Building Costs and House Prices: A Friday Forum Webinar and Panel Discussion

Friday Forum: January 9, 2026
1h 38m 58s

Keith Porter 00:00:21
Hi, everyone. We're going to let people settle in. All right, welcome to Friday forum. Today is January the ninth, 2026 this is the 236th Friday forum in this series. The series is hosted by ICLR, the Institute for catastrophic loss reduction. We're Canada's leading source for Disaster Resilience knowledge. Our mission is to make Canada more resilient to natural disasters. Each month we present recent research related to that mission. I'm your host ICLR chief engineer, Dr Keith Porter. I am speaking to you from London, Ontario. This place is on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Chonnonton Nations. Last month, ICLR Director of Research, Dan Sandink, who's joining us today, briefed us on the outcomes of our resilient homes Task Force. The task force produced ICLR Good/Better/Best checklists for above code new design. In next month's Friday forum, we're going to hear From the British Columbia Ministry of Emergency Management afterwards, that's going to be on Friday, February the 13th, 2026 now today, we are going to discuss what may be the central challenge to long term catastrophic loss reduction. And I mean the tension between resilience and affordability when it comes to new buildings and resilience. I mean making new buildings better resist natural disasters. We could make new buildings all but disaster proof. There's no technical challenge to that. Dan's Task Force showed us how to largely eliminate losses in new buildings from flood, we fire, hail, wind and earthquake. But in his talk last month, he also said that doing so adds costs. Now intuition tells us that every dollar of added construction cost increases purchase price by $1 and higher prices mean less affordability. But is that intuition Correct? Do cost and price actually go in lockstep? Our speakers today are going to try to answer that question. Joining us are structural engineer Brian Porter and economics professor Dr Chad Syverson. They're going to present empirical evidence on the correlation between construction costs and purchase price. We can convert that into intuition I just mentioned about cost and price into a testable scientific hypothesis. You can make a prediction with it. The prediction here is that purchase price should strongly correlate with construction cost. Now if the evidence contradicts that prediction, then we have to reject or greatly modify the hypothesis. That is the scientific method Chad and Brian's work tests that hypothesis. Now, after the presentation and before our Q and A, we're gonna have a panel discussion that's this is unusual. Now first, I asked ICLR Director of Research, Dan Sandink, to join us. He and the builders and insurers on the resilient homes Task Force grappled with resilience and cost. Also joining us is our friend, Professor Kevin Simmons of Austin College. Kevin is an economist. He studied the market effect of a supposedly costly code change in Moore, Oklahoma, and he found that it had no effect on price or development, and he's quantified the benefits of code improvements elsewhere in the United States. Together, we're going to discuss some broader

questions that today's talk raises. Now it's right after the presentation, and we're going to reserve 15 minutes or so for questions and answers. Here's our agenda for our speakers begin. Our webinar is going to last 90 minutes. Our speakers will present for about a third of that, then the panel is going to discuss three prepared questions. Then I'm going to moderate Q and A for the last 15 minutes or so. Now, please feel free to chat your questions into the Q and A box. Not the chat box, but the Q and A box. I will try to pose your questions in the order that they appear in the Q and A box. If we have a lot of questions. I may only pose your first question, then I'll move on to others that will circle back to your additional questions. Our webinar. Our webinar is recorded. ICLR is going to post our speakers, slides and a link to the video in the next day or so. If you have colleagues who couldn't attend, let them know. They'll be able to find the slides and the recording at www.recording@www.iclr.org slash workshops, and with that, I will turn it over to our speakers, take it away, gentlemen,

Chad Syverson 00:05:34
Thank you, Keith. Appreciate the invitation to discuss our work with everyone here today and looking forward to it, I'll be primarily the presenter of the paper via the slides. Brian May chime in, but he'll, of course, be very active in the panel discussion and the Q and A. So let me just get started telling you about what we did and what we found. So I'll first share my deck here. Okay, I trust it's up and not hearing otherwise, I'll be looking good. All right, great. So this is work that Brian and I did, and it was published this past summer in the Journal of Economic Perspectives, which is a an academic journal in economics, but it's particularly designed for papers of general interest to economists broadly and for less technical work. So this is I'm going to just show you basically the results that we found. Of course, all the details that I don't have time to get to today are in this article, which which you can find online, and indeed is free, not behind a paywall, so anyone can can access it, all right? So obviously, as folks who are interested in this industry well know, high and increasing housing prices have been a topic of active and sometimes heated debate. This is true in the States, but also in many other countries as well, maybe particularly true in Anglophone countries. It turns out, The Economist had an article about that a couple years ago, and just to the point, given our audience today, implied price to rent ratios in Canada are actually a multiple of their already considered high US counterparts. So this is something that is actively being debated, the sources of high housing prices, if you look just for at a 30,000 foot view level, at the relationship between house prices and the costs of building houses, and I'll get to the details of how we measure those costs in just a moment. But taking that as given, you find patterns that look something like this figure, which shows going back to 1950 indices of both housing prices and building costs for a number of metro areas in the United States, the red line are house prices. The blue line shows house building costs. And you can see that there's quite a bit of variance across cities in terms of how closely prices follow cost trajectories. First lesson is costs that have been going these are, by the way, these are nominal figures, so non inflation adjusted. I'll get to the inflation adjusted figures in a moment, but you can see there's quite a bit of divergence across cities in

how closely house prices follow housing costs. Costs have gone up everywhere in nominal terms, as have prices, but in some cities over the long span of this data, there is a pretty close connection between house prices, housing price growth and housing cost growth, but in others, there's been a divergence, and at that a substantial divergence. So let me just call your attention really quickly to Los Angeles, which is in the first column. In the third row, you can see there, really, since the mid 1970s there's been a big divergence between house prices in LA and the cost of building them. To give you an idea of the sense of magnitudes here the numbers shown on the vertical axes zero to 9000 those are indices where the 1950 value equals 100 so 90 implies 90 times their nominal value, non inflation adjusted in 1950 so a gap between 9000 say for house prices in LA and something like 3000 for housing costs is a three Fold cumulative difference in price versus cost growth. So kind of right off the bat, before you even get started digging in the details, you can see that house prices move for reasons other than costs alone. How much of a divergence the risk varies across geographies, but the fact that there is a variance is quite obvious. Okay, so that's just to motivate things. Now let's dive into some details. And first of all, just to motivate why you might look at cost trying to explain houses. I think Keith sort of gave you a sense of that already. You know, it's not crazy to imagine the cost of something is predictive of its price. And of course, construction costs are a considerable part of the cost of building a house. Just in an accounting sense, building costs account for somewhere in the neighborhood of two thirds of the full cost of bringing house to market in land and constrained areas. And that's something we're going to come back to, about the constraints put on land and building and what that might do to prices, but in in a relatively unconstrained markets, again, just as a an accounting share you're talking about, you know, substantial amount of of the cost of building is in the literal cost of constructing the house, putting the parts together, laid upon this fact is the another fact which I worked on separately with my my colleague, Austin Goolsby, which is the US construction sector, has had very poor productivity growth over the past half century. Actually, poor productivity growth essentially means your costs are rising, or they're not falling, or they're rising faster than they are in other industries. Either way you look at it, poor productivity growth means higher costs. So not only are our building costs a considerable part of the price the cost of building a house, if anything, those costs have been going up relative to other costs. So all of this is to say it's a perfectly logical hypothesis that you might think building costs have a considerable role in predicting the prices of housing, and that's what Brian and I are actually trying to look at. We came into this without any preconceived notions of how big that connection ought to be or anything like that, and we just basically took a look at the data, and we're reported what we find, and that's what we're going to share with you today, and then we'll discuss it afterwards. So how we actually measure building costs in the paper is to use the housing cost database from Rs means. RS means is a company that has been reporting building cost estimates since the mid 20th century. They I've got here verbatim what they say they do to compute these cost estimates. They use a combination of field research, industry surveys, cost modeling and partnerships with construction professionals and suppliers. We did check the validity of this

