Regional Institutional Quality and Startup Activities in the United States*

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Abstract

The decision to start an entrepreneurial activity can largely depend upon the institutional settings in which an entrepreneur resides. Economic freedom is a widely measured index for institutional context and quality. Ample studies find a positive association between economic freedom and entrepreneurship; however, these studies have been limited to correlative relationships and have not determined a consistent set of relevant covariates. In this paper, startup density, provided by the Kauffman Index of Startup Activities, proxies startup entrepreneurship, while the Economic Freedom of North America (EFNA) index represents economic freedom. This paper provides causal insights into economic freedom and entrepreneurship in the US from 2005 to 2015 using a double-selection post-LASSO method and interactive fixed-effect models. We find that increases in labor market freedom are likely to cause significant increases in startup density of entrepreneurial activities. In contrast, increases in government and tax freedoms caused insignificant or weak decreases in startup density.

Keywords: economic freedom, entrepreneurship, model selection
JEL Classification: H70, H73, K20

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1 Introduction

Economic freedom within a state is a critical institutional component within the decision to start entrepreneurial activities, as it reduces uncertainty and risk for aspiring entrepreneurs (Ali and Crain, 2002; Cole, 2003; McMullen et al., 2008; North, 2010). Economic freedom measures the extent to which a market economy allows for the unregulated voluntary exchange of goods and services and protection of property (Gwartney and Lawson, 2002). For entrepreneurs, this economic freedom represents the ability for individuals to act upon the opportunity and, in turn, incentivizes the creation of value and ideas (Powell and Weber, 2013; Hall and Lawson, 2014). Within this study, we determine the causal effect of economic freedom on startup entrepreneurial activities within the United States.

Many studies analyze the correlative relationship between economic freedom and startup entrepreneurial activities (Bjørnskov and Foss, 2008; Campbell and Rogers, 2007; Díaz-Casero et al., 2012; Hall et al., 2012; Powell and Weber, 2013). Correlative relationships are useful but must be placed under scrutiny as these results may be spurious, resulting from three primary sources. First, economic freedom is not randomly assigned. Second, there may be observable and unobservable confounding factors that could affect both economic freedom and entrepreneurship. Finally, there may be reverse causality from entrepreneurship to economic freedom.

The purpose of this study is to identify the causal relationship between measures of economic freedom and startup density. Ideally, to elicit a causal effect of a relationship, the supreme framework would be a random assignment design. In our case, the economic freedom of states is not feasible to assign randomly. Therefore we must rely on disentangling the effect of economic freedom on startup entrepreneurial activities using observational studies employing various correction methods for endogeneity from omitted variable bias, unobservable confounding factors, and reverse causality.

We utilize a double-selection post-LASSO to select confounding observables and covariates from a high dimensional panel dataset from 2005 and 2015. We also employ the interactive fixed-effect (IFE) model to explicitly control for the nationwide time trends in startup density to which different states are either more or less susceptible, depending on the unobservable characteristics of those states. Furthermore, to block the reverse causality, we assume that state-level startup entrepreneurial activities do not change states' economic freedom. We have elaborated on the plausibility of this assumption later in the section. Our methodology improves on the current literature by eliciting the directional effects of economic freedom on a measure of entrepreneurship and contributes a framework for covariate selection in a literature that has not developed a consensus of relevant attributes.

We find that a one-unit increase in labor market freedoms results in a four-unit increase in startup density within a state. These results are highly significant. Conversely, we find that increases in gov-

ernment or tax freedoms have insignificant or weakly significant negative effects on startup density. These results imply two main results for policymakers. First, when determining the impact of policy on entrepreneurship, it is crucial to select the correct observable characteristics to understand the entrepreneurial environment. Second, when designing targeted policy for improving startup density in an area, increases in labor market freedom are more likely to incentivize and grow entrepreneurship activities than relative changes in government or tax freedoms.

The paper proceeds as follows: Section 2 reviews the relevant literature. Section 3 discusses the data sources. Section 4 extends the empirical methodology to incorporate estimation assumptions, a double-selection post-LASSO correction, and interactive fixed-effect models. Section 5 presents the results. Section 6 discusses and concludes.

