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PAPER SESSION 2

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GORDON: [00:00:00] Hello. It's my pleasure to welcome you to session a state and local tax issue as part of the 12th annual Municipal Finance Conference. And the first time that we've been in person since 2019. I'm Tracy Gordon, vice president of tax policy at the Urban Institute and co-director of the Urban-Brookings Tax Policy Center. I just want to say a few words to get us started. This conference is special in that it brings together top flight scholars, market participants and policy experts to talk about things that are happening in state and local public finance. A person who brought all those things together is Dick Ravitch. I want to say a few words about him since he had a big imprint on this conference. And many of us who are here, as I shared with Dick, with Phil Classical of the Volker Alliance and Pence Institute of Urban Research, I often used to say it's a good day when you get a call that says, Tracy, this is Dick Ravitch. And Kim used to get these calls too. Dick was often exercised about the latest jurisdiction that had bungled its finances or member of Congress or bipartisan commission that just didn't get it where it was. The vital importance of state and local public sector. He cared deeply about what he viewed as threats to the sector's fiscal sustainability, measured most importantly, by its ability to provide high quality goods and services that people and businesses cared about. I was honored that he called to share his views with me or to ask me mine. When his book came out. I read every page and I would recommend it to everybody in this room. It's one of the only records about what actually transpired in New York City during the financial crisis of the 1970s. It should be required reading for every graduate program in public finance and any market practitioner. One of my main takeaways from the book is what a different world we live in right now. Despite all the hardships of the seventies, there was a certain level of social capital and trust that made it possible for all the decision makers at the time to basically hold hands and leap. Dick was, I think, distressed about the level of social capital in

today's world, but he seemed to still live in that old world. He was so connected and didn't hesitate to call Nancy. You know, I wish I could remember the name of the person in Congress who he was sometimes referred to as "that smart young man." Might have been Paul Ryan. It was a thrill to talk with him, to roll up our sleeves and get down to business about what a real world dynamic and action oriented commission on the fiscal health of the state and local sector might look like. I hope those conversations continue at this conference. And now it's an honor to introduce two terrific papers whose findings I know will be part of any such conversation. The first is "Firm Responses to State Hiring Subsidies: Regression Discontinuity Evidence from a Tax Credit Formula." It's coauthored by Matthew Freedman, Benjamin Hyman, Shantanu, Shantanu, excuse me, Khanna and David Neumark. And it will be discussed by Tim Bartik from the Upjohn Institute. Take it away.

HYMAN: [00:02:56] I think I'm just waiting for the slides to project here. There we go. Okay, great. So thanks, Tracy, for the introduction. I'm really excited to be here presenting our work on the California Competes tax credit today. And as was mentioned, this is joint with Matt Friedman, Shantanu Khanna, and Dave Newmark, who's sitting right here in the first row. Okay. So to start off, the paper is motivated by the fact that state and local governments spend over $45 billion each year to attract and retain businesses. And this occurs despite only limited evidence that such policies are effective local economic development tools, especially in distressed regions. So there are three key kind of design challenges that might help explain this. First, it's hard to target marginal firms that would hire fewer workers absent a subsidy. The second is that it's difficult to enforce kind of net new job growth beyond an initial baseline. And the third is that it's unclear if negotiated contracts or more classic tools like corporate tax rates or tax based tools are most effective at achieving local employment goals. So even if they if subsidies do increase local hiring out of unemployment, improve job quality, or generate large multipliers. All of this also trades off with displacement effects whereby the employment increase in one jurisdiction might be at the expense of a decline in another jurisdiction, all at the high cost of tax competition. So what we're going to do in this paper is examine firm responses to a best practice state hiring subsidy, which is the Cal Competes tax credit. And we think it's a best practice because of three features in particular. So first, applicants are held to kind of annually audited job creation benchmarks over a baseline and are only allocated credits when they meet those those benchmarks. If they don't meet those benchmarks, the program has enforceable clawback measures and where they can recapture revenue. And not only is this true for the five years of baseline, but a benchmarks, but it's also true for three years after those those five. So these applicants have to retain their net job growth that they generated for an additional three years or be subject to recapture. And finally, Cal competes has this two phase application process where initial scoring is followed by discretionary tools which try to prioritize firms that would likely exit the state or limit hiring absent the credit. And that's important for us because we can take advantage of this sort of formula based applicant scoring to estimate the effects of the program using a regression discontinuity design. So it's kind of a rare opportunity to evaluate the impact of a local hiring subsidy kind of credibly. So what we're going to do is merge the universe of Cal competes applicants to really rich census data on establishments, which has their location to the location of their establishments, the employment and payroll payroll growth within California, as well as we're going to be able to study effects on substitution patterns on a more national scale. And what I mean by that is for a firm that that was subsidized in California, we're going to be able to analyze whether that firm reallocated activity away from a higher tax location to the new the newly subsidized location within firm. So we'll have this data across states. And so our contexts, our setting of both this RDA and the data are kind of uniquely positioned for us to estimate both local impacts of the program, but also this one kind of displacement effect, which is across state displacement. So a bit more on the program. So it's a state corporate income tax available to businesses that want to locate, stay or grow in California. So businesses apply to the governor's Office of Business and Economic Development, detailing annual investment and payroll commitments over a five year period. And these are net over baseline. So if the awardee doesn't meet the annual milestone, it can't claim credits for that year. However, firms can kind of catch up in future years if they meet subsequent milestones. So the way this works is in the first phase of the application process, each applicant I submits a cost benefit ratio score, which is calculated as just the ratio of the credits that the applicant requests and the five year flow of payroll and investment that that same applicant would commit to in

