CONTEMPORARY ECONOMIC POLICY

THE RELATIONSHIP BETWEEN ECONOMIC FREEDOM AND ECONOMIC DYNAMISM

KEITH BARNATCHEZ and ROBERT LESTER*

We analyze the consequences of economic freedom on economic dynamism across U.S. states and over time. Using data from the Economic Freedom of North America index, we show that states with greater economic freedom have higher rates of gross and net job creation and establishment entry. The results are robust to the inclusion of many different control variables and alternative specifications, suggesting a connection between freedom and dynamism. This evidence supports theories in which government policies may impede business dynamism. (*JEL* 043, P16, R5)

I. INTRODUCTION

Economic dynamism—changes in an economic system over time—plays a major role in modern economies. New products are created, old ones are destroyed. New businesses open their doors, old ones close up shop. Firms continually hire and fire workers. In this paper, we show that constructed economic freedom indexes are strongly correlated with the pace of economic dynamism across states over time.

We merge the "Economic Freedom of North America," originally constructed by Karabegovic et al. (2003), with U.S. Census data on entry and exit rates of establishments and rates of job creation and destruction to form a 33-year panel. We measure economic dynamism by following Davis and Haltiwanger's (1992, 1999) definition of "gross reallocation" and "net creation." Gross reallocation is defined as the *sum* of jobs (establishments) created and jobs (establishments) destroyed. Net creation is defined as the *difference* between jobs (establishments) created and jobs (establishments) destroyed. Underlying these definitions is the notion that dynamic economies feature substantial creation and destruction. As new establishments are created, inefficient ones exit and their factors of production are reallocated to the entering and existing establishments. Even after controlling for differences across states and over time, the level of a state's economic freedom is positively correlated with all four measures of economic dynamism. All else equal, a one standard deviation increase in the freedom index is associated with a 0.71 percentage point increase in the net establishment entry rate and a 1.02 percentage point increase in the net job creation rate. Most of these results are estimated precisely using standard levels of statistical significance and are robust to a range of alternative specifications. Moreover, breaking the freedom index into its subindexes shows that labor market freedom—in the form of the percent of the workforce unionized, minimum wage, and the share of government employment—and, to a lesser extent, the size of government are the primary drivers of these results. Discriminatory taxation, on the other hand, is actually negatively correlated with economic dynamism.

The results suggest that various policy reforms may increase the rate of economic dynamism. However, without having a model that prescribes an optimal rate of establishment and job creation and destruction, there is no way to know whether such reforms would be desirable. For all the benefits of greater turnover, namely the creation

ABBREVIATIONS

BEA: Bureau of Economic Analysis
GDP: Gross Domestic Product
GERR: Gross Establishment Reallocation Rate
GJRR: Gross Job Reallocation Rate
IPUMS: Integrated Public Use Microdata Series
NECR: Net Entry Creation Rate
NJCR: Net Job Creation Rate

*We are grateful to two anonymous referees, Julio Garin, and Ron Mau.

Barnatchez: Student, Department of Economics, Colby College, Waterville, ME 04901, Phone (774)212-3927, Fax (207)859-5248, E-mail kbarnatc@colby.edu
Lester: Assistant Professor, Department of Economics, Colby College, Waterville, ME 04901, Phone (406)859-5240, Fax (207)859-5248, E-mail rblester@colby.edu

Contemporary Economic Policy (ISSN 1465-7287)
Vol. 35, No. 2, April 2017, 358–372
Online Early publication August 26, 2016
doi:10.1111/coep.12194

of innovative businesses and the reallocation of factors of production to more efficient establishments, such innovation and reallocation are costly. A social planner would equate marginal benefits and costs, but this imaginative planner's problem is not presented in this paper. However, conditional on having such a model, the results suggest ways to increase or decrease the pace of dynamism.

II. LITERATURE REVIEW

Our paper is most closely related to the literature which examines the relationship between economic freedom and a variety of economic outcomes. There has been a substantial number of papers written on an international scale since the Economic Freedom of the World index was published by Gwartney, Lawson, and Block (1996).[1] From an American perspective, many authors have used Karabegovic et al.'s (2003) Economic Freedom of North America index, now published annually by the Fraser Institute.

Compton, Giedeman, and Hoover (2011) find a statistically significant relationship between the growth of state real gross domestic product (GDP) and economic freedom. Consistent with our results, they also find that the relationship is only present between the size of government and labor market freedom and not discriminatory taxation. Garrett and Rhine (2011) find that states with more economic freedom have greater employment growth, whereas Ashby (2007) shows that individuals migrate to states with greater government consumption, but less labor market regulation.[2] Ashby and Sobel (2008), Apergis, Dincer, and Payne (2014), Compton, Giedeman, and Hoover (2014), and Wiseman (Forthcoming) use the index to study the relationship between freedom and income inequality. Finally, Belasen, Hafer, and Jategaonkar (2015) find that states with more economic freedom have higher bond ratings.

1. While many of these studies focus on the relationship between income and growth, the literature has expanded in a number of ways including analyzing the relationship between crises and the size and scope of government (Bologna and Young 2016) and the relationship between foreign aid, economic freedom, and growth (Heckelman and Knack 2009). Sonora (2014) shows how bilateral trade flows between the United States and other countries are affected by economic freedom. For a survey of the literature see Hall and Lawson (2014).

2. More recently, Heller and Stephenson (2014) show that states with more economic freedom have lower unemployment rates and higher labor force participation rates.