2 Literature Review

Entrepreneurship fosters job creation, expands employment opportunities, and establishes pathways for economic development (Kibly, 1971; Kirzner, 1997; North, 1990; Schumpeter, 1934), economic growth (Carree and Thurik, 2003; Romer, 1986; Wennekers and Thurik, 1999), and capitalism (Baumol, 1996; Bjørnskov and Foss, 2008). Not all environments promote productive entrepreneurial growth and can limit the success of entrepreneurs (Parker, 2009; Acs et al., 2017). The institutional framework and environment in which these entrepreneurs exist can have longstanding impacts on the success of venture creation and survival (North, 1990). A robust measure for institutional environment is the components of economic freedom- government spending, taxes, and labor regulations (Nikolaev et al., 2018).

Economic Freedom has been used to understand how institutional quality affects a wide variety of phenomenon, including: economic growth (Ali and Crain, 2002; Cole, 2003; de Haan and Sturm, 2000; Gohmann et al., 2008; Hall et al., 2018; Heckelman, 2000; Powell, 2003), migration (Ashby, 2007; Hall and Lawson, 2014; Mulholland and Hernández-Julian, 2013; Shumway, 2018), inequality (Apergis et al., 2014; Ashby and Sobel, 2008; Bennett and Nikolaev, 2017; Bjørnskov, 2017; Pérez-Moreno and Angulo-Guerrero, 2016; Webster, 2013), cultural diversity (Sobel et al., 2010), political economy (Hall et al., 2015), and demographic features (Deskins and Ross, 2016; Hall et al., 2018; Hoover et al., 2018). The effects of economic freedom vary depending on the stage of the economy (Kuckertz et al., 2015). For example, in a cross-country evaluation, Saunoris and Sajny (2017) find that the returns from economic freedom are most widespread in countries with higher prevalence of both formal and informal entrepreneurship. These measures of institutional quality are correlated with the success of venture capital investment, patents, growth of sole proprietorships, as well as firm birth and destruction (Sobel, 2008). Economic Freedom gives entrepreneurs the ability to employ resources productively, decreasing the prevalence of

unproductive entrepreneurial ventures (Sobel, 2008; DiLorenzo, 2005; North, 2010; Schumpeter, 1942).

The Economic Freedom North America (EFNA) dataset provided through the Fraser Institute depicts standardized measures of economic freedom in terms of government spending, taxation, and labor relations across the United States, Canada, and Mexico. Stansel and Tuszynski (2017) provide an overview of 235 studies that have used the EFNA as a measure of institutional quality and observe that nearly all empirical studies have found positive outcomes of having more economic freedom.

Economic Freedom measures have been used in a variety of entrepreneurship studies to determine if institutional quality determines successful entrepreneurship (Bjørnskov and Foss, 2008; Campbell and Rogers, 2007; Díaz-Casero et al., 2012; Hall et al., 2012; Powell and Weber, 2013). For example, Campbell et al. (2012) limits the scope of these relationships to determine if economic freedom can be linked in firm deaths and find some interesting yet conflicting results. They determine that some policies lead to a greater number of deaths than others, such as the state spending more on current consumption or spending a larger percentage of income on social security transfers. These economic freedom measures often differ regionally, and robustness of entrepreneurship predictions require subnational analysis (Campbell et al., 2013; Sobel and Hall, 2008; Wiseman and Young, 2011).

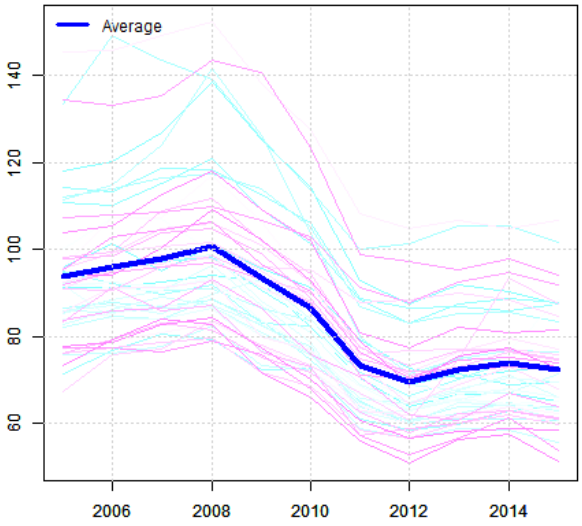
In this study, we analyze if institutional quality at the state-level, as proxied by the EFNA measures of economic freedom, can cause an increase in the birth of new entrepreneurial activities. Cumming and Li (2013) comes the closest to this question by disaggregating the EFNA to determine the effect of state public policy on new firm births and finds that labor market freedom is positively associated with firm creation. Bennett (2019) expands upon this question and analyzes the positive effect of economic freedom in reducing barriers for firm creation in one of the first studies in local economic freedom and dynamism. In 2020, Bennett broadens the analysis of metropolitan economic freedom into underlying indicators to determine the impact of local-level freedom on entry and exit of firms which motivates our evaluation of the subset measures of economic freedom. Though there are substantial studies such as these that look at the correlative impact of economic freedom and institutional quality on the entry behavior of entrepreneurs, the literature has yet to develop a causal relationship. We attempt to circumvent these limitations by utilizing a high dimensionality panel data approach to isolate direct causal effects on state-level entrepreneurial firm birth in the United States.

