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ARTICLE



## Opportunity entrepreneurship and regulation: a state-level analysis

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### ABSTRACT

The paper empirically tests the relationship between opportunity entrepreneurship – i.e. procyclical entrepreneurial activity associated with growth-oriented business startups – across states and the relative effect of federal regulation borne by private-sector industries within each state. With entrepreneurial data from the Kauffman Index and a new and plausibly exogenous index of the relative burden imposed by federal regulations on each state between 1998 and 2015, I find a negative and robust association between federal regulation and opportunity entrepreneurship.

### KEYWORDS

Regulation; entrepreneurship; business startups; firm formation

### JEL CLASSIFICATION

H72; H77; L51

### I. Introduction

Entrepreneurial activity is a driving factor behind economic growth and development, though this activity is largely affected by the institutional environment that exists within a given jurisdiction (see Bjørnskov and Foss 2016 for a literature review). From North (1990), it is the ‘rules of the game’ and specifically both the formal (i.e. written rules, regulations, etc.) and informal (i.e. norms, unwritten conventions, etc.) rules that ultimately impact entrepreneurial activity. One particular aspect of this regards a jurisdiction’s formal institutional arrangements and specifically its regulatory environment, with most research finding that greater regulatory burdens tend to dampen entrepreneurship (DeSoto 2000; Dreher and Gassebner 2013; Klapper, Laevena, and Rajan 2006; Djankov et al. 2002).

The theoretical link here is that formal institutional features such as the regulatory burden placed on firm formation and entrepreneurial activity has a direct effect on such activity and, specifically, the type of entrepreneurial endeavors ultimately pursued (productive, unproductive, or destructive) (Baumol 1990). Further, it is the formal institutions that are intended to affect the transactions costs of doing business (North 2005). Thus, an efficient regulatory environment would be one that minimizes these costs, thereby

encouraging entrepreneurial activities, and ultimately resulting in economic growth.

Additional research has also evaluated the effect that regulation has specifically on opportunity entrepreneurship – where opportunity entrepreneurship is defined as being associated with growth-oriented, procyclical activity (Fairlie and Fossen 2018). Another distinction of opportunity entrepreneurship is that it tends to positively correlate with growth-enhancing firms and thus ultimately economic growth and development.<sup>1</sup> Aparicio, Urbano, and Audretsch (2016) and Ardagna and Lusardi (2009) indicate that opportunity entrepreneurship is negatively affected by a country’s regulatory burden. It is this latter line of research that the current study adds to. Specifically, I evaluate how the regulatory environment across US states impacts opportunity entrepreneurship.

This note adds to this literature in several important ways. First, whereas many studies consider the regulatory environment within an international setting, this paper evaluates the impact that regulation has on opportunity entrepreneurship across US states. While the results may be limited in their generalizability, it benefits from the fact that many cultural and socioeconomic characteristics are similar across states. Second, a jurisdiction’s regulatory environment tends to be endogenous, which requires

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<sup>1</sup>In this sense, opportunity entrepreneurship is in many ways akin to Baumol’s (1990) productive entrepreneurship, but somewhat distinct from indirectly productive entrepreneurship (Padilla and Cachanosky 2016), i.e. entrepreneurial activity which itself emerges to reduce inefficiencies created by regulation (though may not be a first-best use of resources), and evasive entrepreneurship (Elert and Henrekson 2016), which can take on characteristics of productive, unproductive, or destructive activity based on a given institutional framework.

careful attention to the identification strategy employed. I overcome this by employing the Federal Regulation and State Enterprise (FRASE) Index, which is a plausibly exogenous measure of the relative impact that federal regulations have on each state. Finally, this study also disentangles entrepreneurial activity by applying a subcomponent of the Kauffman Index of Startup Activity: the ‘Rate of New Entrepreneurs’, which along with providing an overall measure of entrepreneurial activity, also measures both necessity and opportunity entrepreneurship, adding greater nuance to the literature. These two indices allow for the construction of a panel dataset spanning between 1998 and 2015. Overall, I find a consistently negative association between entrepreneurial activity and regulation within a state.