exchange for that tax credit. So if the state of California pledged $1,000 in tax credits and I committed to producing, you know, $2,000 in payroll and investment over the next five years, that would be a score of 0.5. And so here low scores are better. And then within each allocation period, applicants are then ranked by score from low to high, and a cutoff is imposed at 200% of the budgeted amount for that period. So applicants that have scores that are above that cut off are rejected, while those with scores below the cutoff precedes the next discretionary phase of the review. And so that's what we're going to take advantage of in our in our regression discontinuity design. If you just happen to be narrowly rejected on one side of the cutoff, you should be observable equal, except for the fact that you have a higher probability of receiving a credit. And so importantly for us, there's no way to perfectly manipulate your score to be on the sort of good side of this cutoff, because that the cut off itself depends on other applicants credit requests. So if you have a really large applicant that comes in with a low score but gobbles up most of that budget, that's going to kind of artificially push the score really low. And also, you know, any budget that's not used in an allocation period can pass on to the next period. So, you know, the amount of budget also varies. So it's really difficult for applicants to actually manipulate this. And that's sort of what we're showing here. So on the left, we're showing you that the bars represent the cutoff in each allocation period, of which there are three per fiscal year. And what you see here is this thing kind of varies wildly and kind of in a non systematic way. It's kind of hard to predict. And so what we've done on the right is we've taken each applicant to each of these rounds and we've stacked them up with their score relative to the cutoff for that application period. And if you thought that these these applicants were manipulating their scores, you might expect a large bunching of applicants just left of zero of the of the cutoff. But we don't really have any evidence in support of that. So after they get through this first phase, they then move on to this kind of discretionary phase, which contains an evaluation by state administrators of the likelihood that the that the applicant would leave the state or hire fewer employees, absent the incentive, whether they're going to generate higher wage jobs in struggling areas. And then this sort of fuzzier component, which is the strategic importance to innovation, and that could include size. And finally, I'm not going to talk about this now, but there's a small fraction of businesses that automatically advance to the second phase, irrespective of their score. But I'm going to abstract away from that given time. Okay. So after they get through two phases, they agreements are negotiated to finalize these milestones and voted in a public committee. So here I'm showing you the example from Tesla. So Tesla started with a baseline employment level of 6500 employees and proposed a pretty substantial increase here of about 70%, up to 11,000 employees five years later. And that was accompanied by these really significant kind of investments. So you'll see here that the total five year investment was about $2.4 billion. And the reason for that is that Tesla here was proposing the construction of a new casting foundry in Stockton, California. And all of this package would be in exchange for $15 million in California tax credits. And lastly, you can see here that the average wages and the minimum wages are actually pretty high in this case. So these would be the annual milestones they would need to hit to receive credits as they go. Okay, turning to our data. So what we do is we take complete application information from the state, which gives us the ingredients to construct these scores. And we get about 3800 cal computes applicants in the data. We're going to throw out small firms that are kind of subject to a slightly different application process. So the focus of our paper is really going to be on these larger firms, and then we're going to merge those applicants to two measures of firm employment annual payroll and establishment locations using this rich led data set, which is a restricted use dataset from the Census Bureau. And that's going to give us a panel for each of these applicants of their activity in different geographies. So in California, in high poverty, parts of the state as well as outside of California. So we're going to do this across ten allocation periods, tracked over ten years, and our data are going to allow us to speak to three years of outcome data after the allocation. So it's really going to be short run effects that we estimate. Okay. So just quickly, you know, Tesla is not the only firm in this dataset. In fact, a lot of different industries are represented here. It's a really diverse set of applicants. The one thing I did want to highlight here is that all of them are sort of doing this coupling of a large proposed employment increase and a large capital investment. So that's kind of a unique element of this program. You'll see here that, for example, a number of R&D firms as well. Okay. So to just give you a sense of the underlying data and our empirical strategy. So here what we've done is we're showing you kind of average employment for awardees and non awardees in the year

relative to the year of allocation, which is always going to be zero. So they start with a baseline of about 400 to 500 employees. If you were going to do a kind of naive comparison of this, like in a difference in differences design, if anything, you would maybe overstate a little bit the impact of the program because there's this pre trend among awardees and you might find kind of a small effect. So another thing you could do is just look on either side of the cutoff where you could compare the low scores and high scores. And here, you know, the pre trends start to flatten because you're using more of that random variation. But now there's just a big difference in size where the lowest score guys are just mechanically really large and the high score guys are smaller. And if they were proposing a proportional increase in employment, you would just see that the larger applicants might might kind of spuriously grow more and this would be kind of an apples to oranges comparison. So what you really want to do is focus really close to the cut off where the applicants are really comparable and then see what happens after the allocation. And that's exactly what we're going to do. So this is a restricted sample to our regression discontinuity sample. And what you see is that the pre trends are now on top of each other, except for this kind of delta effect on employment in California, which is what we're going to be estimating formally in our regression discontinuity. So that's what I'm going to show you here. So we're going to use two Audi approaches. We're tracking each applicant. I tell years since the allocation year which to be here is going to be your kind of standard regression discontinuity. When you control for these polynomials on either side of the cutoff in score. And then you're going to have these allocation fixed effects which are going to ensure that you're not comparing across periods which might create kind of compositional issues. And then we have additional controls X, which might contain further compositional kind of time invariant issues, characteristics. And then there's one further strategy we're going to use here. So about a third of the applicants are repeat applicants. They've done this before. And we want to kind of partial out the effects of these repeats. And so what this is doing, this dynamic early approach is essentially adding an additional term, this P term, which is just an indicator for whether you applied in any given period. And it's going to control for the history of your scores and your application history up to the point of today's allocation. So there you'll be able to compare. Okay, how does it applicant just fell to the left of the cut off compared with one that was on the right of the cutoff, assuming they had the exact same prior history of application. So generally, if you look at what happens to the probability you win an award, this is kind of the main first stage result, which is that the probability increases by about six percentage points and that's over a baseline of 20% of applicants that receive that receive credits on the right side. And that's quite a sizable first stage. And this is what's going to be generating kind of all of the local employment effects I'm going to show you now. Okay, So what I've done in these plots is each of these dots represents a different regression discontinuity estimate, such as the one I just showed in the previous slide. But in the year relative to allocation, and I'm doing this for three outcomes log employment, log payroll and log number of establishments in California. And what you see here is in the kind of placebo period prior to the allocation, estimates are close to zero, but then they rise and sort of flatten out after three years for employment and payroll effects. And these are large. These are about 30% effect sizes, which are way larger than a lot of what this literature has found. If you look at the number of established establishments, however, we don't have any strong evidence that they're creating new plants. It seems to be the case that this expansion is happening at existing firms. And it's also the case that we actually find similarly strong effects in high poverty areas. We do the exact same thing with our repeat strategy, and this is kind of looks almost the same, except effect sizes cut in half when we control for these for these repeats. So the repeat strategy kind of uses more information away from the cutoff. But we think that this might provide a bound where the truth, the true estimates kind of fall somewhere between this the strategy and the estimates I showed you a minute ago. And finally, the last thing I want to note is that this is our last kind of striking finding, which is that the share of activity outside of California seems not to change at all in response to the tax credit. So you might expect that that, you know, because you're increasing your share of activity in California, when you look outside California, you should at least see a little bit of a decline. But we can rule out large declines, any decline over 3%. We can we can rule out here. So we think this suggests that firms with preexisting expansion plans are just choosing the highest NPV location, the one with low cost of capital or cost of labor. Okay. So just to wrap up, we find that Cal competes induces business growth within the state, but there's little evidence that expansions are at the expense of operations in other states. And this suggests that,

you know, a targeted or audited policy, if it's structured like how it competes, might be effective. I'm not going to talk about the social return because it's going to come up, I think, in the discussion. But we think the reason for this is that the policy's effective at targeting kind of large and new planned capital investments for whom, you know, a material tax. There's a material tax advantage to receiving a subsidy. So thanks so much. Looking forward to discussion.