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 employer businesses (less than one-year-old) that employ at least one worker relative to the total employer business population. This data was acquired from the Kauffman Index of Entrepreneurship (KIEA)[1]. Though KIEA data exists for each state since 1996, limitations in covariate data required us to limit our sample from 2005 to 2015. Figure (1) depicts the state-level start-up density and average start-up density across states from 2005 to 2015.

Figure 1: Startup-density, (2005-2015)



Notes: The startup-density is the number of newly established employer businesses to the total employer business population (in 1,000s).

We find that that startup density is a more appropriate measure of entrepreneurial activity than sole-proprietor rates, which are used in much of the previous literature. This result may exist because many sole-proprietors that do not employ workers are working contract capacity for another firm. Within this study, we want to focus on firms that actively use people and produce their 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; Tareque et al., 2017).

[1]The Kauffman Index of Entrepreneurship measures the US entrepreneurship across the national, state, and metro levels based on three in-depth studies known as the Kauffman Index of Startup Activity, the Kauffman Index of Main Street Entrepreneurship, and the Kauffman Index of Growth Entrepreneurship (Tareque 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).

3.2 Economic freedom

As a proxy for state-level institutional behavior, we utilize the index of Economic Freedom of North America (EFNA), published annually by the Fraser Institute (Stansel et al., 2017). This dataset measures the extent to which state-level policies support economic freedom and the ability of individuals 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 labor market freedom, on a relative ranking scale from 0 to 10 for each US state, with 10 representing the highest degree of economic freedom(Stansel et al., 2017). Henceforth, we will be referring to these categories as government freedom, tax freedom, and labor market freedom.

Figure (2), illustrates the overall economic freedom, government freedom, tax freedom, and labor market freedom for each state and the associated national average for 2005-2015. Panel (a) exhibits overall EFNA, a composite of government, taxes, and labor market freedom. The government freedom index plotted in panel (b), composites three other indices: General Consumption Expenditures by Government as a Percentage of Income; Transfers and Subsidies as a Percentage of Income, and Insurance and Retirement Payments as a Percentage of Income. Higher government freedom index shows larger government size and potentially less freedom for private choices.