The remainder of the paper is structured as follows: section 2 describes the data and model selection. The results are presented and discussed in section 3. Section 4 concludes.

## II. Section 2. Data description, model specification, and results

Data are drawn from a number of sources, with the dependent variable taken from the Kauffman Index of Startup Activity. This index captures all business types and is drawn from a nationally representative sample of 500,000 observations for each year available. This variable is comprised of three sub-indices, which are the ‘Rate of New Entrepreneurs’, ‘Opportunity Share of New Entrepreneurs’, and ‘Startup Density’. I draw specifically from the measure of ‘Opportunity Share of New Entrepreneurs’ for the current analysis.<sup>2</sup> This score disentangles the type of entrepreneurship that emerges in a particular jurisdiction by examining the share of entrepreneurial endeavors that resulted from an individual exiting unemployment compared to an individual exiting some other labor market status (Ewing Marion Kauffman Foundation 2017, 6). Here, these individuals pursuing entrepreneurial endeavors to avoid unemployment are viewed as necessity entrepreneurs, as the decision to do so may be based

solely on a very limited choice set, and not necessarily due to favorable economic circumstances or actual growth opportunities.<sup>3</sup>

This measure is beneficial for several reasons. First, it measures the rate of new entrepreneurial activity (which is a percentage value between ‘0’ and ‘1’) rather than the stock of existing activity. Additionally, this measure also avoids measuring entrepreneurial activity using payroll or incorporation data, which is important as many entrepreneurs don’t have employees nor do they incorporate. Thus, the index is a comprehensive view of necessity, opportunity, and ultimately overall entrepreneurial activity within a state in a given year. These data are available between 1998 and 2015.

The relative impact of federal regulation borne by each state is taken from the FRASE Index, developed by QuantGov.<sup>4</sup> This index measures the ratio of federal regulation’s impact on the private sector of a given state relative to the impact of those regulations on the private sector across the nation as a whole. This study employs the constant-basis score, which considers how the accumulation of federal regulations over time impact each state, i.e. it accounts for the historical trends in federal regulations going back to 1997.

Overall then, a FRASE index score of ‘1’ would suggest that federal regulations impact the private sector within a given state to the same degree as the US private sector as a whole. Thus, a score of ‘1.5’ would indicate that a particular state’s private sector economy was targeted 50% more than the national average, while a score of ‘0.5’ would suggest a state’s private sector being targeted 50% less than the national average. Data are available between 1997 and 2015. Given the data availability listed, I employ a panel dataset that spans 1998 to 2015 employing both OLS and fractional logit models, given the proportional nature of the dependent variable (being bounded between 0 and 1). Further, I log transform this constant-basis FRASE score for ease of interpretation.

Control variables included in the model follow those conventionally found within the

<sup>2</sup>Data are freely available at <https://www.kauffman.org/kauffman-index/reporting/startup-activity>.

<sup>3</sup>A longstanding empirical anomaly tended to find that economic recessions were positively correlated with entrepreneurship (Fairlie and Fossen 2018). This anomaly has since been explained as a distinctive feature between opportunity and necessity entrepreneurship, i.e. opportunity entrepreneurship ultimately results from greater economic and growth opportunities, whereas necessity does not.

<sup>4</sup>Data and a detailed description are freely accessible at <https://quantgov.org/>.

entrepreneurship literature (see Fritsch and Storey 2014 for a literature review) and include population, population growth, and population density, the first two of which are expected to be positively correlated with opportunity entrepreneurship, the latter being ambiguous. The percentage of the population over 65 and the median age of each state are included, with both expected to be negatively associated with opportunity entrepreneurship. The percentage of the population that is male and white is also included, both of which have an ambiguous effect. Educational attainment, measured as the percentage of the population over the age of 25 with a bachelors degree is included and is expected to be positively correlated. All of these data were obtained from the US Census.

