matter? Is it the number of people or is it the number of dollars that those people generate in some way? 'Cause the rich, the very rich, of course, if you're gonna be raising money through, I don't know, sales taxes, they're not gonna actually pay that much.

If you're raising money through an income tax, the retirees aren't paying that much. If you're raising money through a property tax maybe it does. But I think the instrument choice matters here a lot for how you choose the op- the right way to weight people. And so I think you're weighting people by income.

I'm not... I just want you to maybe motivate that a little bit more.

CHAUHAN: No, I agree with that. So to your point about which instruments it affects I do track like property taxes, and I do find a similar direction of the results. And so the odds of migration are just the number of taxpayers. There's another specification where I do the adjusted gross income by taxpayer, and there you find that magnitude, and that's basically weighting it by the dollar amount that's leaving.

And I think my first order concern was the tax base itself and how much of that is being lost in dollar amounts due to this problem. Thank you.

AUDIENCE QUESTION: Thank you. Hi, Louise Sheiner from Brookings. I have lots of questions. Let me do two completely separate questions. So one is just thinking about the issue. So somehow you made some choice and this has led to underfunding, and now you're showing that leads people to leave. But there's sort of-- And I guess the reason you go to these alternatives, there's nothing you can do about it, because if you went and you said, "Well, let me increase contributions or raise taxes," they'd still leave, right?

Like, so, so I guess I've-- so it's a kind of I'm trying to think about the policy implications. And so maybe if you think that it's really bad for them these-- due to these alternatives, you want to limit what they can do, but-- and sort of just take the medicine. But there's no way to... once they've hit the hit, people are gonna leave, I would think.

But then the other question is, and maybe this is because only the rich people leave, you didn't talk about house prices at all. And this is kind of what you were talking about, like, how is it they're all of a sudden realizing it, and why isn't it capitalized into the house price? It seems like the perfect thing, in which case you don't really benefit by leaving 'cause you just you get a lower value on your house price. So I want to think about that.

And then a completely separate question and I didn't read the paper and look at the model and but when we think about riskiness of public investments and I'm gonna bring it to thinking about Social Security and investing in equities. And we have a really hard time deciding what the optimal investment is there because it's unclear what the risk of not getting a risky return is. What, who's gonna bear it? It's unclear whether people have enough equity risk in their portfolio, and maybe it's a good thing for the government to do it for them.

So I'm just wondering how you had this model where you could kind of answer that question when I think that's a kind of unanswerable question.

CHAUHAN: So the first part of the question, there's a paper by Alo et al which looks at precisely house prices and pension underfunding, and they find that there's an effect.

And in fact, they also use a similar instrument. In response to the model itself, this is like, of course, a stylized model and, you know, I'm not claiming I have the answers. But, The response of the households in the model strictly speaking, is ex-post. So they realize taxes and you know, amenity decisions of different states.

They look at-- They're hit with like a Calvo shock or something, and they look at then which is the best alternative state or location to look at rather than a forward-looking agent, which is, you know, this hyper-rational being which can think of, "Okay, Florida is going to do very well in the next 20 years, so let me don't go there."

So this-- That's the choice I've made, and itself, it's to do two things. It's to rationalize why you would see, like, these differences because you have a lot of moving parts. But my own assessment of it is, like, you have th-this agency friction between the tax authorities and, like, state investment boards.

Because if you think of the actuarially required contribution rates, that's much lower for a lot of these underfunded states than what it should be. So I say, like, it's probably these political reasons. And you saw that in-- even in, like, the New York City budget, where there was some discussion of, like, the pension, you know, payments being delayed or something like that.

So I mean, I'm not saying I have the answers. And then the risk transfer is something which is you know, debatable, which is you're taking on a lot of this alternative asset classes. One argument is this is reach for yield because you're going for private equity and, you know, you're trying to gamble.

The other argument is it's probably volatility smoothing because you're trying to, like, put your money in these relatively opaque asset, assets which you cannot mark to market as, as well. So your, you know, contribution rates wouldn't fluctuate so much over time. And it's-- I, I leave it there. I don't make a normative judgment of, you know, this is good or bad.

BERGSTRESSER: Bonnie?

AUDIENCE QUESTION: Thank you. Really like this paper. I'd like to go to the point raised by the discussant about it's hard to believe that people would respond to unfunded liabilities. But I think you would say in sophisticated wealthier people, what they're looking at is the propensity of the lo- state to be have to raise taxes and to raise taxes eventually.

And I wonder if it would be... If you could foresee to doing another paper over what's going on in California by having this referendum out, which has not been tamped down by the legislature, where a a very big tax could fall at any time without much of a

warning to people living there and encouraging a sense of better get out now just because of the philosophy and propensity in the state.

CHAUHAN: So, so the first part, I think definitely the funding decision is not in their you know, is not salient in, in their decisions to move. It's the intermediate things that move which is, you know, which I show is taxes and expenditures on capital budgets. Along with that, as you pointed out, there's also the second order.

It's not just the level of taxes, it's also the uncertainty of how much it will change in the future, which again, is amplified by how risky your investments are and how you're... So I mean, it's a great area of research. I will probably try to make some effort towards it and looking at that problem.

But yeah, thank you for your suggestion.

BERGSTRESSER: I will say I looked at your table showing the age and AGI propensities to move, and a thought jumped out. I sort of saw all my college classmates in there 'cause I, you know, I went to school on the West Coast and yeah, everybody's moving to Texas.

And these are folks who never thought they would move to Texas. And I think one thing that's interesting is it-- watching the behavior of people in that age group, I think the frictions to moving have, have gotten a little lower. And now that there are kind of social net- like, you know, California is kinda moving to other states, and I think that might mean that the, whatever prediction you would make on historical data about propensities to move based on the historical frictions may be a little off base because I think the frictions appear to be going down somewhat.

So that's my sort of editorial, using my role as the moderator. But it-- we're over time by 30 seconds. I apologize for that, and I hope you'll join me thanking both Rahul and JP and also the presenters Yunjoo and Jess in the earlier session 'cause it's been a fantastic fantastic session.

So thank you very much. We now have a 15-minute break.

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CUNY: Welcome back. All right, if everybody can take their seats, we'll get started with the next session. Excellent. All right. So the next session we're gonna start by kind of continuing the conversation about salt caps, actually. So our first author Francesco Brunamonti, is a PhD candidate at the University of Lausanne. His paper presentation will be followed by a discussion by Ye Tian who is an executive director of municipal research at JP Morgan

BRUNAMONTI: Hello, everyone. Thank you for attending my presentation of our paper, How SALT Spices Up Municipal Bond Markets, joint work with Lorenzo Bretscher and Norman Shüroff. The beginning of our paper is to note that local investment is strongly tied to local wealth due to tax base effects and due to local borrowing in municipal bond markets. Because of this, wealthier counties have higher debt usage. Yeah, sorry. Because of this, wealthier counties also receive more investment from mutual funds. What this means is that if mutual funds focus on a small subset of the richest and the most liquid counties, what may happen is that valuable projects in low-income counties can go unfunded. Therefore, the research question in our paper is: Can financial intermediation loosen the link between local wealth and local spending?

The way we answer this question is to use a tax-driven demand shock from which we read off how municipal issuers heterogeneously adjust their bond supply I briefly go through the heart of our paper, which is the SALT deduction cap. It was one of the most important provisions of the Tax Cuts and Jobs Act of 2017, and what it does is for the first time to introduce a cap to the deductibility of state and local taxes from federal taxes.

We use tax and income data to compute for every county how much the lost tax shield hit. The tax shield loss is proportional to the state taxes paid minus the cap, which means that if you wanted to receive a very large tax shield, now everybody's only going to receive up to ten thousand, which means that your federal bill went up quite significantly.

We use this differential exposure to a tax increase to understand the effects on demand and supply for municipal securities Our sample covers almost the entire cross-section of all the US counties. We use six years of data around the two thousand and seventeen tax reform, and we compute that on average, this tax increase is about five thousand dollars per person per year.

But this is very heterogeneous. For example, in Texas, the effect is zero because of the state tax. But in the richest counties, such as those in California, the effect was north of twenty thousand dollars per person per year. So this tax increase affects almost everybody, but to very different extent.

This is the structure of our paper. We show that this tax increase generates record flows into municipal mutual funds. And then we answer the question, how do the funds deploy the additional funds that they receive? Do they deploy their funds by purchasing municipal bonds in high-income counties? What we find is that for the first time, municipal funds started behaving differently by investing the additional flows into low-income counties that they previously neglected.

The main variable that we study is about the quantity of issued bonds, which is just the par value of municipal debt divided by county income, and we use a standard

difference-in-difference where we compare the evolution of debt issuance of a county compared to the debt issuance of the other counties in the state.

Our estimate is relative. Yes. So we estimate how county leverage changed compared to different counties in the same state. What we find is a quite large and persistent effect by which counties that are lower income enjoyed the possibility to issue more municipal bonds and supply more debt. So again, a negative coefficient means that municipal issuance is concentrated in the low-income counties that are those that responded most to receiving this windfall from municipal funds.

As a second test, we separate counties by those who are financially constrained and those who are not financially constrained. Our results are robust to several different definitions, but one that we like is about interest coverage. And we show that the effect of additional funding allowing for additional spending is particularly strong in low-income counties that are already burdened by high debt payments.

So these counties have small own funds to invest, and at the same time, they are burdened by high existing debt. And these are exactly the counties that were allowed to issue the most from this windfall that they received. We interpret this as the SALT provision causing a windfall funding that was directed exactly against these low-income states that need money the most, these low-income counties that need money the most. Now we split bonds.

We split our sample by bond types to understand the types of bonds that are issued and the destination of the additional funding received by these low-income counties. We find that the effects, first of all, are concentrated in new money bonds. So the counties are not just refunding their debt at a lower cost, but they are issuing new debt to conduct additional spending and fund additional projects.

So this is an expansion in real activity. In particular, the largest effects are in utilities, health care, and housing. The effects are concentrated in revenue bonds that are project-backed and that have a faster authorization time, in the sense that the counties really took the opportunity to issue significantly and to issue quickly by using revenue backing for their bonds.

And the structure of the bond issued is almost exclusively concentrated in discount securities, that are securities that have offered a very low coupon rate, which allows the cash poor issuers to not be subject to very high cash outflow requirements from the coupons. Finally, we ran a placebo test where we estimate this effect for taxable municipal securities, which are about ten percent to fifteen percent of the market, and we find no response whatsoever for taxable municipal securities.

This is a result that is consistent with our story that the causal chain moves from tax-sensitive investors to mutual funds to tax-exempt issuers, and it helps us to rule out

credit risk confounders in the sense of exogenous changes that are affecting all counties at the same time.

Now we delve a little deeper in the mutual fund part of the intermediation chain. So the first thing that we document is that the SALT effect led to very large fund inflows because people subsequently piled into municipal funds. This is something well known. I cite a Bloomberg article which describes the fund flows.

And in particular, what we show is that flows respond to the SALT shock immediately, meaning immediately in two thousand and eighteen after the Tax Cuts and Jobs Act. But importantly, there is no correlation before or after. So in this specific episode of two thousand and fifteen, in two thousand and eighteen, flows line up exactly with the state exposure to SALT.

For identification, we use a common identification strategy known in the literature as fund-driven, flow-driven purchases, where we show in the paper for the first time for municipal securities that current holdings predict future purchases by the same fund, and that flows amplify primary market participation by the funds.

So the funds are supporting counties both by purchasing in the primary market and by deploying additional money by investing in the secondary market. Our second step finally estimates how county bond supply responds to the flows received by the funds. So we regress supply changes onto the investment behavior of the funds.

We find that typically funds invest more in counties in which they have already invested in the past, which may be because of information acquisition, maybe because of home bias. This is something very highly documented in the literature. However, surprisingly, we find a negative coefficient, which means that in two thousand and eighteen, unlike before, funds broaden their asset menu by beginning to invest more in counties in which they previously invested less.