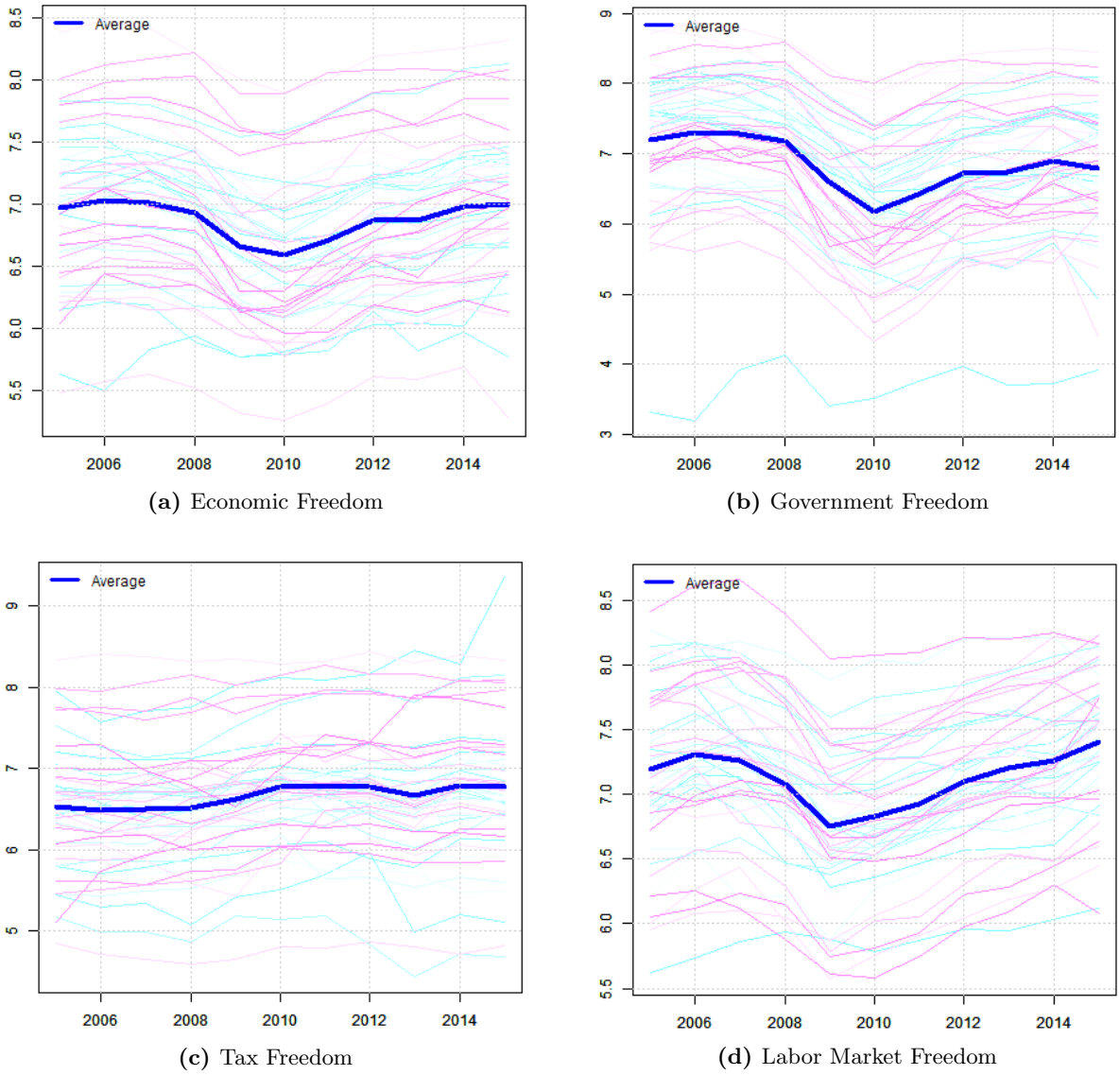
The tax freedom index in panel (c) is a composite measure of income and payroll tax revenue as a percentage of income; top marginal income tax rate and the income threshold at which it applies; property tax and other taxes as a percentage of income; and sales tax revenue as a percentage of income (Gwartney et al., 1996). All these components serve to quantify the tax burdens. The labor market freedom index 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., 2017).

3.3 Control Variables

Within the literature, there is no strong consensus on which control variables should be accounted for when determining the relationship between economic freedom, entrepreneurship, and economic growth. Several studies describe economic freedom and growth in terms 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 (ACS) aggregated to the state level from 2005 to 2015. These controls comprise of the birthplace, race, quality of life measures, poverty and inequality, economic variables, demographic features, socioeconomic demographics, and migration.

In addition to the census data, we further expand our control variables in include state congressional political party affiliation, unemployment rate, population, gross state product, percent of low-income

Figure 2: The Economic Freedom of North America for the United States, (2005-2015)



(a) Economic Freedom

(b) Government Freedom

(c) Tax Freedom

(d) Labor Market Freedom

Notes: Solid blue thick line represents annual average of all 50 US states.

uninsured children, personal income, worker compensation, and poverty rates which we retrieved from the National Welfare data provided through the University of Kentucky Center for Poverty Research (UKCPR, 2018).

The combined aggregate data consists of 58 variables (see Appendix A). We then expand to consider the squared-polynomials of all terms and possible interactions among the 58 variables. After including these additional manipulations, the covariate matrix consists of 1769 variables for 50 states from 2005 to 2015. A general panel estimation is not feasible due to the high dimensionality of the unbalanced panel data (Nebraska does not have a state senate and house). Therefore, we detail the methodology for performing estimations with high dimensional panel data to explain the power and other critical

empirical nuances.

