The Impact of Economic Freedom on Startups*

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Abstract

The decision to start an entrepreneurial activity largely depends upon an entrepreneur's institutional setting. Economic freedom is a widely used measure of institutional quality. Ample studies find a positive association between economic freedom and entrepreneurship; however, these studies have been limited to finding correlative relationships and have not determined a consistent set of relevant covariates. In this paper, startup density, provided by the Kauffman Startup Activities Index, proxies startup entrepreneurship while the Economic Freedom of North America index proxies economic freedom. This paper provides causal insights into economic freedom and entrepreneurship in the United States from 2005 to 2015 using a post-double-selection LASSO method. We find that increases in regulatory freedom are likely to cause significant increases in startup density of entrepreneurial activities. In contrast, increases in freedoms of government spending and taxes cause decreases in startup density.

1 Introduction

New entrepreneurial businesses are signs of economic growth, job creation, and employment opportunities (Kibly, 1971; Kirzner, 1997; North, 1990; Schumpeter, 1934). Entrepreneurs' ability to start and maintain business ventures largely depends on their institutional framework and economic freedoms (Powell and Weber, 2013). Recent literature has explored the relationship between economic freedom and entrepreneurship, primarily focusing on the policies that promote business creation and long-term entrepreneurial success (Kreft and Sobel, 2005; Wiseman and Young, 2013).

Though the literature addresses the relationship between successful entrepreneurial growth over time (Kreft and Sobel, 2005; Wiseman and Young, 2013) and the determinants of new venture survival (Parker, 2009; Acs et al., 2017; North, 1990), it does not address the density of those ventures. Understanding startup density—the percentage of firms under one year of age that employ workers relative to all firms—allows us to understand how a state can attract businesses through changes in policies—such as government spending, taxes, and regulations—that relate to freedom.

The purpose of our research is to investigate the relationship between economic freedom and startup density. Further, we seek to improve the literature's methods using a post-double-selection LASSO method to tease out causal relationships. This approach allows us to select covariates and common-cause confounders in the relationship between economic freedom and startup density. This method addresses the common issue within the literature that results may be spurious if the studies do not correct for underlying time-varying

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state-level characteristics. This method is replicable and can be used in future studies to identify a plausibly causal set of relationships and address reverse-causality and covariate-selection concerns.

We find that increases in economic freedom related to government spending and taxes significantly decrease startup density. In the subcomponent analysis, we find that both government spending on insurance and retirement payments (as a percentage of income) and income, payroll, and sales tax revenues drive that result. These results differ from those presented in the previous literature, and they highlight the importance of blocking spurious correlations. They also provide insight into how some states can see net new venture creation alongside a decrease in startup density under one year old relative to mature firms. This work implies regulation has an opposing effect: increases in labor-market regulatory freedom are associated with increases in startup density. The effect is driven by minimum wage legislation and government employment. If policy makers want to increase the density of startups within their state, they should relax regulations related to the labor market.

Our study contributes to the literature by developing a replicable method of addressing the plausibly causal links between measures of economic freedom and entrepreneurship. We also provide insight into startup density within states using a novel dataset, the Kauffman Startup Activities Index. This work complements previous research and may explain why successful business growth need not be reflected in an increase in startup density. The potential explanation is that a higher percentage of ventures survive after the first year.

Section 2 provides an overview of the relevant literature. Section 3 discusses the data sources. Section 4 develops the empirical methods and incorporates estimation assumptions, post-double-selection LASSO corrections, and interactive fixed-effect models. Section 5 presents and discusses the results. Section 6 discusses the results' policy relevance and concludes.

2 Literature Review

Economic freedom is a measure of institutional quality that has been used to understand a variety of qualitative measures in topics, such as economic growth, migration, inequality, cultural diversity, and political economy in national, state, and local communities.[1] Bennett and Nikolaev's chapter in the Economic Freedom of the World 2019 Annual Report Gwartney et al. (2019) discuss the historical relevance and our current knowledge of the relationships among economic freedom, public policy, and entrepreneurship. While most papers on economic freedom focus on an international comparison of institutional and regulatory quality,[2] recent literature has shifted the focus to subnational analysis at the state[3] and metropolitan levels.[4] The subcomponents of the economic freedom index (government spending, taxes, and regulation) are frequently used to determine the underlying effects of institutional quality on entrepreneurship (Nikolaev et al., 2018).

Entrepreneurship is known to foster job creation, expand employment opportunities, and establish pathways for economic development and growth (Kibly, 1971; Kirzner, 1997; North, 1990; Schumpeter, 1934; Carree and Thurik, 2003; Romer, 1986; Wennekers and Thurik, 1999). Not all environments promote productive entrepreneurship; in fact, poor institutional quality can limit entrepreneurs' success and have long-standing impacts on venture creation and survival (Parker, 2009; Acs et al., 2017; North, 1990). The effects of economic freedom vary depending on the stage of economic development and the institutional context (Kuckertz et al., 2016; Murphy, 2020). For example, Saunoris and Sajny (2017) find that the returns from economic freedom are highest in countries with more formal or informal entrepreneurship. These institu-

[1]See Ali and Crain (2002); Cole (2003); de Haan and Sturm (2000); Gohmann et al. (2008); Hall et al. (2018); Heckelman (2000); Powell (2003); Ashby (2007); Hall and Lawson (2014); Mulholland and Hernández-Julian (2013); Shumway (2018); Apergis et al. (2014); Ashby and Sobel (2008); Bennett and Nikolaev (2017); Bjørnskov (2017); Pérez-Moreno and Angulo-Guerrero (2016); Webster (2013); Sobel et al. (2010); Hall et al. (2015).

[2]The Economic Freedom of the World index was first published by Gwartney et al. (1996) and has since been updated annually. The most recent version is Gwartney et al. (2019).

[3]The Economic Freedom of North America index was first published by Karabegovic et al. (2003) and is updated annually. Stansel and Tuszynski (2017) provide an overview of 235 studies that have used the Economic Freedom of North America index as a measure of institutional quality and observe that nearly all empirical studies have found positive outcomes of more economic freedom.

