

Quantifying the impact of land use regulation: Evidence from New Zealand

RESEARCH SUMMARY

JULY 2017

Background

What has caused the price of New Zealand houses to soar in recent years? Research has identified land use regulation (the rules that determine what can be built where) as a key driver of price rises in the United States. This publication summarises a similar New Zealand investigation into the connection between land use regulation, the supply of houses and prices.¹

How the work came about

The Social Policy Evaluation and Research Unit (Superu) administers the Ministerial Fund for social sector research. In September 2016 the Minister of Finance commissioned research from Superu into the impact of land use regulation on house prices in seven New Zealand cities. The research was to be based on replicating methods used in two United States studies which found land use regulation drove up house prices. Superu contracted Sense Partners to carry out the research. This publication summarises the key points from Sense Partners' full report.

What is land use regulation?

- > Local authorities (city and district councils) use regulations to direct what buildings can be built and where. Land use regulations include zoning, height restrictions, minimum lot sizes, urban growth boundaries and heritage and open space provisions.
- > Land use regulations vary from place to place and enforcement also varies considerably. This can make it difficult to identify the extent of land use regulation and its impact. To address this difficulty, the research used a number of different methods for determining the impact of land use regulation on house prices in a range of New Zealand cities.

WHAT DID WE FIND?

- > Land use regulation is hampering the flexibility of housing supply. Most of our cities cannot build quickly enough to respond to increasing demand for housing, so land prices have gone up, as have housing prices across our cities.
- > Local geography is likely to play a role, but even in New Zealand cities with plenty of flat land, prices are higher than might be expected in a well-functioning market.
- > **There could be benefits from land use regulation, but these would need to be large and increasing over time to justify the status quo.**

1. Lees, K. (2017) *Quantifying the impact of land use regulation: Evidence from New Zealand*, Sense Partners, Report for Superu, Ministerial Social Sector Research Fund.

What else did we learn along the way?

- > No relationship was found between density and house prices. If land use regulation were sufficiently flexible to accommodate demand, highly sought-after areas would accommodate population demand and there would be an increase in density. But regulation appears to not allow this to happen.
- > When there are few restrictions on what can be built where, a piece of land prior to development should have a price close to the price of the same piece of land after development. But the research found that prices post-development are four to nine times higher than for land prior to development.
- > Relative to a world with no land use regulation, regulation could be responsible for 15 to 56 percent of the cost of an average dwelling across a range of New Zealand cities. In Auckland, land use regulation could be responsible for 56 percent or \$530,000 of the cost of an average home.

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Key conclusions

- > Our work closely follows existing methods to show land use regulation in some of our major cities is driving up house prices.
- > Construction costs – that exclude land – matter, but house prices in Auckland and elsewhere are far in excess of construction costs. So policymakers should focus on reducing the cost of the land component of house prices.
- > Monitoring a range of land market indicators over time could help local councils identify where easing land use regulation would substantially reduce house prices.

The size of the problem

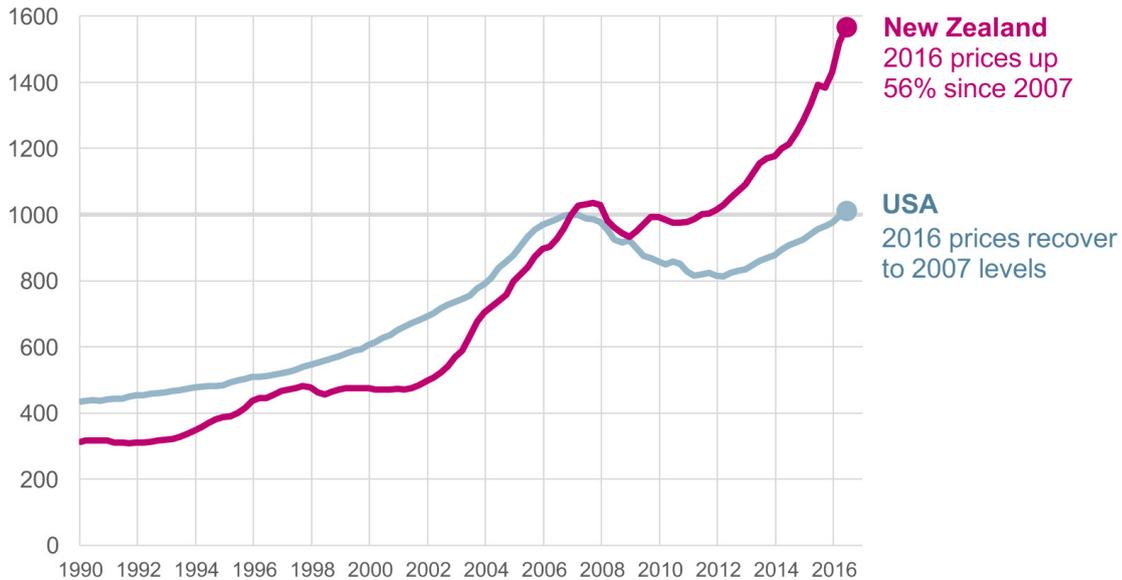
The price of housing in New Zealand has soared in recent years. Since 2010, relative to income, New Zealand's house prices have increased more than any other OECD country. While the US experience has been a slow grind to recover the pre-Global Financial Crisis price peak, figure 1 shows house prices in New Zealand have risen dramatically over the same period. Since the Productivity Commission's inquiry into housing affordability five years ago, house prices have risen 56 percent.²