4 Model and Estimation Strategy

We propose two different models to account for potential variations of new entrepreneur behavior. The first model assumes economic freedom contemporaneously affects start-up related outcomes after controlling for other contemporaneous cofounders. The second model instead allows start-ups to wait, watch, and decide to venture into entrepreneurial activities by assuming there is a lag for how economic freedom affects the current periods entrepreneurial start-up decisions, after controlling for lagged period cofounders.

$$y_{it} = \alpha d_{it} + Z'_{it}\beta + \delta_i + \gamma_t + \epsilon_{it} \tag{1}$$

$$y_{it} = \alpha d_{it-1} + Z'_{it-1}\beta + \delta_i + \gamma_t + \epsilon_{it} \tag{2}$$

Where y_{it} is the startup density in each state and each time. i represents an index of states, t indexes times, δ_i are controls for any time-invariant state-specific unobservable characteristics, γ_t are time-specific effects that control flexibly for any aggregated trends, Z_{it} represents a vector of control variables that account for time-varying confounding state-level factors, and d_{it} is a measure of economic freedom. For the analysis, we argue that economic freedom is exogenous relative to the entrepreneurial activities once the observables have been conditioned. The main point of this paper's departure from the standard literature is that Z_{it} allows for a much richer set of control variables and the possibility where the number of controls is greater than the numbers of observations.

The purpose of this methodology is to determine how startup density is affected by economic freedom. This study relies on observational data to estimate the effect of a non-randomly assigned treatment variable on an outcome variable. In general, economic theory and intuition guide variable selections. However, as a researcher, 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, over-controlling leads to a loss of estimation efficiency. A standard strategy is to report the estimates ad hoc, implementing different sets of controls, and show that the treatment effects are indifferent to changes in controls. Using our methodology, we attempt to understand beyond the correlative nature of freedom and entrepreneurship and instead elicit the causal relationship.

Causal interpretation relies on the belief that there are no higher-order terms of the control variables, no interaction terms, and no additional excluded variables that are associated both to the treatment variable and outcome variable. Thus, controlling a broad set of variables seems desirable to make this

assumption more plausible. However, naively controlling the redundant variables reduces the ability to distinguish the impact of the interest variable and consequently produces less precise estimates. Moreover, including and controlling for all transformations of controls may not be feasible because the covariates space can undergo high-dimensional increases, and regressions are completely infeasible when the numbers of covariates exceed the number of observations in data. In our case, we have a high-dimensional dataset with 550 observations of 58 different variables. Under the assumption of sparsity, we control for the observables using the double-selection post-LASSO method proposed by (Belloni et al., 2014).

The double-selection post-LASSO method is comprised of three steps. We first use LASSO[2] 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 for the outcome variable. In the second step, we use the LASSO methodology for our variable of interest and possible control variables to determine the set of predictors for the variable of interest. Finally, we conduct an ordinary least square 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 causal interpretation between our economic freedom measures and startup density. The results of equations (1) and (2) are later discussed in the results section.

The double-selection post-LASSO method helps to properly select observable cofounders. However, we also estimate a more conservative model, in which we assume an interactive fixed-effect (IFE) factor model as detailed in (Bai, 2009) to serve as a robustness check of our results. The inclusion of the IFE is to account for any potential non-linear geographic-specific time trends when nesting the fixed effects of state and time. The IFE factor model assumes that patterns in start-up density within states can be modeled as a function of r unobserved linear factors, F_{rt} . The factors can be thought of as nationwide nonlinear time trends in start-up density, to which different states are either more or less susceptible depending on unobservable characteristics of those states. The IFE models proceed as follows:

$$y_{it} = \alpha d_{it} + X'_{it}\beta + \delta_i + \gamma_t + \lambda_{it}F_{rt} + \epsilon_{it} \tag{3}$$

[2]The Least Absolute Shrinkage and Selection Operator (LASSO) is an appealing method to estimate the sparse parameter from a high-dimensional linear model is introduce 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 a following linear model $\tilde{y}_i = \Theta_i\beta_1 + \varepsilon_i$, where Θ is high-dimensional covariates, the LASSO estimator is defined as the solution to $\min_{\beta_1 \in \mathbb{R}^p} E_n\left[(\tilde{y}_i - {}_i\Theta\beta_1)^2\right] + \frac{\lambda}{n}\|\beta_1\|_1$, the penalty level λ is a tuning parameter to regularize/controls 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 penalty function induces $\hat{\beta}$ to have many zeros; thus, LASSO solution feasible for model selection.

$$y_{it} = \alpha d_{it-1} + X'_{it-1}\beta + \delta_i + \gamma_t + \lambda_{it} F_{rt} + \epsilon_{it} \tag{4}$$

where, F_{rt} is an unobserved factor that is common across all states in each year t and λ_{it} represents state factor loading, which is constant over time and represents how susceptible each state is to startup density. The X_{it-1} are observable confounders selected from Z_{it-1} . All remaining notation has the same interpretation as in equation (1) and (2).

