Regional Institutional Quality and Startup Activities in the United States*

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Abstract

With innovative mindsets, entrepreneurs organize and manage various factors of production and seize un-grasped profit opportunities. Along with mindset, willingness, and ability, they also need a freedom to act on their vision. The "freedom to act on their vision" can largely depend upon the institutional settings in which they belong. Economic freedom is the widely measured index for the institutional context and quality. Ample studies find a positive association between economic freedom and entrepreneurship at the international level. However, limited studies venture on the regional level analysis. This paper provides newer insights into economic freedom and entrepreneurship in the US from 2004 to 2015. In this paper, startup density, startup early survival rate and the startup early job creation, available from Kauffman Index of Startup Activities, proxies the startup entrepreneurship, while, the Economic Freedom of North America (EFNA) index represents economic freedom. I find startup density is sensitive to economic freedom while startup survival and startup job creation are only susceptible to the labor market freedom.

Keywords: freedom, entrepreneurship, model selection
JEL Classification: XXX, XXX

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1 Introduction

The association between entrepreneurship, economic freedom and growth are mixed at best in the literature. This paper investigates such ambiguous relationship and tries to offer some explanations. Entrepreneurship is a crucial ingredient of economic development (Kibly, 1971; Kirzner, 1997; North, 1990; Schumpeter, 1934), economic growth (Carree and Thurik, 2003; Romer, 1986; Wennekers and Thurik, 1999), and the miracles of capitalism (Baumol, 1996; Bjørnskov and Foss, 2008). Entrepreneurs discover opportunities to employ resources in more productive ways and help the economy to achieve allocative and adaptive efficiency (DiLorenzo, 2005; North, 2010; Schumpeter, 1942). Entrepreneurs have the mindset to seize un-grasped profit opportunities, and in the pursuit of profits, they ponder and take calculative risks to organize and manage various factors of production. These entrepreneurial ability and willingness are the characteristics of entrepreneurs and appear as anthropological constants within all the cultural variations (Kirzner, 1997; Mises, 1949; Rath, 2002).

The decisions to become an entrepreneur comprise the flux between motivation and uncertainty (McMullen et al., 2008; North, 2010) while several factors play a different role in such a decision-making process. For example, a matrix of institutional setting like economic freedom within a nation (Ali and Crain, 2002; Cole, 2003) can play a vital role for aspiring entrepreneurs. (Gwartney and Lawson, 2002) define economic freedom as "the degree to which a market economy is in place, where the central components are the voluntary exchange, free competition, and protection of persons and property.". For entrepreneurs, economic freedom relates to "the freedom to act on their vision" (Powell and Weber, 2013). Economic freedom gives "individuals the opportunity and incentive to arbitrage, take ideas to market, and create value for others, has a positive impact on measures of entrepreneurship across countries" (Hall and Lawson, 2014).

This paper intends to study the effect of economic freedom on the startup entrepreneurial activities in the US. However, any association between economic freedom and startup entrepreneurial activities is likely to be spurious from three sources. First, the fundamental problem to estimate the impact of economic freedom on entrepreneurial activities is that the state-level economic freedom is not randomly assigned , and it is likely that there will be factors that confound to both economic freedom and entrepreneurial activities. Second, a set of confounding factors persists among state-to-state differences in policies, socio-economic profiles, and demographics that are likely related to the overall state-level economic freedom and entrepreneurial activities. For example, it could be the case that entrepreneurial activities are rising over a period while economic freedom is also increasing but could be due to entirely different factors. Without controlling for these confounding unobservable, one can mistakenly associate the rise in economic freedom with entrepreneurial activities. Third, there can be other observable time-

varying characteristics such as state-level socio, economic and demographic characteristics along with other policies and political attributes that explain the rise in economic freedom with entrepreneurial activities.