Another branch of the literature discusses the relationship between entrepreneurship and economic freedom. Kreft and Sobel (2005) and Wiseman and Young (2013) show that economic freedom partly explains the cross-state variation in the entrepreneurship. Campbell, Heriot, and Rogers (2007) show that greater economic freedom at the state level increases the number of firm births and deaths. Similarly, Campbell, Mitchell, and Rogers (2013) analyze the relationship between economic freedom and job creation among new firms as well as the annual percentage change in the number of new firms. Our paper complements theirs in that we are looking at job creation and destruction across firms of all ages, rather than focusing on new firms. To the best of our knowledge, this is a novel contribution to the literature.

Our paper is also relevant to the empirical literature on the sources of business and job dynamics. Decker et al. (2014) and Haltiwanger, Jarmin, and Miranda (2013) are recent examples of examining the question of which types of firms create jobs. In terms of dynamics at the firm and establishment level, Foster, Haltiwanger, and Krizan (2006) and Foster, Haltiwanger, and Syverson (2008) are recent contributions. In an international context, Hyun (Forthcoming2016) analyzes how Korean job flows were affected after the 1997 economic crises and the subsequent economic policy reforms. Also, misallocation of factors of production and distortions of the entry and exit decision has been a major theme in economic development over the last decade and, while too dense to survey here, is summarized by Restuccia and Rogerson (2013).

III. DATA AND METHODOLOGY

The data set spans all 50 states and covers the years 1981–2013. We use data from four sources. Information on business dynamism comes from the Census Bureau's Business Dynamic Statistics. The variables used include: the gross job reallocation rate (GJRR), the net job creation rate (NJCR), the gross establishment reallocation rate (GERR), and the net entry creation rate (NECR). The GERR is defined as the sum of the establishment entry and exit rates, whereas the NECR is defined as the difference in these rates. A positive NECR means there has been a net entry of establishments. Similarly, the GJRR is the sum of the job creation and job destruction rates, whereas the NJCR is defined as the difference

in these rates. These definitions closely follow Davis and Haltiwanger (1992, 1999).

Demographic information comes from the Current Population Survey and was extracted from the Minnesota Population Center's Integrated Public Use Microdata Series (IPUMS).[3] We construct an age distribution for each state by grouping individuals into one of six age categories spaced by 10 years starting at age 16. We also include the proportion of each state's workforce in one of nine industry classifications.[4] As a proxy for human capital, we include the share of each state's working-age population that is a college graduate.[5] Following Ashby and Sobel (2008) and Gallet and Gallet (2004), we include the percentage of the state population that resides in a metro area, the percentage that is Black, and the percentage that is Hispanic. We also include the number of working-age people per square mile as a measure of population density. Finally, we include the growth rate of a state's GDP which comes from the Bureau of Economic Analysis (BEA). We extract nominal GDP for each state and deflate it by the implicit GDP price deflator.

The economic freedom index comes from the Fraser Institute's Economic Freedom of North America database.[6] The freedom index is comprised of three equally weighted components: *size of government*, *takings and discriminatory taxation*, and *labor market freedom*. The *size of government* is a function of general consumption expenditures as a fraction of GDP, transfers and subsidies as a fraction of GDP, and insurance and retirement payments as a fraction of GDP. The bigger any of these numbers are, the larger the size of government. A bigger government results in a lower economic freedom score under the premise that more government expenditures decrease private autonomy by crowding out private expenditures. The *takings and discriminatory taxation* category is comprised of total tax revenue, indirect tax revenue, sales tax revenue (all as a percentage of GDP), and the top marginal income tax rate. The index is decreasing in all these percentages meaning that economic freedom is lower when taxes are higher. Finally, a state's minimum wage, union density, and government employment as a percentage of total employment all contribute to *labor market freedom*. The higher any of these numbers get, the less free the labor market. The idea here is that an increased role of government intervention in the labor market, and hence less freedom, reduces the scope of private contracting. Labor market freedom falls under a broader category of *regulation*, but it is the only component of this category that varies at a state level. Since our focus is on the variation in freedom across states, we use the subnational freedom index which is designed to facilitate comparisons within the same country. Throughout the paper we refer to labor market freedom and labor market regulation interchangeably.

Table 1 reports summary statistics for all these variables. GERR and GJRR are much larger than their net counterparts and show that a large proportion of establishments and jobs are created and destroyed each year. On average, the number of jobs and establishments expand by a little more than 1.5% per year. However, there are many observations where job destruction exceeds job creation and the establishment exit rate exceeds the entry rate.

To better understand the degree of within-state variation of the freedom indexes, we group states into quintiles every year according to their overall freedom index score and calculate the conditional probability of being in quintile j (the column) in year $t+1$ given that the state was in quintile i (the row) in year t. These probabilities are multiplied by 100 and expressed as percentages. Table 2 reports the results. To take an example, the probability that a state transitions to the fourth quintile given that it started in the third is $0.1358(100) = 13.58$, the entry in the third row and fourth column of the transition matrix. Since the quintiles are computed every year, these probabilities are insensitive to common time trends across states in the freedom indexes.

While there is some variation within states, there appears to be substantial persistence in their relative freedom scores. That is, a state that ranks near the bottom of the index in 1990 is likely to rank near the bottom in 1991. This persistence makes sense given the fact that labor market regulations and government policies across states are inertial. For instance, states with high union densities relative to the rest of the country in a given year (Michigan, for example) tend to have high union densities relative to the rest of the country over the entire time period. However, since there are 33 years in the sample

3. We use Version 3.0 from Alexander et al. (2010)

4. These include: agriculture, mining, construction, manufacturing, transportation/utilities, wholesale trade, retail trade, services, and public administration.