5 Results

Table (1) exhibits the estimates of the effects of various indices of freedom on the startup density. Estimates in this table are presented under two different sets of assumptions, two different models, and two different sets of covariates. Therefore, each table is shown with eight different columns for four different indices of economic freedom. The first assumption is that a contemporaneous relationship holds (Contemporaneous), while the second assumption is that a lag period (Lagged Model) of economic freedom affects the current period startup entrepreneurial activities. Each of these assumptions is estimated with double-selection post-LASSO and interactive fixed effect (IFE) methodologies.

Further, for each model variable, the selection is performed among 58 different variables (DSPL list 1). We consider squared polynomials of all variables and all the possible interactions among the 58 variables. Therefore, the covariate matrix is comprised of 1769 variables (DSPL list 2). Each of these models augments state and year fixed effects. The standard error of each estimate is clustered by state level and robust to heteroskedasticity.

Table (1) presents the coefficient estimates for various measures of economic freedom on startup density, i.e., the proportion of newly established employer businesses relative to the total employer business population. Comparing several indices of freedom, we find that increases in labor market freedom cause large and significant increases in startup density. However, a one-unit increase in government, tax, or overall economic freedom has a negative effect on startup density, though only tax freedom is considered significant.

Discussing each of our freedom indices in turn, the government freedom index[3] is a composite measure of general consumption expenditures, insurance, and retirement payments, and transfers and subsidies, all depicted as a percentage of income. We find that a one-unit increase in government freedom, which is

[3]The rise of general consumption expenditure serves two broad government functions: protection of individuals against invasions by domestic and foreign intruders (productive function) and the provision of the public goods (productive function) (Gwartney et al., 1996). Beyond these two functions, the government's provision of private goods can restrict consumer choices and suppress economic freedom. Government spending, independent of taxation, once exceeds the necessary minimum level of protective and productive function, can reduce economic freedom. An increase in government consumption lowers the score of government spending index.

Table 1: Impacts of Various Economic Freedom on the Startup Density

	Contemporaneous				Lagged Model			
	FE	**IFE**	**FE**	**IFE**	**FE**	**IFE**	**FE**	**IFE**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Government Freedom	-2.76*	-0.92*	-2.26	-0.72	-2.98*	-2.07*	-2.59	-1.48
	[0.06]	[0.58]	[0.12]	[0.64]	[0.07]	[0.10]	[0.11]	[0.48]
Taxes Freedom	-4.6**	-1.15**	-3.93**	-1.83**	-5.34***	-0.42***	-4.35**	-0.12**
	[0.02]	[0.36]	[0.03]	[0.34]	[0.01]	[0.71]	[0.04]	[0.97]
Labor Market Freedom	4.68***	-1.4***	3.01	-0.67	7.55***	1.44***	6.02***	2.13***
	[0.01]	[0.50]	[0.17]	[0.76]	[0.00]	[0.4]	[0.00]	[0.25]
EFNA	-5.39*	-3.02*	-5.03*	-1.51*	-3.87	-2.42	-4.50	-1.30
	[0.06]	[0.23]	[0.06]	[0.59]	[0.19]	[0.41]	[0.15]	[0.78]
DSPL	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
State fixed effect	✓	✓	✓	✓	✓	✓	✓	✓
Year fixed effect	✓	✓	✓	✓	✓	✓	✓	✓
Factor	-	1	-	1	-	1	-	1
Clustered (state)	✓	✓	✓	✓	✓	✓	✓	✓
Bootstrapped	-	✓	-	✓	-	✓	-	✓
Observation	550	550	550	550	500	500	500	500

Notes: The 1%, 5% and 10% level of significance are given as ***, **, and * respectively. List 1 represents DSPL selected variables from 58 different variables, while List 2 represents DSPL selected variables from a list of 1769 variables which comprises of square polynomial and all the possible interaction among 58 variables, i.e. $58+58+58*57/2 = 1769$. Each of these models augments state and year fixed effects. The standard error of each estimate is clustered by state level.

represented by decreases in the provision of public goods, among other measures, is likely to decline the density of startups by two units. However, this relationship is only weakly significant or insignificant, depending on the model variation.