For proper identification of estimates of the impact of economic freedom on startup entrepreneurial activities, this paper carefully thinks about reverse causality, proper selection on observables and unobservable confounders. First, this paper assumes that causal flow runs from economic freedom to startup entrepreneurial activities and reverse causal flow from startup entrepreneurial activities to economic freedom is unlikely. Unlike big business and venture capital entrepreneurial projects which can affect economic freedom of a region, the small startup entrepreneurial activities cannot produce a pronounced effect to change economic freedom. Therefore, a reverse causality is unlikely. Secondly, for a proper selection on the observable time-varying characteristics, this paper implements a different estimation strategy that differs from various conventional economic papers or at least within the subdomain which studies economic freedom and entrepreneurial activities. This paper contributes to use high dimensional panel data to model the impact of economic freedom on the startup activities. In addition to that, most of the study use policy variable or treatment variable as binary for the causal inference, while, evidently the economic freedom is not binary. This paper implements the double-selection post LASSO selection method proposed by Belloni et al. (2011, 2014a,b). Their method is theory grounded machine learning approach to select confounders and instruments from the big data. Third, to control for the possible unobservable patterns in economic freedom and startup activities within states, this paper uses (Bai, 2009) interactive fixed-effect model (IFE). The IFE factor model assumes that patterns in economic freedom and startup activities within states can be modeled as a function of some unobserved linear factors, where, the factors can be thought of as nationwide time trends in economic freedom to which different states are either more or less susceptible, depending on unobservable characteristics of those states.

The next section presents the literature review, this helps to design a high dimension panel data of potential observable confounders. Section 3 explains the outcome and treatment variable. In this study outcome variables is startup density, startup early survival rate and the startup early job creation. The treatment variables are a various proxy of economic freedom, mainly, government freedom, tax freedom, labor market freedom, and overall economic freedom. Section 4 extends the empirical approach, including discussion estimation assumptions, double-selection post-LASSO, and interactive fixed effect model. Section 5 displays the results and section 6 discusses the mechanisms. Section 7 concludes the study.

2 Literature Review

Several studies validate the positive link between economic freedom, growth and development (Ali and Crain, 2002; Berggren, 2002; Cole, 2003; de Haan and Sturm, 2000; Gohmann et al., 2008; Hall et al., 2018; Heckelman, 2000; Powell, 2003). While, several other studies relate the economic freedom and entrepreneurial activities only (Bjørnskov and Foss, 2008; Campbell and Rogers, 2007; Díaz-Casero et al., 2012; Hall et al., 2012; Powell and Weber, 2013).

For example, Sobel (2008) tests the institutional quality proxied by Economic Freedom North American (ENFA) index on productive, unproductive and net state entrepreneurial activity and concludes good institutional quality experiences higher venture capital investment, patents, sole proprietorship growth rate, substantial and total firm establishment birthrate, and lower rate of unproductive political and legal entrepreneurship. Sobel and Hall (2008) provide evidence that the differences of regional entrepreneurship across US states can be explained by the difference of the regional economic freedom, in which they measure entrepreneurial activities by the Kauffman Index of Entrepreneurial Activity. Similarly, Wiseman and Young (2011) also find a positive relationship between US state-level net entrepreneurial activity. Cumming and Li (2013) analyze the effect of the state public policy (proxied with disaggregated EFNA) on new firm births, net births, venture capital and patents with 18 different empirical models and finds that the smaller government size promotes firm creation and that labor market freedom is positively associated with firm creation, net births, and venture capital, but is unrelated to patents. These results are robust to different controls; state fixed effects and model specifications.

However, in another study of Campbell et al. (2013) checks the robustness of the effects of economic freedom by using five different spatial measures of entrepreneurial activity. They find that economic freedom is not a consistently significant predictor of entrepreneurship in US states. About this, the general relationship between unemployment and entrepreneurship provides mixed results with many studies showing positive relationships, negative relationships, and zero relationships (Parker, 2009).

