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Is There a Trade-off Between Protecting Investors and Promoting Entrepreneurial Activity?
Evidence from Angel Financing

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Abstract
This paper studies how changes in investor protection regulations affect local entrepreneurial activity, relying on the heterogeneous impact of a 2011 SEC regulation change on the definition of accredited investors across U.S. cities. Using a difference-in-differences approach, I show that cities more affected by the regulation change experienced a significantly larger decrease in local angel financing, entrepreneurial activity, innovation output, employment, and sales. I find that small business loans and second-lien mortgages became entrepreneurs' partial substitutes for angel investment. My cost-benefit analysis suggests that the costs of protecting angel investors through the 2011 regulation change outweigh its benefits.

Motivation

- Entrepreneurship is crucial for job creation and economic growth. Raising capital for small businesses is important but also not easy

  Regulators have called lack of investor access to private companies a "growing concern" (Financial Times, Nov. 7, 2019)

- However, there is often a trade-off between promoting entrepreneurship and investor protection. The concern is that smaller investors may lose a significant amount of money by investing in entrepreneurial firms that turn out to be unsuccessful

  *The Securities and Exchange Commission today requested public comment on ways to simplify, harmonize, and improve the exempt offering framework **to expand investment opportunities while maintaining appropriate investor protections and to promote capital formation**. (SEC press release, Jun. 18, 2019)*

- Angel investors are individual investors, different from institutional investors like venture capital and private equity firms

- The concerns about protecting individual investors led the SEC to restrict the definition on accredited investors by removing primary residency from net wealth qualification standard in the end of 2011, as required by the 2010 Dodd-Frank Act

Research Questions

- How does the above change in the SEC regulation impact angel financing?

- How does the change in angel financing impact local entrepreneurial activities?

- What are the real economic effects in the local area of the above decrease in entrepreneurial activities?

- Are there any substitution effects on alternative financing sources?

- How do the economic costs of the SEC regulation change of 2011 (reduction in entrepreneurial activity) compare with the economic benefits of the above regulation change (reducing angel investor losses)?

Institutional Background

- **Accredited investors:** A person—or a married couple—with a net worth of at least $1 million, or an individual that earned an income of at least $200,000, or more than a combined $300,000, in the case of married couples, for each of the last two years, and reasonably expects the same for the current year.