The percentage of the population that is unionized, real GSP growth rates by state, the overall tax burden of each state, and an indicator variable representing whether the US economy was in a recession (represented with a '1' and '0' otherwise) are included.<sup>5</sup> Unionization and the overall tax burden are expected to be negatively associated with entrepreneurship as is a recession, while per capita GSP positively associated. Finally, a measure of the public sector's share of economic activity is also included, as this has been shown to be negatively correlated with entrepreneurship (Nyström 2008). This is drawn from the Economic Freedom of North America index compiled annually by the Fraser Institute, which is an overall index of economic freedom in a state and

constructed from several sub-indices.<sup>6</sup> This variable is expected to be positively associated with entrepreneurial activity. Finally, state fixed effects and year dummies are also included in each model, with implementation in the fractional logit models following Wagner (2003). Table 1 provides the summary statistics for all of these variables.

The results from the empirical model are found in Table 2. Columns 1 through 5 include the OLS estimates while columns 6 through 10 include the fractional logit estimates. Column 1 excludes all control variables, column 2 only considers the addition of population, population growth, population density, percentage of the population 65 and older, median age, percentage male, and percentage white. Column 3 only includes the EFNA scores, educational attainment, unionization, growth rates, the overall tax burden, and the recession variable. Column 4 presents the full model, while column 5 excludes the overall tax burden (since this variable was only available until 2012). Column 6 through 10 follow the same format.

Overall, the results are all consistently negative and statistically significant at conventional levels, suggesting a strong correlation between the effect of federal regulation on opportunity entrepreneurship across states. Specifically, the point estimates in columns 1 through 5 (the OLS specifications), indicate that a one percent increase in the relative burden that federal regulations impose on a state

**Table 1.** Summary statistics.

Variable	Observations	Mean	Std. Dev.	Min	Max
Opportunity Entrepreneurship	900	0.80	0.61	0.56	0.95
(log of) FRASE Constant-Basis Score	900	1.27	0.29	0.68	2.81
Population (in 100,000s)	900	59.76	65.87	4.91	389.94
Population Growth	900	0.87	0.76	-5.99	5.05
Population Density	900	186.88	254.64	1.09	1215.42
% 65 and Over	900	13.20	1.95	5.45	19.43
Median Age	900	37.31	2.40	26.70	44.40
% Male	900	48.97	1.87	33.35	67.21
% White	900	81.16	12.61	25.59	97.81
ENFA Size of Government Index	900	6.89	0.62	5.20	8.55
% Bachelors Degree	900	26.67	4.90	14.80	40.50
% Unionization	900	11.36	5.55	1.90	26.70
Tax Burden	750	9.55	1.27	4.90	13.00
Recession (1 = Yes)	900	0.17	0.37	0	1

<sup>5</sup>A year is defined as in recession if, based on the NBER's definition of recession, the US economy was in recession for 6 or more months in a given year. Information on official recession dates are available at <https://www.nber.org/cycles.html>. Tax burden data are taken from the Tax Foundation's 'Annual State-Local Tax Burden Ranking' which simply calculates the total taxes paid by a state's residents divided by total income, thus generating the overall tax burden. These data run between 1977 and 2012 and are freely available at <https://taxfoundation.org/state-and-local-tax-burdens-historic-data/>. GSP data were taken from the Bureau of Economic Analysis, while unionization data come from unionstats.com.

<sup>6</sup>Specifically, I employ the 'Size of Government' sub index from the EFNA. A higher score here would indicate less public-sector involvement in the economy. Data are freely available at <https://www.fraserinstitute.org/studies/economic-freedom-of-north-america-2018>.

Table 2. Cumulative impact of federal regulation on opportunity entrepreneurship.