5. Working age is defined as the ages between 16 and 65 inclusive.

6. We use the most recent vintage which has data through 2013. See McMahon et al. (2015).

TABLE 1
Summary Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Gross establishment reallocation rate	15.40	38.80	22.78	3.55
Net establishment creation rate	−12.80	20.20	1.57	2.09
Gross job reallocation rate	20.20	55.80	31.07	4.66
Net job creation rate	−18.20	14.10	1.72	2.87
Percentage college graduate	7.99	39.17	20.91	5.41
Percentage Black	0	38.08	9.65	9.10
Percentage Hispanic	.05	43.19	6.20	8.15
Percentage Metro	0	100.00	68.77	22.66
RGDP growth	−28.08	30.61	2.78	3.56
Overall freedom index	4.00	8.50	6.69	0.71
Government size index	1.90	9.50	7.25	1.07
Takings and taxation index	3.40	8.70	6.51	0.80
Labor market freedom index	2.20	8.70	6.32	1.07
Percentage 16–25	1.27	32.55	19.12	2.76
Percentage 26–35	12.16	33.69	19.70	3.34
Percentage 36–45	9.36	31.02	18.34	2.59
Percentage 46–55	4.96	22.70	15.66	2.87
Percentage 56–65	5.34	19.91	12.20	2.11
Population density	0.733	1,211.75	175.58	244.34
Working-age population density	0.709	1,024.67	152.21	207.95
Percentage agriculture	0.19	15.16	3.21	2.26
Percentage mining	0	14.52	.87	1.59
Percentage construction	2.54	12.89	7.00	1.46
Percentage manufacturing	7.82	32.30	9.36	4.67
Percentage transportation	1.85	12.26	6.71	1.23
Percentage wholesale trade	0.76	6.90	3.40	.949
Percentage retail trade	12.60	26.36	17.58	1.70
Percentage services	27.98	57.71	41.55	4.91
Government consumption	8.77	32.45	14.82	3.16
Transfers/subsidies	0.07	1.34	0.42	0.20
Insurance/retirement payments	0.30	5.00	1.60	0.71
Income/payroll tax revenue	0.20	14.6	3.15	1.36
Top marginal income tax rate	0	16.10	5.23	3.28
Property tax	1.70	11.50	3.88	1.19
Sales tax	0.80	6.90	3.60	1.19
Minimum wage legislation	24.16	87.62	42.67	9.74
Government employment	8.10	16.90	11.54	1.60
Labor union density	3.30	36.0	15.38	6.60

Notes: The sources are described in the text. Note that the percentage above 65 years old and the percentage of workers in public administration are excluded from the table. This means that the age and industry bins sum to less than one.

TABLE 2
Transition Matrix—Overall Index

	Q_1	Q_2	Q_3	Q_4	Q_5
Q_1	88.54	11.46	0	0	0
Q_2	12.62	76.31	10.77	0.31	0
Q_3	0	10.12	76.30	13.58	0
Q_4	0	0.34	15.25	77.29	7.12
Q_5	0	0	0	8.07	91.93

Notes: This is the year-to-year transition matrix for a state's overall index score. The entry in row *i*, column *j* is the probability a state in the *i*th quintile in year *t* transitions to the *j*th quintile in year $t + 1$.

TABLE 3
Transition Matrix—Government Size Index

	Q_1	Q_2	Q_3	Q_4	Q_5
Q_1	87.02	12.39	0.59	0	0
Q_2	13.58	74.38	11.73	0.31	0
Q_3	0.30	11.87	71.22	16.02	0.59
Q_4	0	0.31	16.56	68.75	14.37
Q_5	0	0	1.07	16.79	82.14

Notes: This is the year-to-year transition matrix for a state's government size index score. The entry in row *i*, column *j* is the probability a state in the *i*th quintile in year *t* transitions to the *j*th quintile in year $t + 1$.

and 50 states, the fact that the freedom index is persistent across states should not impede identifying the effects of economic freedom on dynamism. Tables 3–5 show that the persistence of the overall freedom index carries over to its various components.

As a start to understanding how different measures of freedom correlate with measures

TABLE 4
Transition Matrix—Takings Index

	Q_1	Q_2	Q_3	Q_4	Q_5
Q_1	91.07	8.04	0.60	0.30	0
Q_2	8.10	73.18	17.60	1.12	0
Q_3	0.31	18.89	62.54	17.65	0.62
Q_4	0	4.41	16.95	63.49	9.15
Q_5	0	0.35	0.69	9.38	89.58

Notes: This is the year-to-year transition matrix for a state's takings and discriminatory taxation index score. The entry in row *i*, column *j* is the probability a state in the *i*th quintile in year *t* transitions to the *j*th quintile in year $t+1$.

TABLE 5
Transition Matrix—Labor Market Freedom Index

	Q_1	Q_2	Q_3	Q_4	Q_5
Q_1	90.29	9.41	0.29	0	0
Q_2	9.14	74.00	16.86	0	0
Q_3	0.31	20.06	66.05	13.58	0
Q_4	0	0	16.25	73.50	10.25
Q_5	0	0	0.33	9.24	90.43

Notes: This is the year-to-year transition matrix for a state's labor market freedom index score. The entry in row *i*, column *j* is the probability a state in the *i*th quintile in year *t* transitions to the *j*th quintile in year $t+1$.

of economic dynamism, Figure 1 shows how the four metrics of dynamism correlate with the overall freedom index for the last year in the sample, 2013. The regression line through each graph shows that there is a positive, albeit rather weak, relationship between proxies of economic dynamism and the freedom index. Moreover, the slope of the trend line changes depending on what proxy for dynamism we use. Unquestionably, there are other factors correlated with economic freedom that influence dynamism. We control for many of these in the subsequent regressions.