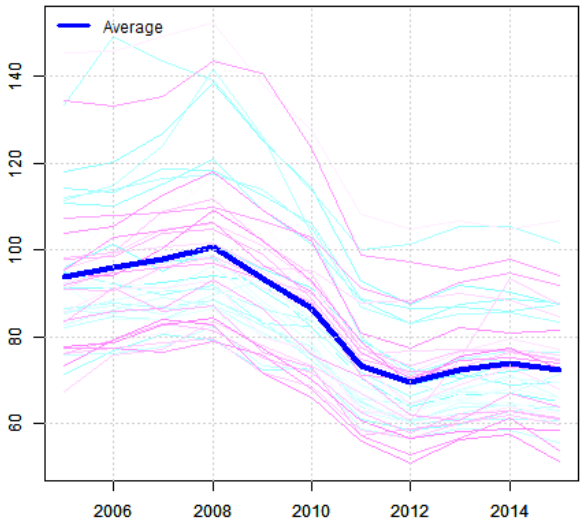
Another set of literature relates economic freedom to: migration (Ashby, 2007; Hall and Lawson, 2014; Mulholland and Hernández-Julian, 2013; Shumway, 2018); inequality (Apergis et al., 2014; Ashby and Sobel, 2008; Bennett and Nikolaev, 2017; Bjørnskov, 2017; Pérez-Moreno and Angulo-Guerrero, 2016; Webster, 2013); cultural diversity (Sobel et al., 2010); political economy Hall et al. (2015), demographic features like race Deskins and Ross (2016); Hall et al. (2018); Hoover et al. (2018). Controlling for a relevant socio-economic-demography profile of US states is crucial to tease out the effect of economic freedom on entrepreneurial activities. The literature review provides an idea on the potential list of observable confounders.

3 Data

3.1 Entrepreneurial Activity

We use indexed information related to start-up density to proxy for entrepreneurial activity in the United States. The start-up density index measures the number of newly established employer businesses (less than one year old) that employees 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 start-up density is a more appropriate measure of entrepreneurial activity than sole-proprietor rates, which are used in much of the previous literature. This is because many sole-proprietors that do not employ workers are actually working contract capacity for another firm. Within this study, we want to focus on firms that actively 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; 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 U.S. Senate and House of Representative, by U.S. 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 are supportive of economic freedom and the ability of individuals to operate without undue restrictions. The EFNA is comprised of ten components of the subnational indices, which walls 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). We will henceforth be referring to these categories as government freedom, tax freedom, and labor market freedom, respectively.

Figure (2), illustrates the overall economic freedom, government freedom, tax freedom, and labor market freedom for each state and the associated average for 2005-2015. Panel (a) exhibits overall EFNA, which is 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.