So in a sense, they are increasing their diversification by investing in more counties that they had previously neglected. This result is concentrated in states such as California, where single state funds matter more. So we split our sample according to which state funds are more important, and we find that it seems that state-specific funds are really the main driver of this relationship between fund demand and bond supply.

Now, this is the main real effect of the SALT shock. This is the aggregate macroeconomic implications of the flows and supply that we discussed. On the left, we show that debt concentration significantly decreases, which means that typically the richest counties and the most liquid counties can issue more, such that there is an imbalance in debt usage between rich counties and poor counties.

But we find that beginning in two thousand eighteen with the SALT reform, the concentration significantly reduces as the low-income counties become able to issue more by placing their bonds with the now larger municipal funds. And we show something fully similar on the right plot, where we show that the relationship between debt supply and income is on average positive and significant up to a breakpoint in two thousand eighteen, in which this relationship between debt and income starts to decrease to the extent that in two thousand twenty-one becomes insignificant.

This means that there has been a decoupling between the local tax base and the local municipal market and the ability to place municipal bonds.

In conclusion, our paper exploits the SALT cap, which we use to represent a large and sudden demand shock for municipal bonds. We use this demand shock for municipal bonds and the associated flows into state funds to understand the supply response by municipal issuers. We find that municipal issuers respond quickly.

They respond by issuing new money bonds for additional funding, in particular revenue bonds, but they do not increase their supply of taxable munis. So this is really a tax-driven effect due to their ability to place their tax-exempt bonds to investors that are demanding tax-exempt securities. Funds matter in the sense that funds receive money from high-income counties, which are the counties where people have savings to invest and the tax shield matter most.

But even if the money is coming from the high-income counties, the funds are pooling the money at the state level, and then at least in this case, they are deploying it especially in the low-income counties, decoupling the source of the funding from the ultimate destination of the, of the funding.

Across counties in a state, that concentration falls again as low-income counties are supported by a larger investment base that allows them to issue more, catching up to the level of issuance of the high-income counties. Finally, we have a policy implication. That is that the Tax Cuts and Jobs Act provision introducing the SALT cap was-- had the aim of being a broad-based policy affecting everybody in the US.

But what we show is that even if the policy is broad-based, it can have very heavy distributional consequences across counties at the local level. This is in this case, because of portfolio rebalancing that changed the investment structure and changed the spending structure at the local level. In this case, the spillover was positive, as we document that while it's wealthy counties that invest, it's low-income counties that receive the investment.

Hence, there can be very large spillover effects even from the most broad possible federal policy, which is something to consider in optimal policy design. Thank you.

TIAN: Perfect. Yeah Thank you. Thank you, Rich, for inviting me to speak at Brookings with lots of people who shared a similar interest here. So my name is Ye Tian. I'm from JPMorgan. I'm on the broker-dealer side, and my role is sell-side research analyst. So we publish market commentary reports for our clients, mostly investors and muni investors and issuers. So we cover in topics ranging from market structure, credit and policies as, and as well as the market concerns.

So, moving to this paper. So what I like about this so this paper utilize a significant amount of data spanning from muni bond issuance data, fund flow data, fund holding data and as well as IRS income, state level and county level data, which I think is amazing to tackle such good amount of data in one paper.

And Francesco and the team do come up with quite a few interesting conclusions. One notable outcome is that, as he mentioned, so the SALT cap policy change increased the demand of muni bond from the individual investors. So I think this is pretty compelling and agree with that. As the high earners' effective tax rate becoming higher after the TCJA, so which -- this naturally make municipal bond more, more attractive to them, and they also quantify that approximately eighty percent of the counties were affected by the cap.

And on another side, I verified this using another data source called the Fed Z.1 data, which Federal Reserve published the data of all the financial assets across different fixed income across different holders, right? So we see that at end as of end of 2017, about 75 percent of the entire muni bond outstanding were held by retail-based investors.

So when I say retail here, I actually mean those who finally pay the individual tax rate rather than those who pay the cooperation tax rate. So these include all the household holders SMAs mutual fund, ETF. Yeah, you can argue that some of the mutual fund and ETF were held by some institutions, but in a large amount, those are still held by individual investors, right?

Most of them, they pay the highest top tax bracket on their fed tax. So this ratio, 75 percent, has been gradually moved higher to 81 percent as of end of 2025. And also note that the entire muni bond market size has been growing from 3.8 trillion to 4.4 trillion as of now from that time.

So this means that the retail investor bought a significant amount of muni bond through these years. And another finding by the paper is that they found out the low-income counties increased their borrowing and leverage more than the high-income counties. Yeah and also the state-specific funds, they play a role in the middle by reducing the segmentation within the muni bond market.

In the end, the team also identifies some patterns of those extra muni supply patterns, such as more low coupon supply and more revenue bond supply and more new money proportions in the extra supplies. So overall, I think this paper is solid and well-written. It cover a lot of topics. I have three suggestions here.

So number one, I believe that the SALT cap do have a series of spillover effect to the municipal bond market. But it's also also worthy to mention that some of these changes in my view, is the confluence of other policy changes within the TCJA provision. They just are running together and make such change.

So, as such, let me just do a quick recap of what TCJA does to the muni market. So number one is the SALT cap. We all know that. Number two they banned the advanced refunding so there will be no more tax-exempt advanced refunding fund allowed. So what is advanced refunding? It's actually issuer can take advantage of the lower interest rate 90 days before the call date, right?

If they call the bond within 90 days prior to the call date, it-- they call it current refunding, so that's allowed. But issuer are not allowed to do the advanced refunding, which means, like, if you advanced refund the, the bond, like, two years ahead of the call date, that is not allowed anymore. So that's actually shut one door for one way for the local government to save money.

So in that said, they are looking for more ways, es-especially to issue more new money funds new money bonds to meet their financial need, especially for those smaller counties who are under financial pressures. So this explains the new money patterns in the paper Francesco discussed. And, Another change of the TCJA to our market is they permanently lower the tax rate for the co-operations.

So you, you might think this is not quite related to us, but actually remember what I said, the 75% were individual investors. So the rest of the 25% of the holders in the market are actually co-operations such as bank insurance companies. So they are pretty sensitive to tax as well. So their tax rate declined from 35% to 21%.

So that means muni bond are not attractive to them anymore. So we-- I look at the Fed Z.1 data again, right? If you look at the AUM of the muni holdings by the banks. So the AUM is ramping higher until the end of 2017, and they, the bank insurance company, they start to selling the bond into the market.

And then naturally, it's all those individual investors ab-absorb those those sellings. And, Yeah, that's why I think that in my view it's worthy to mention all these policy changes in the paper, right? Soft cap might not be the only driver for that. And one more thing is the low coupon structure issuance in those years.

So I believe that's more a function of the lower interest rate in s- especially post-COVID, right? We all know that the Fed funds rate declined close to zero, and the long end rate is much lower. And the demand for the muni bond is actually still premium bonds. So all these high earner investors, they're still looking for premium bonds as the... but the long end rate is as low as two percent, three percent. That's why they are able to issue those low coupon structures.

And suggestion two is pretty quick. So, I was using a different data source but I do agree that the strong demand from individual and the goes to the strong fund flows. But in 2018 data, the data I use is from LSEG Lipper that shows actually 2018 flow was sort of weak, only three billion in total through the year, but it pick up significantly in 2019 and 2021. I think the reason of the weaker flow in 2018 was because the Fed was still in the hiking cycle, late stage of the hiking cycle.

The Fed hike start in December 2016 and end, the hiking about end of 2018 or early 2019. So basically after the hiking cycle ends a lot of cash, you know, they think their short shorthand yield was stabilized there or even lower. That's why all this cash moved to the long end, and that's why it triggers a lot of very strong inflow to the bond market, to the bond funds. And lastly I think the, the-- Francesco mentioned that the state fund is is doing a great job to reducing the segmentation within the states. But I think that the entire muni market actually is doing the good job for-- on a national level as well, right?

Think about the people who buy a national muni fund or just in SMAs. They can buy any state's muni bond, actually, right? Their main goal is to avoid the federal tax, and we only seen the California and the New York specific state funds are in a higher demand. Other than that yeah I think the author can expand the horizon into the national level, maybe in a follow-up research.

I'll stop here. Thank you.

CUNY: Great. Thank you. So before we open it up to questions, I think first we should give you the opportunity to respond to the thoughts from the discussant.

BRUNAMONTI: Yeah. Thank you, Tian. All your... Yeah, all your comments were very thoughtful and very punctual. My main answer is about the refunding part. So we separated our bond supply in new money, current refunding, and advanced refunding.

Advanced refunding, despite losing the tax-exempt status, is still actually surprisingly large, but we still find that the effects are mostly in new money issuance. This is what we use to explain that the supply of additional municipal bonds has real effects on the real economy, and it's not just a refinancing of existing bonds.

We have considered looking at refundings, but we didn't find any important results in that sense.

TIAN: Yeah. I do agree with that, but my, my point is maybe because the, the ban of the advanced refunding is another driver for the more new money-

BRUNAMONTI: Certainly. Perhaps this allowed them to decide for the new money bonds.

Yes. But our point is that this salt effect is a real increase in the amount of funding that is available to the counties for local spending.

TIAN: Okay. Yeah. Yeah. Agreed.

BRUNAMONTI: Thank you.

CUNY: Great. Okay. Why don't we open it up to questions?

Dan?

AUDIENCE QUESTIONS: Dan Garrett, Wharton. Thanks for letting me ask all the questions. Francesco and Ye Tlan, I really appreciate this, this presentation discussion. I think it's a nice paper. I think I would like to know a little bit more, looking at the paper, about what this income divide was and how this income divide is disappearing.

'Cause I think when you start regressing local income on stuff, it's-- you'll see it's a very strong urban-rural divide, and I think there are lots of things that were changing in how urban and rural communities were relating to each other and how economic activity is spilling over them. And I think one of the big things we saw during COVID, of course, was the house price appreciation that had been so strong in urban areas, of course, spread to rural areas as people were working from home and all sorts of things.

So I was wondering, could you talk just a little bit about how you were able to control for other stuff to make sure this is really about income and wealth and not about the kind of larger trends in urban-rural dynamics?

BRUNAMONTI: Yes, certainly. Thanks for the question. So our last slide was just a depiction that shows the uncoupling of local spending from local income, but we just used that as a support for our idea that even if normally high-income counties have higher levels of leverage, the additional issuance in the low-income counties kind of reduces the gap between the two.

So our story is about the relative usage of municipal debt across counties. And this addi- this use of additional debt, again, narrows this gap between rich counties and poor counties. My last slide was only a graphical description of this gap narrowing I'm not sure this fully answers your question

AUDIENCE QUESTIONS: The, the tricky part is saying that this is all because of SALT and how SALT changes how investors demand for municipal debt in their own portfolios, instead of necessarily maybe how people living in those places change their demand for amenities or change their, the, the economic activity happening in those places that changes repayment likelihood.

I think it's a really big thing that has been happening, and it's happened quite quickly, and how economic activity and like business starts and whatnot across urban and rural places have converged. And saying that this, what you measure is because of SALT, I think needs a little bit... Could benefit from a little bit more support, and maybe disentangling other things going on in the urban rural comparison.

BRUNAMONTI: Certainly, it's a good point. So our main identification is about the effect of SALT on municipal bond issuance. Then we show that there is this decoupling of local spending from local income, which happens at the same time, may well be confounded by a number of other aspects at the same time. We just show that this happens beginning in 2018 as well.

This is not the central part of the identification, it's just a support to our central result. But I agree that we can look especially at income trends in the same period.

CUNY: Guess maybe on a related note, that we just saw in the last session that around the time of the SALT cap, we also see migration patterns being different across different kind of income groups. Does that play a role in your results at all?