cost data in a couple of ways. We compared it to other metrics, both metrics of building costs created both by government agencies as well as other private firms, they seem to match pretty well, both in time series and in the cross section across cities, giving some confidence about the quality of this, RS means data, and frankly, the construction industry is a heavy user of Rs means data, which also speaks to positively to its ability to capture actual costs as they exist in the market. In terms of measuring house prices, we primarily use two sources in the paper. One is the FDF, a home price index put out by the government agency that is available since 1975 that's available for the entire country, as well as for specific metro areas, an increasing number of those only over time. So 1975 1980 there's only 13 metro areas with separate indices. But then after 1980 more and more added, and you get to near 200 by the by mid 1990s these are based on repeat sales or refinancing of existing homes, so that helps control for compositional changes in the quality of houses that might be sold being sold at any given moment, So that, in principle, the price index shouldn't move around, simply because in this year, a lot of expenses houses were sold relative to cheap ones, and in the next year vice versa. This should be sort of controlling for any persistent differences in quality across different kinds of houses. So that helps with the quality of that house price data a little bit for some of the work, especially the cross sectional comparisons on the dollar to dollar basis, which I'll get to later on in the presentation. We're going to use median house prices as reported by Zillow, which we've got for just under 100 different metro areas. This gives us house prices in dollars rather than an index, which is what the FHA FA is. So we can actually say $1 of cost as measured by RS means, implies how many dollars of price as implied by Zillow FHFA indices, and the RS means indices are about percentage changes rather than actual dollar for dollar comparisons, but we'll be doing both, and I'll walk you through all that as we go along. So first, just to give you a notion of what's going on, both with costs and with house prices, they're all going up faster than inflation. So now everything you see here is inflation adjusted. So there is both the artist means, there's the artist means cost index, that's sort of the royal blue series. We have the Consumer Price Index, which is its own measure of inflation, but a particular one, we have the construction sector gross output index, which you can think of as basically the price of a unit of output of the construction sector. So it's kind of a cost based sort of thing, the FHA index, which I already discussed about, and then a separate house price index, the Schiller home price index. And you can see all of these now have been deflated by the GDP deflator, which is the overall level in prices, price change for the entire economy. So that's pulling out average inflation. So all of these numbers are showing the level of each of these series relative to inflation. So these you can think of, are real prices, inflation adjusted prices, and you can see they've all gone up. And indeed, by the end of our sample 2024 you know the house prices, which are the you know the navy blue and the yellow series there, which are the highest ones, they're up somewhere around 150% total growth since 1950 that's, again, that's 150% relative to inflation. So it's just 1.5 times a house costs relative to everything else in the economy, one half times as much as it used to. Or actually, I should say two. Well, yeah, so 100% growth would be twice as much, two and a half times as much, pardon me, as it used to. So house

prices have definitely gone up relative to inflation. Costs have as well. You can see RS means costs have gone up roughly doubled. So it's more expensive to build a house than it used to be, but not as much as house prices have gone okay. So now let's start digging into the major question, which is, what is the actual connection between prices and costs? And what I'm showing you here are some summary statistics in a city level panel of both changes in building costs and changes in house prices. So the RS means is the building cost measure. FHFA is the house price measure. What I'm showing for each row, each row is a different time period, and you can see the number of cities we've gotten a metro level panel for each of those time periods. The averages, show the average growth rate, and these are compound average growth rates over the five year period. So for example, that first number in the second column 6.84 means for those 13 cities for which we have data, the RS means average building cost measure went up 6.84% per year over those five years. Now compare that to house price growth over the same five years in those same 13 cities, and you can see that went up on average 13% per year, so quite a bit faster. So there's a period where we saw faster housing growth than housing price growth, than housing cost growth, roughly twice as fast per year. In fact, the other columns show the standard deviations across metro areas in these growth rates. So this is a measure of how variable the average growth rate, which you see in columns two and four, how variable that is across cities. A larger standard deviation means more variance in those in growth rates across cities. Okay, so just some very quick things, which we'll come back to in different ways, you can see there's quite a bit of movement in both cost growth and price growth over time, over these five year periods, but there's more movement in the average growth rates in house prices. So you go from, you know, five year periods where you got over 10% growth per year to some five year one, five year period 2005 to 10, where there's actually negative average price growth, whereas cost growth has does move around from period to period, but less so at the bottom end, you're looking at about two and a quarter percent per year. At the top and six and three quarter percent per year, that same sort of prices are more volatile than cost pattern is true across cities within periods as well, and you can see that if you compare the two standard deviations. So it's always true in every period that the FHFA House Price Index growth rates are more variable across cities than are the RS means building cost indexes. So one takeaway is that just simply put, house prices move around a lot more than do building costs. Now, that alone might suggest that other things other than cost tend to move around prices, not that costs never move around prices, although, as you'll see in a second, that tends to be we're moving in that direction lately, but that there are other things besides just costs that move around prices as well, and that's summarized in this table here. So underlying this table is an exercise that Brian and I did where we asked, statistically, speaking, as you look across these metro areas for each of these five year periods, how much of the housing price growth you saw in those various metros? Could you explain by looking at the building cost growth in that same metro area? Okay, and that number has to be between zero and 100% by construction. 100% would be you can perfectly predict what house price changes were. Average house price changes were in that city by knowing what cost changes were, 0%