2. See New Zealand Productivity Commission (2012). The Productivity Commission also published a report on Urban Planning in March 2017: productivity.govt.nz/inquiry-content/2682?stage=4

Figure 1 _ House prices in New Zealand have continued to increase

US (USFHFA) and NZ House prices indices (CoreLogic) indexed to March 2007 = 1000



Source: CoreLogic, US Federal Housing Finance Agency

Unlike earlier housing booms, marked differences across regions have persisted. Despite region-specific lending restrictions that might be expected to slow growth in house prices, the average Auckland house price is 76 percent higher than in July 2012. Other regions that earlier posted modest growth rates are now catching up.

Research methods and results

Regulations differ not just across cities but within cities, varying by suburbs and even smaller land areas within district plans. Enforcement of rules can vary across time and space. All this makes for difficulties in measuring the extent of land use regulation.

There are, however, several approaches available for estimating the impacts of land use regulation, including case studies; multi-city analysis; building structural models; and using data reduction techniques to develop measures of land use regulation intensity for use in regression analysis, to test for impacts.

Rather than rely on any single approach, this report is based on four different methods or lenses to examine the impact of land use regulation. Details of these methods and results can be found in the full research report.

The four different methods used to indicate the extent to which costly land use regulation might be present are all suggestive of potentially large impacts that make housing supply relatively unresponsive to increases in demand (see table 1). That drives prices higher in the face of additional demand for highly sought-after locations.

Table 1_ All four of our methods suggest impacts of land regulation

	Theory	Our approach	Results	Inference
Method 1	High prices relative to costs indicative of poorly functioning markets	Compare unit record sales to construction costs estimates	Large differences between prices and costs that increase over time	Evidence of impact of land use regulation. Monitor price-to-cost ratio over time
Method 2	A wedge between intrinsic and extrinsic land prices could be created by land use regulation	Use hedonic tools for intensive prices and calculate extensive price	Extensive prices are four to nine times intensive prices	Likely presence of impacts from land use regulation
Method 3	Density and prices should correlate in high-demand areas	Compare density and prices at the area unit level	Mixed results — many regions have no strong effect and behave differently	Some locations accommodating, but restrictions push demand into high prices in many suburbs
Method 4	High prices relative to costs indicative of poorly functioning markets	Compare unit record sales for apartments to construction costs estimates	Large differences between prices and costs that increase over time	Evidence of impact of land use regulation. Monitor price-to-cost ratio over time

Source: Sense Partners

In the cities studied by Sense Partners, housing looks expensive relative to measures of construction costs. Even allowing for additional costs such as financing and council fees, prices far outstrip costs in most major cities. These results for residential homes broadly carry over to apartments – which adds weight to the findings.

Prices in most cities were expensive relative to construction costs in 2012 and have moved higher.

Comparison of the price of land with a home on it to the extra value from a backyard suggests that land use regulations are preventing sufficient supply in response to demand. When a house with 400m² of land is not much different in price from a house with 800m² of land, we can use land more effectively to produce cheaper houses. Figure 2 shows that when we apply this method to our cities, land use regulation could be costing up to 56 percent of the cost of the average home in Auckland.