BRUNAMONTI: So this is a great point, especially because we are focusing our data exclusively on tax returns of individuals in the highest income bracket. This is something that we should control. We compare counties to other counties in the same state, but despite being in the same state, they might have different migration patterns. There is a recent paper looking at that, and we can follow them to try to understand more about migration.

TIAN: Yeah. We do track the migrations in our research before. So in late 2019, we already see that New Jersey and California first time saw the outflow population since past few years.

Yeah, definitely SALT. Because you, you think about that, people see their tax bill every year, right? So the SALT changes suddenly. So yeah they probably will some, especially for those high earners, they will make decision quickly. Yeah.

AUDIENCE QUESTIONS: Thomas Lee, UT Aus-- from UT Austin. Thanks, Francesco and Ye for great paper, great discussion. Just have one quick question about the supply response, especially among high-income counties. I I apologize if I missed something during the presentation, but it seems like, I guess my, my thought was that perhaps

high-income counties could have responded differently to SALT in the sense that, like, maybe they could have, you know, issued, like, taxable securities as opposed to tax-exempt securities that, you know, they were familiar with.

And, you know, I think sort of having a fuller picture of both types of counties could provide maybe, like, a better description of what was really happening around the time when the SALT was implemented.

BRUNAMONTI: Yes, this is a good point. We find that for taxable securities, both the demand and supply didn't move significantly.

We just used the flows, these flows into mostly tax-exempt municipal funds. The division across counties is a little bit of an arbitrary choice to aggregate issuers at a more aggregate level. And typically, we try to partial out county effects, but it could be a good idea to run tests for heterogeneity across county types.

In particular, as was mentioned, urban-rural is a important possible heterogeneity.

TIAN: Yeah. The, the, the buyer base for taxable municipal bond is much smaller versus the tax-exempt bond. So ideally, yeah, most of the... Especially for, like, a smaller names, state, local government they definitely will issue tax-exempt bond.

We do see some larger municipal issuers. They can sell the taxable bonds because it's more like a well-known names. So those taxable investors can accept that easily. But yeah, the -- if it's like a smaller state local county it's better to issue a tax-exempt bond.

CUNY: Okay. Looks like that, that's it. We're gonna end right on time for this one. That's good. All right, so next up we're gonna have a paper presented about school districts in Texas. So the author is going to be Thomas Lee from the University of Texas at Austin followed by a discussion by Howard Cure from Evercore.

LEE: The same mistake again. I'm good. Yeah. All right. Thanks so much everyone, especially Brookings for inviting me to this wonderful presentation and conference. And thank, I thank everyone for you know, your patience making it to the last paper presentation. Of course, this is not the last part of the conference, so please stay until the last session.

Oh, this way. Okay. So today I'm super excited to present my paper on sort of school districts in Texas, and the usual disclaimer applies here. The conclusions of this this research do not necessarily reflect the opinion of Texas Education Research Center and other related agencies and, of course, the state of Texas.

So to give you a little bit of background of the paper, the public school districts in the US are deteriorating and, you know, total deferred maintenance costs has nearly tripled over the last decade. But not all school districts have the capability to fix those rundown buildings because that capacity depend or that capability depends on a district's capacity to issue additional debt. And when I say debt, it's typically, you know, municipal bonds which are, you know, repaid through local property taxes, right?

So, right. So with caps on, you know, property tax rates or property tax revenues for debt service these limits are binding for highly indebted school districts to address their long-term facility needs. So when a district cannot address these needs, what could happen is that there could be short-term learning losses for students during the K to twelve education but it could also last longer for these students as well Now, what this paper really does is asking the question whether the capital expenditures could improve student outcomes, especially among those that are debt-strapped, that have that, you know, lacks capability to fix those buildings.

And the design I use in this paper is the state debt assistance programs in Texas, which was basically, you know, the state would come in and share the cost, a proportion of that service cost. And the key intuition here is that the sort of the existing debt burdens before the programs kicked in would determine the debts the amount of debt subsidies.

And these debt subsidies would unlock resources for additional capital expenditures for school districts. And what this buys me also is that it allows me to focus on sort of the marginal products, projects that were out of reach for these highly indebted school districts. Now, the headline result here is that capital spending does improve student outcomes but it takes some time because if you think about the benefits of facility improvement, it takes a few years for the project to complete.

And then once that's complete, students start to feel that, you know, they're in a better building and they can focus on their you know, courses. So let me explain the empirical specification here. So obviously a lot of things sit between capital expenditures and then student outcomes. So I utilize debt assistance programs in Texas, and as, as I alluded to it, it's essentially the state sharing the cost of that service with local school districts.

And this came in two forms. The first one's called Instructional Facilities Allotment, which is essentially helping with the newly issued bonds. And school district had to apply for the funding, but once these bonds become eligible, the state would cover or share a portion of those debt service costs until those bonds mature.

And the second part came in 2000 which is called like Existing Debt Allotment. This time the state was trying to help with the existing bonds that were already issued before. And this time, you know, school district didn't have to apply. It was like automatically eligible as long as this local school district's property taxable wealth was below the statutory threshold

So how do I use this, you know, this, this setting? So the key intuition here has two parts. The first, the districts with more existing debt burdens would either have a stronger incentive to apply for the funding through IFA, or they would be mechanically eligible for larger debt subsidies because of its proportional payout structure. And once, you know, these debt subsidies are received by those school districts, this would unlock more more resources for capital expenditures because it's-- you can think of this as like effectively expanding their debt capacity by lowering their debt service cost.

Now, this is how I operationalize this sort of intuition from the setting. So I construct the instrument for capital expenditure or capital expenditure or kind of a causal proxy for capital expenditures using the difference-in-differences estimator, where it has two parts. One is cross-sectional split of school districts based on their sort of debt to pay tax levy ratio or kind of leverage ratio for school districts. And I measure this specifically in the 1987-1991 period, which is like way before the programs kicked in to sort of, to address kind of, anticipate sort of some districts anticipating these programs. And so, you know, school district would be either classified as like high like DTL high or low, depending on their position of their average DTL below or above median value.

Now this is the second part is that the timing of the instrument. I, I chose 1998 because that's when state of Texas started rolling out multiple funding rounds in both IFA and EDA. So, so the interaction between these two terms really capture the different differences in debt subsidies between highly indebted school districts and less indebted school districts after the programs began.

And what this buys me is that this removes, you know, any of the variation in capital expenditures that are unrelated to the instrument itself. And also it allows me to-- It, it largely reflects the incremental capital spending by highly leveraged school districts, thanks to this debt subsidy program.

Now, of course, there's a lot of assumptions to make, but two things. One is that it's a strong -- it should be a strong predictor, and I'll show you in a couple slides that there is a you know, strong correlation between the instrument and the capital expenditures. And then two this is, you know, the instrument is kind of robust to alternative explanations.

I'll, I'm gonna explain if I have time later, but it's essentially I'm ruling out like an like it's an unanticipated shock, and it's not really related to the local economic growth or any like concurrent events. Now, here's the actual two regressions behind the in the background.

But two key things. One is that I only use the variation in capital expenditures that comes from the instrument. And then two, I use that part of the capital expenditures to understand how that impacts student outcomes, which are measured in two ways. One is short short term, and another one's long term. The short term, it's like year zero to four after the increase in spending. Long term, year five to year nine

So, data, I you know, as you could have guessed from the disclaimer, I use a lot of data from Texas Education Agency. They have a unique and granular data that tracks individual students from their K to 12 ages to working ages. And for the balanced information of school districts, I mostly rely on NCES Common Core of Data, which is standard in the literature. So the resulting sample here is about 870 school districts over in the 1994 to 2004 period.

Now to the main results. So it's about the first stage where I look at, you know, how does the instrument predict or cor- is correlated with capital expenditures, right? So here the capital spending here is three-year cumulative in the unit of \$1,000 per pupil. And both specifications have district fixed effect, year fixed effects, and the first one doesn't have district level controls. The second one has district level controls in it. And what this really shows is that you know, districts with a greater amount of greater debt burdens would spend about \$570 per pupil more than the less indebted school district, which is, you know, in, in, in line with the intuition that I explained in the previous slide. And this is just showing you know, allowing the coefficient to vary by year.

So it's just visual representation of how it looks like. So two things to mark. One is that there's not much difference between highly leveraged school district, less leveraged school district in terms of their capital expenditures before the debt assistance programs. And two, you see kind of an an increase in capital expenditures following those debt assistance programs. And here's the main results.

So, in, in this table, I look at how that sort of capital expenditures affect student outcomes, especially the standardized eighth grade test scores for reading and math. And if you look at the odd numbered columns like short-term results, we don't see much impact from capital expenditures.

Whereas if we move on to the even numbered columns in or long-term outcomes, we see substantial gains in terms of educational outcomes or test- testing scores, right? So, you know, to put this number in context, this is the investment of this size is enough to move a district's average student to about two to four position up in a ranking of 100 students statewide. And I also look at non-test outcomes such as attendance rates, graduation rates, and college-related outcomes.

You see the same pattern here where, you know, in the short run there's not much response, but in the long run you see substantial gains, except the college-related outcomes are not statistically significant here.

So I also-- I extend the horizon a little bit further to understand, you know, the wages and employment status during the age of 24 to 26. And here the interpretation is a little bit different, like year zero to four means refers to student cohorts who reach their twelfth grade zero to four years after the increase in spending, and year five to nine refers to cohorts that reach twelfth grade five to nine years after the increase in spending.

And we don't see much impact from the, you know, whether they're employed or not in in, in the ages of twenty-four to twenty-six. But we see positive gains for the cohorts that had longer exposure to the increase in capital expenditures. Now this is kind of the essentially spreading out the short-term and long-term effects across all the horizons.

So these are essentially showing the effects of year zero to year nine in just one picture, and this is an example from reading score. So you can see in the first, you know, couple of few years, you wouldn't see much impact from capital expenditures. But over time, you see substantial gains in those educational outcomes.

So this is in line with the benefits of facility investment because, or upgrades, because you can imagine the case where it might take a few years for construction or renovation to complete. But then once these are complete, students start to feel those upgrades and perform better.

Now this is like one of the alternative mechanisms that you might think. So it's essentially saying that "Gee, you know, this district is investing a lot in capital improvements. I wanna move my kids to that district." And perhaps these students, these kids tend to be high achieving, right? So, but what I show in this table is that a lot of the educational gains from capital expenditures is coming from existing students who stayed with the current school districts.

So I'm here, I'm just listing a bunch of tests to rule out alternative explanations in the paper. I'm just gonna skip in the interest of time. All right. So let me conclude. So let me close with three main takeaways. First, this is an important topic. Deteriorating school facilities can pose a threat to students.

And, you know, especially there are some school districts that fall behind in fixing those rundown buildings. Two, this finding really highlights that there's a substantial gains from capital expenditures, especially capital projects that were out of reach for highly s- leveraged school districts before the state state kind of intervened.

And this happens in the long run or relatively long run and is consistent with having better buildings for students. Now the last part in some in terms of policy implications now debt capacity should be one of the key factors in school capital finance policy. States are actively revisiting and discussing school district debt financing rules and debt capacity, especially, you know, its variation across school districts should be fact-- should factor into these discussions because my findings show that where it's most constrained districts might miss out on projects with substantial value.

And this is not just relevant to, like, very limited to school district, but relevant for other types of local governments that are dependent on property tax supported debts to finance their infrastructure. Thank you very much and I very much look forward to the discussion.

CURE: Just, I just move it by, okay My name is Howard Cure. I am Director of municipal bond research at Evercore Wealth Management. We deal mostly with high net worth individuals, rich people, and retail markets very much driven by headline risk, or questions emanate, or more specifically, I have to answer questions. The K through twelve school systems around the country have been in the headlines quite a bit. Other questions I get is what's gonna happen in New York City with a socialist mayor? If you invest in higher education, how can the federal government start withholding monies for research? Things that I have to explain.