[4]The Metropolitan Economic Freedom index is the most recent addition to the freedom literature. It was first published by Stansel (2013) and is updated annually.

tional quality measures are correlated with the success of venture capital investment, patents, growth of sole proprietorships, and firm birth and death rates (Sobel, 2008; Wagner and Bologna Pavlik, 2020; Xue and Klein, 2010). Economic freedom gives entrepreneurs the ability to employ resources productively and decreases the prevalence of unproductive entrepreneurial ventures (Sobel, 2008; North, 2010; Schumpeter, 1942). By investigating these institutions, researchers are able to better understand what policies best promote business creation and long-term entrepreneurial success (Kreft and Sobel, 2005; Wiseman and Young, 2013).

New business ventures are a sign of a dynamic economy. Previous studies have used the Business Dynamics Survey to investigate the relationship between economic freedom and net firm creation at the state level (Barnatchez and Lester, 2016). Increased economic freedom leads to higher net job creation, increased rates of firm births and deaths, and more-diffused innovation (Campbell and Rogers, 2007; Barnatchez and Lester, 2016; Wagner and Bologna Pavlik, 2020). The subnational economic-freedom measures used in these studies differ from region to region (Campbell et al., 2013; Hall and Sobel, 2008). To the best of our knowledge, these empirical studies have not made causal arguments and have not corrected for potential spurious correlations and confounders in the underlying data. Cumming and Li (2013) come the closest to our approach by disaggregating the Economic Freedom North America index (EFNA) to determine the effect of state-level public policy on firm births and find that regulation is positively associated with firm creation. Bennett (2019) expands upon this question and analyzes the effect of economic freedom in reducing barriers to firm creation in one of the first studies of local economic freedom and dynamism. Bennett (2019) broadens the analysis of metropolitan economic freedom by including underlying indicators to determine the impact of local-level freedom on entry and exit of firms. This inquiry motivates our evaluation of the subcomponents of economic freedom.

Our paper builds on this empirical literature by investigating the density of startups across states that are heterogeneous in government spending, taxes, and regulation. Our research is different from previous works, as we analyze new firms (less than one year old) that employ at least one worker instead of either all existing firms or only employment within existing firms over time. In this study, we analyze whether institutional quality at the state level, as proxied by the EFNA measures of economic freedom, affects the birth of new entrepreneurial activities. We use a novel dataset that incorporates the Kauffman Foundation's relatively new Startup Activities Index. We use new methods to tease out causal relationships between economic freedom and startup density (Fairlie et al., 2017). These improved methods can be replicated to alleviate potential concerns about spurious correlations and focus on the specific effects of future economic policy.

3 Data

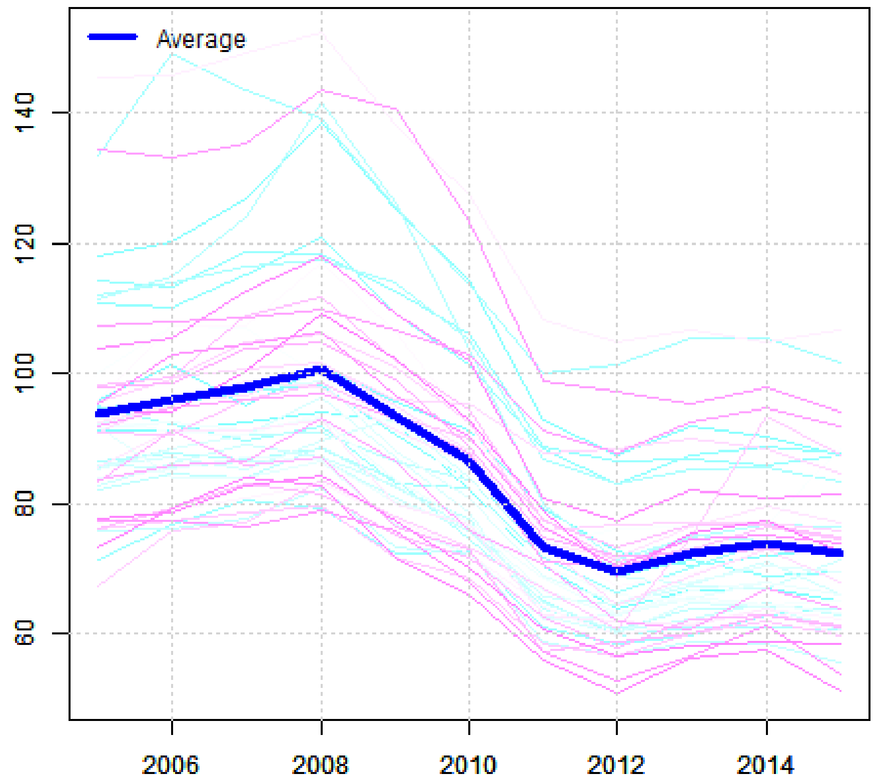
3.1 Entrepreneurial Activity

We use indexed information related to startup density to proxy for entrepreneurial activity in the United States. The startup-density index measures the number of newly established businesses (less than one year old) that employ at least one worker relative to the total employer-business population. These data were acquired from the Kauffman Index of Entrepreneurship (KIEA).[5] Though KIEA data exist for each state since 1996, limitations in covariate data require us to limit our sample to 2005–15 periods. Figure 1 depicts the state-level startup density and average startup density across states from 2005 to 2015.

We prefer startup density as a measure of entrepreneurial activity rather than sole-proprietor rates, which are used in much of the previous literature because it represents new employer-firm growth. This may be because many sole proprietors that do not employ workers are working as contractors for other firms. In

[5] The Kauffman Index of Entrepreneurship measures US entrepreneurship at national, state, and metropolitan levels based on three in-depth studies known as the Kauffman Startup Activities Index, the Kauffman Index of Main Street Entrepreneurship, and the Kauffman Index of Growth Entrepreneurship (Fairlie et al., 2017). This index has been referenced in "multiple testimonies to the US Senate and House of Representative, by US Embassies and Consulates across various countries—including nations like Spain, Ukraine, and United Kingdom—by multiple federal agencies, by state governments and governors from fifteen states— from Arizona to New York—and by the White House's Office of the President of the United States" (Morelix et al., 2015).