would mean. It's unpredictable based on cost and anywhere in between. And here's what you find. So for the very first period, where we've only got a small sample, house price growth, house building cost growth does explain about two thirds of house price growth, but that's a small sample. I wouldn't put too much stock in it. More meaningful are the comparison starting in the 1980 to 85 period, where we've got over 100 cities worth of data. And there you see in the first few periods this number, this fraction of house price growth explained by cost falls from that two thirds number quite a bit, anywhere between 11% in 1990 95 to about a third in the prior five years. Okay, so cost growth differences across cities do tell you something about house price growth across cities in those periods. Okay, something, but not most. And then after that, after 1995 that fraction falls basically to almost zero. So from this point forward, essentially, what these results are saying is that you really can't predict how much house prices changed in a city over a five year period, even if you knew exactly how much building costs changed by. That is to say other things that move around, house prices are so large relative to any effect of cost, that cost just isn't able to predict, ultimately, what happens to prices in that city. Okay, so this is a pattern, and you can see this has basically been true for for 30 years now, where this cost cost changes matter very little in terms of predicting price changes within cities. Just for fun, if you want to look at some of the where these divergences are coming from, what I'm showing here is for two periods, and I'll show you a few more in a second, the cities with the five, the five largest divergences between price growth and cost growth, and the five smaller, really, I should say five most negative. So the top five would be the cities where prices outpace cost growth the most for the period, and the bottom five in a panel would be the cities where prices fell behind cost growth the most. So. For example, in the 80 to 85 period, Boston saw the greatest divergence between prices and costs. And on average, that 7.7 means in a typical year. During that five year period, house prices in Boston went up 7.7% more than building costs did in Boston. Okay? So you can see 1980 that prices in excess of cost was heavily focused in the Northeast. On the other hand, prices lagging costs seem to occur mostly in the Midwest, in places like Detroit, Davenport, Waterloo and Peoria. 85 to 90, which is the right most set of columns, you can see price growth exceeded cost growth the most in Hawaii and California, and lagged cost growth the most in Texas and Oklahoma, probably due and acreage probably due to the decline in oil prices during the shock of 86 and afterwards. Here's a couple more, just for fun to look at. This is 2000 to 2005 and 2005 2010 periods. You can see California had a lot of excessive price growth over costs in the early 2000s Midwest declines relative to costs, although smaller than in other years, oh, five to 10, of course, this was the great financial crisis and the housing collapse. Only one Metro in the entire country that we have data for anyway saw price growth in excess of cost growth, and that was Odessa, Midland, Texas, and that was because of the fracking boom there. Every other metro saw prices increased less than costs, and some a lot less, as you can see there, California, now on the other side and Vegas, seeing price growth that lagged cost growth by some 1315, even 18% per year. So just incredible declines in prices there, even relative to cost. And then here are the same numbers. I'm not going to talk you through every observation, but if you're curious, you

can take a look while I'm talking here the same numbers for the 2015 to 20 and the most recent 20 to 24 period, when our data ends in 24 Okay, so those are so just some examples of the divergence between price and cost growth. If you can now take those five year periods and of course, add them up and say, Okay, well, here's what happened 80 to 85 what happened in Boston say 85 to 90 and just accumulate them over time. And if you do that for the 128 cities were able to follow since 1980 interestingly, a not insignificant fraction of them saw cumulative price growth that was actually less than cumulative. Sorry, cumulative, yeah, cumulative price growth that was less than cumulative. Cumulative cost growth. So 33 of the 128 cities over this 40, nearly 45 year period saw costs grow more than prices did, okay, but of course, the flip side is that, of that is most cities did see prices go up by more than costs. This ends up being driven not completely, but substantially, by some very right tail, highly skewed cities that just saw enormous price growth relative to costs. And there you're talking about the San Jose's, the Los Angeles is, you know, the the and the San Francisco's of the of the country, where price growth has just been consistent, almost consistently, with a few five year exceptions, higher than cost growth, and you accumulate that over time, and pretty soon you've got an enormous difference between prices and costs that have accumulated over the decades. One interesting thing that the RS means data lets us do is break out, building costs into two components that they label, materials and installation materials are as they sound. The actual costs of the materials that go into building installation are costs tied to the assembly of those materials. It's not quite exactly right, but it's not a terrible mnemonic to just think of materials as physical costs of physical inputs into houses installation as costs of the labor inputs into building houses. I think that's a it's a reasonable way to summarize what those two components are capturing. If you look at what's been good now this data is only available since the financial crisis, but here's what it shows. If you look at what's going on in terms of the components driving total cost growth, which you can see there was 2.35% per year, 2010 to 15, 2.81% 15 to 20 and faster after covid, so almost 6% per year in cost growth. If you break that out into the components. In the first five year period, installation costs grew about 50% more than materials cost did. That flipped in the latter half of the 20 teens, and then since covid, you can see most of the cost growth, and certainly the increase in cost growth since the 20 teens has come from acceleration in materials costs, and that's consonant with what we know about supply chain problems and other things that have affected the prices of building materials since that point, and You could see that reflected in these average cost component changes. One thing you can't see in the table, which is also true, though, is if you look at these components across cities, there's more variance, considerable more variance in installation cost growth than materials cost growth, which is probably reflecting the fact that you can move materials around as relative prices changes. If, if drywall ends up getting a really high premium in the northeast, you can put drywall in a truck and send it there in response to that price change. But labor costs, it's hardly it's harder for the market to respond to those people aren't as mobile as goods are, and you can sustain bigger variances and installation costs as a result. Now that amount of that variance difference has come down since Kovacs because of the the building

costs, effects, or the materials costs I was effects I was talking about, but nevertheless, you do see that pattern. Okay, so that's what's everything I've showed you up to this point is basically been comparing RS means indices that is growth of prices, either within cities or for the entire US, to the set to an index for housing prices. Now let's do some dollar to dollar comparisons. Okay, we can do that one because RS means, besides having an index also does give us $1 figure. So you put in a set of attributes, there's going to be a 2500 square foot house of median level, trim and so on and so forth, components, and it'll tell you, Okay, building costs on that is going to be in $204.50 per square foot or whatever. So it gives you $1 figure. That's nice. Zillow gives us actual dollars in terms of house prices. Now we can only do that for contemporaneous data. So everything I'm going to show you now is is for 2024, but this lets us do dollar to dollar comparisons. Okay, so what you should think of is everything I've shown you up to this point has been mostly a comparison of growth rate on growth rate. So change in house prices on changing costs. Now we're looking at levels to levels. So level of house prices to level of cost. That's the dollar to dollar comparison. All right, all that intro, here's what you find. So this shows for 100 metro areas where we've got Zillow price data shows the median price in a metro area versus the RS means cost for building a house of a particular specification that we describe in the in the in the paper, in detail, this shows the correlation between those and here you can see there is a clear correlation. You know, houses or cities where it's more expensive to build a house of this given type do indeed have higher house prices. There's a fair amount of variation in building costs. So this particular type of house in one metro area can cost upwards of $350,000 of building costs to construct in another metro area, the same house would cost only about $225,000 to construct. So there is variation in building costs across metros, and those are, again, at least partially reflected in housing price differences. That said, there's a lot more variance in dollars and percentage terms in prices than there are in costs and in total, the correlation between costs and prices is about point five, which means, in its statistical sense, 25% of the variation in house price levels. Now we're talking levels, not changes. Remember, 25% of the differences in house price levels across cities is explainable by cost levels across cities. Okay, so we're back to some explanatory power, but again, limited explanatory power in terms of price levels. Now, what this comparison doesn't control for is the mix of houses that might exist across cities, if some cities just have nicer, larger, in particular larger houses being sold, that's going to drive up the Zillow median price might not be reflected as much in housing costs because we're using a standardized house. So what we're going to do next is we're going to try to focus on cost per square foot and price per square foot. So we're going to control one for the size of houses that are sold across metro areas. And the other thing we're going to do is just look at the prices of newly built houses. The Zillow medium price index for this figure I'm showing you now is all listed houses. So you've got stuff that's constructed long ago. The price, you know, prices can diverge from building costs for a bunch of reasons, for a house that's been around for a while. So let's focus on newly built houses, the prices that are being asked for those and the construction costs of, by definition, newly built houses. And look everything, at everything on a square foot level, and here's what