	Dependent Variable: Opportunity Share of New Entrepreneurs									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	OLS	OLS	OLS	OLS	Fractional Logit	Fractional Logit	Fractional Logit	Fractional Logit	Fractional Logit
(log of) FRASE Constant-Basis Score	-0.0749** (0.0293)	-0.0713** (0.0294)	-0.0726** (0.0298)	-0.0904*** (0.0323)	-0.0558* (0.0297)	-0.0765*** (0.0295)	-0.0728** (0.0294)	-0.0698** (0.0297)	-0.0854*** (0.0315)	-0.0542* (0.0296)
Population (in 100,000s)		-0.000464 (0.000286)		-0.000318 (0.000410)	-0.000426 (0.000290)		-0.000424 (0.000273)		-0.000146 (0.000373)	-0.000390 (0.000276)
Population Growth		0.0102*** (0.00366)		0.00481 (0.00384)	0.00667* (0.00361)		0.00916*** (0.00346)		0.00334 (0.00345)	0.00570* (0.00345)
Population Density		0.0378 (0.0295)		-0.315 (0.307)	0.0268 (0.0326)		0.0430 (0.0279)		-0.388 (0.295)	0.0329 (0.0301)
% 65 and Over		-0.00970* (0.00530)		-0.0151* (0.00784)	-0.00974* (0.00545)		-0.0102** (0.00515)		-0.0145** (0.00719)	-0.0103* (0.00531)
Median Age		-0.00796** (0.000941)		-0.00869* (0.00484)	-0.00788** (0.00395)		-0.00819** (0.00380)		-0.00790* (0.00462)	-0.00828** (0.00394)
% Male		-0.000941 (0.00156)		-0.000129 (0.00137)	-0.000877 (0.00164)		-0.000848 (0.00136)		-0.000227 (0.00117)	-0.000777 (0.00142)
% White		-0.000757 (0.000702)		-0.00159 (0.00250)	-0.000885 (0.000726)		-0.000832 (0.000678)		-0.00209 (0.00247)	-0.000951 (0.000695)
EFNA Size of Government Index			0.0452*** (0.0120)	0.0315** (0.0129)	0.0328*** (0.0109)			0.0430*** (0.0117)	0.0319*** (0.0123)	0.0329*** (0.0107)
% Bachelor Degree			0.00240 (0.00149)	0.00269* (0.00155)	0.00256* (0.00155)			0.00250* (0.00148)	0.00289* (0.00154)	0.00268* (0.00156)
% Unionization			0.00236 (0.00195)	0.00302 (0.00204)	0.000923 (0.00177)			0.00214 (0.00181)	0.00264 (0.00190)	0.000985 (0.00168)
Real GDP Growth Rate			-0.000236 (0.000780)	-0.000604 (0.000775)	-0.000516 (0.000740)			-0.000128 (0.000778)	-0.000436 (0.000776)	-0.000491 (0.000751)
Tax Burden			-0.00195 (0.00581)	-0.00342 (0.00588)				-0.00169 (0.00544)	-0.00304 (0.00547)	
Recession (1 = Yes)			-0.000622 (0.0129)	0.0252 (0.0160)	0.00886 (0.0147)			-0.00186 (0.0125)	0.0215 (0.0155)	0.00919 (0.0143)
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	900	900	750	750	900	900	900	750	750	900
R-squared	0.416	0.443	0.472	0.488	0.452					
Log-Pseudolikelihood						-441.67	-441.41	-366.93	-366.81	-441.31

Robust standard errors in parentheses. Constant suppressed from output table.  
 Note: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

is associated with a reduction in opportunity entrepreneurship of anywhere between 5.6% and 9% depending on the specification. The results from the fractional logit specifications produce similar estimates, with a one percent increase in federal regulation associated with a reduction in opportunity entrepreneurship anywhere between 5.4% and 8.5%. To the extent that these results are causal then, an increased regulatory burden borne by the private sector within a state is consistently and negatively related to opportunity entrepreneurship. This finding is consistent with the broader literature, and strengthens that literature given that this study uses an exogenous measure of regulation at the state level.

### III. Section 3. Conclusion

This paper evaluated the effect that the relative burden borne across states from federal regulations has on opportunity entrepreneurship – i.e. procyclical, growth-oriented entrepreneurship. Overall, the results indicate a strong negative relationship between opportunity entrepreneurship and the relative federal regulatory burden imposed across states, which is robust to a number of specifications. To the extent that these results are in any way causal, then they would suggest that the regulatory environment in a jurisdiction on net is a hinderance to achieving greater opportunity entrepreneurship. This result is consistent with and adds to the existing literature.

### Disclosure statement

No potential conflict of interest was reported by the author.

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