Figure 1: Startup Density (2005–15)



Notes: Startup density is the number of newly established employer businesses relative to the total employer business population (in 1,000s). The solid bold line represents the annual average of all fifty US states.

this study, we focus on firms that employ people and produce their own goods and services. Although new businesses with employees represent only a small share of all new businesses, they represent a crucial group for job creation and economic growth (Morelix et al., 2015; Fairlie et al., 2017).

3.2 Economic Freedom

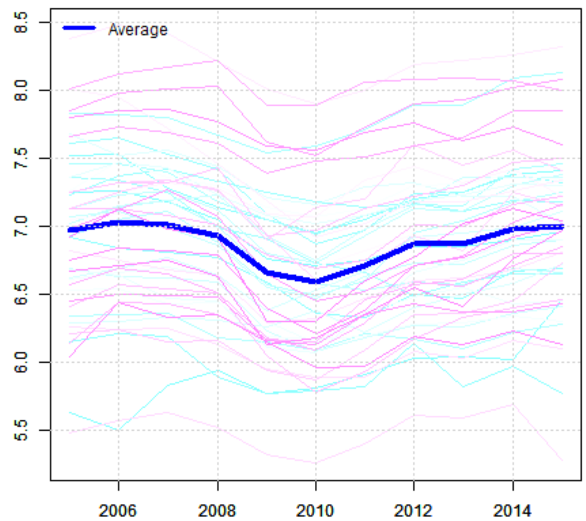
As a proxy for state-level institutional behavior, we utilize the EFNA, published annually by the Fraser Institute (Stansel et al., 2019). This dataset measures the extent to which state-level policies support economic freedom and individuals' ability to operate without undue restrictions. The EFNA comprises ten components of the subnational indices, which are divided into three subject areas—government spending, taxes, and regulation—and ranked from 0 to 10 for each US state, with 10 representing the highest degree of economic freedom (Stansel et al., 2017).

Figure 2 illustrates overall economic freedom and freedom in government spending, taxes, and regulation for each state and the associated national average for 2005–15. Figure 2, Panel (a) shows the overall EFNA–a composite of government spending, taxes, and regulation. The government-spending index plotted in Figure 2, panel (b) comprises three indices: general consumption expenditures by the government as a percentage of income; transfers and subsidies as a percentage of income; and insurance and retirement payments as a percentage of income. A higher government-spending index score indicates a larger government size and potentially less freedom for private choosers.

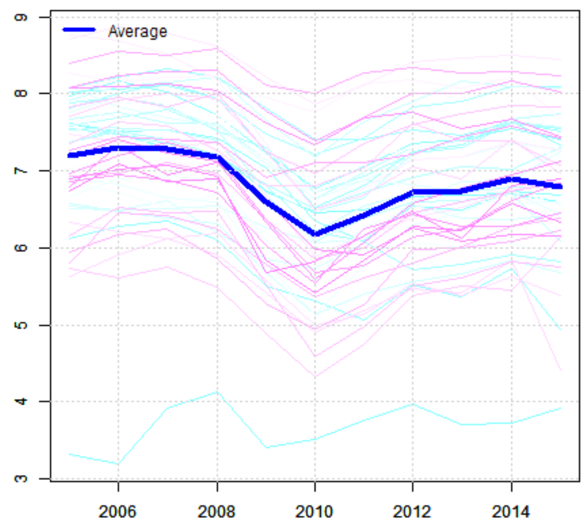
The taxes index in Figure 2, panel (c) is a composite measure of income and payroll tax revenue as a percentage of income; the top marginal income tax rate and the income threshold to which it applies; property tax and other taxes as a percentage of income; and sales tax revenue as a percentage of income

(Stansel et al., 2019). All these components serve to quantify the tax burden. The regulation index in Figure 2, panel (d) comprises an index of minimum wage legislation, government employment as a percentage of total state/provincial employment, and union density (Stansel et al., 2019).

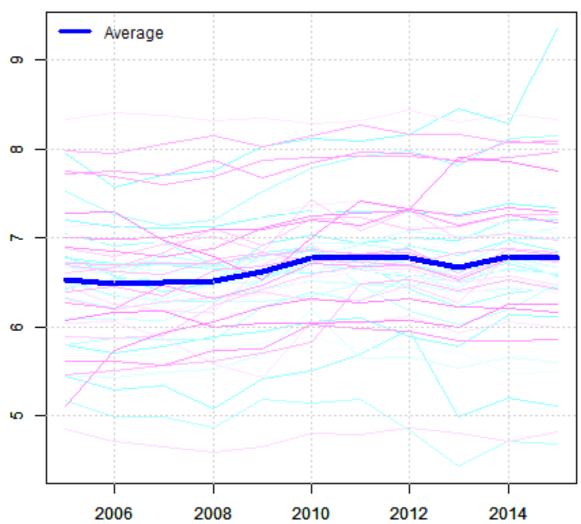
Figure 2: The Economic Freedom of North America index for the United States (2005–15)



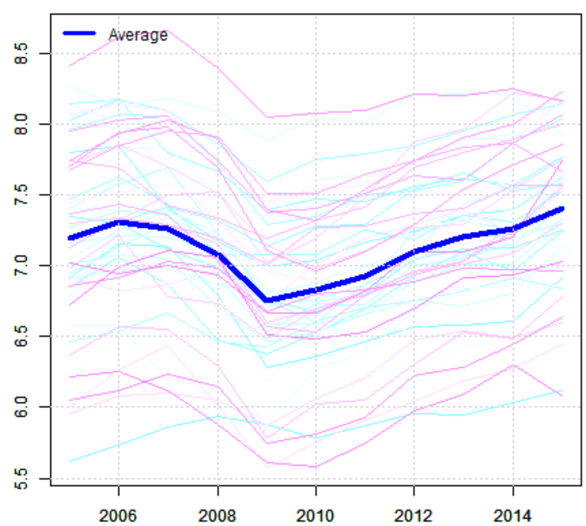
(a) Total Economic Freedom



(b) Government Spending



(c) Taxes



(d) Regulation

Notes: The solid bold line represents the annual average of all fifty US states.