you find. Okay, now there's still a positive correlation. There's still a fair amount of variance in building costs and house prices across metro areas. The correlation is now about point seven five, which means roughly half of the variation now in house prices per square foot for new houses is explained by building cost per square foot for new houses. So it's a little more apples than apples than the first comparison. And you do see that explanatory power go up a fair amount. But even there, with something close to apples to apples, the flip side of that figure is that half of price variation is not explained by cost variation. Something else is going on besides the building costs themselves actually explaining house prices. Okay, now a little more, just for fun, data. If you take our Zillow and our dollar for dollar data, which I just showed you, and ask, okay, what cities have really high prices relative to their costs? Or the flip side, what cities have really low prices relative to building costs? Here are the top five and the bottom five. Okay, so you can see that the city with the highest house prices in 2024 relative to their building costs, is my end after that, you've got the three metros in California, which I already mentioned, by the way, Miami, basically average house price in Miami is twice what you would expect from its costs given the overall relationship across cities between costs and prices. That's the way to interpret that figure. 98% higher than you would predict based on costs. Seattle comes in at fifth place. Interestingly, if you look at the total rank of prices across these to the 74 metros, we've got data for as well as their costs. Miami's got it's really over price. It does have a pretty high price. It's the seven most high house price city in our data. But partially this gap comes from the fact it's not a very high cost city to build it. It's number 46 out of 74 in terms of cost. So the big excess of price over cost is coming mostly from the fact as high prices and kind of just medium costs. On the other hand, look at San Jose. It's the most expensive city, but it's also the third most highest cost city. So even as expensive as it is to build in San Jose, and as it turns out, you can see Los Angeles and San Francisco, the house prices are all the higher still. So not only is it expensive to build in those places, the prices that the houses sell for are even higher still, and so much higher that indeed, they exceed what you would predict based on those even high costs by some two thirds to even even more. Now the other side of the spectrum, you've got many metros that have prices that are below what you would expect based on their building costs. Baton Rouge, Greenville, Philadelphia, Minneapolis and my hometown, Chicago, at the bottom. Now Baton Rouge and Greenville have low prices relative to their expected costs, mostly because they are really low prices. They're at the bottom end of the price distribution across cities, and they kind of have middling costs. Both Minneapolis and especially Chicago, however, have low prices relative to cost, not because they're such low price cities so much they're kind of in the middle of the distribution, but instead, because they have such high costs relative to their prices. So Chicago is the, actually the fourth most expensive metro area to build in. Yet we only have prices in the roughly in the median of the distribution. So we've got house prices that are much less than you might predict based on our cost. That's the takeaway there. All right, so let me wrap up and get us to our panel discussion. Housing price growth has largely over the past 30 ish years, decoupled from construction cost growth, both in the aggregate, if you looked at the I forgot to point this

out when you look at the inflation adjusted series, but I did mention in the overall numbers, housing prices move around a lot over time, as opposed to construction costs, which grow rather smoothly. So both over time and certainly across cities, we spent a lot of time on that, there's just a decoupling of house price growth from housing cost growth. There's more connection in the levels, that's the dollar for dollar comparison. Though, as I said, even in the closest thing we could do to apples to apples, you still see at least half of price variation being caused by things not tied to building costs. A lot of this decoupling is being driven by some very high priced metros the California cities I mentioned. But there are, there are others. It's So this raises the obvious question, okay, if costs don't, if building costs don't explain prices, what does you know? My hypothesis, I think Brian's largely in tune with me on this, but he can, he can chime in, if he likes, during the panel or otherwise, is that, you know, there's a lot of regulatory components of building, houses, housing that don't go into the building cost index. Maybe I should. So the RS means number. Basically, you can think of Rs means is, you've got the land, you've got the blueprints, and you've got permission. Now, what is it going to cost you to actually put the physical house together? That's what the RS means. Building cost number is capturing so all that other stuff, land, permission, blueprints, those are things that aren't in the building cost index. So if we think about what sort of things in those categories might be explaining a lot of the price growth. I think a fair amount of it is just how difficult or easy, and there's big variance in this across metros in the US it is to build housing and from a permitting and a political economy perspective. So what is it going to cost you to be able to actually get the right to construct a house on a particular plot of land? That difficulty? Basically, it gets capitalized into land prices, and so it shows up as the cost of land, which, again, does not go into the RS means index that, of course, will show up in the house prices. You know, the house sits on a piece of land. You're buying the land along with the house, so it gets capitalized in the house prices, but it doesn't go into building costs. And I think there's a, you know, we don't work on it so much in this particular paper, but there's an entire research literature out there showing that this sort of political economy, permitting a bunch of stuff tied together, has been increasingly capitalized into land prices get shows up as higher home prices. And those things are moving around in a way that's completely decoupled from the actual cost, again, of assembling the physical components of the house. And I think that's probably a big thing that's driving this decoupling, at least in growth rates. Now there's still some leftover cross sectional levels variation from other stuff going on between costs and prices, but I think, again, I think that's a reason why we've seen changes in cost, basically not affecting changes in prices anymore. Okay, so I said enough for now. Happy to revisit any of these in the results in the panel and Q and A section, but I'll turn it back over to Keith now. Thank you.

Keith Porter 00:43:46
Thank you so much. That was great presentation. Panelist, let's talk about three things. I'll list them first, then I'll start posing questions. Number one, the tension between resilience and

purchase price. Chad and Brian are talking about cost versus purchase price, but I want to broaden our discussion to resilience versus purchase price. Second, market level effects versus effects on individual builders and third, other issues that matter here that Chad didn't talk about so on that. Let's go to the first question, and I'm going to kick this to first Kevin and then to Brian. So first, my first question is tension between resilience and purchase price. ICLR and others like us strive to improve resilience in new buildings. A lot of people believe that code changes to increase Disaster Resilience necessarily increase purchase price, and that more resilience therefore means higher price and fewer people able to buy today's presentation somewhat weakens that case, or at least it seems to Kevin tell us about consensus among economists. Does today's talk align with your research and those of others have economists reach some sort of consensus around the power of cost to predict price?

Kevin Simmons 00:45:15
Well, I don't know if I would ever say economists ever reached a consensus about anything, but theoretically, price is a function of of a dance between demand and supply. Costs are going to reflect on the supply side. And as you know, you've seen with what you know, Chad presented there, can be not always, but there can be a wide divergence between costs and prices. Some things, you know, I was thinking about this we were when I was driving up to campus, some things will have a pretty direct connection. I was thinking particularly about price of gasoline. You know, you can see the price of gasoline go up as you watch the price of oil go up. And so that that's a pretty strong connection. But other things you know, not so much. Now you hinted at the resilience. And I think, I think, Keith, what you were guiding me toward was to think about what we found in Moore, Oklahoma. And in Moore, we had a very unusual situation where an city on its own stiffened their building codes, and it was in response to a horrible thing that happened. Tornado came through. It hit an elementary school. Seven kids were killed in the elementary school. So it became a very emotional issue that surrounded the folks in Central Oklahoma. So more did something that no other city has done, and that was to enhance their building codes based on wind engineering. Thought the concern that was being brought out was that, well, they've just made the cost of buying a house and more more expensive relative to other cities. And so what what we did, we looked at the difference in the market and more compared to Norman, which is right next door. And what we found, as you know, was that there really wasn't much change in the price of homes more compared to Norman after implementation of this new building code compared to before. Further, we looked at sales, we looked at permitting action. If builders were avoiding more the you'd see a change in the permitting going on, and we found no change in permits and more compared to Norman. So that certainly suggests as Chad's as Chad's paid, Chad and Brian's paper is saying that at least in Oklahoma, there wasn't much of an impact of that enhanced cost on the price of homes, therefore on the sales of homes. So again, I don't know if this is a consensus, because there's one city that's done this, and so, you know, you'd have to replicate this in other areas. Be great to replicate it like, you know, Chad and Bryant's paper was talking about these

high cost areas, it'd be great to be able to replicate this somewhere there, but, but this is what we have, and that's what the evidence has has shown us on that, on that piece.

