

A Causal Analysis of Pro-Forma Returns on Residential Construction Starts

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Abstract

Policymakers seeking to end regional or local housing shortages depend on analyses of how many homes a bill makes economically feasible to build, even though such analyses lack statistical assurances regarding how many homes will get built if the bill passes. This paper solves this research gap by estimating the causal effect of economic feasibility on housing production. To estimate this effect, I use 1031 exchanges as an instrumental variable that reduce the cost of land acquisition for developers. bankruptcies that cause landowners to sell their land at a reduced rate. As a robustness check, I compare this estimated causal effect with the estimated indirect effect of the Palmer Fix in California.

1 Introduction

Policymakers in California care about the impact of legislation on ending the housing shortage. Two types of studies exist: 1) causal studies that require the policy's effects to have been observed in the past; 2) economic feasibility studies that, for the price of statistical guarantees, do not require a similar policy to have been enacted in the past.

1.1 Economic Feasibility

Feasibility for location l at time t is defined as

$$F_{l,t} := \frac{\sum_i NOI_{i,l,t}}{\sum_i DevelopmentCost_{i,l,t}} - CapRate_{l,t}$$

A capitalization rate is the rate of return in an area of buying property without redeveloping it.[3] In San Francisco, it's around 5%.

Net Operating Income (NOI) is evaluated over the first year alone. It can be composed of several streams: 1) unsubsidized residential rents; 2) subsidized residential rents; and 3) commercial rents.

Development costs are also composed of several streams: 1) land costs; 2) soft costs (such as financing and fees); and 3) hard costs, i.e. construction costs.

2 IVs

Consider: 1. 1031 exchanges 2. Fires 3. Bankruptcy

Assumptions: 1. No direct effect on Y 2. 3.

3 Literature Review

To-read:

- "we develop ... novel doubly robust semiparametric locally efficient estimator" for a generalization of FD adjustment [2]
- "We show that if a particular (well-known) generalized equality constraint a.k.a Verma constraint [Verma and Pearl, 1990, Spirtes et al., 2000] holds in the observed data distribution between an "anchor" variable and the outcome, it is sufficient to ensure that the assumptions of the front-door model are satisfied; (ii) We propose ways of testing this constraint with finite samples." [1]

Done:

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References

- [1] Rohit Bhattacharya and Razieh Nabi. *On Testability of the Front-Door Model via Verma Constraints*. 2022. DOI: 10.48550/ARXIV.2203.00161. URL: <https://arxiv.org/abs/2203.00161>.
- [2] Isabel R. Fulcher et al. *Robust inference on population indirect causal effects: the generalized front-door criterion*. 2017. DOI: 10.48550/ARXIV.1711.03611. URL: <https://arxiv.org/abs/1711.03611>.
- [3] David Garcia. "Making it pencil: the math behind housing development". In: *Terner Center for Housing Innovation at UC Berkeley*. Retrieved from: <https://ternercenter.berkeley.edu/making-it-pencil> (2019).