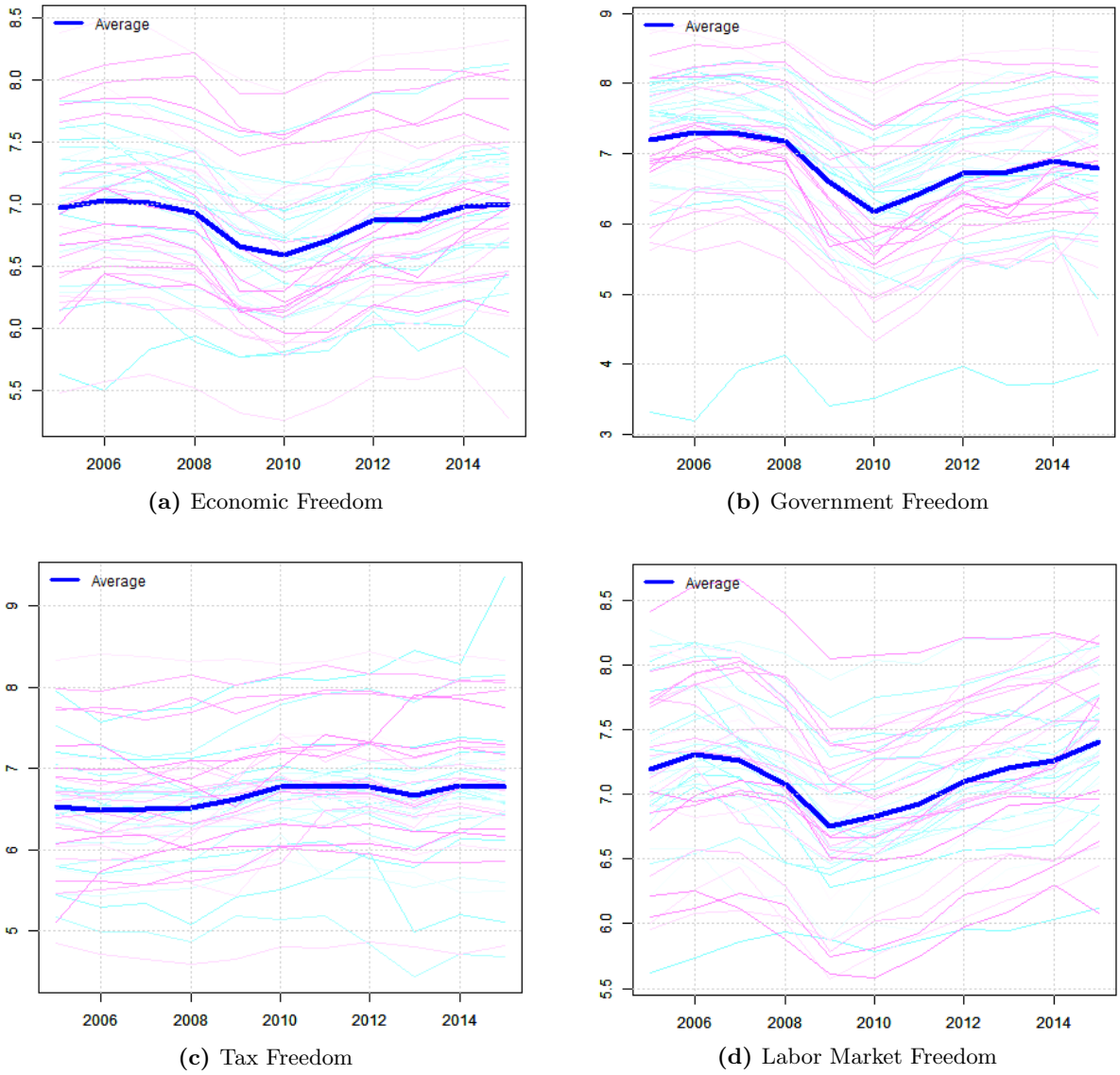
The tax freedom index in panel (c) is a composite measure of income and payroll tax revenue as a percentage of income; top marginal income tax rate and the income threshold at which it applies; property tax and other taxes as a percentage of income; and sales tax revenue as a percentage of income (Gwartney et al., 1996). All these components server 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 om 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 racial makeup of a community. Based on these studies, we collect variables from the U.S. census that are aggregated to the state level for 2005 to 2015. These controls are comprised of birth place, 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 are 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 **??**). We then expand to consider the squared-polynomials of all terms and possible interactions among the 58 variables. The covariate matrix, after including these additional manipulations, consists of 1769 variables for 50 states from 2005 to 2015. Due to the high dimensionality of the unbalanced panel data (Nebraska does not have a state senate and house), using a general panel estimation is not feasible. Therefore, we detail the methodology for performing estimations with high dimensional panel data to account explanation power and other

important 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 start-up density in each state in 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 the 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 departure of this paper from the standard literature is that Z_{it} allows for a much richer set of control variables and allows for the possibility where the number of controls are greater than numbers of observation.

The purpose of this methodology is to determine how start-up density, our outcome variable, is affected by economic freedom. This study relies on observational data to estimate the effect of a non-randomly assigned treatment variable to an outcome variable. In general, economic theory and intuition guide variable selections. However, as a researcher, we do not observe the exact data generating processes. 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 treatment effects are indifferent to changes in controls. Instead, we want to determine causal interpretations of these relationships to understand beyond just the correlative nature of the relationship of freedom and entrepreneurship.

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 treatment variable and outcome variable. Thus, controlling a large 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 increase as high dimensional, and regression is 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 observation 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., 2014a).

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 absolutely 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 variables of interest and possible control variables to determine the set of predictors for the variable of interest. Finally, using the union of the regressor sets from the two LASSO models, we conduct an ordinary least square regression on the outcome variable and variables of interest. We then correct the inference with heteroskedastic robust OLS standard errors to yield a causal interpretation between our economic freedom measures and start-up 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) exhibit the estimates of the impact of various indices of freedom on the start-up 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 presented with 8 different columns for 4 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 start-up entrepreneurial activities. Each of these assumptions is estimated with double-selection post-LASSO and interactive fixed effect (IFE) methodologies. Further, for each model variable, selection is performed among 58 different variables (DSPL list 1). We consider squared polynomials of all these variables and all the possible interaction 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.