Increases in transfers and subsidies of government redistribution are associated with a rise in taxes. Taxation reduces the real return of revenue-generating activities (Gwartney et al., 1996). Higher levels of transfers and subsidies lower the government freedom index while simultaneously lowering the taxation freedom index since this increases the burden of taxation. However, these increased burdens of taxes are sometimes partially offset by increases in public goods. We find that a one-unit increase in tax freedom is associated with a weakly significant decrease in startup density by approximately four units. This relationship, coupled with the previous results, indicates that further research should be made into the nature of these indices to determine the proportion of taxation and government expenditures associated with public goods accessible by entrepreneurs.

Intuitively, higher government freedom should incentivize startups. However, our findings suggest that increases in government freedom or reductions of government spending are linked with a decline in startup activities. Startups are more likely to be prevalent in restrictive environments. One potential interpretation is that lower government freedom makes it necessary to start entrepreneurial activities

rather than pursue other options. Since the startup is recorded as the proportion of newly established employer businesses relative to the total employer business population, therefore; higher government freedom is linked with better opportunities for the business other than the startups; thus, it does not defy the economic logic.

The labor market freedom index comprises other indices, including government employment as a percentage of total state employment, minimum wage legislation, and union density. Government employment as a percentage of total state employment, if increasing beyond the protective and productive functions, shows the government's attempt to supply the goods and services otherwise provided by the private sector. Higher government employment as a percentage of total state employment, therefore, restricts individuals and organizations to freely contract the labor services (Stansel et al., 2017). Likewise, high minimum wages curtail the ability of employees and employers to negotiate contracts (Stansel et al., 2017). In particular, minimum wage legislation limits the ability of low-skilled workers and new entrants to the workforce to negotiate for employment they might otherwise accept and, thus, restricts the economic freedom of these workers and the employers who might have hired them (Stansel et al., 2017).

The ability to freely negotiate contracts for labor services at cost-efficient rates has a large and significant effect on startup densities. A one-unit increase in this labor market freedom can increase startups by approximately four units. This is a critical relationship to understand for policy provision because this indicates that if a state wanted to prioritize increasing new startup entrepreneurial activity, they should focus on reducing barriers to labor market freedom instead of focusing on direct expenditures or tax freedoms, which may have weak or insignificant effects on startup activity.

6 Conclusion

The general narrative of freedom is that it should incentivize entrepreneurial activities; however, this correlative relationship has been subject to an absence of proper selection of both observables and unobservables, which induces endogeneity. Our study uses multiple empirical methods to elicit the causal impact of economic freedom on startup entrepreneurial activity by utilizing a double-selection post-LASSO selection of covariates from a high dimensional set of observable features commonly referenced in the economic freedom literature. We determine that the causal relationship between economic freedom and startup density is mixed and dependent on economic freedom.

Using startup density and 1769 variables from the Census and University of Kentucky Center for Poverty Research, we determine that increases in labor market freedom, such as minimum wage, are likely to cause significant increases in startup density. Unlike labor market freedom, increases in government

or tax freedom have insignificant or weakly adverse effects on startup density. These results evoke two crucial implications for policymakers. First, when determining the policy effects of economic freedom on subset groups, learning the proper covariate measures is essential for eliciting a cause-and-effect relationship within the data. Second, when developing a policy that is targeted at increasing startup density, reducing regulations that affect labor market freedom would have a more substantial positive effect than changes in either government or tax freedoms. Decreasing labor market freedom regulations within a state is likely to increase startup density in the immediate and next annual periods.

This study is subject to potential limitations. Without the understanding of the nature of the government expenditures and how tax revenues are utilized, it is difficult to determine how government and tax freedom may affect entrepreneurs, as some of these effects may be partially offset by public goods that are accessible to new entrepreneurial businesses. Further research is needed to determine the nature of these components in how they relate to entrepreneurial activity and growth. Being able to disentangle different types of public goods distinctly, and the tax revenue raised to fund them would allow researchers to analyze these competing effects. At the time of this research, a comprehensive database does not exist for making these distinctions within the categories of government and tax freedom.