I think this was a terrific paper and I don't have any specific comments or critiques on it except that we'd ultimately like to expand it because implicit in, in the paper is the fact that there's a increasing reliance on the state. And I'll go through what it means for essentially school districts that can't afford to issue more debt or different policy changes that are affecting the school districts.

So that's what I wanted to come up with. It's no doubt that improved facilities intuitively you think would lead to better learning outcomes. And now we have quantitative evidence for that, and that's terrific. Also that underlying some of this, it's very easy to neglect deferred maintenance needs because you don't have an immediate impact on the operations but ultimately it catches up with folks. And also the disparity with po-poorer school districts and the capital needs they have and raising capital a-affordably.

So, also, do they need help in applying with states or other outside sources 'cause they may lack sophistication on navigating a, sorry, grant or loan process? Concerns also stem from issuing debt to improve facilities and then ultimately having enrollment declines. And I'll be talking about this a little bit more, but within Texas and other states, you have increased competition from state programs, say, to subsidize private school tuition or more money or general demographic declines, lower birth rates, or things in a state like Texas, immigration policies, and not having as many children going to school for fear of ultimately, frankly, deportation.

So let me go through just a couple of charts that I have. First one discusses just spreads. And, you know, people have been throwing out bond terms. I, just for the few that may not know or be as familiar with that, we're essentially... In corporate world, you see what kind of yields there are compared to treasuries.

You don't have the same benchmarks in a tax-exempt market, so you use a proxy for gilt-edge AAA-rated securities and what kind of spread. And this also sort of negates any kind of interest rate fluctuations. And you see... and the other thing to point out is Texas has this amazing program called Permanent School Fund, where through the years they have accumulated, through their Permian Basin oil reserves, right now 67 billion dollars in assets that they use to guarantee school debt and also distribute money for K through 12 and the higher education system.

They use this for over 900 school districts. So they're getting AAA ratings on that, which provide not only lower interest rates, but more liquidity. So, they've had this program in place since 1983. They've never had a default on any of the school districts because they also scrutinize it. So what you have here is, you know, I put in school districts that have underlying ratings under the PSA program of double A, single A, below A, and then within it, non-PSF schools and then the charter schools.

And you see the way it operates is a pretty tight band for everything but the orange. And within that, as you'd expect, the underlying stronger school districts of double A have the lowest spreads tighter spreads closer to the triple A, and then it increases. The, the anomaly was they've also started including charter schools, which are weaker traditionally schools, because you could actually lose your charter and have to be shut down.

They're usually rated at best in the triple B category. And when they first initiated it, you can get extra spreads from that at over, you know, close to a hundred basis points. And people got familiar with the program, it's closed down. So for someone like me looking to take advantage of the of additional spread, we would... and know how the PSF program works, we try to get that purchase those bonds. Then the only other one I wanna show is this. Is just basically PSF versus non-PSF bonds. And you see they fluctuate pretty closely because the non-PSF bonds could include a variety of underlying rating bonds that they went in on their own, or at some points, the PSF program didn't allow additional debt because they didn't wanna over-leverage their corpus.

However, if you notice over the last since this year, there's a widening of the spread between PSF and non-PSF bonds. And the only thing I wanna bring out to that is the possibility that the, the market is signaling some concern in school districts without that credit enhancement due to some of the the issues I was speaking about, like more competition from state-subsidized private schools or a greater reliance on state aid or declining enrollment from demographics or immigration or just competition.

So just a couple more points in talking about Texas specifically, although this may apply to other school districts around the country. They refer more and more to public schools as government schools. And when someone in Texas legislature starts referring to something as government, it's a negative connotation. It's pejorative. And I think underlying some of this is that teacher unions are usually supportive of Democratic politicians, and it's a way to undermine the, the programs and the state aid for public schools by by supporting other schools that might, may not be as unionized. There's also, and we've spoken about it or touched on it in different papers throughout the conference, pressure on states to relieve property tax burden.

Now, most school districts, you get your money, your revenues from property taxes and state aid. It really was considered a very safe sector compared to things like healthcare or housing or higher education. And it's starting to shift now because there's... If you cap

the property taxes and the state, at least initially, is committed to maintaining revenues for the school district, well, state aid has to go up. And in fact, in Texas back in 2023, 40% of revenues came from the state. Now, it's over 50% in Texas from the state. The national average is about 43%. So when you have less state money, more state money is coming in, you control more of the power from that, and it's just something to be very cognizant of.

And there's also less guidance and monies potentially from the federal government, which is also something to be concerned about. So that cap on the property taxes is something I really start-- And it's not just Texas. There are other parts. And what does it mean? It means the state is gonna be ultimately perhaps giving more money, and then the risks of balancing the budget for a state may mean that they'll be making cuts to school districts.

And how do they select which school districts to cut, or do they have some outside mechanism to let them raise property taxes temporarily? So big concerns, but as far as the paper is concerned, you know, showing and proving that there is a need for decent s- facilities for the kids to go to school and having results is very important.

So hopefully that is going to be very persuasive with the state and the legislature. So I went over a minute, sorry.

CUNY: Thank you both. Thomas, would you like to take a moment to respond?

LEE: Sure. I just wanted to thank you, Howard, for having a very colorful discussion that, you know, my presentation lacked in some sense. He covered a lot of, like, past policies regarding school capital finance and current events as well. So I think it was a great sort of a discussion to you know, kind of polish the presentation a little bit more.

CURE: Yeah. I mean, it's in a way, a shame how increasingly politicized just basic education is. And I'm not even talking about curriculum now. It's just I think there are there is gonna be a greater and greater tie to state resources, and it... a lot will depend on the state.

Now, the-- it's not to say that K through 12 programs are all efficiently run, and there's not room to make cuts. But you have to watch which way that pendulum is swinging as far as cuts to that versus supporting private schools, for people may not even need the the extra support.

And then the whole charter school, which sure runs in between the two, and what it means for the K through 12 basic system, which used to, again, be such a a, a s- a safe sector that wasn't that complicated unless enrollment fell off a cliff. And if enrollment starts declining, almost every state formulaically reduces their state monies.

And then what happens when you have a burden of, for a new facility for debt if the state's not putting in money? So that's, you know, I try to... I'm not going to pretend to... It's been a long time since I've done my own economic analysis like this with econometrics, but it's the political element that's more and more concerning to me.

CUNY: All right. Do we have some questions from the audience?

AUDIENCE QUESTIONS: Just a question about basic facts. I don't have a good sense in Texas for how meaningful the charter school sector is. When we're looking at these numbers with charter schools, should we think about this as-

CURE: It's right -- well, so the bigger, the state with the biggest is about 20% and that's Arizona. Texas is at 8%. 8%. So there's room to grow there. And you know what you don't, what, for a poor school district, you understand the parents need to want to have the best education for their schools, and unfortunately some of the worst teachers are in some of the poorest districts. But you're losing the best -- those are the parents you want in your K through 12 public school system.

So we always sort of, unfortunate cycle in that. So there's room to grow on that. But then, now also Texas has started to subsidize the the private school tuitions. So that's the concern

AUDIENCE QUESTIONS: Hi, Louise Sheiner, Brookings. Thanks for an interesting paper. I have two questions, little questions. So you, you are motivated by saying there's, like, these good projects that they can't issue debt 'cause they, their debt is too level, is too high. But then you said there was no difference in debt issuance between the treated and non-treated states before. So I was sort of surprised at that. I thought we would've seen, well, they had debt capacities, they were issuing debt. So that was one question.

And the second question was, you seemed to gloss over it, but there were a number of outcomes where the results were actually worse and kind of the same magnitude as the improvements after, like test scores and earnings, and I wonder how you think about that, whether or not you think of it as disruption from construction or, like, I was just wondering what you thought of those.

LEE: Sure. So to your first question, I was showing the... There weren't that much differences in terms of capital expenditures between those two, the highly levered and less levered. And that's of course after controlling for like district fixed, like per- like, some assumptions like time invariant differences across school districts and, you know, your, like macroeconomic shock that could potentially affect those.

So like after controlling for those, I would you know, there wasn't that much difference in capital expenditures. Just wanted to clarify. And then the second-

AUDIENCE QUESTIONS: Would you have expected there to be if one was limit- one was constrained and the other one wasn't, you would expect to see a difference in capital expenditures?

LEE: The way I think about that is that there wasn't much, I mean, obviously there could be level differences, right? 'Cause a less levered school district could spend more constantly over time, but it's just been subsumed by district fixed effects. So level difference is a, a, kind of a absorbed.

And to your second question, I'm also actually thinking about how how to reconcile those findings, especially, I think I'm pretty confident with test score out, like test outcomes and non-test outcomes because those are, especially the short-term ones, are not that far from the timing of the increase in spending.

But labor market outcomes like, you know, wages I think you rightly pointed out that's something I'm still looking into because a lot of things can happen between their K-12 education and their working ages. So I would be... I wouldn't read, like, too much into the exact magnitude, but in terms of the you know, the direction, I think it's potentially capturing something that weren't measured in, like, tested outcomes or non-test outcomes.

So yeah.

AUDIENCE QUESTIONS: Yep. Howard made a very interesting statement that I would like to bring to the attention to everybody who's interested in municipal bond analytics about computing spreads. He pointed out that on the taxable side, we look at treasuries as the benchmark, but on the municipal side, there's no benchmark, well-accepted benchmark for computing spreads.

And I actually published a commentary about this very problem earlier this year in The Bond Buyer. So it's something that to keep in mind for anybody who is interested in municipal, in the calculation of spreads for munis.

CURE: We have someone from JPMorgan here. Why don't you, why don't you fix that for us?

TIAN: Yeah, we do. There are like, yeah, it's not like... a Treasury is the benchmark for the entire fixed income market, right? And it is trading. Like, it's only like a five or six CUSIP on the run trading every day. It's live, it's benchmark. But munis, actually, there are a couple of companies, they are doing that.

So we're... It's not like a no benchmark. So it's the benchmark are sort of artificial, published by a firm called Refinitiv some one call it MMD. This has been used by

industry for probably like, 20 years. But in the recent years, Bloomberg launched their AAA curve, which they try to compete with the MMD.

And I know that ICE, the, which is another competitor, they are doing a benchmark as well, right? So actually, for all the new issue coming to the market they do use the benchmark, mostly Biva or Bloomberg and MMD to, to calculate those spread. Yeah.

But so, so- sorry, just one more thing. But those are, in the end, these are still like sort of artificial. Sometime our traders will complain the benchmark doesn't move along with what market really trading. So that's why it's hard to have a real benchmark in our world because there is no, like, a real things like a Treasury bond trading real time.

CUNY: All right. I think we have time for one more question.

AUDIENCE QUESTIONS: So I think maybe this answer is intuitive, but I'm curious, did you divide your study into cohorts? Like, is the capital spending for getting a, a school from fair to good or good to great different in results than getting a school district from, you know, great facility or good facilities to great facilities? You know, is there, does the, is there incremental gain?

LEE: So I guess you're asking about the results on kind of different samples of school district, whether, like if they had good facilities to begin with versus like the ones that didn't have. I would say unfortunately we don't have that data 'cause again, the sample period goes back to late 1990s, and back then we didn't have good disclosure of the facilities the status of school facilities.

I think now the state of Texas is actively working on to produce the report on facilities so that, you know, the parents or residents could, you know, know the s- the how the school districts are maintaining their facilities. But unfortunately I don't have the data at the moment, and I think this could be one thing to I don't know, like we had a lot of discussions yesterday about like, you know, if there's like one thing, what would you want to improve in terms of like the municipal market?

I think we need better disclosure of like facilities as well, or infrastructure quality in the bond document to have better understanding of what we're investing in.