Table (1) presents the coefficient estimates for various measures of economic freedom on start-up 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 start-up density. However, a one unit increase in government, tax, or overall economic freedom have a negative effect on start-up 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 are represented by decreases in the provision of public goods among other measures, is likely to decline

[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 provision of private goods can restrict the consumer choices thus suppress economic freedom. In other words, 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 selects variable from 58 different variables, while List 2 represents DSPL select variable 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. Factor in interactive fixed effect model (IFE) the nationwide time trends in startup density to which different states are either more or less susceptible, depending on unobservable characteristics of those states.

the density of start-ups by 2 units, though this relationship is only weakly significant or insignificant depending on model variation.

Increases in transfers and subsidies of government redistribution is associated with the rise of taxes. Taxation reduces the real return of revenue generating activities (Gwartney et al., 1996). Therefore, 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 burden 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 start-up density by approximately 4 units. This relationship coupled with the previous indicates that further research should be made into the nature of these indices to determine what proportion of taxation and government expenditures are associated with programs or public goods accessible by entrepreneurs.

Intuitively, higher government freedom should incentives to startup. However, our findings on this paper suggest otherwise that the increased government freedom or reduction of government spending is linked with a decline in the startup activities. In other words, people tend to start up in a more restricted environment. One potential interpretation would be lower government freedom suggesting necessity driven entrepreneurial startup activities. Since the startup is recorded as the newly established

employer businesses to the total employer business population therefore; higher government freedom is linked with better opportunities for the business other than the startups, thus, does not defy the economic logic.

The labor market freedom index is a composite of other indices including government employment as a percentage of total state employment, minimum wage legislation, and union density. The government employment as a percentage of total state employment, if increase beyond the protective and productive functions, shows government's attempt to supply the goods and services which otherwise could be provided by private sectors or individuals would not care to obtain if provided by the private sectors. Higher government employment as a percentage of total state employment, therefore, restricts individuals and organization to freely contract the labor services (Stansel et al., 2017). Likewise, high minimum wages restrict the ability of employees and employers to negotiate contract (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).

These labor market freedoms in ability to freely contract labor services and negotiate contracts at cost efficient rates have a large and significant effect on start-up densities. A one unit increase in this labor market freedom can increase start-ups by approximately 4 units. This is a critical relationship to understand for policy provision because this indicates that if a state wanted to prioritize increasing new start-up 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 start-up activity.

6 Conclusion

Intuitively, the common narrative has been that freedom should be associated with incentives to start entrepreneurial activities; however, an absence of proper selection on the observables and unobservable induce endogeneity to estimates of these relationships. Our study identifies the causal impact of economic freedom on startup entrepreneurial actives based on the appropriate choice on the high dimensional of observable features in response to diverting trends among the economic freedom literature. After review several studies within the economic freedom, entrepreneurship, and growth literature we gather 58 (totaling 1769 variables after interactions and higher-level polynomials are considered) previously-used variables from the Census and the University of Kentucky Center for Poverty Research for all states between 2005 and 2015. We utilize double-selection post-LASSO methodology to determine covariate selection. We also utilize an interactive fixed effect model to nullify potential endogenous effects to ensure

robustness.

Using our empirical strategies, we determine that there are mixed and varying causal relationships between economic freedom and start-up density. We find that that increases in labor market freedom are likely to cause large increases in start-up density, while increases in government or tax freedom have insignificant or weakly negative effects. This evokes two important observations for policymakers. First, when analyzing economic freedom on subset groups, it is important to determine distinctive categories of policy since different measures of economic or governmental freedom may have competing effects. Second, increasing labor market freedoms within a state is likely to increase start-up density both immediately and within the next annual period.

This study is subject to a few potential limitation. 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 distinctly disentangle different types of public goods, 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 freedoms.

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Table 2: 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.