Figure 2 _ Land use regulation could cost 56 percent of an Auckland home

2015 estimates of the cost of land use regulation



N.B. The estimates above use CoreLogic residential dwellings data (excluding apartments) and closely follow the method in an existing US study by Glaeser and Gyourko (2003).

Source: Sense Partners

Well-functioning housing markets with flexible supply in high-demand locations should produce a strong correlation between prices and density. Supply would be expected to adjust and accommodate more residents, and some extra demand to push up house prices a little. But results suggest only mixed and modest relationships between density and prices. Only a few areas, such as downtown Auckland, are accommodating more households, with new dwellings more likely on the periphery of the city.

There are other factors that help determine prices within our key cities, including geography, political economy, financing, demographics and the growth of location-specific demand. But results of this research, while not decisive, suggest that land use regulation is playing a large role. Glaeser and Gyourko’s (2003) policy recommendation seems even more appropriate for many housing markets in New Zealand:

If policy advocates are interested in reducing housing costs, they would do well to start with zoning reform.

References

- Alonso, W. (1964) *Location and Land Use: Toward a General Theory of Land Rent*, Cambridge, MA., Harvard University Press.
- Angel, S. (2012) *Planet of Cities*, Cambridge, MA., Lincoln Institute of Land Policy.
- Beacon Pathway Incorporated (2015) *Cost tower: residential construction costs for affordable and social housing in Auckland 2015*, Auckland, NZ.
- Bertaud, A. and Brueckner, J.K. (2004) *Analyzing building height restrictions – predicted impacts, welfare costs, and a case study of Bangalore, India*, The World Bank, Policy Research Working Paper Series 3290.
- Desmet, K. and Rossi-Hansberg, E. (2013) 'Urban Accounting and Welfare', *American Economic Review*, vol. 103, no. 6, pp. 2296–2327.
- Fischel, W. (2015) *Zoning rules!: The economics of land use regulation*, Cambridge, MA., Lincoln Institute of Land Policy.
- Gibbons, S. and Overman, H.G. (2012) 'Mostly Pointless Spatial Econometrics?', *Journal of Regional Science*, vol. 52, no. 2, pp. 172–191.
- Glaeser, E.L. and Gyourko, J. (2003) 'The impact of zoning on housing affordability', *Economic Policy Review*, vol. 9, no. 2, pp. 21–39.
- Glaeser, E.L. and Gyourko, J. (2005) 'Urban Decline and Durable Housing', *Journal of Political Economy*, vol. 113, no. 2, pp. 345–375.
- Glaeser, E.L. and Gyourko, J. (2017) *The Economic Implications of Housing Supply*, Zell/Lurie Working Paper #802.
- Glaeser, E.L., Gyourko, J. and Saks, R. (2005) 'Why is Manhattan so expensive? Regulation and the rise in housing prices', *Journal of Law and Economics*, October, pp. 331–369.
- Glaeser, E.L. and Ward, B.A. (2006) *The Causes and Consequences of Land Use Regulation: Evidence from Greater Boston*, National Bureau of Economic Research, Inc, NBER Working Papers 12601.
- Grimes, A. and Aitken, A. (2010) 'Housing Supply, Land Costs and Price Adjustment', *Real Estate Economics*, vol. 38, no. 2, pp. 325–353.
- Grimes, A. and Liang, Y. (2009) 'Spatial Determinants of Land Prices: Does Auckland's Metropolitan Urban Limit Have an Effect?', *Applied Spatial Analysis and Policy*, vol. 2, no. 1, pp. 23–45.
- Grimes, A. and Mitchell, I. (2015) *Impacts of Planning Rules, Regulations, Uncertainty and Delay on Residential Property Development*, Motu Economic and Public Policy Research, Working Papers 15-02.
- Gyourko, J., Saiz, A. and Summers, A. (2008) 'A New Measure of the Local Regulatory Environment for Housing Markets: The Wharton Residential Land Use Regulatory Index', *Urban Studies*, vol. 45, no. 3, pp. 693–729.
- Hsieh, C.-T. and Moretti, E. (2015) *Why Do Cities Matter? Local Growth and Aggregate Growth*, National Bureau of Economic Research, Inc., NBER Working Papers 21154.
- Kulish, M., Richards, A. and Gillitzer, C. (2012) 'Urban Structure and Housing Prices: Some Evidence from Australian Cities', *The Economic Record*, vol. 88, no. 282, pp. 303–322.
- Lees, K. (2014) *Big city life? Challenges and trade-offs for Auckland city*, *New Zealand Institute of Economic Research*, NZIER Working Paper 2014/2.
- Lees, K. (2015a) *Moving on up Relaxing land use restrictions can lift Auckland city*, NZIER report to Auckland Council.
- Lees, K. (2015b) *The price is right: Land prices can help guide land use regulation*, NZIER report to Ministry for the Environment and New Zealand Treasury.
- Lees, K. (2016) *Growing up in Auckland? Mapping drivers of residential land growth*, NZIER public discussion paper 2016/03.
- Lees, K. (2017) *Quantifying the impact of land use regulation: Evidence from New Zealand*, Sense Partners, Report for Superu, Ministerial Social Sector Research Fund.
- LeSage, J.P. and Pace, R.K. (2014) 'The Biggest Myth in Spatial Econometrics', *Econometrics*, vol. 2, no. 4, pp. 217–249.
-