3.3 Control Variables

There is no strong consensus in the broader literature about which control variables should be accounted for when determining the relationship between economic freedom and entrepreneurship. Several economic-freedom studies control for various measures of migration, inequality, cultural diversity, political economy, and demographic features such as the racial makeup of a community. Based on these studies, we collected variables from the American Community Survey aggregated at the state level from 2005 to 2015 that represent dozens of the controls selected in the previous literature. In addition to the census data, we further expand our set of control variables to include state congressional-political-party affiliation, unemployment rate, population, gross state product, percent of low-income uninsured children, personal income, worker compensation, and poverty rates. These variables were retrieved from the national-welfare data provided through the University of Kentucky Center for Poverty Research (UKCPR, 2018).

4 Model and Estimation Strategy

We model startups' decision of whether to wait, watch, or decide to start entrepreneurial activities by assuming that economic freedom affects entrepreneurial startup decisions with a lag. We use two general models. The first is a simple regression of startup rates on the lag of the economic-freedom index:

$$Startup_{it} = c + \alpha EF_{it} + \epsilon_{it} \tag{1}$$

The second is an extension of the previous regression to include state- and year-level fixed effects:

$$Startup_{it} = \alpha EF_{it} + \delta_i + \gamma_t + \epsilon_{it} \tag{2}$$

Next, we control for lagged-period confounders:

$$Startup_{it} = \alpha EF_{it-1} + Z'_{it-1}\beta + \delta_i + \gamma_t + \epsilon_{it} \tag{3}$$

In all these equations, $Startup_{it}$ is the startup density for a given state and time period. i is an index of states, t indexes time, δ_i consists of controls for time-invariant state-specific unobservable characteristics, γ_t consists of time-specific effects that control for any aggregated trends, Z_{it} represents a vector of control variables that account for time-varying confounding state-level factors, and EF_{it} is a measure of economic freedom.

This study relies on observational data to estimate the effect of a non-randomly-assigned treatment variable (economic freedom) on an outcome variable (startup density). In general, economic theory and intuition guide variable selections. However, as researchers, we do not observe the exact data-generating process. Failure to adequately control for relevant variables can lead to omitted variable bias and endogeneity. However, overcontrolling leads to a loss of estimation efficiency. A standard strategy is to report the estimates ad hoc, implement different sets of controls, and show that the treatment effects are indifferent to changes in controls.

We use Z_{it}, a much richer set of control variables and LASSO[6] for variable selection. In the simplest form, LASSO is a basic ordinary least squares (OLS) regression that penalizes a regression model's variables the closer its coefficients are to zero (in absolute terms). This means that LASSO drops the variables whose coefficients are closer to zero and selects the remaining variables. Note that before performing the LASSO, the variables must be standardized such that variable selection does not depend on the measurement scale. However, LASSO alone is just a predictive method and must be adjusted to make plausibly causal inferences. Hence, we implement the Belloni et al. (2014) post-double-selection LASSO estimator. Nowak and Smith (2017), Hall et al. (2020), and Shakya et al. (2020) use this estimator.

The post-double-selection LASSO method comprises three steps. We first use LASSO to estimate the sparse parameter from our high-dimensional linear model containing the list of potential control variables. LASSO simultaneously performs model selection and coefficient estimation by minimizing the sum of squared residuals while including a penalty term, which penalizes based on the sum of absolute values of the coefficients. From this first step, we select a set of predictors that predict the outcome variable. In the second step,

[6] The Least Absolute Shrinkage and Selection Operator (LASSO) is an appealing method to estimate the sparse parameter from a high-dimensional linear model. It was introduced by Frank and Friedman (1993) and Tibshirani (1996). LASSO simultaneously performs model selection and coefficient estimation by minimizing the sum of squared residuals plus a penalty term. The penalty term penalizes the size of the model through the sum of absolute values of coefficients. Consider the following linear model, $\tilde{y}_i = \Theta_i\beta_1 + \varepsilon_i$, where Θ comprises high-dimensional covariates, the LASSO estimator is defined as the solution to $\min_{\beta_1\in\mathbb{R}^p} E_n\left[(\tilde{y}_i - \Theta_i\beta_1)^2\right] + \frac{\lambda}{n}\|\beta_1\|_1$, the penalty level λ is a tuning parameter to regularize the degree of penalization and to guard against overfitting. The cross-validation technique chooses the best λ in prediction models and $\|\beta\|_1 = \sum_{j=1}^{p}|\beta_j|$. The kinked nature of the penalty function induces $\hat{\beta}$ to have many zeros; thus the LASSO is feasible for model selection.

we use the LASSO method for our variable of interest and possible control variables to determine the set of predictors for the variable of interest. Finally, we conduct an OLS regression on the outcome variable and variables of interest using the union of the regressor sets from the two LASSO models. We then correct the inference with heteroskedastic robust OLS standard errors to yield a plausibly causal interpretation between our economic-freedom and startup densities.

5 Results

Table 1 presents the naive-OLS, fixed-effects (FE), and post-double-selection LASSO (PDSL) estimates of the effects of government spending, taxes, regulation, and overall economic freedom on startup density. Table 2 further disaggregates the indices into their subcomponents. For each model, the PDSL selects from among the thirty-eight different variables listed in appendix A1. The FE and PDSL models include state and year fixed effects. The standard errors are clustered at the state level and robust to heteroskedasticity.