Keith Porter 00:48:53
Well, thanks, Brian, you and I are structural engineers. How are engineers going to what are engineers going to make of this research? Are they going to believe the case against strongly correlated resilience and purchase price?

Brian Potter 00:49:10
Yeah. I mean, I think the the sort of way that it's expressed in the paper and in this research where it's just, you know, an increase in construction cost doesn't do an amazing job of predicting an increase in house prices, because there's so many other factors, like, as Chad talked about, the cost of land across the permit and the cost of like, getting the ability to build on it is such an overwhelming factor. I do not think that that would come as a surprise to most people working in the in the building industry. You know, I spent, like you said, I spent 15 years working as a structural engineer, and I kind of agree with Kevin, is that the relationship between these sort of code provisions that on their surface might add cost, and the actual cost of construction, of putting up a building can be quite complex, because, you know the building, the building code doesn't tell you exactly the size and shape, and you know layout of the building you have to build. A builder has a lot of like degrees of freedom and like the size, you know, of how they decide to put their buildings together. That's going to be sort of a function of these code requirements. And if code requirements get more strict, the builder has a way to sort of, you know, meet those requirements, but change the way that they, you know, put their building together in a way that maybe won't increase house prices all that much. You know, a sort of example of this is people, you know, the one aspect of codes that have continually gotten more strict is, like, energy codes and requirements for air sealing and stuff like that. But there's ways to, like, sort of meet these requirements more easily. You like, don't have, you know, you have less large windows, or you change the way that they're arranged, stuff like that, and they can make it meet these more strict energy requirements in a way that doesn't necessarily add cost. So, yeah, I kind of, you know it. I think it will not be sort of a surprise to the sort of people working in the industry, you know, sort of these results, because there are so many sort of degrees of freedom that said, I think ultimately builders are also do believe that, you know, if you make a code much, much stricter, that is going to, that is going to, sort of, you know, put a floor on how, on, sort of the level of price that you can charge for something, and it's ultimately going to drive up their their cost of building. Builders are builders are very concerned with it without their cost of building. We have a lot of organizations in the US that work hard to sort of try to prevent that as much as possible. So I think they would not be sort of, they would not be convinced that it doesn't matter, to maybe put it that way,

Keith Porter 00:51:50
yeah, let me stick my order in here. I think maybe this story is an exception rather than the rule, or maybe it is the rule, but in a conversation in California about 10 years ago about upping the building code for seismic requirements, we were thinking about increasing strength and stiffness above the code by 50% and there Were structural engineers who said that that would increase construction cost for buildings. There was at least one who said that's going to double or triple the construction cost of a building. Doesn't make any sense, but that that was that seemed intuitive to at least one prominent structural engineer. So I think that there's some of us out there who will be maybe a little bit more surprised, more resistant to this, this idea. Let's move on to the second question. And Brian, you sort of alluded to it, trends at the sort of the macro market level versus effects on individual builders. We've We've spoken mostly about market level effects. What do we know about how costs affect individual builders Now, Dan, you work with individual builders and with big Canadian building lobby, the Canadian Home Builders Association. What makes the difference in your experience? What makes the difference between between builders who struggle with code changes, and those who don't,

Dan Sandink 00:53:25
yeah, so I was thinking about this question, and I think I would differentiate three types of changes, at least with respect to the work we're doing on resilience. So there's code changes, so that's actual changes to the code that become regulation that are then required for all builders. That's different than, I think, what we often deal with, which is proposed code changes and voluntary actions that exceed code requirements, which is most of the resilience work, the status most of the resilience requirements or recommendations in Canada. So with respect to proposed code changes, I would say the push back cost is one factor, and it's often leaned on as as an important factor to push back against change. But there's additional factors that we hear about more often from builders, and that's usually related to sort of practicality and technical readiness of builders to adopt changes, and they and this, the pushback tends to come for changes that haven't really been tested in the marketplace by builders and are perceived to really increase complexity and cost, whether or not there's an actual relationship between home price and construction costs, there is a perception that will reduce their competitive advantage if we're introducing significant additional cost, and it's really related to their perception about practicality. And that really comes down to, can we actually achieve this objective? Do we have to hire more trades? Do we have to train trades or to track down additional supply chain and so on? And we're seeing this in in like BC, with heat health requirements currently, once changes are accepted into code, and so our official code changes, the pushback really is not so much an issue, because everybody there's no market disadvantage for that perceived incremental cost. Everybody has to raise their prices. Everybody has to apply that, that market, that measure. And so we don't necessarily see pushback when it gets to that stage. And in some cases, we even see builders competing with resale homes using better code provisions as a marketing advantage. And a specific example is

Collingwood, Ontario, where the local code official required backwater valves in all new construction, and new home builders were using that to compete against resale homes. So I would differentiate those two things, and then one last point about voluntary options and who like does well with progressive building practices versus those who don't really get engaged. I would say the progressive builders seem to be more willing to think creatively about marketing resilience measures and the potential increment in cost can it can be sort of offset by their ability to market that feature and address the cost in that way. And there's also a builder, sort of being concerned with getting ahead of potential code changes. And so they're driven to understand what the potential code changes could be in the future. That's why a lot of the builders, and I would say CHBA, became interested in working with us, because there's a prospect of code changes nationally in 2030 related to resilience. And so they want to understand what those are. And so some progressive builders are willing to try those out, see what the actual cost differences are, and so on. And other builders are not interested. They don't understand it. If it's not in code. They don't see the value in in pursuing those practices. There's multiple factors there, but generally there's, I would say, once our recommendations are accepted in code, the resistance does seem to decline. Interesting.

Keith Porter 00:57:29
Thanks, Chad, you studied differences in cost efficiency and productivity across companies operating within narrow markets. Can you help us understand where these differences come from, from, from your observations?

Chad Syverson 00:57:44
Oh, sure, yeah. So one point is those differences are, are ubiquitous in any industry you look at. I've done a lot of work in manufacturing, but also hospitals, business services, and then I've got hundreds of colleagues have done similar exercises in other places, there's just enormous variation in productivity and costs, even for again, companies working in one of these same narrowly defined markets, just to give you a sense, folks, a sense of the magnitudes here, for a typical manufacturer in the US manufacturing industry narrowly defined, there's going to be one producer who will get twice as much output from the same number of workers and total capital stock. That's machinery, buildings all the twice as much as another and operating in that same industry, same year. That is the typical difference within a manufacturing industry and I construction is as large, if not not bigger. So if you got easily, a two fold, maybe a three fold, difference in productivity across individual firms. Where do those differences come from? A lot of it is tied to management, which is a bit of a nebulous concept, but the research, research kind of narrowed down particular things. It's one is how you manage your people? Do you reward high performers? Do you try to correct low performers? How do you seek out high performers to hire in the first place? That sort of thing. The other is process. What are the sort of things you do with your sort of throughput, whether it's physical or conceptual, if you're a business service, how do you manage those things? How tight are the feedback loops between

your performance and what you're doing about changes in performance, how you handle Suppliers and distributors? Just a number of things that we know are correlated and probably causally related to productivity levels, and those differences exist again, everywhere in construction, I guarantee is no exception.