Luen, M. (2014) 'Up or out? Residential height regulations in Auckland – understanding the effects and implications', Working Paper presented to *The New Zealand Association of Economists Annual Conference*, Auckland, 2–4 July.

Mills, E.S. (1967) 'An Aggregative Model of Resource Allocation in a Metropolitan Area', *The American Economic Review, Papers and Proceedings*, vol. 57, no. 2, pp. 197–210.

Muth, R.F. (1969) *Cities and Housing: The Spatial Pattern of Urban Residential Land Use, Third Series: Studies in Business and Society*, Chicago, University of Chicago Press.

New Zealand Productivity Commission (2012) *Housing affordability inquiry*, Wellington, New Zealand.

Nunns, P., Hitchins, H. and Balderston, K. (2015) *The value of land, floorspace and amenities: a hedonic price analysis of property sales in Auckland 2011–2014*, Auckland Council technical report TR2015/012.

Roback, J. (1982) 'Wages, Rents, and the Quality of Life', *Journal of Political Economy*, vol. 90, no. 6, pp. 1257–1278.

Rosen, S. (1974) 'Hedonic prices and implicit markets: product differentiation in pure competition', *Journal of Political Economy*, vol. 82, pp. 34–55.

Saiz, A. (2010). 'The Geographic Determinants of Housing Supply', *Quarterly Journal of Economics*, vol. 125, no. 3, pp. 1253–1296.

Sheppard, S. (1999) 'Hedonic analysis of housing markets', in Cheshire, P.C. and Mills, E.S. (eds) *Handbook of Regional and Urban Economics, volume 3*, Amsterdam, Elsevier, pp. 1595–1635.

Timar, L., Grimes, A. and Fabling, R. (2014) *That Sinking Feeling: The Changing Price of Disaster Risk Following an Earthquake*, Motu Economic and Public Policy Research, Working Papers 14-13.

Turner, M.A., Haughwout, A. and Van Der Klaauw, W. (2014) 'Land Use Regulation and Welfare', *Econometrica*, vol. 82, no. 4, pp. 1341–1403.

The report on which this summary is based has been commissioned through the Ministerial Social Sector Research Fund, which is managed by Superu. The topic has been determined by the Minister of Finance to meet policy concerns that might be addressed by expanding the available evidence. Superu is responsible for ensuring that appropriate research methods were used, including peer review and quality assurance. The Office of the Minister has managed the release of this report, including the preparation of associated communications materials. Once released, all reports commissioned through the Fund are available on the Superu website superu.govt.nz and further information on the report can be provided by Superu.





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- We generate evidence that helps decision-makers understand complex social issues and what works to address them.
- We share evidence about what works with the people who make decisions on social services.
- We support decision-makers to use evidence to make better decisions to improve social outcomes.

We also provide independent assurance by:

- developing standards of evidence and good practice guidelines.
- supporting the use of evidence and good evaluation by others in the social sector.

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Quantifying the impact of land use regulation:
Evidence from New Zealand report (July 2017)

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