CURE: And there's a big I know we're on. There's a big project going on GASB about moving the deferred maintenance needs from just the notes to a liability, just like they did with pensions many years ago.

And it's gonna get more and more attention because of that. And it's before you start getting into gradations of how bad something is or good something is you gotta have some kind of measurement.

CUNY: All right. Thank you. This is an excellent conversation that we'll have to defer to later. Finish Okay, so we have no break now.

We're gonna go straight into the next panel.

LARSON: All right Well, we started this panel yesterday, David Wessel did, in his great conversation with the elected officials. If, I don't know if everyone caught that, but if this conversation really what was on their mind, what's-- how are their governments using AI, was a big part of the conversation. So we're here to continue it, and we have an amazing panel for you.

First, I'm Lauren Larson. As you learned yesterday, I'm a Brookings fellow, former state budget director, and president of NASBO. I've also spent the past couple years working with companies on the hardware side of the AI race, the ones tackling the energy and compute wall to to try to scale quickly.

So, I have a, this incredible panel. We have three here in person and one on the line, and we appreciate Ryan. He had to suffer through two, not one, but two canceled flights, so we're glad he can still be with us. So the panel, we have three folks that are gonna, that have really, are gonna give us a broad perspective because they're talking with a lot of different state and local governments.

And so it's a perspective it's hard to get from the narrow lane that, you know, each of us sits in most of the time. So I'm excited to hear that. And then we have our a fourth panelist that's really had experience rolling up their sleeves and digging in to implement AI in a local government. So, so with that I'm gonna kick it off to you, Andrew, to please introduce yourself. We'll go down the line here. And also tell us an intriguing AI use case in your intro. Sure. Thank you.

NGUI: Good morning. Yeah, it's still morning. I'm Andrew Ngui, chief digital officer for the city of Kansas City. The work that we're doing really is focused on identifying and solving problems as it relates to local government, and really the heart of it is the integration.

The technology is a tool, AI is a tool, and so really the heart of it there that we're doing is to address problems. So one clear example that we recently had a real-life simulation was when a disaster happens in order to unlock federal aid and state aid, you have to have an official disaster designation, and oftentimes that takes a significant amount of time.

And what is the opportunity for AI and perhaps new technologies like drones and other things where they are actually being able to be integrated together? And so we've worked with X, the Moonshot factory from Google, to combine a drone mission with their novel AI, and that led to twenty minutes to ninety-six percent accuracy of the initial

damage assessment that would then begin to help rapidly unlock the damage assessment and of course, the state and federal aid.

So really the heart of this, the work that we're doing is in that lens of making sure that we can have the outsize impact through technology like AI and others.

RENTERIA: All right. Well, thank you for having me here. It's exciting to hear all the different financial modeling, et cetera, 'cause I started my career actually in at Goldman Sachs in financial services for private wealth management. And so as remind-- it was like exercising all the different analysis we used to do.

Since then I've been in politics and policy for a long time, worked in the United States Senate for about 10 years and have also worked at all levels of government. And so I bring a policy and political lens to now my role as CEO of Code for America for the last six years, where I thought I'd work on all these policies and politics to get things passed.

And now for the last six years, I have been in implementation where what has actually happened to those policies, particularly SNAP, Medicaid, tax benefits. We work, Code for America works in about any one time in about 40 states in our safety net and tax work. We partner with governments to modernize their systems. That was pre-AI, and now and now we're actually working pretty directly for the last two and a half years on what makes sense to use an AI tool for or not, and what is that government's model.

Earlier this year, we re-released an AI landscape assessment. We did our first one about a year and a half ago and realized when you do an AI landscape assessment these days, they don't last a year. You need it updated in six months. And so we did that just recently. We launched that in May, really giving people a sense of across the country, where are states utilizing AI? How are they embedding it? My my AI use case really rests around one of our key areas in our tax portfolio where we help people file their taxes for free.

We work with VITA sites around the country to do so. And our approach is, what is the biggest barrier to throughput? And the biggest barrier we were seeing is we had volunteers across the country clicking on data files, so IDs or birth certificates to make sure it was actually a person for identification veri-verification.

And it was a p-piece that was taking up the most time. So we started to look at, of course, early on, document intelligence tools. We actually were able to-- One of the-- We have 249 volunteer sites that we work with today right now on what's called Get Your Refund. Immediately embedding that, we were able to actually build those partnerships so that volunteers can get through much faster.

They no longer have to click. They can actually they're actually only looking at I think it was we improved it, I wanna say five times as fast for any one volunteer for their

casework file. So they now can process a lot more tax filing and they don't have to do as many clicks. It's just automatically this is a document and it's verified. So thanks for having me here.

KLEIMAN: Great. I'm Neil Kleiman, and my day job, as I like to say, is I'm a public policy professor at Northeastern University. But I also help run two major AI efforts. One is called InnovateUS, and this is a partnership with the National Governors Association, and we are working with governors around the country to provide the largest amount of AI training for their state workforce. But InnovateUS is totally free, so I highly recommend it for everyone here or any jurisdictions you work for. And it's a great resource for the basics of AI and how it works. I also run something called Rethink AI which is the largest collaborative effort of higher education institutions looking at AI adoption.

So we have a number of policy reports looking at what this looks like. And in the course of that work, I have my use case. And I know it's July here in Washington, but this is a use case about how AI saved Christmas. And it has to do with Brooke Smith. Brooke Smith is from Murray, Utah which is in the Salt Lake Valley, and those of you geographically inclined, it's just eight miles south of Salt Lake City, and it's a relatively small city of 50,000 people.

And Brooke is the city recorder, and as you know how this goes in small places, she is the maître d', the line chef, and the waiter all in one. And her official job is as city recorder. She's in charge of purchasing, but much more, including procurement and many other things. And all these responsibilities built up on Brooke in the fall of 2023 when Murray, Utah moved its city hall to a new location, and they needed to get a 70-foot artificial tree in time for the holidays.

I'm sure you've all been in that situation before. Needing an artificial tree of 70 feet in length. So Brooke had to, in short order, put together an RFP, which meant to draft it, to review it, to publish it, to evaluate it, and to award this contract for the tree. So she then ran to the city manager to get permission to use AI, which you should do, as everyone should do.

She received the permission. She started at 4:00 that day, and by the next afternoon, she had the first draft, which included the solicitation language, organized the requirements, and all the evaluation. And then Brooke went on to say, "This would not have been possible to do a first draft in 24 hours." And guess what?

They met the deadline, right? So AI, in fact, saved Christmas. And now it is not just a holiday season component of what is happening in Murray, Utah. They continue to experiment to see how it can be helpful.

LARSON: And last but not least, Ryan. And so we can see Ryan in front of us here, and you should all be able to see him up there. Great.

MINNICK: Oh, fantastic. Nothing like being twice the size I'm supposed to be. Good morning or almost afternoon, everybody. So I'm Ryan Minnick. I'm the chief operating officer for the Federation of Tax Administrators, and we are the trade association that works with the principal tax and revenue agency for all 50 states, plus New York City, city of Philadelphia, Washington D.C., and actually Kansas City, Missouri. Those are our full members. We work with a number of local large municipalities that have a direct tax collection responsibility.

And for the last few years, we've been working relative to the AI space, my background at FTA, I, I work on our technology programs in addition to being our COO. And our technology programs always focus on, you know, large systems modernization, cybersecurity, data security, and most importantly, innovation. And where all of those things come together, we work to protect I might be a little biased, but the most sensitive data sets in, in the U.S. These are tax records.

These are the most intimate records that you have as a taxpayer or as a government entity. And with that we are uniquely positioned to really look critically at some of these issues around emerging technology. And this isn't just AI. It's any time something new comes along, our members and our technologists look really closely at how we can implement it both responsibly and safely in order to have positive outcomes.

And so a little under two years ago, we began a process to develop a AI white paper, which is available to our members. It's actually quite comprehensive, and we keep pushing towards a a more broad public release. But if you're within a government agency, you can reach out to me, and I can release it to you.

But to the broader public, we have quite a bit in there about the, the history and usage of broad AI. So everything from machine learning and advanced analytics all the way through to more of the generative AI conversation that we're having today. And it's it's a pleasure to, to be chatting with with my colleagues across industries.

And as we had our pre-meeting, we had such a great conversation about some of these use cases. My personal favorite that I'll share with all of you is a really boring one, but one that I think impacts government operations and budgeting rather closely. And there's several tax agencies in the U.S.

that have been pivoting their image recognition pipeline. So when you receive paper tax returns and yes, there are still paper tax returns. They keep going down in percentage every year, but up in volume because more people are filing. When you receive those, you have to scan them and get them into your system somehow, and that's a traditional- - traditionally an OCR, an optical character recognition process.

It's been around for more than 20 years. And a few states i-in the U.S. About two years ago began a journey asking the question of, can we get this accuracy up?" Because traditionally The document comes in, you have to have a reviewer look at the document, you have to check every field, check every line.

You wanna make sure somebody wrote 100 and not 1,000, or 100,000 and not a million. And then you process it through your system. That takes a lot of time to get that accuracy to the point where you are comfortable, where you have that 98, 99% accuracy. So a couple of agencies partnered with some leading tech firms, and one in particular that I'm I'm very proud of won a award from our organization actually an award that's granted by their peers.

They improved that pipeline by layering in a generative AI-based image recognition layer, which enhanced the ability to have confidence in what was being scanned and what was on the document, which reduced the amount of manual human time required to analyze that data. What that ultimately did for that agency is free up hundreds of staff to be reallocated to more critical work so that they could meet the needs of the organization without having to put work aside and increase workflows and increase pipelines.

So this is the enablement of technology to get the work done that you already have, not being so efficient that that, you know, you fall into the category that people are afraid of, which I find is a rather unfounded fear, that somehow all the work will be done by computers and we won't need people anymore.

This put people in a place to do more effective work by letting the technology do what it does best. So that's my rather boring, didn't save Christmas, but it certainly saved a good- ... saved everybody a lot of time.

LARSON: And you did talk about intimate records, so.

Okay, well, I'm gonna kick off the first question here to Amanda. Code for America is renowned at helping governments with tech transformation. Tell us how you see the AI transformation different from what's happened before.

RENTERIA: Yeah. I think one is just, first of all, the context we're in right now. So, their governments are being squeezed at all levels. We're seeing that in real ways, especially around SNAP and Medicaid, and that's the real focus that we are in right now.

But it's also happening at a time where it's unclear what federal guidelines are, policy is being passed, and implementation needs to happen in a faster timeline than we've ever seen before. And so AI feels like it is the answer for a lot of states and a lot of counties who are having to distribute stuff.

That's the context that states are in, and yet the legacy systems, the paperwork that they're dealing with isn't any easier, right? Those same legacy systems that we have seen states interacting with isn't different. And so there's a lot of tech debt, there's a lot of tech training that still needs to happen.

And I find it... So the context is different, but I also find that there's a step function that states still need to go through today in order to be ready for it. The other thing is it's a powerful tool. Haven't seen this before, and it's evolving faster than ever as well. That is different. I haven't seen a discussion.

I remember back in the social media days, government wasn't talking about it. AI, people are talking about it on both sides. Finally, I'll, We talk about this with our state partners and our county partners, it's wild as an actual tool. You have to watch it, you have to shape it, you have to direct it.

That is very different than a rote tool that you can come in and just make things faster. Generative AI now moves, and so the checking and the iteration needs to be faster, more thoughtful, more disciplined. So it really is a different time and a different kind of tool that's gonna require some investment in really working with it.

LARSON: Yeah, that absolutely resonates. Any others?

KLEIMAN: So I mean, I kind of pick up on Amanda's passion, 'cause as someone who's been following data and technology in local governments for 30-plus years, I have the same passion. I'm just so excited re- regardless of the outcomes of AI, I know we have to talk about that, but this is radically different, I think, than anything we've seen before.