BARTIK: [00:19:04] Well, thanks for inviting me to discuss this paper. This is a really important paper. It's one of the best papers ever on business tax incentive policies. However, the key issue is how you interpret these estimates. And, you know, it's a good paper because it uses, as it was, describe a natural experiment. The scoring cutoff varies and you're looking at firm just below and above. So it's kind of a natural experiment. And however, what needs to be understood is that these effects are incredibly large. So if the average credit is a one time credit, one time not repeated of $10,000 per job. And if you look at their job creation cost. It implies that as a percentage of the job creation at the proposed project site, this is 82% of the job creation. 82% of that. So, you know, 18% of these jobs would have been created anyway. The but for the jobs that were not in the credit but for the insane over 82% and the cost per job is 8000 per job. So if this effect is not only effect on how much the what the firm does within a two year period. But it also affect on total jobs in California. This program is a no brainer. Every state should instantly put all their economic development funds into this program. It's the greatest thing since sliced bread. First of all, it pays for itself. It's a free lunch. I mean, for 8000, for a job, you're creating jobs at a payroll of 60,000 per job. The California tax revenues from this will easily exceed that within 2 to 3 years. However, I think there are other interpretations that are more plausible. I think it's hard to believe that these estimates actually reflect the fact on total Californian jobs, and there are at least three reasons for that. The first, as mentioned on this page. This conflicts with most of the other literature on business tax incentives, which have found cost per job not of 8000 per job. But at least 160,000 for a job. So it's a factor of 20. This is 20 times the effect of most other studies. Second reason is just look at the amount of the subsidy and think of what it is as a percent of the firm's total cost. Okay. If this represents a persistent effect on the firm's investment and jobs, this $10,000, the jobs that they're looking at pay on average 60,000. So it is 16% of one year of payroll, right? 16%. 10,000 out of 60,000. But the firm if this is a permanent job effect, the firm has to look at what's the payroll over the next 20, 30 years or ten years or whatever. You take a present value calculation, and this is maybe equivalent to a permanent 2% wage subsidy. And yet what we what they find is that if you interpret this as permanent effects on the firm's employment, that essentially the firms employment quintupled instead of being an 18%, you know, it's 100%. So that's like a quintuple is this is a very large elasticity. So the question is, is that plausible? I appreciate the thing that in theory at least, if you target the marginal firm. Right, a $1 subsidy could tip the decision. But how much can target every state tries to do this with all its program? This is a very common thing, not just California that tries to target marginal firms. Every state would like to have a telepath on their staff who could read the mind of the business decision maker and find out whether or not they would have located that. What they've done, the expansion without the subsidy. If you had much of my reading telepaths, we could make state economic development as far more effective. But we don't. And I don't think California does either, any of that. The other thing to note is these effects are so large that if you look at California's overall job creation. This should result in an increase in total California job creation. Of almost 20% of what actually occurred. So 20% of California's job creation from 2014 to 2021 should be due to this program. Here's California's job creation history. This program started in 2014. I do not see an effect of this program on California's job creation during this period. There's no sign of really some break in the trend. So what's going on here? So I believe the authors results. I believe that due to California competes, the firms that score below this cutoff are more likely within the next two years to expand employment. I believe that I'm not sure this represents permanent effect on the firms jobs in California. It could be due to effects on timing. It should be understood that firms they can't exactly manipulate. But if a firm has some flexibility on when to invest, on when to expand jobs. It can play the following games. I make a high incentive bid today if I'm lucky enough that in this round I'm below the cutoff. Then I expand. But if that doesn't work out a year or two later, I can make a lower bid. And yes, if that was the case, we would find effects on employment growth in the next two years of this program. That might be quite large, but they do reflect effects on the timing of the job creation, not on what happens, say, over

the next ten years. A second interpretation. One thing that I'm not sure is fully understood by everyone who works simply on tax incentives is that there's a lot more to state economic development policies than tax incentives. In particular, every state economic development agency has people who work with firms to help them overcome problems with environmental permitting, with zoning regulations, etc.. California in particular is known to have very involved and onerous zoning and permitting requirements. Now they do this selectively. I can assure you that if you have ten employees and want to make an investment adding three employees, you are not going to get a state agency official spending a lot of time trying to help you. They just can't do it. They can only help a certain selected number of firms. They need to be very careful about who they select. They can only work with a certain number of firms. Now, my hypothesis is that prior to California competes, existing state had a somewhat subjective process for simply choosing who to help. After California competes. They use this as part of their process for deciding who to help. I'm not saying they did extra help to California keeps keep. COMPETES recipients over what they gave to some other firms they selected to help. I am saying this determined in part who they selected to help. Now if that's the case, if they first if they if the state each year going back in time is helping about the same volume of firms, the same number of job creation project, etc., then what California competes would do is would not change the total amount of job creation in California, which under this hypothesis is largely due to how many firms. To what degree does the state decide to loosen its rules on whether or not you can actually do anything in California? Right. To what extent is the state loosened those rules, and for who and for who do you loosen the rules? So you could see California compete essentially as a type of industrial policy under which this incentive, this first round incentive game is used in part to determine who gets selected in the second round through California's implicit industrial policy. Again, can I prove these interpretations are correct? Not now. I mean, some of these things, the timing thing, you may have longer term data. The second interpretation really rests on looking at this program and saying, Do you actually see any evidence that California's job growth is different? As I said, you would expect to see it if the program is actually affecting California's overall job growth, you don't see it. This program is so big, it should be actually showing a measurable increase in California's job growth. And I simply do not see that in these data. Thank you.

GORDON: [00:28:46] All right, We've got some stuff to discuss. Ben, I want to give you an opportunity to respond.

HYMAN: [00:28:52] Sure. Okay. Wow. So, thanks, Tim, for all the great comments. And I should mention that Tim has been really helpful, you know, over the last, I don't know, weeks, weeks, months in helping us frame and interpret this these final kind of the size of our effects. So what I will say is we're not going out there saying that this is the best thing since sliced bread and that, you know, every every state should go out and design their policies exactly like this. I think what we're trying to learn is, you know, we have found using what we think is a strategy which is kind of dominates a lot of prior work that used kind of maybe less compelling strategies, very large effects. But we're also finding that in a setting where, you know, the program is really targeted. So indeed, it has, you know, a price discrimination element where it is picking out very large firms. And we think that's that's part of the interpretation. Even if you take our our estimates and adjust for repeats, repeat applicants, those actually control for timing issues. So let's say you cut all of our magnitudes in half and focused on those. You would get, you know, 4 to 5% growth in California. And if you added the multiplier like you did, you know, maybe 10% employment growth. I just I have a hard time looking at the aggregate and saying what's the counterfactual of what would have happened in California? You know, absent the policy. So that's kind of my comment on the macro part in terms of what I do think might be going on. Maybe it's not that state officials are helping applicants overcome kind of zoning barriers and other regulatory barriers, but it's possible that there are layered invest, you know, layered subsidies like R&D tax credits in the state, which would, you know, increase the cost per jobs. We can't see that in our data. And this is a similar critique of the federal Empowerment Zone program that Pat Klein and Gregory Rousseau found. So I think we basically agree with a lot of what's Tim saying here. It's just about how to interpret these large effects. You know, one thing that I think we didn't note here is that, you know, we spent several weeks in Sacramento sitting with these administrators, and they're quite sophisticated at

actually trying to pick out these firms. We were surprised about that. But I think I will not because we didn't expect them to be. But they were kind of really impressive. So I think I will leave it at that for now. Thanks.