Keith Porter 00:59:50
Wonderful. My last question other issues of resilience and purchase price. What do you gentlemen think of the most important issues that we haven't addressed today. Name one, each of you at Ask east to name one important issue and name one where we have consensus around the facts, not the not issues where, well, we need more research or something of the boundaries of our knowledge. And I'll ask Chad this question first.

Chad Syverson 01:00:25
Oh, man, I was hoping he'd go to other I always want to say, we need more research. Maybe that's but no, I, I look one thing. I, I don't think once it's laid out, there's a lot of disagreement, although there, I think people might have a bit of a knee jerk reaction, which is, when I think of affordability. I, I'm I don't think it's about the price of something, per se. It's about the price of it relative to its value. And so if something is added, if some feature is added to a product that raises its price, but the value of that object goes up by as much or more than the price goes up, that's okay. And to me, it's still affordable. And indeed, if, if the value goes up considerably in excess of the price, it's even more affordable, even though its price went up. And conversely, if something you know, you cut something out and its value goes down by more than the price does, you haven't made it more affordable. You probably made it less affordable. That's kind of the Economist. My view is of affordability as an economist, don't price per se isn't the issue. It's price relative to the value. We don't want things that increase price when no valuation is associated with it. So if the government passes a law that from here forward, no one else is allowed to build a house in the city, no matter how many people want to live in the city, or the prices of all the houses will go up, but how much the people already live in those houses aren't enjoyed. That doesn't change at all. The house is still exactly the same house it was before the law. That's not, that's not a good thing. So it's really, again, it's not about price per se. It's price relative to values, how I like to think about it.

Keith Porter 01:02:24
Awesome. Thanks. Dan, same question to you, what? What's an issue? What do you think is the number one issue around with that we have consensus around that we haven't, that we haven't talked about today, ret, resilience and price,

Dan Sandink 01:02:38
great, great. And I actually picking up on the point that Chad just made. And I think we have some consensus around this point, maybe not from the economics field, but from our work in

Canada and and the experience of home home builders. And that's it seems to be with respect to resilience, that public demand, or home buyer demand for resilience features seems to be low, and that seems to be the biggest sort of determining factor for home builders. When we propose resilience features that, do, you know, increase the construction price of homes, their concern is that they don't see demand for those features. And so, you know, I guess, sort of related to Chad point, the value doesn't increase despite the increase, the increase in cost of construction, and we've we've seen this specifically so Calgary, we spent a lot of time talking with built home builders and Calgary track builders, small builders, medium sized builders. Calgary has been hit repeatedly by major damaging hail events. We know we can reduce loss or impacts with impact resistant, roof cover, better siding, etc. And we talk with builders frequently, including marketing staff and sustainability staff, about whether or not they're getting questions from buyers about resilience, how to reduce impacts. And the feedback we get is that they're not asking for these measures if it's not required by code, and buyers are not asking. They don't really have an incentive to offer these features. So, I mean, an ongoing question we have in the task force, and something we want to explore is like, how to learning how to market these features more effectively. So I think that we, I mean, we do have consensus, I think, from many years of hazards perception research, that it's difficult to engage the public in these topics, in finding some ways from the business field, I think to address these concerns would be valuable. Awesome.

Keith Porter 01:04:36
Brian, what do you thought?

Brian Potter 01:04:39
Yeah, I don't know if there's the most, literally, the most important thing I'm going to I'm going to satisfice and not optimize here. But one I think important distinction that we touch on a little bit in the paper, but I think has been pretty easy to gloss over, and is important in these sorts of discussions, is sort of the difference between existing construction and new build construction like, what, when? So in this pay in the paper, largely were these price divergences that we're talking about is the divergence in which is a price that includes all existing buildings and construction cost. Obviously only applies to new construction, and you compare, as we saw, on like the Zillow data for just looking at new builds, that correlation is a lot tighter between, like, the cost of construction versus the cost the price that it sold at builders actually try pretty hard to do to sort of avoid some of these problems that you see in in sort of housing more generally, which is you have these, like, really expensive land prices that drive up the cost of the building overall. Builders try pretty hard to keep their their land prices down. And see, that's one of the reasons that you'll see that that tighter correlation, but also just going more to your sort of discussions of resilience. You know, the housing stock turns over, and building stock turns over, like, quite slowly, like, in the US, I think we're something that, like, you know, less than 1% a year, you know, new new built, new houses are, are getting built, and houses are

getting sort of removed from the house in stock. So it's really kind of, you know, you're talking about these changes. They're going to take a very, very long time to, like, have, like, Major, substantial effects. And so it's also, I think, you know, when you're talking about resilience and stuff like that, and how you can sort of improve loss and stuff like that, you really want to sort of be also thinking about, like, existing construction, and what options do you have for buildings that are already in place? I think just, you know, keeping that distinction, and this is something I see this sort of housing research frequently just keeping the distinction between new construction and new houses versus sort of the existing housing stock in mind when you're sort of talking about these things.

Keith Porter 01:06:50
Absolutely. Thanks, Kevin.

Kevin Simmons 01:06:53
Well, I'm going to return to what Dan and Chad have been talking about. And this is certainly not a new topic. I mean, we've been talking about the disconnect between perceived and actual risk with low probability, high consequence events since Howard Kenner brought that up in the 70s. So it's not a new one, but it is one that has the potential to turn around. And I want to, I want to turn your attention to some work that was done by some folks at Florida State after Hurricane Andrew, before the state of Florida put into place the statewide building code. That was a response to Andrew. Three counties of South Florida had the South Florida building code, and they put in what ultimately became the statewide code in place for the Miami area. And the folks at Florida State did a study to try to quantify what Chad is referring to as value, what Dan is talking about. And they found that in the immediate aftermath of Hurricane Andrew, there was a premium that was placed on homes that were purchased built after the implementation of South Florida Building Code compared to those that were built prior. However, as time goes on, that premium dissipates, in other words, as the memory of the event fades away, the ability to get consumers to place that value that Chad was talking about on the home dissipates. So I think the challenge is, and this is probably a public policy question as much as anything else, what can we do to continue to remind people who live in vulnerable areas that the risk of this happening to you is not zero. There is a positive risk, and we need to make sure that you have some appreciation of the fact that you live in a place like this and and in just come up with something that we can do to keep that active in people's minds. I don't, man, you've got me there. What's the answer? I don't have an answer. I just know that people do respond to that risk when it is something that they are made aware of, either personally or whatever. So I think, I think I would put that there.