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A Appendix A

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

SN	Variables	Sources
1	Migration outflow	US CB
2	Migration inflow	US CB
3	Migration net	US CB
4	Population	UKCPR
5	Unemployment rate	UKCPR
6	Gross State Product	UKCPR
7	Percent Low Income Uninsured Children	UKCPR
8	Personal income	UKCPR
9	Workers compensation	UKCPR
10	Poverty Rate	UKCPR
11	The fraction of State House that is Democrat	UKCPR
12	The fraction of State Senate that is Democrat	UKCPR
13	Per Capita Gross State Product	UKCPR
14	Per Capita Personal Income	UKCPR
15	Per Capita Worker's Compensation	UKCPR
16	Percent_BEDROOMS_Nobedroom	US CB DP
17	Percent_CLASSOFWORKER_Governmentworkers	US CB DP
18	Percent_CLASSOFWORKER_Privatewageandsalaryworkers	US CB DP
19	Percent_CLASSOFWORKER_Selfemployedworkersinownnotincorporatedbusiness	US CB DP
20	Percent_CLASSOFWORKER_Unpaidfamilyworkers	US CB DP
21	Percent_COMMUTINGTOWORK_Cartruckorvancarpooled	US CB DP
22	Percent_COMMUTINGTOWORK_Cartruckorvandrovealone	US CB DP
23	Percent_COMMUTINGTOWORK_Othermeans	US CB DP
24	Percent_COMMUTINGTOWORK_Publictransportationexcludingtaxicab	US CB DP
25	Percent_COMMUTINGTOWORK_Walked	US CB DP
26	Percent_COMMUTINGTOWORK_Workedathome	US CB DP
27	Percent_EDUCATIONALATTAINMENT_9thto12thgradenodiploma	US CB DP
28	Percent_EDUCATIONALATTAINMENT_Associatesdegree	US CB DP
29	Percent_EDUCATIONALATTAINMENT_Bachelorsdegree	US CB DP
30	Percent_EDUCATIONALATTAINMENT_Graduateorprofessionaldegree	US CB DP
31	Percent_EDUCATIONALATTAINMENT_Highschoolgraduateincludesequivalency	US CB DP
32	Percent_EDUCATIONALATTAINMENT_Lessthan9thgrade	US CB DP
33	Percent_EDUCATIONALATTAINMENT_Somecollegenodegree	US CB DP
34	Percent_INDUSTRY_Agricultureforestryfishingandhuntingandmining	US CB DP
35	Percent_INDUSTRY_Artsentertainmentandrecreationandaccommodationandfoodservices	US CB DP
36	Percent_INDUSTRY_Construction	US CB DP
37	Percent_INDUSTRY_Educationalservicesandhealthcareandsocialassistance	US CB DP
38	Percent_INDUSTRY_Financeandinsuranceandrealestateandrentalandleasing	US CB DP
39	Percent_INDUSTRY_Information	US CB DP
40	Percent_INDUSTRY_Manufacturing	US CB DP
41	Percent_INDUSTRY_Otherservicesexceptpublicadministration	US CB DP
42	Percent_INDUSTRY_Professionalscientificandmanagementandadministrativeandwastemanagementservices	US CB DP
43	Percent_INDUSTRY_Publicadministration	US CB DP
44	Percent_INDUSTRY_Retailtrade	US CB DP
45	Percent_INDUSTRY_Transportationandwarehousingandutilities	US CB DP
46	Percent_INDUSTRY_Wholesaletrade	US CB DP
47	Percent_OCCUPATION_Managementprofessionalandrelatedoccupations	US CB DP
48	Percent_OCCUPATION_Naturalresourcesconstructionandmaintenanceoccupations	US CB DP
49	Percent_OCCUPATION_Productiontransportationandmaterialmovingoccupations	US CB DP
50	Percent_OCCUPATION_Salesandofficeoccupations	US CB DP
51	Percent_OCCUPATION_Serviceoccupations	US CB DP
52	Percent_PLACEOFBIRTH_Native	US CB DP
53	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_Africa	US CB DP
54	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_Asia	US CB DP
55	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_Europe	US CB DP
56	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_LatinAmerica	US CB DP
57	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_NorthernAmerica	US CB DP
58	Percent_WORLDREGIONOFBIRTHOFFOREIGNBORN_Oceania	US CB DP

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