So I'm gonna give just four examples of how. One is states are leading. States are all in on this, and cities are almost nowhere. We have never seen that before. So states have created a new job category called state AI officers. Cities don't have that. States are engaged, as I mentioned before, with the National Governors Association of having training of the entire workforce on AI.

Again, cities are still just catching up. So big difference there. The other is I see this as a universal application, meaning most waves of technology in the past, at least within government, have been bottled up with specialists in the CIO's office, performance management office, dashboards, purchases of large enterprise systems.

No more, right? Caseworkers, teachers, cops are starting to use AI, and they will use AI. The next is it levels the playing field. I'm one of these advocates that's been storming the barricades saying, "We need open data. We need smart gov," right? Where did that get us? Nowhere. A lot of cities opened up their data, but did citizens understand what was going on in government?

Heck no. Right now, I'm working with communities like that. They can start interrogating budgets and financial records in a way they never could before. Small towns like Mur-Murray, Utah, feel as though they just hired McKinsey to get that tree, right? On a dime. Very different. Here's the other big difference that I think a lot of us haven't paid attention to.

AI, and this is counterintuitive, is making human judgment valuable, right? In the past, all tech waves were about data. Give me data. We don't need data anymore. We got the data. What we need are human beings to decide what is accurate What's fair and what's just, and what should lead to our decision-making based on the analysis that we get from the AI, very different.

NGUI: I'm just going, I was gonna say, just to build on that as a city we are part of the GovAI Coalition led by the city of San Jose, which is roughly about 3,000 practitioners over 900 cities all across the US, Canada and beyond to practice, right? It is really the practice of using the tools.

And to Neil's point and Amanda's point, you know, the outsize impact that we can suddenly now begin to have because of that, that 24-hour turnaround, I mean, it's just incredible.

MINNICK: I would just add one-- Neil, all of your points are great. I'd add one more, which is urgency. Yeah. This is one of the few technologies in history where there is an urgency to adopt it from a variety of vectors.

There's an urgency because criminals are using it. They're using it very effectively, and we have to produce better tools in order to stop that volume of criminal activity. There's an urgency because you're changing over your workforce, and the next generation of the workforce expects these tools and is competent in them and is building competency in them.

All leading universities are finding their way to educate and to enable students to interact with them, and folks are entering the workforce expecting to be able to use them. And now they're entering workforces, especially in government, that haven't quite figured out how to let them do that yet. And in fact, in some cases, if they do it, it could compromise their job, so you're putting people on their back foot in terms of workplace satisfaction.

And there's an urgency because this is the first technology that regular consumers, kind of building on one of your points, you know, regular people are familiar with it. Every other technology, just like Neil said, was trapped in the CIO's office. It was trapped with specialists. It was a bunch of technologists who were really excited.

You know, if I'm talking to my 95-year-old grandma about AI and what, what conversation she had and how she figured out how to improve a recipe, that tells me it's a far more broad applicable technology than what we're seeing, what we've seen in the past 10 years.

LARSON: Christmas cookie recipes maybe? All right, I'm gonna go back to Neil.

Let's dig in a little bit. You've been around the country recently. You wrote a great paper that looks at AI adoption in state and local government. And I was-- I found it really interesting your view that mostly governments are using AI to optimize old processes versus a rethink. And not, they're not preparing for the demand that AI will unleash.

So could you talk to us a little bit about that concept, and if it helps with what you've seen, if it helps to, like, categorize between GenAI and agentic AI, that could be useful too.

KLEIMAN: Sure. So again, this is one of these... It is one of these counterintuitive dynamics that we're experiencing, that when you talk to local governments and also some businesses and say, "Is there much resistance to AI?" There's like, "Oh yeah, a lot of people don't wanna do this." And one of the reasons is a fear of job loss. But in fact, what is likely to happen, and we studied this in our paper in the public sector, and there's been a lot of work, Harvard Business Review had a large paper recently in the private sector, that AI has been and will increase demand, right? Increase the need for workers because we are getting to the answers to problems so much faster that there's a real need to be responsive to it.

And I think in a conference like this where you talk about investments in finance, I think we have to have a better understanding about that, that this is not gonna enable us to just lop off headcounts right away. On the contrary, there's gonna be a greater demand for people in the jobs that they're in, again, to exercise that human judgment that is becoming more important now that we have AI.

LARSON: Thank you. That's helpful. Ryan, IBM is gonna release its quarterly results the end of the day today, and their CEO's already cautioned investors that they've had a infrastructure performance shortfall. As you know, we all know, big maker of mainframes IBM is. So tell us what changes you're hearing to plan capital investments and related, what does this mean on the agency balance sheet for their tech debt?

MINNICK: Yeah. There's a-- there are a lot of variables right now, and I wish I had a better crystal ball to give all of our wonderful friends in the room. Best I can do is give advice on what to watch.

So over the next 18 to 24 months, we have a confluence of variables that are creating huge issues across supply chains. And supply chains are going to be the chief

bottleneck for the moment for AI enablement and adoption. It's going to drive how we see, you know, token costs or the individual unit cost of usage of generative AI is gonna be driven by that.

It'll also be nominally driven by the rate of IPOs, so looking at Anthropic and OpenAI as they move towards those benchmarks. We've already seen kind of a more nominal AI lab in terms of the xAI hidden inside of SpaceX that IPO'd. A lot of insti- a lot of the large institutional investors are holding their pocketbooks waiting for that.

But outside of what the markets are going to dictate, the supply chain matters tremendously. So we entered probably eight months ago, a RAM supply constraint environment where major manufacturers, IBM on the dataware-- on the data center side, Google a lot of third-party data centers that are building these massive facilities that utilize this RAM, not just RAM as you think of it in your computer or your phone, but RAM that powers the high-speed flash memory or the intense graphics cards that NVIDIA produces.

And now those producers are so supply-constrained that they call their customers once a month and say, "Here's your quantity and here's the price. Do you want it or not?" And if you say no, you don't get the option to buy next month because they'll find somebody else who wants to buy it. So that price inflation's hit the consumer markets things like gaming consoles, and you'll see it with cell phones.

You've already seen it with Apple's price adjustment about two weeks ago across the board. And what that means for capital planning at the state level is that all of the equipment that we procure, even the cloud services that we're procuring, are limited in their availability despite being these bottomless pits of clouds that are advertised to us, and that limited capacity is going to start impacting on a price standpoint.

Now, as that supply chain recovers, unfortunately, RAM foundries take anywhere from eighteen to twenty months to come online, and the major producers have been working on new facilities for the last few months. They're incredibly complex facilities that have incredibly high volume output. We have an opportunity, potentially, from a budget standpoint, to see tremendous relief in the next few years.

So I'd say on one hand, optimistically, you'll see consolidation in the startup market like we do with most emerging technologies. which will drive down the demand just about the time that supply increases by twenty to thirty percent, which will create a really great opportunity for everyone to get some relief.

But until then, everything from workstations that you're procuring for staff to the AI services that you're procuring, a lot of the tools that people are integrating into their systems now that we're really excited to see, those tools could tremendously change in price. And then you can layer on top of that the hard- hardware costs for folks that are

now looking at including state government, that are looking at running large open source models on their own hardware in their own state data centers.

That hardware still has to come from somewhere. And so I doubt I'll be too terribly shocked by IBM's release this afternoon. I expect it'll be very similar to a lot of the other hardware manufacturers where they share that the demand is there, we can't procure the material in order to produce at the volume that we need to produce, and it's a huge across-the-market supply constraint that we should all be keeping our eye on.

LARSON: And-- But just back to this tech debt concept and the, you know, big mainframe modernization projects that I know a lot of tax agencies, for example, are engaged in. On the prep call, you had shared some observations about how those plans were shifting, those modernization plans.

MINNICK: Oh, sure. So modernization in general is going to change. I mean, it's already changing, right? So modernization twenty years ago was, we have a mainframe, we need to have a better mainframe. Then, you know, ten years later, well, maybe 25, 30 years ago, it was we need to move to better mainframes. Then it was, we need to move to better decentralized server-based environments.

We need software that's going to replace our mainframes. The, the states that have been kind of in what we consider a modern tax software environment for the longest, they're reaching their kind of 10, 15th year anniversaries in that software. Then we saw five years ago the shift in where that software is run from.

So is it more effective to run it on-premise in a state data center? Is it more effective to run it in a cloud environment? Now there's a number of agencies that are weighing those costs and advantages from a cybersecurity standpoint, and a number of them have made that decision to move into a cloud environment.

But now we're seeing a shift driven, I think, largely by this change in methodology that we're seeing with AI across all of their business units. They're no longer looking to replace a giant system. There's not a lot of hundred-plus million dollar systems being procured right now across the country in the tax space.

There's a few states that are working on larger modernization efforts. Everyone else is looking at best-in-breed, small, concentrated projects with partners. Sometimes it's partners like Code for America, where they can come in and provide their expertise and help identify the best opportunity.

Sometimes they're working with large tech firms on the frontier end. But the goal is to build out almost like I keep calling it technology Legos. Build your favorite Lego set, find what's gonna work best for your agency, replace that piece, and then continue to iterate. Because what they're-- I guess what we're starting to unlock with the rapid rate of

innovation in generative AI is an attitude that rapid innovation can happen in other areas of technology, even if gen AI doesn't touch it.

And that is a fundamental shift which is causing a lot of organizations to contemplate shifting how they look at their long-term capital budgets and how they look at their short-term operating budgets, and making a concerted effort to shift funds into that operating budget to accommodate that change in acquisition methodology.

LARSON: Great. That's thank, thank you. So the, maybe we get a little CapEx savings and that is something desperately needed, but it sounds like on the OpEx side, some supply chain hiccups will be in the short term. So I wanted to pivot to Andrew and see if, can you talk to us more about OpEx on the ground? What do you see when you're implementing AI?

And in particular, 'cause I'm a budget director, aren't there bodies that will no longer be needed? I mean, I just find it sort of, impossible to imagine that there wouldn't, there isn't a way to do this with a smaller human capital budget eventually.

NGUI: Yeah. So certainly there are opportunities for that in terms of, you know, headcount, but the way I think about it, you know, my colleague here on the video, which I can't really see, but really the heart of it is can we become better users of technology, right?

Do we have to use Fable 5 versus we use a lower end model? And so really the resource constraint there to us, that's really the heart of how can we best maximize the resource that we do have as opposed to like, "Oh, let's go buy the next best thing."

LARSON: Yeah, and we heard that from the mayor of Hartford yesterday, who was saying, you know, his police officers are gonna save time not writing reports, spending as much time on reports, but they're gonna add their spend additional time policing.

Yeah. Others have thoughts on this?

RENTERIA: Yeah. I, I wanna just double down on what folks are saying, Ryan Andrew are saying on s- states are really thinking about this budget conversation. It isn't in the headlines, but they recognize that they're, that not only are they receiving things at a discount, but philanthropy has also come in to help civic tech organizations to help states directly to try and lower the cost to help people understand AI.

And we're beginning to see a lot more conversations around, "Code for America, can you test A versus B, and how much better is it? And let me do a cost efficiency analysis in the long run. Should we do it in-house and build up our tech talent? How close we are we, or is this really off the shelf, and how do we think about that cost?"

So one of the things that we are seeing is some of our experience or our experiments used to be, can it do it faster? Can you have better customer service? Now we're s- now we're hearing questions of, "If it's faster, what do you imagine that's gonna cost me in the future? Do I have to get an AI expert on my team?"

I think it's incredibly thoughtful in the way that we're seeing states and cities really approach this, but it's also making it a little bit more difficult for cities to say, "Gosh, we don't have the resources or the bandwidth. Can someone move to a rural area in order to actually maintain this?"

So those questions are in some ways creating barriers for some of our cities around the country.

LARSON: And on the cost of AI itself, so you talked a little bit about some support, some grants coming in and things. What do you see in the future?