Table 1: Impact of freedom in government spending on startup density

	Startup Density		
	Naive	FE	PDSL
	(1)	(2)	(3)
Government spending	5.403^{***}	2.498^{**}	-2.983^{***}
	(0.931)	(1.039)	(1.039)
Constant	46.635^{***}		
	(6.223)		
Observations	500	500	500
R^2	0.080	0.939	0.965
Adjusted R^2	0.079	0.931	0.959

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Naive, FE, and PDSL represents naive-OLS, fixed-effects, and post-double-selection LASSO models.

The first three columns of Table 1 show the effects of a one-year lag of government spending on the proportion of newly established employer businesses relative to the total employer-business population. In the naive-OLS and FE models, increases in the freedom of government spending increase the density of startups within a state. These models do not include any additional controls beyond state and year fixed effects. The relationships in the naive-OLS and FE models are similar to those found in the literature, but these models do not control for potential confounding variables. For each component and subcomponent of economic freedom, we analyze one variable at a time to avoid potential multicollinearity.[7]

Table 1, column 3 expands this definition to include controls selected through the PDSL method. When these controls are included in the model, we observe that the direction of our effect shifts from positive to negative, suggesting that increases in government spending in the previous period are associated with a reduction in startup density within a state. There are many possible reasons for this, such as the possibility that states with more economic freedom have a higher concentration of long-lasting high-productivity entrepreneurial projects (Haltiwanger et al., 2010) which decrease the percentage of startups under one year old. Another potential argument is that government spending in these areas reduces the need for necessity entrepreneurship. Individuals conduct venture projects as a form of employment and survival rather than as a source of engagement in new opportunities and innovation (Zheng and Musteen, 2018; Rodrigues and Teixeira, 2021).

Table 2 shows that the only significant underlying effect of freedom in government spending is that insurance and retirement payments (as a percentage of income) reduce next-period startup density. An

[7]Not including confounders (common cause variable) between treatment (economic freedom) and outcome (startup density) in the regression leads to a biased relationship or specifically endogeneity due to failure to control from observable confounders. However, not including controls (which only affect the treatment variable or only affect the outcome variable) does not lead to biased estimates but leads to higher standard errors of the estimates (Pearl, 2009).

Table 2: Impact of subcomponents of freedom in government spending on startup density

	Startup Density		
	(1)	(2)	(3)
Subcomponents of government spending			
General consumption expenditures	−0.988		
by government as a percentage of income	(0.767)		
Transfers and subsidies		−0.700	
as a percentage of income		(0.535)	
Insurance and retirement payments			-1.656^{***}
as a percentage of income			(0.638)
Observations	500	500	500
R^2	0.963	0.960	0.964
Adjusted R^2	0.956	0.953	0.958

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Estimates are based on post-double-selection LASSO.

increase in this measure means that less income is going to insurance and retirement payments, and more is being used for other direct government expenditures. We do not observe significant effects of general consumption expenditures or transfers and subsidies. This implies that policy makers who want to prioritize startup density should not increase funding for state pensions and other retirement programs. This makes intuitive sense, as self-employed individuals and small-business owners are exempt from participation in these programs but benefit from other community expenditures.

Table 3: Impact of freedom in taxes on startup density

	Startup Density		
	Naive	FE	PDSL
	(1)	(2)	(3)
Taxes	0.780	-4.802^{***}	-5.342^{***}
	(0.984)	(1.171)	(1.115)
Constant	78.448^{***}		
	(6.558)		
Observations	500	500	500
R^2	0.001	0.941	0.963
Adjusted R^2	−0.001	0.933	0.956

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Naive, FE, and PDSL represents naive-OLS, fixed-effects, and post-double-selection LASSO models.

The second component, taxes, is presented in Table 3. In the naive-OLS model, lagged freedom in taxes leads to higher startup density, though this effect is insignificant. When additional FEs or additional controls using the PDSL are incorporated, the direction of the effect changes and increased freedom in taxes in the lagged period leads to a significant decrease in startup density in future periods. The literature finds that economic freedom leads to more net venture creation. Our results imply that this increase is merely a small percentage of the overall firms within a state (Barnatchez and Lester, 2016).

When analyzing the subcomponents of the tax indices in Table 4, we observe that the overall negative effect of tax freedom on startup density is driven by income and payroll taxes as a percentage of income and by sales tax revenue as a percentage of income. This means that as income, payroll, and sales tax revenues rise in a state, the concentration of new employer startups under one year of age falls compared to the set of existing businesses. Lower startup density indicates not that something is inherently wrong but that more firms are surviving beyond their first year.

The final component of economic freedom is regulation. This index comprises three subcomponents affecting labor markets: minimum wage legislation, government employment as a percentage of total em-

Table 4: Impact of subcomponents of freedom in taxes on startup density

	Startup Density			
	(1)	(2)	(3)	(4)
Subcomponents of taxes				
Income and payroll tax revenue	-1.935^{***}			
as a percentage of income	(0.524)			
Top marginal		-0.810		
income tax rate		(0.498)		
Property tax and other taxes			-0.264	
as a percentage of income			(0.789)	
Sales tax revenue				-3.152^{***}
as a percentage of income				(0.602)
Observations	500	500	500	500
R^2	0.962	0.963	0.962	0.963
Adjusted R^2	0.955	0.956	0.955	0.956

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Estimates are based on post-double-selection LASSO.

ployment, and union density. Across the OLS, FE, and PDSL results presented in Table 5, the effect of lagged regulatory freedom on startup density is significant and positive. This effect is primarily driven by minimum wage legislation and government employment rates, not union density (Table 6).

Table 5: Impact of freedom in labor regulation on startup density

	Startup Density		
	Naive	FE	PDSL
	(1)	(2)	(3)
Labor regulation	6.922^{***}	13.523^{***}	7.551^{***}
	(1.461)	(1.775)	(1.333)
Constant	34.528^{***}		
	(10.175)		
Observations	500	500	500
R^2	0.051	0.950	0.967
Adjusted R^2	0.049	0.944	0.961

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Naive, FE, and PDSL represents naive-OLS, fixed-effects, and post-double-selection LASSO models.