GORDON: [00:31:30] I just want to, I'm going to take the moderator's prerogative and just ask a question. I feel like the federal government has been inveighing against local economic development subsidies for a while and sort of trying to use the bully pulpit to talk about wastefulness and citing research of the people in this room. So to bring it back to sort of a policy prescription, understanding the difference, sorting out the causality, I mean, do we care? Right? Like, should the federal government be saying, look, we discretion might sound like a bad thing, but it's a good thing if you've got this ability to claw back benefits and this these audited results that you can look at this enforceability. We think that these supplementing supplemental services might also be important per Tim's comments. So so do it all. Is that a fair policy prescription?

BARTIK: [00:32:19] And that the federal government should allow this because it's they work. I'm not clear what your question is that they should allow it because I guess the question is, does it work from a global perspective? I mean, what we do in the U.S. in economic development would generally be illegal in the European Union. They risk they have a whole subsidy regime that restricts subsidies heavily and targets and that a stress places Paris and Berlin can't do much, Bulgaria can do a lot, etc.. And, you know, their argument is, you know, one, you know, across the different jurisdictions, it's a lot of it's a zero sum game unless it goes to distressed areas, in which cases maybe not, because there may be greater economic and social benefits to helping distressed areas. I certainly think so and so. So do some other folks. The other issue is they see as they are competitive and we know from this that the political thing is firm. States are much more likely to help large firms and small firms for a variety of reasons and political reasons as well as substantive. It's easier to provide one subsidy to one large company than ten subsidies to ten small or medium sized companies on 100 subsidies to 100 smaller companies. So there's a tendency thus to favor increasing monopoly power in the U.S. economy, frankly. So from the viewpoint of competitive strategy, you know, maintaining competition and markets as well as possibly saying, look, do we really want California to succeed in putting more activity in the booming areas of the state or New York to subsidize the booming areas of the state? In many other cases, I mean, state, you know, that's what's going on a lot. I mean, at the state level, states do not do much in the way of targeted distressed places right now, I'm sad to say.

GORDON: [00:34:12] Okay, great. Let's go to the audience for Q&A. Please flag down Megan or Stephanie if you have a question. And don't forget to identify yourself and your affiliation, please.

AUDIENCE MEMBER: [00:34:23] Seems almost unfair. Kim Rueben, Tax Policy Center, Urban Institute. You'll hear me opine afterward. I have. This is all really interesting. I it raises two questions in my mind. One is. How big should California make it? Like if you thought that this was being as productive as it is, and even if it's just raising the amount of money in income tax revenues directly, should they be doubling it? Should they be quadrupling it? And do you have any idea how this type of incentive compares to, say, other incentives other states have given to some of these big companies? I sat here thinking about, well, how does this compare to what Vegas or what Nevada just offered Tesla, which in my mind was a much larger incentive for them to move some of their employment there. And so have you thought about sort of what the optimal size of the program might be and how it sort of fits into this broader set?

HYMAN: [00:35:21] Yeah, sure. Great questions. You know, I think while the the optimal size of the program is a little bit out of the scope of the paper, we do estimate this marginal value of public funds, which is this sort of popular way to evaluate, you know, the social return to the program. And we find estimates that are quite high for some of the reasons to mentioned. But even if you have them, they are close to other investment tax credits and impacts of those that have been found in the literature. You know, of course, when you do these things, you know, this is a very partial equilibrium exercise. You have agglomeration returns, you have other congestion. You know, if Tesla grows and other car companies decline in California, you know, on net, that actually

might explain why you might not see it in the in the state numbers. So there is a distributive kind of element to, you know, who's who's getting subsidies here. I didn't we didn't have time to get into it today. But in high poverty zones, we actually do find that there are large employment effects there as well, because you can either rationalize this in terms of drawing workers out of unemployment as a job creation program or as a kind of productivity industrial policy, agglomerate of effect. And I think that's when you're thinking about that, the planner who's thinking across space, that's a really hard problem to think about, you know, juggling unemployment in distressed areas and productivity gains in other places and where should I optimally allocate? I think what our paper is showing is that indeed, you know, discretionary tools may be more powerful than than we once thought.

BARTIK: [00:36:51] One thing I comment is I took their estimated effects. I have a model of the benefits and costs of incentives. It's essentially a regional econometric model and you can download for free for the options through website. If I enter in their data, their results, I get a benefit cost ratio for this program of 70 to 1. Okay. So that includes not just the fact that's free fiscally, but it has earnings per capita benefits, employment rate benefits, property value benefits, all kinds of stuff. So I think, yeah, you could imagine expanding this forum quite a bit. Now, one thing it implies, actually, if you only need if you can target firms so well, that $10,000 triggers 82% of the decisions. This is actually small compared to the 300,000 per job or 200,000 per job that a lot of states are handing out. Now, let's say electric vehicle or battery plants. So you could argue and I don't know if the authors intend to make this argument as they revise the paper that let's stop handing out 300,000 per job and just, you know, 10,000 per job, because, after all, it turns out that we can hire economic travel agency staff who essentially can read minds of firms and figure out who's the marginal firm is. As I said, I'm skeptical that I also think politically this is more likely to be interpreted as the sky's the limit on incentives. Let's hand out more. I honestly think that's the way this will be interpreted, unless you're very careful about how you frame the paper.

GORDON: [00:38:20] Yeah, I think. Oh, I'm sorry. Go ahead. Oh, sorry.

AUDIENCE MEMBER: [00:38:23] I'm Sadie Bogat, I'm also the Tax Policy Center. I'm curious, Ben, you've talked about this two phase process in which there's this subjective assessment of how likely a firm is to exit the state or reduce its hiring. And I'm just curious, you said that you found these officials to be very sophisticated. Could you elaborate on what that process looks like and how they're actually determining the likelihood of an exit or reduced hiring?