We estimate two types of baseline regression models. In one, we pool the data across all states and years. In the other, we take advantage of the panel nature of the data and include state and time fixed effects.

$$Y_{i,t} = \delta\left(\mu_i + \gamma_t\right) + (1-\delta)\theta t + \beta X_{i,t} + \alpha \mathrm{FREE}_{i,t} + \varepsilon_{i,t}. \quad (1)$$

δ is an indicator variable that equals 0 in the case we pool the data across all states and years and equals 1 when we include state and time fixed effects. $Y_{i,t}$ is the measure of economic dynamism under consideration. $X_{i,t}$ is a vector of control variables including: percentage metropolitan, percentage with a bachelor's degree, percentage Black, percentage Hispanic, real GDP (RGDP) growth, the number of working-age individuals per square mile, and age and industry controls. State and time fixed effects are given by μ_i and γ_t, respectively. In the pooled regression we also include a linear time trend. The parameter of interest is α which shows the marginal effect of the freedom index on the economic dynamism measure. Standard errors are clustered at the state level.

IV. RESULTS

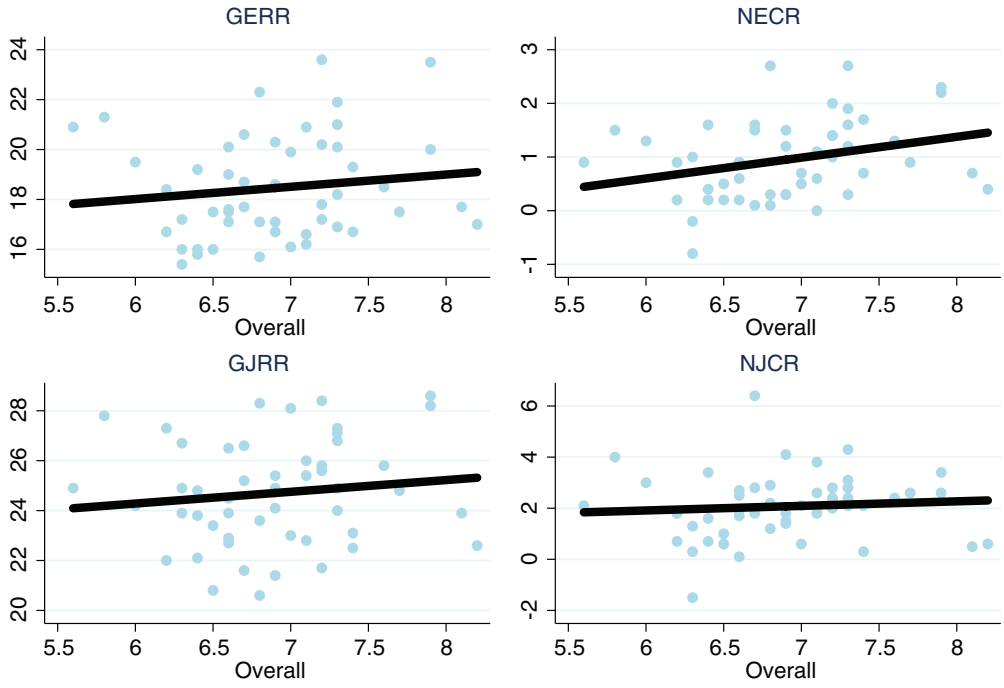
A. *Overall Freedom Index*

As a baseline we include the overall freedom index in Equation (1). Table 6 shows the relationship between GERR and the freedom index.

We compare pooled ordinary least squares with fixed effect regressions. In all the regressions, the coefficient on the overall index is positive, implying that increasing economic freedom increases GERR. Moreover, in all of the fixed effect regressions, the result is significant at the 1% level. Judging by the R^2, state and time fixed effects are very important in explaining the variation of GERR and should be included in the regression. In the panel data regression with demographic and industry controls, a one standard deviation increase in the index is associated with a 0.50 percentage point increase in GERR. The demographic variables and RGDP are entered as percentages. Using the last column as an example, raising GDP growth by 1 percentage point decreases the GERR by −0.01 percentage point. Similarly, the number of working-age people per square mile variable is entered in units of hundreds of people. Continuing to use the last column as an example, a coefficient of 1.356 means that 100 more working-age people per square mile raises the GERR by 1.356 percentage points.

Table 7 shows the results when the dependent variable is NECR. Recall that a positive NECR implies that there was net entry over the course of the year. The coefficient on the overall index is positive and statistically significant at the 1% level in each regression. Using the regression results in the last column, a one standard deviation increase in the freedom index corresponds to a 0.77 percentage point increase in the net entry rate. An alternative way of interpreting this is that a one standard deviation increase in OVER

FIGURE 1
Dynamism and Freedom for 2013



Notes: The horizontal axis is the overall score from the freedom index. The vertical axis is a percent. The trend line is estimated from a linear regression with the overall score being the only covariate.