- **Removal of primary residency from net worth qualification standard:** On **December 21, 2011**, the SEC amended its rules as requirements of the 2010 Dodd-Frank Act to exclude the value of a person's home from net worth calculations used to determine whether an individual may invest in certain unregistered securities offerings.
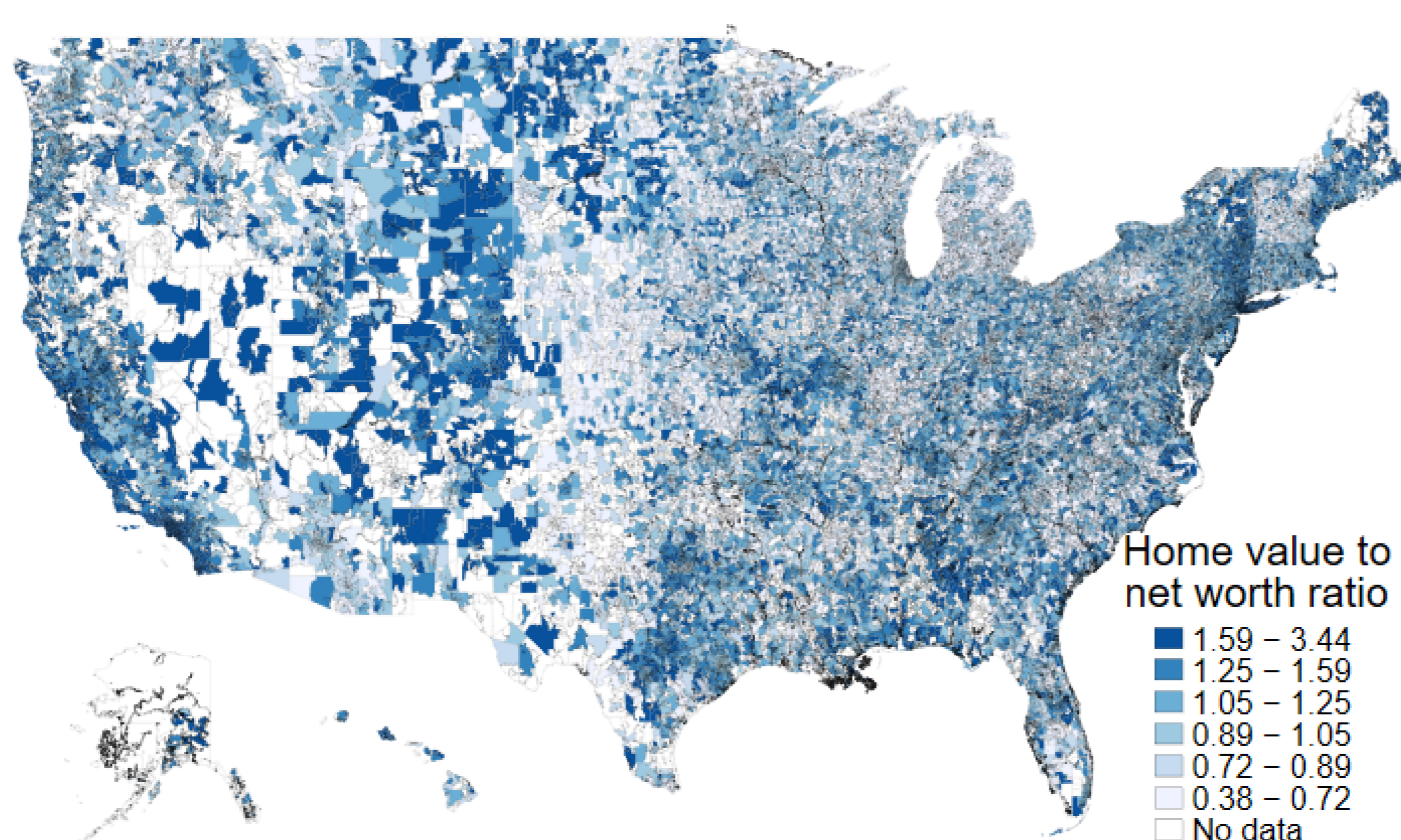

Home value to net worth ratio
- 1.59 – 3.44
- 1.25 – 1.59
- 1.05 – 1.25
- 0.89 – 1.05
- 0.72 – 0.89
- 0.38 – 0.72
- No data

Figure 1: Geographical Variation of the Home-Value-To-Net-Worth Ratio in 2011

Data and Methodology

- **Main data sources:**
  – Angel financing: SEC Form D Filings, VentureXpert, and CrunchBase
  – Housing value: Zillow; Net worth: estimated by combining Survey of Income and Program Participation (SIPP) and Internal Revenue Service (IRS)
  – Patent data: United States Patent and Trademark Office (USPTO)
  – Firm employment and sales: National Establishment Time-Series (NETS)

- Aggregate data to city level with a sample period from 2009 to 2013

- A **DiD approach** with a continuous treatment by estimating the following equation:

$$Y_{i,t} = \alpha + \beta ln(HV/NW)_i * Post_t + Controls_{i,t} + \delta_t + \eta_i + \epsilon_{i,t}.$$

where i represents a city and t represents a semiannual time period. $Y_{i,t}$ are outcome variables of city i in time t. $ln(HV/NW)_i$, the natural logarithm of the home-value-to-net-worth ratio.