While the decreases in the previous measures imply that the number of new startups is low relative to the number of mature ventures, this result implies that the number of new startups is high relative to the number of mature ventures. Expanded government employment as a percentage of total state employment restricts individuals' and organizations' ability to freely contract for labor (Stansel et al., 2017). Likewise, high minimum wages curtail employees and employers' ability to negotiate contracts (Stansel et al., 2019). In particular, they limit the ability of low-skilled workers and new entrants in the workforce to negotiate for employment they might otherwise accept and thus restrict these workers' economic freedom and the employers who might have hired them (Stansel et al., 2017).

The overall economic-freedom index in Table 7 reflects the effect of increases in economic freedom when including all of our subcomponent measures. In the OLS and FE models, we find results similar to those for our subcomponents: increases in freedom are correlated with higher state-level startup density. These results do not account for underlying confounders or potential heterogeneity. We again allow the model to select the relevant control variables using our PDSL method to address these possibilities. We find that the magnitude and direction of the effect changes. In the aggregate, increases in economic freedom cause a reduction in startup density in the next period. This is not an indication of reduced startups (the previous literature has found an increase in net job creation). It is instead a testament to the survival of firms past

Table 6: Impact of subcomponents of freedom in labor market regulation on startup density

	Startup Density		
	(1)	(2)	(3)
Subcomponents of labor market regulation			
Minimum wage	2.677***		
legislation	(0.745)		
Government employment		4.262***	
as a percentage of total state employment		(0.884)	
Union			0.383
density			(0.796)
Observations	500	500	500
R^2	0.962	0.964	0.964
Adjusted R^2	0.955	0.957	0.957

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity. Estimates are based on post-double-selection LASSO.

their first year. This is crucial for policy makers for two reasons. First, it alerts them to the existence of subcomponents that may have additional effects on the density of startups within a state. Second, these results show that policy makers should not be disheartened by a policy change's effect of reducing startups.

Table 7: Impact of economic freedom on startup density

	Startup Density		
	Naive	FE	PDSL
	(1)	(2)	(3)
Economic freedom	7.430***	6.250***	−3.869**
	(1.483)	(2.011)	(1.957)
Constant	32.658***		
	(9.994)		
Observations	500	500	500
R^2	0.058	0.940	0.965
Adjusted R^2	0.056	0.932	0.958

Notes: The 1%, 5%, and 10% levels of significance are denoted ***, **, and * respectively. The standard errors are clustered at the state level and robust to heteroskedasticity.

6 Conclusion

Startup density is the rate of new entrepreneurial ventures compared to the overall population of businesses within a state. Policy makers who want to encourage entrepreneurship have control over the institutional framework and economic freedom, which can have drastic long-term implications for firms' success and growth. But the research that policy makers rely on may derive inaccurate results because the observational nature of the data means that it is unable to make plausibly causal arguments. Using the Kauffman Startup Activities Index and the Economic Freedom of North America index, we use a post-double-selection LASSO method to select control variables that allow us to tease out the causal link between government spending, taxation, and regulation in one period and startup density in the next.

Once we block spurious correlation, the results show that increases in freedom of government spending and taxes are associated with decreases in a state's startup density. In the subcomponent analysis, we attribute this relationship more specifically to government spending on insurance and retirement payments (as a percentage of income) and income, payroll, and sales tax revenues. These results provide insight into why some states see net new venture creation while the average firm age increases because startup density falls relative to existing firms. Regulation has an opposing effect: increases in labor-market regulatory freedom are associated with increases in startup density, a result driven by minimum wage legislation and government employment. When considering a combined index of these subcomponents, the overall effect is that increases in economic freedom lead to decreases in startup density.

Our study makes two contributions to the literature. First, it develops a replicable method of addressing the causal links between measures of economic freedom and entrepreneurship. This is important because, as is evident in the flipped signs in many of our results, not addressing spurious correlations may be biasing results and policy recommendations. Second, we provide new insight about startup density within states using a novel dataset, Kauffman Startup Activities Index. Our work complements previous research and may explain why business growth is not always reflected in an increase in startup density: a higher percentage of ventures survive past the first year. Our research is subject to several limitations. First, the estimates can be interpreted as causal if and only if (a) there are neither unobservable confounders nor reverse causality from startup density to other institutional-quality variables and (b) any potential confounding effects are adequately addressed by properly selecting the confounders. Second, we do not address the distribution of firm maturities within each state, nor do we directly measure firms' longevity. Finally, we do not directly measure net job creation; instead, we rely on the previous literature for insight and rationale.

References

Acs, Z. J., E. Stam, D. Audretsch, and A. O'Connor (2017). The Lineages of the Entrepreneurial Ecosystem Approach. *Small Business Economics 49*(1), 1–10.

Ali, A. M. and W. M. Crain (2002). Institutional Distortions, Economic Freedom, and Growth. *Cato Journal 21*(3), 415–426.

Apergis, N., O. Dincer, and J. Payne (2014). Economic Freedom and Income Inequality Revisited: Evidence from a Panel Error Correction Model. *Contemporary Economic Policy 32*(1), 67–75.

Ashby, N. J. (2007). Economic Freedom and Migration Between U.S. States. *Southern Economic Journal 73*(3), 677–697.

Ashby, N. J. and R. S. Sobel (2008). Income Inequality and Economic Freedom in the U.S. States. *Public Choice 134*(3), 329–346.

Barnatchez, K. and R. Lester (2016). The Relationship Between Economic Freedom and Economic Dynamism. *Contemporary Economic Policy 35*(2), 1–15.

Belloni, A., V. Chernozhukov, and C. Hansen (2014). High-Dimensional Methods and Inference on Structural and Treatment Effects. *Journal of Economic Perspectives 28*(2), 29–50.

Bennett, D. L. (2019). Local Economic Freedom and Creative Destruction in America. *Small Business Economics Forthcoming*, Available ahead of print. Forthcoming, Ahead of Print.