TABLE 6
Gross Establishment Reallocation Rate

	Pooled	Panel	Pooled	Panel	Pooled	Panel
OVERALL	0.611	0.995***	0.668*	0.888***	0.548*	0.699***
	(0.496)	(0.301)	(0.360)	(0.251)	(0.319)	(0.198)
RGDP	0.032	−0.039**	0.024	−0.013	0.019	−0.010
	(0.023)	(0.015)	(0.017)	(0.015)	(0.018)	(0.013)
% Bachelor's			0.021	0.125***	0.018	0.118***
			(0.057)	(0.042)	(0.068)	(0.034)
100 Psqm			−0.295**	1.302***	−0.231**	1.356***
			(0.125)	(0.466)	(0.113)	(0.491)
% Metro			0.010	−0.019	0.014	−0.025
			(0.015)	(0.014)	(0.015)	(0.015)
% Black			0.001	−0.008	−0.027	0.004
			(0.021)	(0.042)	(0.025)	(0.038)
% Hispanic			0.135***	−0.039	0.089**	−0.033
			(0.047)	(0.040)	(0.043)	(0.037)
Age controls			X	X	X	X
Industry controls					X	X
State FE		X		X		X
Time FE		X		X		X
R^2	.349	.885	.557	.901	.625	.907
Obs	1,650	1,650	1,600	1,600	1,600	1,600

Notes: There are 1,650 observations in the first two columns, but because of some missing demographic information there are only 1,600 observations in the last four columns. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

TABLE 7
Net Establishment Creation Rate

	Pooled	Panel	Pooled	Panel	Pooled	Panel
OVERALL	0.460***	1.380***	0.497***	1.221***	0.444***	1.081***
	(0.104)	(0.306)	(0.095)	(0.285)	(0.083)	(0.291)
RGDP	0.170***	0.118***	0.169***	0.117***	0.161***	0.114**
	(0.040)	(0.039)	(4.00)	(0.040)	(0.043)	(0.045)
% Bachelor's			−0.016	−0.002	−0.035**	−0.007
			(0.017)	(0.024)	(0.015)	(0.026)
100 Psqm			−0.029	−0.134	−0.007	−0.130
			(0.031)	(0.306)	(0.028)	(0.335)
% Metro			−0.003	−0.021**	−0.004	−0.028***
			(0.004)	(0.008)	(0.004)	(0.010)
% Black			−0.006	−0.013	−0.019***	−0.003
			(0.006)	(0.027)	(0.005)	(0.027)
% Hispanic			0.017*	−0.018	−0.001	−0.018
			(0.009)	(0.022)	(0.008)	(0.022)
Demographic controls			X	X	X	X
Industry controls					X	X
State FE		X		X		X
Time FE		X		X		X
R^2	.225	.607	.279	.614	.316	.621
Obs	1,650	1,650	1,600	1,600	1,600	1,600

Notes: There are 1,650 observations in the first two columns, but because of some missing demographic information there are only 1,600 observations in the last four columns. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.
*Significant at 10%; **significant at 5%; ***significant at 1%.

(the overall score) is associated with a 49% increase in the net entry rate relative to its mean. The growth rate in RGDP is also significant at the 1% level as states that are growing faster are also creating more net establishments. The proportion of people living in metro areas is negatively related to the net entry rate and is statistically significant at the 1% level.

Tables 8 and 9 show the analogous regressions for jobs rather than establishments. Increasing the overall freedom index is associated with an increase in both the gross and net rates. While none of the coefficients on OVERALL (the overall score) in the GJRR regressions are statistically significant at the 5% level, they are all statistically significant at the 1% level in the NJCR regressions. The magnitudes are also large in the NJCR regressions. Taking the coefficient estimate on OVERALL from the last column of Table 9, a one standard deviation increase in OVERALL is associated with a 1.01 percentage point increase in the NJCR or an increase of 35% relative to its mean. Similar to the net entry rate for establishments, the coefficient on RGDP growth is positive and statistically significant in all the NJCR regressions.

To summarize, the relationship between economic freedom and economic dynamism is both statistically and economically significant in three out of four measures of economic dynamism. Moreover, the results are robust to the addition of many control variables. However, these regressions give no information as to which component or components of the freedom index drive the results. This is what we turn to in the next section.

B. Components of the Freedom Index

To understand how economic dynamism correlates with various components of the freedom index, we use each component of the index in Equation (1) in place of $\text{FREE}_{i,t}$. We include state and time fixed effects in each regression, as well as all the demographic and industry control variables. The results are displayed in Table 10. The rows contain the component of the freedom index included in the regression and the columns contain what measure of economic dynamism is used as the dependent variable. Standard errors are clustered at the state level as before.

The numbers in Table 10 are the coefficients on the relevant component of the freedom index on each of the four dependent variables. Just like with the overall index, higher numbers on any of the subcomponents imply a greater degree of economic freedom. The results from the table show that both the size of government

TABLE 8
Gross Job Reallocation Rate

	Pooled	Panel	Pooled	Panel	Pooled	Panel
OVERALL	0.641	0.794*	0.626	0.347	0.515	0.313
	(0.684)	(0.434)	(0.423)	(0.436)	(0.309)	(0.435)
RGDP	−0.025	−0.082***	−0.038	−0.049*	−0.026	−0.039*
	(0.034)	(0.028)	(0.025)	(0.025)	(0.024)	(0.022)
% Bachelor's			−0.001	0.154**	0.039	0.089
			(0.050)	(0.075)	(0.038)	(0.063)
100 Psqm			−0.292**	0.964	−0.194*	0.578
			(0.148)	(0.615)	(0.105)	(0.559)
% Metro			0.008	−0.027	0.030*	−0.028
			(0.019)	(0.021)	(0.017)	(0.023)
% Black			0.020	−0.076	−0.007	−0.089
			(0.022)	(0.066)	(0.019)	(0.064)
% Hispanic			0.190***	−0.183***	0.123***	−0.164***
			(0.045)	(0.048)	(0.037)	(0.049)
Demographic controls			X	X	X	X
Industry controls					X	X
State FE		X		X		X
Time FE		X		X		X
R^2	.380	.861	.589	.885	.673	.889
Obs	1,650	1,650	1,600	1,600	1,600	1,600

Notes: There are 1,650 observations in the first two columns, but because of some missing demographic information there are only 1,600 observations in the last four columns. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.
*Significant at 10%; **significant at 5%; ***significant at 1%.