RENTERIA: So for the next three years, I think we're gonna continue to see real support from tech community, et cetera, 'cause finally people sort of look at it and go, "Finally, you can modernize."

And you can use the expertise, particularly in your program sector, when you have someone, let's say, really deep in knowledge on Snap. That deep knowledge really matters for training a tool to help people through the system. That's opened up in a whole new way. I think there is a timeline though, where governments are gonna go through the same process that you're already seeing in the private sector, which is how do you budget on a token basis, right?

How do you make sure that the staff you had, how do you transition either the training that's gonna be required and excited about all these different options for InnovateUs that are putting training out there. But do you need a different kind of team in order to continue this going forward? Those are the kinds of questions and things that we're seeing.

LARSON: And so related and you've recently published an essay on this, calling for governments to measure the ROI of their investment. So can you talk to us about your, the case you're making there, and are there specific metrics--

RENTERIA: That's exactly right.

LARSON: --that you th- you would point to?

RENTERIA: So, the first is it feels like, in these first six months of the year, that the metrics has, have been how many press releases can you put out that you're doing partnerships?

And once you start to look under the hood obviously that's not the kind of measurement we push people towards. It really is what are the outcomes? Is it saving customers time? And we're very client-based in this way. Is it saving customers time? Do they trust the system more at the end of it? Are you making sure caseworkers can finally get to that caseload where it really needs a human touch because it's complicated, versus the easy answers that maybe chatbots can answer?

Those kind of real people outcomes that link the press release of the political promise to the actually deliver of outcomes on the front lines. And so we push, even as we get into the project with anyone, "Hold on a second. What is the goal?" Because if the goal is just AI, that's not gonna get you to the answer and really kind of push to that new level of government delivery.

So that's why there's not necessarily a set of these are your five questions. It is really what problem are you solving and it's how does that affect a real person that's interacting with government?

KLEIMAN: I couldn't agree more. I mean, one of the most dangerous things you can do with this technology is start measuring to optimize for speed or cost per transaction.

It's a very different technology. So we need to measure things more like reliability and outcomes, as you're saying, and even start getting into the area of trust and do people feel as though this is reliable. So it's not to say we shouldn't be measuring this, but again, do not optimize for speed with this particular technology 'cause then you're gonna just start automating bad decisions.

RENTERIA: One of the examples I always like to when people talk about AI as efficiency, well, it's really efficient if you just throw everyone off of SNAP. It's incredibly efficient, right? And so it is really important to say, how are you measuring this thing and what do you mean by even the words you're using when you're directing a tool?

LARSON: And Neil, talk to us a little more about this trust factor because you, your paper discusses it a lot. How would you go about measuring that?

KLEIMAN: I mean, there are different experiments and researchers out there, but a lot of it has to do with checking in with residents. And I think that's one of the encouraging things about AI, and it goes back to what was said before around the urgency of the moment, which is not something we've seen before.

And I think in a lot of ways it's turning the public sector in the right direction, which is to residents, and how do you build that trust and checking in with them to see what their assessment is of the services and of local government. And I have to say, I've always been a huge fan of KC MO because KC MO does an annual, I'm assuming you still do it, annual citizen survey every year that I don't know of any major municipality that does, and it's really darn good.

And they are able to get a feedback loop in terms of what citizens think of various services. I'm doing this out of Oh, no, yeah ... about it and how they feel about the parks or government overall and this and that. And I always say we need to be doing more what KC MO does. And you don't even have to ask about AI generally.

I think ask about how local government is doing, and it starts building in the right incentives and feedback loops that again, I think get us to a, a better place. And it reminds me of this whole conversation about cost and what we're measuring because we really have to broadly measure just data hygiene, right?

Like I think this is getting us to a better place where when we're looking at measuring things, you don't necessarily measure the cost of AI specifically. It's really the cost of what does it take to run a data system.

NGUI: If I can just build on that really, you know, our agency has the strategy that leads to the priority-based budgeting, that leads to the output, that leads to the outcomes.

And so we've been on a two-year journey of data alignment all across the entire city.

So we talked about tech debt, but we haven't talked about data debt. Right. And the McKinsey report, if you remember from 2020, said that 30% of the entire enterprise, there's this layer of 30%. I mean, you can talk about the time and savings, but really ultimately how are we integrating across the entire organization?

And that is really the opportunity here.

LARSON: Well, Andrew, you touched a little there on your process management and some of the change management techniques that you've implemented. I've been really impressed looking at them. So tell us what, w-what are your concerns about cha- the change management needed to implement AI?

NGUI: Absolutely. So I'll speak to one project that we started probably almost a year ago with Bloomberg Philanthropies, the City Data Alliance. We were trying to innovate our 311. So it was really a, a data-focused perspective of like, well, how does this journey for the resident actually fall through the gaps?

Because literally it's not calling the person, it's not just entering the app, but literally it's the entire journey. And so what we discovered was there was a technology issue that then led to a you know, personnel issue where they were trying to address the issues that the technology couldn't provide or implement.

And so then as a result of that, all these other systems and processes that happen. And so now we just closed the RFP for the next generation of AI-ready 311. And so that's currently being evaluated. Not only that, to your point with regards to change management, we're also simultaneously developing a customer service excellence standard

LARSON: So it sounds like Casey Mosler a little ahead of the game here thinking broader.

You know, what are... I think implementation is challenging, change management's challenging. What are your concerns?

NGUI: So from the Prosci methodology perspective, individual- organizational change starts with individual change. And so we all know what Swiss cheese looks like. If you don't address it at an individual level, you get lots of holes everywhere. So I think that's really the heart of the concern, to make sure that we can bring the entire organization forward.

And I would say from this perspective our HR team has been significantly helpful because it all started with a five-minute conversation you know, with the work that InnovateUs has done with what Code for America has done. Like, here's how you can create a small co-pilot agent. And now as a result of that, it started from that five-minute conversation to one agent and then led to three agents, and now literally there's an entire training curriculum around creating these things for yourself.

And to the point of like really not only should there be practitioners within the organization, but actually the leaders should also be practitioners because you can't outsource the understanding.

KLEIMAN: I... Just to build on this, 'cause this is huge, like how do you engage in this change management? 'Cause we have to do it, right?

We have to be more oriented towards trust, towards residents, and we also have to be more oriented towards human judgment, which is essentially frontline discretion, and governments are not used to doing that. And again, we're not all Casey Mo as great as Casey Mo is. And so one of the best examples I've seen of that is the state of Pennsylvania.

And they have this strategy, I call it base to pyramid, meaning they want to bring more people into the decisions, right? Break out of the CIO's office, the innovation office, all these goofy offices that are out there, and how do you really bring people in? So they created a sandbox or walled gardens for the AI experimentation, and they said, "Everybody, you're welcome."

We have these free licenses that we got," as you said, "from philanthropy or from corporations. Come on in." So they had 14 different agencies, 175 staff from all over the place within state government experimenting with AI, and they loved it. And they came back and they said, "We've saved about 100 minutes a day in terms of our work."

And then they became evangelists back to their home agencies to talk about this, meaning we are being referred to by sort of senior leadership within the governor's office, and our discretion is being appreciated. So again, I think that's some of the ways you're starting to see different approaches within very large governments to move in this direction.

LARSON: That's exciting. And so before we go to Q&A with the audience, I wanna hear on this point from Ryan because You know, tax agencies might be the most famously risk-averse. They need to be. But be arguably almost all, you know, all of government needs to be somewhat risk-averse. But tell us what it, what do you, what are your concerns about change adoption in that group of agencies, and then anything broader?

MINNICK: Yeah. Well, when you're focusing in on generative AI specifically, right? There's, there's-- We have a lot more certainty than we had three years ago. There's a lot more on the research end. In fact, I was doing a quick count since we had our panel get together, you know, a little over a month ago.

There's been, I think, between eight and 10 frontier-level next-generation model releases. So you're talking a 30-day period, the bar has been pushed that much forward, and that becomes a really hard change management layer to work through, right? Most government agencies are used to defining scope, identifying a need kicking off a pilot, studying the pilot results, implementing something else, and then eventually, 12 to 14 months later, you've got something in production.

If you take that attitude with generative AI, everything you trained people on during your pilot and your implementation phase is now completely expired and past date by the time you get to full production. You may have followed your methodologies, and we've got a lot of them, especially in the tax world, to preserve data privacy and security to make sure that everyone's following not only the state and local level mandates, but also the federal level mandates for the federal data the agencies receive.

So that level of complexity is typically handled really well. Generative AI makes that more complex, and it limits, in some ways, where you can implement these tools and

where you can experiment with them. But it also is now forcing, and we- we're seeing very positive results. It's forcing competency building within the agency.

And it's exactly to Andrew's point. You have to find those leaders who are capable of and interested in building that competency. They have to have both of those traits. And we're seeing it being built almost as rapidly in the business side, the non-technical users, as we are seeing it in the technical leaders.

And the agencies to what Neil was saying in Pennsylvania, the state of Georgia is doing something very similar. The states and agencies that are enabling those interested, who are in non-technical roles to pursue that interest, are the ones, I think, seeing the best outcomes. You see far better outcomes when your business users and your technical users can actually have common language and common conversation.

For a long time, we sat in very isolated businesses in government where the technologists knew what they were doing and the business folks knew what they were doing, and when you asked one or the other a question and they said it couldn't be done, everybody just dropped it. There was never that dialogue, that rich dialogue that pushed projects forward.

And to getting back to the change management piece, once you align on what you're doing, how do you create a continuous learning environment where people are comfortable learning continuously and are pursuing that constant update in language? We have a number of communities nationally that our members participate in, and there is one in particular that when there are new frontier models they share what they're doing in their private lives or non-government roles.

What are they experimenting? How are they learning? How are they sharing those tips to each other? Because one thing we had to learn very quickly in government, they're seeking this knowledge with or without permission. What they're trying to do is seek the knowledge and make sure they're following all the rules so that when they bring those ideas to their agency, they're understanding the complex regulatory environment.

I've got more business level leaders in tax agencies that understand their regulatory environment now than 10 years ago. Because the specialists who govern that data privacy and security are now being brought into the conversations earlier to understand the technology and to not be seen as the no people, but the, "Okay, well, here's how we put guardrails on.

Here are the requirements we need from the software industry." We're now seeing the broader technology and software industry interested in building more specific safeguards. They're interested in innovating, but they understand that government needs something a little bit different in order to be confident because, you know, it's that very flip saying, but trust is super easy to lose and incredibly hard to earn.

And right now, and the way it should be, is that every taxpayer in the country with, you know, rare exception doesn't think twice when they click submit on that tax return when they're filing with a software product. They trust that chain of custody of their most personal data from the moment it leaves their computer until the moment it's processed and they get a refund check or their payment's processed.

We gotta maintain that. So we put that in the, the foreground, and then we build backwards from it.

LARSON: Mission critical. Thank you. All right. Well, we're here for your questions. Yes, please wait for the mic and don't forget to introduce yourself.

AUDIENCE QUESTIONS: Yeah. Hello. My name is Tanya Mitchell. I'm from Silicon Valley AI Safety Lab.

So my question is how do you work today with AI startups? What formats of work do you have, and how do you engage with the industry and AI startups in particular? Thank you.

LARSON: Any volunteers?

NGUI: I can speak to that. One of the things that we're specifically doing in our procurement is actually the idea of a public innovation challenge, and it's not just the idea of, And actually, I'm actually speaking in an hour on that. It's not just about the, the definition of what the challenges that agencies face, but ultimately it's a milestone unlocking like you would see with what SpaceX is doing, what DARPA used to do and continues to do, what SBIR is doing as well.

So just to give you an idea quite broadly.

RENTERIA: We're looking for solutions. So, if you have a deduplicating tool we will look at, does this make sense? What I'll say about startups, or at least what we've seen in the civic tech space, is for some it's a first-time conversation with government as a actual client in a real way.