HYMAN: [00:38:47] Yeah, sure. I mean, the first reason that we know that they do this in a way that is so okay, so they evaluate at the very beginning, they kind of look for unfeasibly low and high scores and try to purge those out initially. Then they have these conversations with the applicants to try to suss out the validity of the information that's being provided. And they have these attestation boxes for applicants that are, you know, whether I would, you know, the CFO or the CEO attest that they will leave the state or, you know, lay off employees. Absent this incentive, you know, whether that's a credible threat is a is a different question. But there's a whole kind of back and forth where we've sat around, you know, listening to them, you know, kind of interrogate the firms about these decisions. And the last thing I'll say is that, you know, at the end of this, it goes to a public committee vote. And almost all of the time when Kal competes, puts forth an applicant, the committee, which is, you know, state treasury officials, other kind of high ranking officials usually approves, approves these these applicants. And they can state a dissenting opinion. But like the fact that most of these end up going through at the end suggests that indeed the screening that happens among the compete officials is probably pretty effective.

GORDON: [00:40:02] So, unfortunately, we're out of time. I see there was one question over here. And Josh, you had a question maybe in the after the next paper we can do sort of a round robin for any remaining questions. So the next paper is by Johannes Fleck, Jonathan Heathcote and Kjetil Storesletten. And it'll be discussed by my colleague, Kim Rueben.

FLECK: [00:40:34] Okay. Thank you so much, Tracey, for the introduction. Thanks to all of you for coming. It's a great pleasure to present this paper, this this joint work with John Heathcote, Kjetil

Storesletten and Gianluca Violante. The two of us work at the Fed, so the usual disclaimer applies at the starting point of this paper is the observation that there is a humongous amount of research paper on the progressivity of the federal income tax and transfer system, but there's much less emphasis on the progressivity of state and local taxes and transfers. This is to some extent surprising because when you look at the total tax collections of the state or local governments, we actually see that we're in the ballpark of what the federal government collected income taxes and in Social Security taxes. Another reason why we wanted to look a bit more carefully into their taxes is because they tend to heavily taxed sales and also property. And the conventional wisdom is that those are two kinds of regressive Texas. So the questions we're after in this paper is once you bring in the taxes raised by the state and local governments and also account for their transfers, how does this change the overall picture of redistribution that we have here on the tax and transfer system in the U.S.? Does this progressivity vary across states? Are there some that do more redistribution than others? Where do these differences come from? And finally, are they stable over time? Do states wiggle around a lot or is there some some sort of deep structural difference between those states? I thought the way we answer this question, what you're going to see today is we basically do to a comprehensive measurement exercise. We built a fairly comprehensive data set, and then we're going to estimate a popular tax and transfer function at the state level. So I should already mentioned that despite all of the efforts we do, we are not able to estimate this function at the local government level. So think of the results that our state averages today as essentially aggregating all of the local governments within each state. I'm going to walk you through how we construct this dataset, but basically we start out from publicly available survey data and then we're going to augment them in the dimensions which we think are relevant to capture these differences in cross state tax and transfer progressivity. So we start out from the CPS March supplement, the so-called basic data set. We focus on households and we focus on those households which are somewhat active in the labor force. So we want to make sure that we only select households with a head who is of working age and where at least one spouse has worked part time at the minimum wage. You can see here that this income requirement is not overly stringent, but we also have one version where we literally include everyone in the sample. We do this exercise for three different year pairs. The results you're going to see today are for 2010 and 11. Our measure of pre government income that we construct from this data set is fairly comprehensive. It has labor income as well as a fairly comprehensive measure of interest income and also in particular realized capital gains for households at the top. And then the post government measure we work with is literally just that same pre government measure, plus the transfers minus the Texas. And I'm going to walk you through them in the next few slides. I want to mention that the basic dataset has a fairly it's fairly low top quotes on the income variables. So we replace the incomes of all of the households with income. Top quotes by pulling in data from the IRS statistics of income just because we want to make sure that both the income as well as the taxes paid are actually representative, in particular at the top, including at the state levels. So where do the taxes and transfers come from that we work with? The income taxes have already been imputed into the data set by the Census Bureau tax model. And as I already mentioned at the very top, we use our estate on the transfers who work with are all self-reported. I just want to mention the role of Medicaid here. So here we are using a modified version of the CBO's imputation algorithm just to make sure that we capture the cross-state differences in generosity and eligibility. And in particular, we split both the Medicaid and the tenant transfer programs into state and federal components, again, to account for the fact that states have a lot of leeway in deciding who they want to include and how much they want to pay to those eligible households. Out of all the transfers that we have in the ACA data set, we construct two measures a narrow and a broad one. The guiding principle of the narrow one is that it should be cash or near cash programs. So you see here that the programs that we have on the state side and the ones that we have on the federal side as well for the broad measure, we add to this narrow measure, the Medicaid program, just because it's so large, it's going to affect our our different measures big time. And we also come up with an imputation for the future value of old age pensions, just to account for the fact that Social Security pensions are by themselves already quite regressive. Property taxes and sales and excise taxes are not available sort of off the shelf in the basic data set. So let me walk you through how we impute them. So the basic data set actually contains a measure of property taxes that is sort of a byproduct of the Census Bureau tax model. But we

realized while working on this that from 2011 onwards, they no longer use any information on on geography, essentially. And so this is this is precisely what we're after. We had to design our own algorithm to have like one consistent way of making sure that we get those property taxes into our dataset. So the starting point of the imputation algorithm that we developed is the American Community Survey, which actually has for owners self-reported measures for house values and also property taxes that they paid. And for renters, it has self-reported rents. So now, essentially, if the problem that we have the access data set where we have the information that we want and the basic data set, where we have all the other income variables and transfers, how do we get this together? We essentially find for every basic homeowner, nine nearest neighbors in the American community survey who live in the same county or the same state, at least if the county is not identified. So we match on a bunch of variables using demographics. For example, the age of the household, the number of people in the household. We use income and we also use some information about the characteristics of their property. Now, once we found those 90 race neighbors in the American community data set, we get the mean of their self-reported property taxes and assign this value back to our owner household in the ISSAC dataset. And we do this for all owners and ask. What do we do about renters? They also pay property taxes implicitly through their rent. So here we have a similar procedure, but we have to do some first steps. Namely, we make it to assumptions on how rent is passed on and how we can basically go from reported rents to the value of the property that people are renting. And so we have information from Zillow which allows us to figure out what's the value of the rental property of every renter in the American Community survey. And then once we have the value of this property, we are just multiplied with a linear tech property tax rate to then essentially come up with how much in property taxes did each renter implicitly pay it through their rent? Okay. And so then we have in the American Community survey for every renter a property tax value, and then we can essentially proceed in the same way as for the owners, namely, we do again, the nearest neighbor matching and assign the median of their property taxes back into our dataset. And here's a spoiler alert. We're going to find that property taxes are surprisingly regressive. And we wanted to make sure that this isn't an artifact of our magic matching, but that this actually comes directly out from what people say. So these two graphs here have been generated using the self-reported information directly from the American Community survey before we did any magic here with matching. So on the x axis of both of these plots, you see that log of pre government income and on the Y axis, you see on the left side, the holding value for owners again in locks. And on the right side you see the log of the monthly rent that renters report. The dashed lines are what would come out from a model where people were perfectly authentic with respect to consumption in housing. So if you if your income goes up by essentially $1 and you keep spending the same amount on housing, you would end up with a dashed line. The dots here represent a means of entirely of the government income distribution. What you see on the left hand side, on the left picture is that up until an income of about $60,000, so that's exponent of 11. House values basically don't change with income. Okay? They're about $175,000 and only after a value of about $60,000. You see spending behavior that somehow looks like homeostatic for renters, this pattern is even more striking. Your rent does not go up at a specific proportion as your income goes up, but it's at lower end. At lower incomes, it's almost flat. What does this mean? Well, in the moment in which you tax housing consumption in a linear way, which is how the property tax works, you end up with low income households having to spend a larger fraction of their income on property taxes. That makes it a regressive tax. Okay, how do we take care of sales and excise taxes? So we work with a consumer expenditure survey to essentially compute expenditure shares on different categories of sales and excise taxable goods. So we have sales tax of goods and services all in there. We have to excise taxable goods and services all in there, even broken down by various categories. And we then compute how much households with different incomes to income groups here are indexed by K spend on each of these categories. Once we have these expenditure amounts, we can essentially multiply with a linear ISED measure of the tax rates for each of these goods and services and just some of those taxes up to get a sense for how much they spent in total on sales and excise taxes. Let me put some structure now on how we estimate progressivity here at the state level. So we use the so called been a blue or just vertex function, which is the mapping that you can see here. So on the right hand side you have the pre government income of any household that's indexed here by Y. And on the left hand side you have the post government income. So the Y minus the T, Y, where the T is