Bennett, D. L. and B. Nikolaev (2017). Economic Freedom & Happiness Inequality: Friends or Foes? *Contemporary Economic Policy 35*(2), 373–391.

Bjørnskov, C. (2017). Growth, Inequality, and Economic Freedom: Evidence From the U.S. States. *Contemporary Economic Policy 35*(3), 518–531.

Campbell, N., D. T. Mitchell, and T. M. Rogers (2013). Multiple Measures of US Entrepreneurial Activity and Classical Liberal Institutions. *Journal of Entrepreneurship and Public Policy 2*(1), 4–20.

Campbell, N. D. and T. M. Rogers (2007). Economic Freedom and Net Business Formation. *Cato Journal 27*(1), 23–36.

Carree, M. A. and A. R. Thurik (2003). The Impact of Entrepreneurship on Economic Growth. In *Handbook of Entrepreneurship Research*, pp. 557–594. Springer.

Cole, J. H. (2003). The Contribution of Economic Freedom to World Economic Growth, 1980-99. *Cato Journal 23*(2), 189–198.

Cumming, D. and D. Li (2013). Public Policy, Entrepreneurship, and Venture Capital in the United States. *Journal of Corporate Finance 23*, 345–367.

de Haan, J. and J.-E. Sturm (2000). On the Relationship Between Economic Freedom and Economic Growth. *European Journal of Political Economy 16*(2), 215–241.

Fairlie, R., A. Morelix, and I. Tareque (2017). 2017 The Kauffman Index Startup Activity: State Trends. Technical report, Ewing Marion Kauffman Foundation, Kansas City, Missouri.

Frank, L. E. and J. H. Friedman (1993). A Statistical View of Some Chemometrics Regression Tools. *Technometrics 35*(2), 109–135.

Gohmann, S. F., B. K. Hobbs, and M. McCrickard (2008). Economic Freedom and Service Industry Growth in the United States. *Entrepreneurship Theory and Practice 32*(5), 855–875.

Gwartney, J., R. Lawson, and W. Block (1996). Economic Freedom of the World: 1975-1995. Technical report, Fraser Institute, Vancouver, British Columbia, Canada.

Gwartney, J., R. Lawson, J. Hall, and R. Murphy (2019). 2019 Annual Report Economic Freedom of the World. Technical report, Fraser Institute, Vancouver, British Columbia, Canada.

Hall, J., K. Harger, and D. Stansel (2015). Economic Freedom and Recidivism: Evidence from US States. *International Advances in Economic Research 21*, 155–165.

Hall, J. C., B. R. Humphreys, and J. E. Ruseski (2018). Economic Freedom, Race, and Health Disparities: Evidence from US States. *Public Finance Review 46*(2), 276–300.

Hall, J. C. and R. A. Lawson (2014). Economic Freedom of the World: An Accounting of the Literature. *Contemporary Economic Policy 32*(1), 1–19.

Hall, J. C., A. R. Scarcioffolo, and S. Shakya (2020). The Political Economy of Vermont's Anti-fracking Movement. *Journal of Public Finance and Public Choice*, 1–20.

Hall, J. C. and R. S. Sobel (2008). Institutions, Entrepreneurship, and Regional Differences in Economic Growth. *Southern Journal of Entrepreneurship 1*(1), 69–96.

Haltiwanger, J., R. Jarmin, and C. J. Krizan (2010). Mom-and-Pop meet Big Box: Compliments or Substitutes? *Journal of Urban Economics 67*(1), 116–134.

Heckelman, J. C. (2000). Economic Freedom and Economic Growth: A Short-Run Causal Investigation. *Journal of Applied Economics 3*(1), 71–91.

Karabegovic, A., F. McMahon, D. Samida, and C. M. Schlegel (2003). North American Economic Freedom: An Index of Ten Canadian Providences and 50 U.S. States. *European Journal of Political Economy 19*(3), 431–452.

Kibly, P. (1971). *Entrepreneurship and Economic Development*. New York: Free Press.

Kirzner, I. M. (1997). Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature 35*, 60–85.

Kreft, S. F. and R. F. Sobel (2005). Public Policy, Entrepreneurship, and Economic Freedom. *Cato Journal 25*, 595–616.

Kuckertz, A., E. S. C. Berger, and A. Mpeqa (2016). The More the Merrier? Economic Freedom and Entrepreneurship. *Journal of Business Research 69*(4), 1288–1293.

Morelix, A., R. W. Fairlie, J. Russell-Fritch, and E. J. Reedy (2015). 2015 The Kauffman Index Startup Activity: State Trends. Technical report, Ewing Marion Kauffman Foundation, Kansas City, Missouri.

Mulholland, S. E. and R. Hernández-Julian (2013). Does Economic Freedom Lead to Selective Migration by Education? *Journal of Regional Analysis and Policy 43*(1), 65–87.

Murphy, R. H. (2020). The Quality of Legal Systems and Property Rights by State: A Ranking and Their Implications for Economic Freedom. *Journal of Regional Analysis and Policy 50*(1), 29–45.

Nikolaev, B., C. Boudreaux, and L. Palich (2018). Cross-Country Determinants of Early Stage Necessity and Opportunity-Motivated Entrepreneurship: Accounting for Model Uncertainty. *Journal of Small Business Management 56*(S1), 243–280.

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.

North, D. C. (2010). *Understanding the Process of Economic Change*. Princeton, NJ: Princeton University Press.

Nowak, A. and P. Smith (2017). Textual Analysis in Real Estate. *Journal of Applied Econometrics 32*(4), 896–918.

Parker, S. C. (2009). *The Economics of Entrepreneurship*. Cambridge, UK: Cambridge University Press.

Pearl, J. (2009). *Causality: Models, Reasoning, and Inference*. Cambridge University Press.

Pérez-Moreno, S. and M. J. Angulo-Guerrero (2016). Does Economic Freedom Increase Income Inequality? Evidence from the EU Countries. *Journal of Economic Policy Reform 19*(4), 327–347.