Like, it has opened up new relationships. And so what I often say when startups come to us or we end up we end up in partnership or even before partnership, is I need you to actually, like, really understand government and who they serve, because you'll miss it if not. Right now governments are getting a lot of, "This is the silver bullet.

Here you go." The difference is who have spent the time really thinking both about the client and how government is a different kind of entity. And it's the first time at least

we're experiencing so many new startups coming into the space without having done that real client experience and really government understanding.

MINNICK: I- Amanda, I couldn't agree with you more about that because when we're working with startups now, when they're entering the tax agency they wanna serve, they wanna solve a problem in tax, the education that we find they need most is procurement and government. It's data security standards. It's the complex data privacy environment.

They are very innovative and brilliant co-founders and people working on these problems, but they come in lacking that. They think it's they make an assumption that it's more similar to private sector, and they don't understand those differences. So we-- I find we're having a lot of the same conversations where we wanna see them bring their innovation.

We want them to have productive conversations with potential customers at the state agency level. But in order to do that, they have to be able to speak the language so that, you know, they don't get shut out of opportunities because they just didn't understand the environment.

NGUI: If I can just add one more thing.

It's really not just about the tech, right? Like, your pilot or your starting points. It's not just about technology, but the how does-- do you really understand how it fits into the agency and the potential disruption that can actually happen if you don't do it well?

LARSON: Yes

AUDIENCE QUESTIONS: Hi, Rob Mayer. So I can understand at a local level the opportunities that AI presents. At the same time, I think from a political standpoint, at the local level, you're starting to see more residential pushback against AI. And I'm just wondering how you would advise local leaders to navigate what their constituents may be telling them about their concerns with more AI being introduced especially in terms of utility bills and and the resource-intensive data centers that may be coming to support AI, as well as potential job loss with some of the benefits that you've all been highlighting here today.

NGUI: So certainly I think the short version of the answer is listen to them. But the longer conversation is really a dialogue, right? Like you have to hear what people have to say, the people that you serve. And then what does that look like? So one of the things that we're engaging right now with Stanford is to explore the opportunity of that in a more robust perspective particularly as it relates to data centers, and a huge issue there

KLEIMAN: I'll just mention there's a fantastic group that Andrew mentioned earlier called GovAI Coalition that's doing a lot of work in this space.

And it started in San Jose, and the city of San Jose, California, I think, has done the most on this. And it's pretty remarkable. You have the CIO office going to church basements and to schools, and you're seeing more cities doing that because they need to. And what they have s- found is that when you do these kinds of projects, communities initially revolt.

They wanna have nothing to do with AI. But then if you work on a project they care about, like the budget, they find out, wow, now we have this tool that enables us to understand what's happening. And Santi Garces, the CIO in Boston, has done a great job actually translating city council legislation through a chat into simple English.

So now residents are finding out the minute a bill passes in two sentences, well, what are the implications of it for me, right? So I think we just need to be more proactive and get out and engage communities. So this doesn't mean maybe as a mayor coming out and saying, "Here's the AI agenda," which will freak everyone out, but it means starting to again shift the position of local government so that communities have these tools as well.

RENTERIA: If you look at any polling on this it is all across the board, people are worried and scared, and it's old, young, urban, rural. There's very few things that are bipartisan these days. This is one of them, the worry and concern around it. And I think for the reasons that Neil is talking about, it's even more important to start talking and building a vision for what AI for good is looking like.

Not just to convince people that AI is okay, but really to drive the industry and the tools and solutions of companies who are doing this work to make sure they are pointing it to our biggest societal problems. And I think if we don't do that, I think there will be even more backlash to come because you can see the polling now that if this doesn't go in the right direction, I think the public will have a say in it more than any other technology that has started at this level right now.

LARSON: All right. We have a lot of questions.

AUDIENCE QUESTIONS: Hi, Monica Guerra. I'm head of policy at Morgan Stanley Wealth Management, and one of the things that we're spending a lot of time thinking about is the dynamic between federal regulation and policy development versus state. And we're seeing more activity at the state level around AI.

So I have two, two questions. One, how does that patchwork effect across the country impact the companies that you're working with? And then the second piece of this is how do you internally, maybe this is for you know, KC Mo, that's new lingo for me, for

KC Mo. How are you implementing all of this new operating expenditures on AI while your state and local government is regulating AI?

NGUI: Well, so our official AI is Copilot, and that's built into our-- the free version is built into, or included version is built into the system. And by the way, if you didn't press those three dots at the top, you can actually get GPT 5.6 Think Deeper at no additional cost. Just FYI. Which actually it's been really helpful, I would say.

I was surprised. I yeah, so I'll stop there but really the heart of it is, again, coming back to the issue of efficiency, can you do more with the things that you have, find new ways of using the things that you have, find more people who are actually, I will say the issue is ownership, right?

Like, can we invite people to own a more specific scope of the things that they have, and also at the same time integrate and connect with other people and have that technology and the human system empower one another.

KLEIMAN: I would just quickly say, you put your finger on the biggest worry that most people have, which is we're operating in a complete vacuum.

There is no leadership, there is no guidance, there is no legislation, right? So this country has a long tradition going back to the mid 90s of deciding not to regulate tech at all. The Trump administration has continued that. What is different now, and I think it's actually making things worse, is state governments are taking the opposite approach.

There have been 2,000 bills proposed or passed in the last six years, specifically around AI at the state level, and they all add up to nothing. I've been talking to people in the state of California at the government level, and I said, "Your governor just passed a really important piece of legislation. How is this impacting your work on a daily basis?" And they said, "It's just white noise. There's so much legislation swirling around." So it's an unfortunate situation, but right now we are just in a vacuum, and it's leading to-- It's exacerbating the confusion and the urgency that people feel.

RENTERIA: Or is it giving us different options for the future, right? I mean, we see this in all of our work that we're doing. It is really states and governments or states and local governments are on your own, in, in an on your own kind of phase. And they are experimenting, and they are doing things. And I'm not sure whether we're gonna look back on this and go, "Wow, we get to actually choose from all the different governance models that are out there," and we'll appreciate it three years from now.

But man, when you're in it we are seeing all kinds of different things. I will say there are already some states who are saying, "If you're gonna help us on a modernization plan, it better not include any AI," and it's written into the contracts in some places. So Wild

West is right. But maybe, and I'm an optimist obviously, but maybe that's giving us a patchwork of things that then will allow for a better centralized process.

NGUI: I like it.

LARSON: Anything to add on this, Ryan? I can't see if you raised your hand on that.

MINNICK: No, I think it's, it's such a interesting-- The regulatory landscape is going to continue to evolve. I tend to fall more into Amanda's camp. It's been interesting to see the approach that different states are taking and how they're pushing responsibility either from the executive branch at the state level down to agencies to set policy.

It's been really intriguing internationally to see what's going on. So I was just with a lot of our national tax administrator colleague national level tax administrator colleagues at CIOT, which is a peer organization to FTA in Central and South America. And Spain was sharing that the, the large initiatives that are being shared by government agencies in Spain they're almost distilling it down to guidance akin to, you know, if Word autocorrects the wrong word on your memo that you send out, you sent the memo out.

You can't blame autocorrect for bad work. And so if you're going to be utilizing AI in your day-to-day work, you're still responsible for the output. They're trying to manage the personal accountability in order to keep that human in the loop in a reinforced way. But it's such a variety of policies that you're seeing.

And of course there are states in the U.S. that will look to Europe, for example. There are states that are trying to forge their own way. Maybe we'll see at some point maybe best practices picked up and looked at federally. But I'm with Neil. It's the Wild West. There's a big snowstorm.

We don't know when it's gonna end and how tall the snow is gonna be before it stops.

LARSON: I think we have time for one more question, and then we're gonna do a lightning round. So one more quick question.

No? Okay. We'll just go the lightning round then. So take us to the future. You can pick 18 months, 24 months. What is, what AI use are state level governments gonna have that no one, we're not even thinking or talking about right now?

KLEIMAN: I'll start. One, I would say we're gonna start to see benefits without applications. So you're gonna see a pivot, and I think this goes to the great work Code for America is doing, a pivot from people applying for benefits and having to fill out the same facts and information over and over again, to just automatically benefit matching.

The second thing I think we'll see is what I call conversational budgeting, meaning residents will be able to ask how much money was spent on youth services, how has that changed over time, and what have been the results? Again, residents will be able to do that on a daily basis. And the third thing is I think we're gonna see a new form of data, a new form of administrative data.

I'm doing this radical experiment in Dorchester in the Boston area, in which we're working with community groups, and we have pooled community data, meetings. There're interviews we've been doing with administrative data around crime to have almost hybrid data, which brings in community nuance to answer questions about why crime is going up or down.

So I think you're gonna see a redefinition of what administrative data looks like.

RENTERIA: Excited? What I hope it leads to is people trusting a new system, a different kind of system. That for me would be the win. But I'm gonna build off of Neil and our tax work, which is I hope that everyone files taxes, and when they do, you all of a sudden are able to understand what programs are out there, what kind of economic opportunities are out there wherever you live, and it's customized exactly for you to basically walk your own path.

Set in your language and your dialect for the time in life that you are in. And whether you're living in a city or rural or you're on your phone you get that s- you get that plan. So I'm excited for that.

NGUI: And to build on that further, I think we have been on a journey of transparency and increased public trust, and I do think that the personalization aspect's gonna be huge.

LARSON: Wrap this up, Ryan.

MINNICK: I'll follow the the theme and build a little bit more. I think it may not even take two years to get there, and we're already seeing it in the private sector with some startups. The... There will be an abstraction layer between the complexity of government and un- the understanding of a citizen trying to interact with government.

And whether or not government agencies participate in that layer is not going to affect whether it's created. So the choice I think that I hope that a lot of agencies will get engaged with, and this is beyond the tax base, agencies hopefully will participate in the creation of that layer, making laws and policies and regulations more understandable.

If they don't, the data is still there, it's still public data, it's still public record, it's still going to be done. And so in, I think in 24 months, we're gonna be able to, you know, Neil's point, gonna be able to answer any question that you have. The complexity that has

potentially created barriers to entry for certain, you know, communities or competitors or industries or markets, those barriers are going to be largely removed because the inherent complexity of law and policy will be abstracted down to something understandable.

Again, we're seeing all the seeds being planted. Two years from now it's an inevitability, and the, the curiosity that I have is to what extent will this be driven by external stakeholders in the nonprofit and private sector world, and to what extent will the public sector participate?

LARSON: Well, terrific.

So back to AI unleashing new demand, sort of where we started, so, all right. Well, please join me in giving a round of applause to our excellent panel. And it's time to close the conference.

BERGSTRESSER: All right. We have we've reached the end. Let me just put really first things first. The engine that makes this conference go is the staff of the Hutchins Center, the staff of the Brookings Institution. So I hope you'll join me in thanking Haowen Chen, Stephanie Cencula, Megan Waring, Adrianna Pita. So give them a big round of applause because they really are the, the engine that makes this thing go.

And I will close this by saying a couple things. First thing one of the things that's particularly refreshing for me about this year and this conference is we're living in weird times. But I think across all the panels, there's a spirit of optimism. And I think the-- a thing that makes America what it is that we have our federal structure, and the cities and the states are these kinda engines of experimentation. And and mayors, as we saw yesterday are where the rubber hits the road in terms of delivering the services that we rely on.

So it's been, this conference has been in a lot of ways, kind of uplifting. So I I wanna thank everybody who's been a part of it, thank all the discussants, all of the presenters, all of the moderators and the panel participants, and thank the, the sponsors. So Brookings, Brandeis, Purdue, the University of Texas.

So with that, we're gonna send out a survey. We wanna see what you think, so respond to it, and we will see you next year. Thank you.