TABLE 9
Net Job Creation Rate

	Pooled	Panel	Pooled	Panel	Pooled	Panel
OVERALL	0.479***	1.322***	0.536***	1.252***	0.596***	1.425***
	(0.114)	(0.372)	(0.097)	(0.363)	(0.080)	(0.391)
RGDP	0.371***	0.260***	0.370***	0.258***	0.362***	0.254***
	(0.054)	(0.044)	(0.054)	(0.048)	(0.053)	(0.048)
% Bachelor's			−0.030*	−0.062*	−0.069***	−0.100**
			(0.017)	(0.036)	(0.020)	(0.042)
100 Psqm			−0.035	0.536	−0.014***	0.434**
			(0.031)	(0.369)	(0.028)	(0.403)
% Metro			−0.007	−0.024**	−0.011***	−0.031**
			(0.004)	(0.011)	(0.004)	(0.013)
% Black			−0.013**	0.001	−0.014**	−0.018
			(0.005)	(0.036)	(0.006)	(0.035)
% Hispanic			0.013	−0.046	0.005	−0.029*
			(0.009)	(0.029)	(0.008)	(0.026)
Demographic controls			X	X	X	X
Industry controls					X	X
State FE		X		X		X
Time FE		X		X		X
R^2	.263	.642	.304	.657	.313	.661
Obs	1,650	1,650	1,600	1,600	1,600	1,600

Notes: There are 1,650 observations in the first two columns, but because of some missing demographic information there are only 1,600 observations in the last four columns. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.
*Significant at 10%; **significant at 5%; ***significant at 1%.

(SIZE) and the degree to which labor markets are free (LABREG) strongly affect economic dynamism. The coefficient on LABREG is statistically significant at the 1% level in all four regressions and is rather large in magnitude. For instance, a one standard deviation increase in LABREG increases NJCR by 1.29 percentage points. As the SIZE variable increases (which implies a smaller government), all four measures of dynamism increase and the increases are

TABLE 10
Components of Index

	GERR	NECR	GJRR	NJCR
SIZE	0.353**	0.564***	0.228	0.909***
	(0.141)	(0.176)	(0.221)	(0.231)
TAKINGS	−0.279	−0.081	−0.781*	−0.169
	(0.307)	(0.141)	(0.453)	(0.221)
LABREG	1.334***	1.196***	1.794***	1.201***
	(0.233)	(0.278)	(0.403)	(0.379)

Notes: There are 1,600 observations. The rows show which component of the freedom index is included in the regression. The columns show the dependent variable. Standard errors are clustered at the state level and are displayed in parentheses.

*Significant at 10%; **significant at 5%; ***significant at 1%.

statistically significant at the 5% level in three of the four regressions. However, the magnitudes are not nearly as large as the LABREG variable suggesting that labor market freedom is more important for dynamism than the size of government. Finally, the coefficient on TAKINGS is negative in all regressions implying that as takings and discriminatory taxes increase, economic dynamism also increases. Although none of these coefficients are statistically significant at the 5% level, the sign in and of itself is surprising.

The surprising result for the tax variable leads to more questions. For example, are these negative results just coming from a firm of a particular size or age? For instance, Wiseman (Forthcoming) shows that an increase in TAKINGS is associated with an increase in income for those at the bottom 90% of the income distribution, but a decrease in income for those in the top 10% of the distribution.[7] Wiseman speculates that this may be because lowering taxes constrains the amount of crony capitalism that disproportionately favors high income groups. To investigate a similar possibility, we estimate the model grouping firms into various size and age categories. The results are displayed in Figures 2 and 3.

The bar charts do not reveal an obvious pattern between the size and/or age and the sign of the coefficient. If anything, bigger firms are more likely to increase dynamism as discriminatory taxes become less burdensome. At the same time, neither young nor old firms seem to be particularly more dynamic when taxes ease, although the coefficient is positive for some categories. Consequently, breaking the results down into size and age categories does not alter our conclusion that more freedom from taxation does not seem to increase dynamism.

While explaining why more stringent labor regulation decreases dynamism more than either higher government spending or higher taxes is beyond the scope of this paper, some hypotheses are readily apparent. Labor regulation through higher minimum wages and a larger union presence is a direct effect on a firm's bottom line. Any decision to open new establishments or post more vacancies will take these costs into account. The variables that go into TAKINGS and SIZE, such as the top marginal income tax rate and the ratio of government consumption to state GDP, are felt indirectly by firms. In general equilibrium, an increase in government consumption or the top marginal income tax rate will affect prices the firm faces, but will not exert a direct influence. In fact, an increase in some of the tax variables, such as the sales tax, could increase a worker's search effort through a negative income effect and thereby increase dynamism.