Chad Syverson 01:09:37
Good, thanks. That's really good. Very quickly, square the circle and all this value is like social value. A considerable component of social value is the private buyer's valuation of the thing

they're buying. But you're going to have social value that's different from the buyer's own value too. So that's really what's price relative to social value, and all these sort of things can factor into that as well.

Keith Porter 01:10:05
Yeah, I want to amplify on Kevin's point there. Kevin didn't mention that he did similar studies of the the added price, the added value that, the added price that people are willing to pay for resilience, particularly shortly after natural disasters. You studied the value of tornado shelters in Oklahoma and storm shutters along the Gulf Coast in Galveston, or something like that. There was a University of Alabama study that came out few years ago, showing the value that people pay a big premium for, for fortified home hurricane rating. And I've done some similar work in California and in Canada, and Dan has done some similar work there. So the this business of people placing assigning value to resilience, at least when they're thinking about natural disasters that's well supported. Okay, gentlemen, thank you so much for that discussion. I think we could go on and on, but I want to turn it over. Take some Q and A from the from our attendees. Let's see. I'm going to go to the first question by Kane, sorry, the font here is really small. Leighton, who asks, are development charges, land transfer taxes, rezoning applications, etc, considered as part of the materials or labor,

Brian Potter 01:11:48
I can speak to that that's not included in in these Rs means costs. The RS means costs is basically what is considered the hard costs of construction, which is putting up the physical structure, the materials you need for that, the labor you need to add any equipment you need for that, as well everything else that's like, you know, permitting, or the marketing costs or sales, or anything, you know, overheads of the general contractor or whatever, that's all in a different bucket, which is called soft costs, so that none of that would be in these sort of this, these Rs means costs as a general rule of thumb in the US, at least for a new single family home, the cost to put it up are roughly 60% the hard costs of construction, so the physical structure, 20% soft costs. So like development costs, marketing profit margin all that other stuff, and then 20% is the cost of land that's for a typical new build single family home. And like a you know, housing development in the US is a very rough guide. Thanks. Next question,

Keith Porter 01:13:02
um, from I hope I'm going to get this right. Chad dash cafaly, who asks, during the presentation, we've mentioned that building cost was around 67 Well, this is sort of getting at Brian's point. Just now, building costs is around 60 to 70% of the total cost to bring a new house to the market. And if I understand, sorry, I'm having trouble seeing the whole question. Give me a second to maximize here. Oh, I am not, for some reason I'm not able to see the whole question. Anybody else able to see Chad as question under the See More? You able to expand the See More, it's the next to the last question in the Q and A do. I maybe. Alexa, can

you see and read the full question there? Can't see it either. It's not a button. It's just like text. Okay, sorry Chad ash, if you wouldn't mind trying that one again. We'll come back to you. Leighton and Keith in asks With scatter plot of cost to price, demonstrating a reasonably clear line of best fit. Why is calculating the slope not valuable? Why can't you just state that $1 of added construction costs equates to $1.50 of added home prices based on the graph?

Chad Syverson 01:14:54
You could I doubt it's causal. I mean, there's a lot of other stuff going on there. We were mostly interested in how much it explains it. But if you want to interpret as a marginal relationship, you could actually don't have the figures in front of me, I could, I could send that to you if you want to forward that along to the question asker, thanks.

Keith Porter 01:15:21
Here's another from

Chad Syverson 01:15:23
I should say those were log, log, lots. So the answer is not going to be dollars of prices explained by it's going to be percentage change in cost, percentage change in price, because we plotted them in log, logs, we those scales were log and the regression was log two,

Keith Porter 01:15:42
yeah, one was log linear, though you had cost linear only

Chad Syverson 01:15:47
correct, yeah, so it's semi elasticity, sorry, so $1 of cost is a percentage change in price. Yeah, thank you, and it

Keith Porter 01:15:54
looks like about double. Looked like a slope of about two to one. That was just my sort of eyeball on it. Another one from Chad ash about the paper in your research analysis, have you observed any signals between building costs and catastrophic event occurrences, such as the impacts of hurricanes or the 2021 Texas freeze event or major wildfires,

Chad Syverson 01:16:26
we didn't look at that. We didn't try to isolate metros where we know there were effects at a particular time. Be interesting in the early years, we really only have five year changes, so some of that might be hidden anyways, in where we might see blips in annual data in response to particular events, but we didn't look at it. So I don't have an answer, I'm afraid, an

Keith Porter 01:16:51
interesting question, though,

Brian Potter 01:16:53
yeah, I haven't, yeah, to add to that, we haven't seen any of that in this work. From my, you know, experience working in the industry, my sense is that big, major disasters usually cash out to codes. Often will cash out to sort of increase in code stringency that may have fairly broad effects. So, you know, Hurricane Andrew resulted in more stringent wind code that, then, you know, were applied more generally. And earthquakes is the sort of classic example of this, because our understanding of earthquakes is so poor. So every time there's an earth a major earthquake, somewhere, the engineers go and study how the various buildings failed, and then that gets, you know, they go back and make updated code changes to, you know, these sort of components have to be designed this way and stuff, and so that you have a ratchet effect of the requirements getting more stringent over time, but that, you know, again, that'll be everywhere. So a really bad earthquake in California will make the design in South Carolina, which has, you know, actually surprisingly high seismic requirements, go up as well, absolutely.

Keith Porter 01:17:58
And we're always closing the barn door, even when we knew that before the earthquake, that the door was open. And interestingly, sometimes our design forces and design requirements will drop down again, as research says, Oh, this building material is actually better than we thought it was. So it was a period in time when we thought reinforced concrete could tolerate, maybe a steel reinforced concrete, we thought briefly that it could tolerate 12 times as much deformation as what caused it to yield. And then maybe, with hard experience, we learned that that wasn't so so and made code stricter. Again, I see a hand up from Charles. Charles, we're doing written Q and A so if you wouldn't mind typing your question into the the Q amp a box, I'd be very grateful. We kind of come to the end of our our attendees questions here. So you know, let's turn back to while we're waiting for Charles to type his his question into the into the Q, amp, a, and gentlemen, do you have questions for each other, something that we should something else that we should be talking about? I mean, I actually, I have one so the not everybody understands difference between you know, correlation. If there can be, there can be a it could be that $1 of construction costs generally does add $1 to price, but there's all these other things that might add another couple of dollars, or might subtract $1 that, you know, it could be that it's simply other noise that is drowning out the signal of cost. Chad is my take on that correct

Chad Syverson 01:20:18
sure and in, you know, one way, one way to look at my job as a economics reacher researcher is try to separate correlation from causation in a lot of settings. Here that was, we're more about explanatory power in this paper, but it is a good point. You You don't want to come

away from others no correlation, so that is no possible causation, like you said, there can be other things that move around, when costs move around that end up. One would be the nature of competition in the market is such that for small cost changes, the sellers eat it, and they don't pass along in terms of prices, that'll create a zero correlation between cost changes and price changes. But that, well, I don't mean know whether that's good or bad, but that's that creates a zero. But doesn't mean that costs aren't moving around or costs are meaningless in the market. It's just something is disconnecting it from price, or it just there are other things that affect price, and those things are just enormous compared to the changes in costs that we see. I think part of it is that, I think especially if you compare, you know that early period where, why do we go from some explanatory power in changes on changes to basically zero? I think it's because other things that change price have become so variable relative to cost changes that it just swamps any any cost effects. I think you know to be silly, but to make a point, if a law were passed that said a builder had to burn a pile of cash of an amount equal to the cost of building a house, effectively doubling, I bet that'll show up in prices. A change that big is going to show up. So I wouldn't take away that doesn't matter what you do to cost will never change prices. I think the bigger conclusion here is whatever does move around costs in the data, or has moved around cost in the data has been small relative to other things that move around prices, and it just ends up not mattering that much in the big picture of things, because the other stuff that affects prices turns out to be so variable and have such a big effect. So yeah, that's always something you have to struggle with. Is how you interpret the correlations you see, no, you know, a regression will only ever tell you a correlation. If you want to interpret causally, you need to do a lot of thinking

Keith Porter 01:22:49
too, and talking to the people who are actually building this stuff. That's true too.