the tax liability net of transfers. And you can see here, this is a fairly simple mapping as it just relates those two measures using two parameters, the lambda and the tower. The tower now means something else than in the previous talk. Here is our preferred index of progressivity. So higher values of this tower mean more progressivity. And you can see that once you take locks to this a relationship, you can estimate it in a pretty straightforward less way. And we then estimate this equation in three different ways by changing whatever we put into the tie. So we can estimate the federal progressivity, we can estimate the state progressivity, and we can also estimate them jointly. Let me show you how this looks like from a big picture perspective. So again, in these plots you have on the x axis, the log of pro-government income and on the Y axis of both of them, you have the log of disposable income. So the post government income, the left hand side, we computed this disposable income after accounting for federal taxes and transfers on the right hand side. We computed it after accounting for state taxes and transfers the dashed lines. Here are 45 degree lines and the green sorry, the red line line is the best fit of just fitting an all as a regression line to the relationship that you saw earlier. While the blue dots now indicate means of percentiles of the pre government income distribution. Let's start with the left hand side. You see that the break even point of this tax and transfer system is at about exponent of 11, which is $60,000 for households below the $60,000. They tend to be recipients of this tax and transfer system. Right. The dots are above the 45 degree line, while the opposite is true for those households with higher incomes. But as you can see, these lines are not parallel. The red line is actually tilting down relative to the 45 degree line. So this indicates there is actually quite a lot of redistribution in federal taxes and transfers accordingly. The estimates tell us about point two. Let's turn to the right hand side chart. This is after state taxes and transfers. And what you see there is that this does not apply to the state taxes on transfers, maybe with the exception of the very lowest percentile, mean they are essentially parallel to the 45 degree land. It doesn't really matter what your income is, you tend to pay about the same in texts and transfer and receive the same in taxes and transfers. We can now essentially estimate this towel in various different ways. We can zoom in on different kinds of Texas and transfers. We can do this separately for narrow and broad transfers. So the key point that I just want you to take away from this table here is that federal taxes and transfers remain highly progressive no matter whether we use the narrow or the broad measure. They are what they are on the side of the states that stories are a bit different. So income taxes at the state level, they tend to be slightly progressive. But as you add in more of the property sales and in particular excise taxes, you then see that the estimated progressivity goes down more and more. Now, this is sort of the the main result of the paper that I would like to spend some time on. So here we have now estimated at the state level, after partitioning our sample into the different states, the progressivity of each of these different programs. The black dots now refer to the overall progressivity at the state level. So on the very left end of the spectrum, you have two very regressive states. On the right hand side, you have two progressive states in each of the states, the income taxes and the transfers are progressive. They're always above the above the zero line. They always make a positive contribution towards progressivity in each of the state. Sales and excise taxes are regressive. They are always below the zero line. They make a negative contribution to progressivity. But what really stands out here is that the green portion of these bars and this is the property tax. So you see that in every state, the property tax is actually fairly regressive and you see that there are big differences across some states, and that's really what drives these differences. So on the left hand side, I want to mention New Hampshire, New Jersey and Connecticut. Those are states that do have very regressive property taxes, which then gives them an overall regressive print of our estimated progressivity. While on the other side of the spectrum, you have states, for example, like West Virginia and North Carolina, they tend to have relatively moderately regressive property taxes. That's why they end up with a positive trend overall. So what we do in the paper is we first of all, look at the overall redistribution here in the United States. We can confirm that the federal income tax and transfer system is progressive. Importantly, it remains progressive even after taking out all those components which are essentially decided on by the state and local governments. But you also saw that on average, the state and local tax and transfer systems are close to proportional. Remember that the line that was essentially parallel to the 45 degree line there isn't that much redistribution. From a bird's eye picture. But once you zoom into the different states, which is what you saw on the previous chart, there is substantial cross state heterogeneity. We saw that there are some states that are fairly

progressive and others that are fairly regressive. Where do these differences come from? It really depends what kind of tax basis a state decides to go for. If they're tax primarily property and consumption, they typically end up with regressive systems. If they instead focus on income taxes and they seem to be good at designing progressive income taxes in general. They end up with a typically progressive system. The final result that we have in this paper is that when you then look at the time differences of our approximately estimates, so I showed you today 1011 we also have it for earlier and later use. We see that these estimates are actually fairly consistent over time. In particular the ranking there is some wiggling around related mostly to the unemployment insurance system because of its sort of automatic stabilizing effect. But what we find is that the ranking is very well preserved all the time. So we are fairly confident that these measures reflect some sort of structural, persistent differences across states. And with that, I think I'm almost out of time, and this concludes my remarks. Thank you.