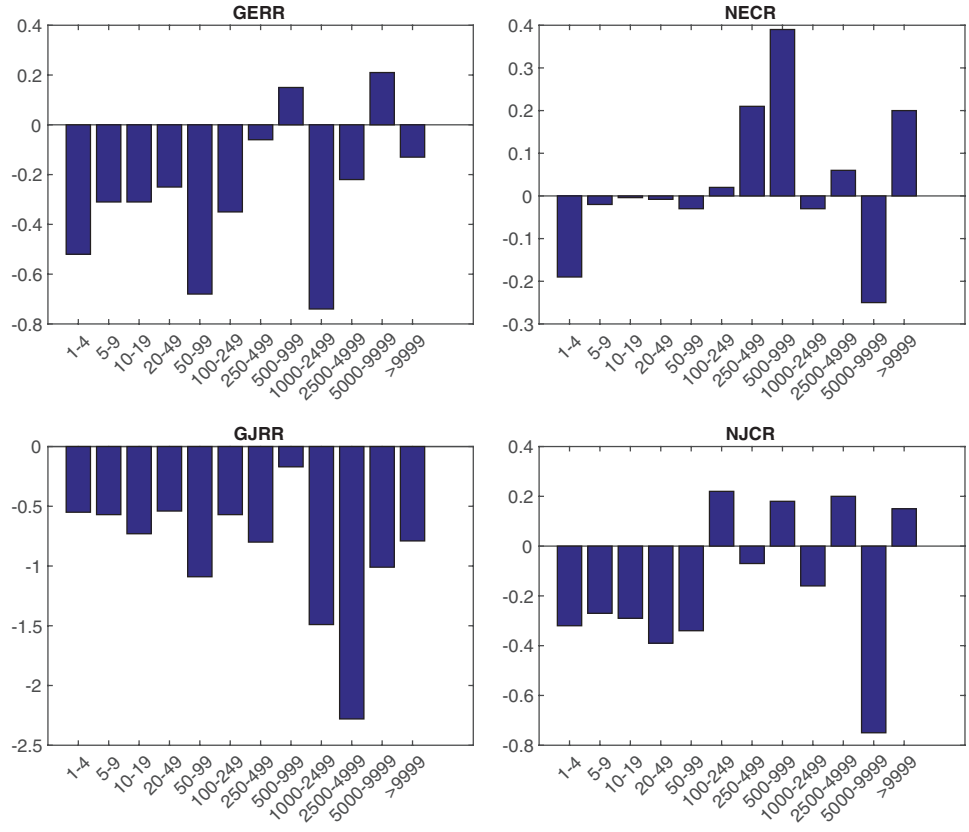
Although the relationships between the freedom index and various measures of dynamism are interesting, the index itself is composed of a number of economic variables. When thinking about policies that affect dynamism, it is obviously important to think about these tangible measures. Along these lines, we estimate Equation (1) but include the economic variables each index is composed of rather than the value of the index itself. That is, rather than one index value, $FREE_{i,t}$ is a linear combination of economic variables.

Start with the variables that go into the size of government index. These include: consumption expenditures by government, transfers and subsidies, and insurance and retirement payments all as a percentage of income.[8] Table 11 displays the results. NJCR and NECR appear to be most adversely affected by an increase in any of these measures. An increase in any of the three measures reduces net entry and net job creation and the results are statistically significant. On the other hand, the results on GERR and GJRR are usually not statistically significant. As far as economic significance goes, a one standard deviation increase in government consumption decreases NJCR by 0.89 percentage points and NECR by 0.61 percentage points. A one standard deviation

7. More precisely, Wiseman estimates the effect of a *change* in the TAKINGS variable on income growth.

8. As explained in Section II, we use the subnational freedom scores. The national index for size also contains a variable for government enterprises and investment.

FIGURE 2
Regression Results Based on Size



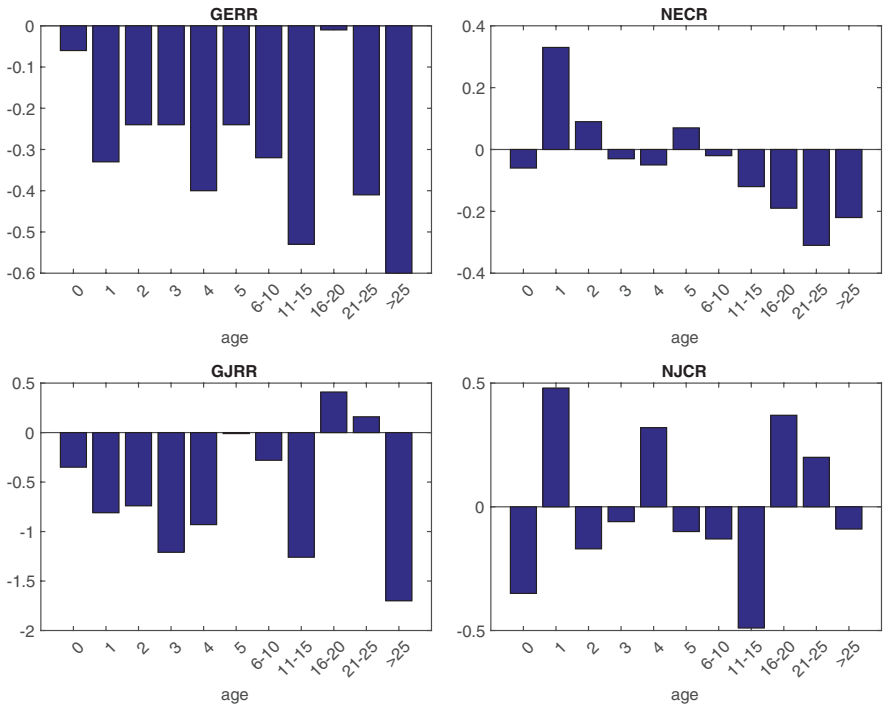
Notes: The horizontal axis is the firm size in terms of number of employees. The vertical axis is the coefficient α from Equation (1) when the model is estimated with state and time fixed effects and demographic and industry controls.

increase in either transfers and subsidies or insurance and retirement payments has a smaller effect on both variables.

The four components of takings include the top marginal income tax rate as well as income and payroll tax revenue, property tax revenue, and sales tax revenue all as a percentage of income. As our earlier results would predict, many of these variables are positively correlated with economic dynamism. The only one that is statistically significant at the 5% level is property tax revenue as a percentage of income.