Chad Syverson 01:22:53
Yes, it's understanding causal mechanisms.

Keith Porter 01:22:59
Andre Mendez, or Andres Mendez asks, I'm trying to better understand the implications for insurance. Person is charged a premium that's the the semi annual, or the annual or the monthly amount of money they have to pay for the insurance based on the reconstruction costs, so the limits of liability, you know, the amount on the on the policy is based on what it would cost to replace the building, new the replacement cost, not on the market value, what you buy and sell the house. For any thoughts in that regard about the distinction between replacement cost, new and market value?

Brian Potter 01:23:37
Yeah, I think there's some kind of interesting implications there. Because, if you're, you know, if

your house is damaged or whatever, and you're like, rebuilding it in the same location that what matters is, like, cost to build, right? Because all the a lot of these other factors are going to be sort of screened off if the cost of, you know, if the price of a new house is being driven up by, like, really high land costs or whatever. Then, you know, the cost to replace part of it or do some repair work is not, you know, that is not impinged by, like, these rising land costs or whatever. They have to, like, you know, if there's a disaster and you have to, like, rebuy a new house somewhere else, then that's a, you know, then all of a sudden, these costs of all these other factors, the price of, you know, the sort of market value, becomes much less, much more important. Yeah, I don't have any amazingly deep thoughts on that, but it seems, you know, the sort of mechanisms of of compensation and sort of what you're actually providing for these, these people that are being covered. Seems important there?

Keith Porter 01:24:47
Well, I have no additional questions for you. Do you have any questions for each other? Look, actually, why don't we do this? Why don't we? Oh, there's one more question, and then I'm going to have you give like a, you know, like a 62nd takeaway each. But the last question by Robert Caron is, was there any consideration given to the diversity of homes in a given Metro? How was Rs means used to model these variations?

Chad Syverson 01:25:22
Yeah, so I can speak to that the IRS means index is, in principle, holding the thing that's being built constant, so it shouldn't be affected by compositional changes. It's a notional house with a certain set of characteristics as built in this city given the prices and materials prices, labor, etc, etc. And then, as I mentioned, the FHA FHFA index, because it uses repeat sales or refinancings of the same house, should be doing a pretty good job changing or controlling for compositional changes in what's sold. Now, if every house that gets sold gets upgraded right before it's sold. That's going to be a problem, and sometimes that happens. So it's not a perfect solution for compositional changes, but it's sort of best practice, at least given what what we can do. Awesome.

Keith Porter 01:26:15
Now I'm going to give each 60 seconds. What is your big takeaway from our conversation today, Kevin, do you want to lead us off? We you want to leave us with one big thought, what is it? I was really

Kevin Simmons 01:26:31
encouraged when I read Chad's paper, Chad and Brian's paper, because, you know, as you know, Keith, we've been fighting this battle of trying to incorporate, you know, resilience into either some type of voluntary mitigation strategy or codes, and the pushback has been strong, to say the least. And so, you know, just just having a better understanding, like I do after, after

having read the paper and listening to Chad and Brian today, that I think we would have had some arrows in our quiver 10 years ago that we didn't, that we didn't have. And so I am encouraged by what they've they've put together, because it, it certainly helps me approach this better from a policy format.

Keith Porter 01:27:31
Thanks, Dan, what's your big takeaway? What should we all walk away from with? Walk away with from this talk?

Dan Sandink 01:27:39
Yeah, no. The the Chad and Brian's presentation is really interesting, and definitely, as Kevin mentioned, it's, it's an arrow in the quiver. I still think there's a challenge convincing building company owners of these arguments. They they are. There is a perception that increased cost will reduce demand for their product, and that is real fear that prevents many builders for becoming engaged in these topics. And even if, you know, even if home buyer affordability isn't really their main motivation, if we're increasing construction price, somebody's got to eat that cost. And if it's not the buyer, if a builder can't market their home for a higher cost, because there's resilience features the builder has to eat that cost, and a lot of builders are not willing to do that. So lots to think about, but I think we still have a challenge convincing builders of some of these arguments.

Keith Porter 01:28:36
Awesome. Brian, last thoughts, yeah.

Brian Potter 01:28:41
I mean, my takeaway is kind of echoes, kind of what Chad said at the end that this really points to, I think that we've just been very we've gotten worse and worse at basically building enough homes where people want to live, and thus we're seeing this huge divergence in cost versus versus price. And, you know, costs rising so much higher. Prices rising, excuse me, prices rising so much higher than costs were. And, yeah, I guess it's, it seems like one of the biggest problems that we need to deal with, at least in the US, which is, you know, what this research is, is for, is making it possible to sort of build the homes where people want to live, and costs are, you know, sort of a, you know, that's seems less urgent, less acute to me, than being able to, sort of, again, going back to the questions of supply and demand, being able to sort of increase the supply, rather than, that's the sort of main impinging factor, rather than, sort of how the sort of, you know, comparatively more minor effects of driving up, driving up the cost of building and how that's going to, you know, affect demand for the product.

Keith Porter 01:29:58
Thanks, Chad. Last thoughts,

Chad Syverson 01:30:01
well, I first want to say how much I've enjoyed working with Brian on this, and I don't want to embarrass him too much, but he's got a fantastic blog, construction physics, and he just wrote a book The origins of efficiency, which is great. So check that out. But to the substance in also picking up on what he said, I think supply is the big deal, and all the things you're talking about in vis a vis the battles you're having to fight about costs and potential affordability, if we can get supply shifted out for reasons that he's talking about, these limits on building, which I think largely are artificial, that is going To reduce prices, and it's going to make your case that you would like to make easier to make, even so if, if that no one believes our evidence at all, you can if house prices go down, people are going to be less worried about any potential, plausible cost increase coming from the sort of things that you're having to fight your battles over so over for So, I think that that just a way to make everything better is to try to shift out supply housing. Awesome.

Keith Porter 01:31:09
Thank you, gentlemen, thank you all for participating today. I'm very grateful, and I'm sure our attendees are as well. I want to remind our attendees that next month's Friday forum will be from the British Columbia Ministry of Emergency Management, climate readiness. They're going to tell us about the province's disaster and climate risk and resilience assessment. That's going to be on Friday, February the 13th, 2026 and once again, you'll be able to point your colleagues to today's video and Dak at www.iclr.org/workshops I hope to see everybody next month. Thanks. Thanks everyone for coming today. Bye, bye, thanks, bye.