REUBEN: [00:57:54] Yes, that's me. All right. And to go forward and back. Okay. Hi, I'm Kim Rueben. This is a little bit different from the last paper. If we think that that was a very specific focus on one thing. This paper basically does everything that I've done for the last 25 years of my life in one paper. So it is interesting and these are hard questions. And I was sort of amused when he said it's surprising that we do a lot of progressivity and we look at these things at the federal level, but we don't get into what's going on in the state and local level that much. And it's because it's really hard rate If you're looking at progressivity and what's going on with the federal government, you have one system you have to think about. When you start bringing in these other tax systems, you have to think about how there are nuances and differences between them and how that all works. So they started from the HSV project and then, you know, we want to include state and local governments and we want to think about how, especially in a federalist system, all of these pieces work together. But it does make this a much bigger issue and problem. And it also is going to depend, critically, what you include, what you don't include, and what assumptions you make along the way, and where you sort of put things and your emphasis on things. So the paper finds, you know, asks how progressive are U.S. taxes and transfers? It finds patterns that are similar to previous work. But the devil in doing this is in the details. It's what are you assuming? What data are you using? And the fact that we don't have an ideal data set to do these kinds of questions makes this really hard. I'm also going to say, besides this being all I've done a lot of what is in my career, I work at the Urban Institute. We have not one but two different micro simulation models because depending on what questions you ask, it's going to determine what kind of data is most important and what kinds of things you want to do. Okay, so I did some of this, but we're going to go into more of it. Right. So the authors included taxes on individuals, so income sales, residential property, excise taxes, but not businesses. So we don't know how those taxes are going to be allocated and what it might mean for progressivity overall. And I'm not as worried about corporate income taxes, but commercial property taxes and whether we think property taxes are progressive or regressive in part are going to depend on what we think is going on on those commercial property taxes and also pushing on some of those assumptions. It is a really strong assumption to assume that 100% of property taxes are pushed over into rent. And part of this is I look at your, you know, graph where you're basically saying that New Jersey and Connecticut are not progressive states. It sort of takes away from a lot of the details of what's going on with their property taxes and the fact that there were all sorts of, you know. Changes and circuit breakers involved that might make this a little less so. There are also things like rent control that, you know, thinking about rent control in the fact that property taxes are 100% point pushed over into renters is hard to think about in a place like New York where we might see things where rent control is in place and they can't actually do that. So I think it's really important to think about how these things might work and what the simplifying assumptions are and what they might be doing to what you're doing. Okay. So there's specific transfer programs. We're also looking at the working age population and households with at least one person working. By doing this, in some ways, you're getting away from some of the biggest groups that actually get a lot of the transfers going on in this country. Right. If we think about retirees get a fair amount of money from the federal government, they also get money from the state government when we include Medicaid, especially for the elderly. And a lot of what we might be seeing for people who aren't working. So it's just sort of going to affect what kinds of questions you ask depending on how you put your table, your data

together. And then also the CPS is a good data set to represent households. It's not as good a data set representing the income that is raised by the income tax. And so you're getting around that by adding a slide data onto CPS. Top coded observations. But it is missing some of the nuance of what's going on and what's going on above a couple of million dollars. Right. So there's a lot of there's tremendous variation. Once we get into that very high income category and what kinds of taxes are in there? And so it's going to be important as you think about the questions you're asking, what data is important and what kinds of assumptions might be driving some of what your results are. Okay. And so now I looked at these questions and I thought, Oh, okay, as long as we're just asking you a couple of easy questions, no problem. So how do state and local taxes and transfers contribute to redistribution across the United States? This is incredibly important. We want to think about how we're redistributing money and what that means so the individuals and households matter. This is some place where using something like the CPS feels like it's good because it gives you a good representation of our households. Excluding the elderly is going to understate this a little bit. But the main thing I would love for you to do as we're thinking about this and doing the decomposition, the other thing that's going to matter a lot is the interaction between federal and state and local taxes. You know, if we think about something like after the tax reform in 2017 and we had limits on the salt, it may have put pressure on state and local taxes. And so we kind of want to think about in general, when you're going to start decomposing these, what it means on net. Byron, lots with a couple of authors. So Cooper Lutz and Palombo did a great job looking at sort of the federal and then federal state taxes and what that meant for regressive ROE versus progressivity. They did not do the transfer programs, but I think that's a good paper to look at and also to look at sort of what the interactions might be. How much is progressively vary across states. This is a really important question, and this is sort of something that keeps coming up in terms of is it okay that we have different progressive systems and different help for people depending on where they are geographically located? The pattern is very similar to what we might see in other work that's been done. But thinking about whether this is something that is a good thing or a bad thing in the country and whether there's something we can do about it. I spend a lot of time talking to people internationally who are surprised that we have no broad redistribution within this country. Our federal grants generally do not get rid of some of the poverty and the differences in these things. And so it is sort of an interesting question to think about how much progressivity exists and how it varies across places. But again, partly getting back to sort of what's excluded and the fact that you're finding property taxes are so regressive is sort of problematic to me. Like I've done some work in California where we have also find that people are actually not very good at knowing what their property values are like when they're in a system that their property taxes don't reflect their property values. And so thinking about what those kinds of decisions and whether if there is biases in the data, what that might mean to what you're doing and what happens if you sort of loosen some of those assumptions will be really important. So if you could do something like, say, you know, assume that renters pay 80% of their property taxes instead of 100%, and whether that might vary across types of property taxes that are paid. And what does that mean across the heterogeneity? The other thing that they do that wasn't presented here is they actually do look at sort of what seems to be driving the heterogeneity. And I find these results believable. But again, I would like to see it on the state federal combined. But politics, politics matter, as do demographics and income heterogeneity. The regressive city of some of your blue states is a little surprising, but I think a lot of what we're seeing in terms of what's going on with property taxes might be driving that. And then how has this changed over time? This feels like a really important question, but this is also something that it feels really important to think about how federal, state and local together interact and how that might vary. And especially as we think about a world where we have more income inequality going forward. Is this getting better or worse is important, not just in terms of the ranking, but also sort of what is the level of inequality? And if you can measure some of that, that would be really useful and helpful. And so I have a bunch of specific questions that I'm going to skip a bunch of this. I think this is a heroic effort and I applaud you for doing it. And I'd love to see you do more of this. I think it's just sort of pushing a little bit more on what's going on and especially when you're doing some of these estimations, noting that some of the estimates of what you're doing in terms of, say, how much of the property tax should be attributed for renters, how does that vary across different places? And so some of the actual rules might matter a lot and you might need to take that into account, even if it makes it more

difficult to do this exercise. But thank you. And I, you know, I did generally encourage people to read this version of the paper and any future versions that are coming up. All right. I'm going to stop.

GORDON: [01:08:18] Hey, Johannes, do you want to take a minute or so to respond to Kim?