Powell, B. (2003). Economic Freedom and Growth: The Case of the Celtic Tiger. *Cato Journal 22*(3), 431–448.

Powell, B. and R. Weber (2013). Economic Freedom and Entrepreneurship: A Panel Study of the United States. *American Journal of Entrepreneurship 6*(1), 67–87.

Rodrigues, D. and A. Teixeira (2021). Opportunity and Necessity Entrepreneurship and Economic Growth:

The Moderating Effect of Human Capital. *Journal of Developmental Entrepreneurship Available ahead of print*.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy 94*(5), 1002–1037.

Saunoris, J. W. and A. Sajny (2017). Entrepreneurship and Economic Freedom: Cross-Country Evidence from Formal and Informal Sectors. *Entrepreneurship & Regional Development 29*(3-4), 292–316.

Schumpeter, J. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Cambridge, MA: Harvard University Press.

Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy*. New York City, NY: Harper & Bros.

Shakya, S., E. Erfanian, and A. Scarcioffolo (2020). The Political Economy of Vermont's Abortion Bill. *Applied Economics Letters 0*(0), 1–5.

Shumway, J. M. (2018). Economic Freedom, Migration and Income Change among U.S. Metropolitan Areas. *Current Urban Studies 6*(1), 1–20.

Sobel, R. S. (2008). Testing Baumol: Institutional Quality and the Productivity of Entrepreneurship. *Journal of Business Venturing 23*(6), 641–655.

Sobel, R. S., N. Dutta, and S. Roy (2010). Does Cultural Diversity Increase the Rate of Entrepreneurship? *Review of Austrian Economics 23*(3), 269–286.

Stansel, D. (2013). An Economic Freedom Index for U.S. Metropolitan Areas. *Journal of Regional Analysis and Policy 43*(1), 3–20.

Stansel, D., J. Torra, and F. McMahon (2017). Economic Freedom of North America 2017. Technical report, Fraser Institute, Vancouver, British Columbia, Canada.

Stansel, D., J. Torra, and F. McMahon (2019). Economic Freedom of North America 2019. Technical report, Fraser Institute, Vancouver, British Columbia, Canada.

Stansel, D. and M. P. Tuszynski (2017). Sub-National Economic Freedom: A Review and Analysis of the Literature. *Journal of Regional Analysis and Policy 48*(1), 61–71.

Tibshirani, R. (1996). Regression Selection and Shrinkage via the Lasso. *Journal of the Royal Statistical Society Series B 58*(1), 267–288.

UKCPR (2018). UKCPR National Welfare Data 1980-2018. Technical report, University of Kentucky Center for Poverty Research, Lexington, KY.

Wagner, G. A. and J. Bologna Pavlik (2020). Patent Intensity and Concentration: The Effect of Institutional Quality on MSA Patent Activity. *Papers in Regional Science 99*(4), 1–42.

Webster, A. L. (2013). The Relationship Between Economic Freedom and Income Inequality in the United States. *International Business & Economic Research Journal 12*(5), 469–476.

Wennekers, S. and R. Thurik (1999). Linking Entrepreneurship and Economic Growth. *Small Business Economics 13*, 27–56.

Wiseman, T. and A. T. Young (2013). Economic Freedom, Entrepreneurship, and Income Levels Some State-Level Empirics. *American Journal of Entrepreneurship 6*(1), 100–119.

Xue, J. and P. G. Klein (2010). Regional Determinants of Technology Entrepreneurship. *International Journal Entrepreneurial Venturing 1*(3), 291–308.

Zheng, C. and M. Musteen (2018). The Impact of Remittances of Opportunity-Based and Necessity-Based Entrepreneurial Activities. *Academy of Entrepreneurship Journal 24*(3), 1–13.

A Appendix A

Table A1: List of Potential Control Variables for PDSL Variable Selection

SN	Variables	Sources
1	Net	US CB
2	Unemployment rate	UKCPR
3	Percent low income unisured children	UKCPR
4	Poverty rate	UKCPR
5	PCGSP	UKCPR
6	PCPI	UKCPR
7	PCWC	UKCPR
8	Percent bedrooms 5 or more bedrooms	US CB
9	Percent bedrooms no bedroom	US CB
10	Percent class of worker private wage and salary workers	US CB
11	Percent class of worker unpaid family workers	US CB
12	Percent commuting to work public transportation excluding taxicab	US CB
13	Percent commuting to work walked	US CB
14	Percent educational attainment 9th to 12th grade no diploma	US CB
15	Percent educational attainment associates degree	US CB
16	Percent educational attainment bachelors degree	US CB
17	Percent educational attainment graduate or professional degree	US CB
18	Percent educational attainment high school graduate includes equivalency	US CB
19	Percent educational attainment less than 9th grade	US CB
20	Percent educational attainment some college no degree	US CB
21	Percent housing occupancy occupied housing units	US CB
22	Percent housing tenure renter occupied	US CB
23	Percent industry agriculture forestry fishing and hunting and mining	US CB
24	Percent industry arts entertainment and recreation and accommodation and food services	US CB
25	Percent industry construction	US CB
26	Percent industry educational services and healthcare and social assistance	US CB
27	Percent industry finance and insurance and real estate and rental and leasing	US CB
28	Percent industry information	US CB
29	Percent industry manufacturing	US CB
30	Percent industry other services except public administration	US CB
31	Percent industry professional scientific and management and administrative and waste management services	US CB
32	Percent industry public administration	US CB
33	Percent industry retail trade	US CB
34	Percent industry transportation and warehousing and utilities	US CB
35	Percent industry wholesale trade	US CB
36	Percent occupants per room 151 or more	US CB
37	Percent place of birth foreign born	US CB
38	Percent residence 1 year ago different house in the us different county same state	US CB

Notes: US CB represents United States Census Bureau, UKCPR represents the National Welfare data provided from the University of Kentucky Center for Poverty.