Main Findings

- The 2011 SEC regulation change has a significant negative impact on local angel financing:
  – A 10% higher HV/NW ratio prior to the regulation change on average leads to a 2.28% larger decrease in the amount and a 0.26% larger decrease in the number of angel investments
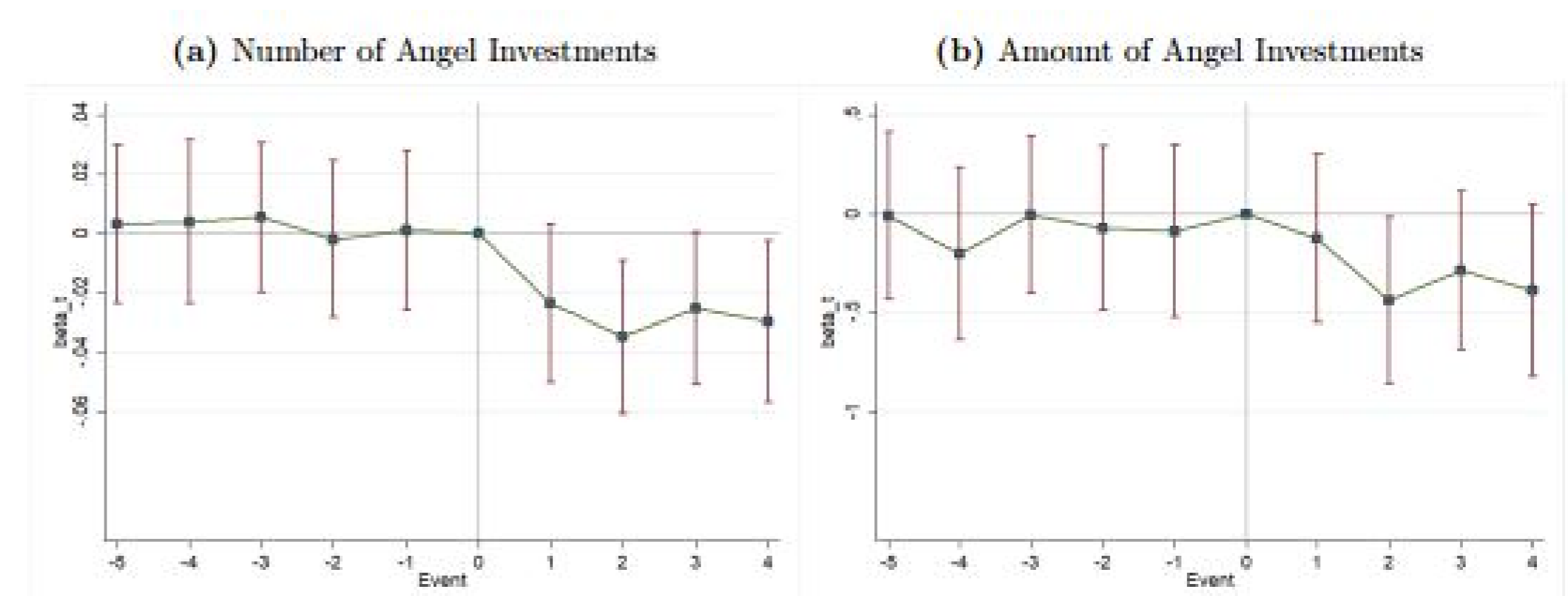

Figure 2: Plot of Coefficients Around the Event Time

- The decrease in angel financing has a significant negative effect on local entrepreneurial activities:
  – larger decreases in the number of angel-backed firms that receive subsequent financing or have a successful exit (*i.e.* acquisition or IPO)

- The 2011 SEC regulation change has a real impact on the local economy:
  – A 10% higher *HV/NW* ratio in 2011 leads to a 0.2% larger decrease in the number of patents, 0.01% larger decrease in the number of patent citations generated by the angel-backed firms
  – The same city also experiences a 2.26% greater decrease in sales generated and a 0.65% greater decrease in the number of jobs supported by angel-backed firms

- The regulation change generates substitution effects on alternative financing sources:
  – The number and amount of small business loans and second-lien mortgages increase significantly more in cities that were more affected by the SEC regulation change
  – The results suggest that the SEC amendment indeed reduced the supply of angel financing and pushed some entrepreneurs to borrow from taxpayers or to mortgage their own home

- The economic costs of the 2011 SEC regulation change (in terms of the real effects of reduced entrepreneurial activity) outweigh the benefits of the SEC regulation change (avoiding angel investor losses)

g= \ r=	5%	10%	15%	20%	25%	30%
0%	-36.36	-18.83	-9.49	-4.33	-1.38	0.33
5%		-26.80	-14.26	-7.31	-3.32	-0.97
10%			-20.27	-11.02	-5.71	-2.57
15%				-15.66	-8.67	-4.52
20%					-12.32	-6.91
25%						-9.85

(Assuming the impact of SEC regulation change lasts for 10 years)

Figure 3: Cost-Benefit Analysis with Various Assumptions on Growth Rate (g) and Discount Rate (r)