FLECK: [01:08:23] Yes. Thank you so much. This was super helpful and comprehensive. So I just have a quick response. Is so Texas, the corporate income tax is going to be in the next version. What was not on our radar was the commercial property tax topic that you brought up. So we'll think hard about this. I want to say one thing about what you mentioned. Connecticut and New Jersey suddenly looking very regressive. What I showed today, when you work with that narrow measure of of transfers, once we look at the broad measure of transfers, which includes the Medicaid program, you actually see that these states still end up being among the most progressive states just because the Medicaid program is so large there and so much more generous than in other places that it actually completely underused the rec facility that comes from from the property taxes. But so the property taxes is really something we have been struggling for with quite some time now. So I just want to mention two things. So you mentioned there is things like circuit breaker programs, there are property tax credits, etc.. Our hope is and this is also what we learned after talking with people from the Census Bureau, is that these self-reported measures account for those. And we see this. So if you were to plot this picture that I had shown you earlier at different states, you see that in some states low income households pay less in property taxes. So we think that this is to some extent already baked into the measures that we are working with about the assumption for the property taxes paid by renters and maybe this one on one pass through. So what we realized is that, as you pointed out, there is good reason to believe that this is different by geography, right? If you and it essentially depends on the elasticity of the housing supply. So you would think that in a place like New York or San Francisco, that story is just different than in, say, Minneapolis or Omaha. So this is one of the things we're currently doing. We sort of relax this assumption that we see. How much of a difference does it actually make to what we find? Let me just briefly say something about the federal state interactions. So this is an excellent point. And we know that there are other papers that have already look carefully into this. The reason why we stopped with this analysis in 2016 is precisely because we did not want to get into the part where the salt cap kicks in because that would really, I think, change our entire exercise a little bit. I think it's a very useful and interesting exercise that is on our radar. I'm not sure we're going to do it for this paper. I want to say a final word about the simple. So we started out having everyone, including students, including retirees. We then, as you mentioned, realized that, well, essentially the US Social Security system, the U.S. safety the safety net overall is just completely different for the for these people. Right. Their working income looks completely different. In the case of retirees, it's just, you know, flat. It's the Social Security pension, whatever else they have, they tap into very different programs. There is also a lot more migration decisions in these groups that we were a bit concerned about. So I think this should probably be addressed in a separate paper in particular, since as you mentioned right, there are a lot of different state rules when it comes to like generosity of Medicaid, to what seniors, what kind of incomes to their tax, what kind of savings to their tax. So this is a point very well taken. I think we're not ambitious enough to try to get at it in this paper, but it will be --

REUBEN: [01:11:51] This can be a research agenda.

FLECK: [01:11:54] Thanks.

GORDON: [01:11:55] David.

AUDIENCE MEMBER: [01:11:56] Hi, David Schleicher, Yale Law School. So your treatment of property taxes was extremely unconventional, I think relative to the literature on the economics of the property tax in, I think, three separate ways. And I just want to see what you think about them. The first one is that property taxes are capitalized into property values. And so the extent of this is somewhat debated, but looking at it year by year, the progressivity of the top of the property tax

excludes the benefit. If you're paying high property taxes, your property values are lower. So when you buy it, you buy it for a lower price. And so that's like one category. The second is the kind of Hershberger tax effect on other types of capital returns. Zelinski And a whole bunch of people written about property taxes suggest that we should think about the property tax as kind of a inefficiently applied broad capital tax, which would affect all sorts of things that are on the returns side that may be outside of the outside of the measures you're doing. And the third is that property taxes usually fund services and not transfers because they're done at the local level. And so because you're looking at taxes and transfers, but you don't have, say, public schools, but at the same time you do have property taxes, you end up with a kind of seeming, to me, weird measure of what is happening and what is not happening. So if there's a lot of transfers going on in the public school system, we'd get more progressivity then taxes and transfers would show. If there's not, you wouldn't. And so. Just seemed that you like you kind of because you're looking at it as a straight income thing. You're not looking at the broad literature on property taxes. What gives?

FLECK: [01:13:27] Okay, Many thanks. Let me go one by one from the back. The final point about schooling and redistribution is something that we stumbled upon in this project. There is no theory on the progressivity of public goods. We don't know. We know that people have different valuations for schools. Some sent their kids to private schools. Others sent them to public schools. We know from a basic means a regression that there is heterogeneous returns to education. So this makes a lot of sense. I don't think we can address this shortcoming in the literature, in this paper. What we do is we constructed a super broad measure where we take into account the per student spending per state and bring that in as a lump sum. It goes towards what you're pointing out. I think it's a sort of satisfactory first approach. It's a lump sum. We would like this to vary across different households. We don't really know what the incidence looks like unless we get our heads around. Okay, What is really the progressivity of these cuts? The second point you mention about that, the sort of the rate of return on other kinds of of outcomes here. This would come in through the other capital return variables that we have in. Right. So if there was some systematic component in which higher property taxes to affect other kinds of returns, we are fairly confident of fairly confident that they would be in. The other point also the more general point here is when you look into the the theory is the property tax, the capital tax, or is it a consumption tax, There isn't a clear consensus here. So what we decided was, okay, let's treat it as a consumption tax. Let's see if there are any other interpretations that would really turn this around. I think this goes into what was already mentioned earlier and that maybe once we put in the corporate income tax bill, we have to think about an incidence. I think this is the same sort of ballpark where we're going to address this concern. But those are all very valid concerns. I think the the reason why the property tax is sort of treated in very different ways is because we don't have a good understanding of, you know, is this something that people generally purchase just for consumption purposes? Is this something that they want to invest in and pass on, you know, as part of an inheritance? We took one view here just to make sure that everything remains tractable within our framework.

GORDON: [01:15:39] I just want to say we are running pretty late and I know there were two questions in the previous session or the for the previous favorite that we can get to. So I'm going to propose that if anyone has any questions, we'll just take all the questions and try to get to them very quickly, including the previous authors, if that's okay. Mark.

AUDIENCE MEMBER: [01:16:01] So my day, my main takeaway from your paper is that while I have seen maybe a dozen specific incidences of property tax problems where, you know, low income people were paying a lot more and higher income people were paying less. Your paper tells me it's in Denmark. It's it's in every state. That's that's interesting to me.

GORDON: [01:16:26] Did you still want to ask your question from the previous paper? Okay.

AUDIENCE MEMBER: [01:16:40] Oh, can you hear me now? Leonardo Mayer and WMATA, I just had a question about the previous paper, and there was that I was wondering if how policy wise, how you would address that. It seems like larger corporations are favored in that tax credit and how, policy wise it can be changed to favor also smaller corporations. I just didn't know.

GORDON: [01:17:11] I was going to give Josh a chance to ask a question. But David just gave me this sign that so quickly, do you want to respond? And if you guys want to maybe continue the conversation during the break.

FLECK: [01:17:22] Yes.

REUBEN: [01:17:25] And I'm going to say we need to figure out what's going on with that property tax stuff and we can talk more afterward. But I do think that there are problems with sort of what are reporting with house values in the CPS, too.

GORDON: [01:17:38] I also wonder if you can do better than state price to rent ratios. Yeah. Anyway, thank you very much. Great questions. Great conversation, terrific papers. Thanks, everyone.