As expected, the most consistently negative estimates come in the form of labor market regulation. The regulation index is composed of three variables: a variable capturing minimum wage legislation, government employment as a percentage of state employment, and union density. Raising the minimum wage is associated with less dynamism across all four measures. The coefficient interpretation is not straightforward since the minimum wage variable is a state's minimum wage times the number of hours worked by a full-time worker divided by a state's per-capita income. A one standard deviation increase in the share of employees working for the government decreases GERR and GJRR by 0.58 and 0.01 percentage points, respectively, although only the former is statistically significant (Table 13). The same one standard deviation increase in the share of government employment decreases NECR and NJCR by 0.61 and 0.70 percentage points, respectively and both are statistically significant at the 1% level. While statistically significant in three of the four regressions, union share decreases dynamism by a lower magnitude than government employment.

FIGURE 3
Regression Results Based on Age



Notes: The horizontal axis is the firm age in terms of number of years since birth. The vertical axis is the coefficient α from Equation (1) when the model is estimated with state and time fixed effects and demographic and industry controls.

TABLE 11
Components of Size

	GERR	NECR	GJRR	NJCR
GOV CONS	−0.047	−0.194***	0.016	−0.281***
	(0.124)	(0.072)	(0.179)	(0.078)
TRANSFERS	−1.175*	−0.797*	−0.633	−1.380**
	(0.659)	(0.408)	(0.847)	(0.578)
INSURANCE	−0.187	−0.675***	−0.426	−1.033***
	(0.325)	(0.238)	(0.453)	(0.313)
RGDP	−0.008	0.103**	−0.041**	0.234***
	(0.014)	(0.049)	(0.020)	(0.049)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
State FE	X	X	X	X
Time FE	X	X	X	X
R^2	.907	.627	.890	.671
Obs	1,600	1,600	1,600	1,600

Notes: The rows show the coefficient estimates on all the components in the size of government index as well as the coefficient estimate for RGDP. The columns show the dependent variable. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

Unpacking each subcomponent into its various economic variables more or less confirms the results from Table 10. The variables that measure takings and discriminatory taxes are positively correlated with economic dynamism, variables in the government size category are mostly negative but are only occasionally statistically significant, and variables in the labor regulation category are consistently negative and statistically significant. Consequently, the key to further understanding how economic freedom affects economic dynamism may be through a more detailed analysis of labor market policies.

V. ROBUSTNESS

Although we include many different control variables and fixed effects, it is still worthwhile to consider some robustness exercises. This section contains the results from these exercises. One concern with the results presented in the last section is simultaneity bias. Time *t* values of the freedom index affect time *t* values of dynamism,

TABLE 12
Components of Takings

	GERR	NECR	GJRR	NJCR
INCOME	−0.052	0.048	0.156	0.146*
	(0.079)	(0.129)	(0.170)	(0.075)
TOP MARG	−0.011	−0.029	−0.005	0.009
	(0.056)	(0.022)	(0.061)	(0.047)
PROPERTY	0.658***	0.075	1.19***	−0.100
	(0.243)	(0.256)	(0.261)	(0.267)
SALES	−0.021	0.038	0.172	0.193
	(0.183)	(0.149)	(0.319)	(0.181)
RGDP	−0.032*	0.133***	0.014	0.267***
	(0.016)	(0.034)	(0.023)	(0.048)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
State FE	X	X	X	X
Time FE	X	X	X	X
R^2	.912	.612	.903	.652
Obs	1,600	1,600	1,600	1,600

Notes: The rows show the coefficient estimates on all the components in the takings and discriminatory taxes index as well as the coefficient estimate for RGDP. The columns show the dependent variable. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

TABLE 13
Components of Labor Market Freedom

	GERR	NECR	GJRR	NJCR
MIN WAGE	−0.080**	−0.081***	−0.187***	−0.081**
	(0.032)	(0.022)	(0.046)	(0.031)
GOV EMPLOYMENT	−0.362**	−0.378***	−0.008	−0.436***
	(0.167)	(0.111)	(0.245)	(0.157)
UNION SHARE	−0.118***	−0.040*	−0.150**	−0.016
	(0.036)	(0.022)	(0.060)	(0.030)
RGDP	−0.019	0.111**	−0.064***	0.254***
	(0.013)	(0.046)	(0.021)	(0.050)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
State FE	X	X	X	X
Time FE	X	X	X	X
R^2	.913	.627	.900	.661
Obs	1,600	1,600	1,600	1,600

Notes: The rows show the coefficient estimates on all the components in the labor market freedom index as well as the coefficient estimate for RGDP. The columns show the dependent variable. Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

but the reverse might also be true. However, it is less likely that contemporaneous values of dynamism influence lagged values of the freedom index. As Table 2 shows, the freedom indexes within states are very correlated over time. Therefore, we use lagged values of the freedom index in all of the regressions. Also, it is a reasonable conjecture that changes in economic policy may affect dynamism with a lag. If this is true, these regressions will capture the lagged effect. We include the full set of demographic and industry controls and state and time fixed effects. The results are shown in Table 14.

The lagged value of OVERALL is statistically significant at the 5% level in three of the four regressions and has a similar magnitude as the coefficient on the contemporaneous value of OVERALL. Consequently, including the lagged value of OVERALL does not change the conclusions from the previous section.

Next, we follow a similar specification as Garrett and Rhine (2011) by including a 3-year average of the economic dynamism measure as the dependent variable. This allows for changes in the freedom index to have both contemporaneous and longer lasting effects in the model. The results are shown in Table 15 and have the same signs of coefficients on OVERALL. The main observation is that the magnitudes of the coefficients in the NECR and NJCR regressions are dampened relative to the baseline specification of Tables 7 and 9. Despite this, NECR is statistically significant at the 1% level.

Another concern is that inertia in some of the measures of dynamism bias the coefficients. To account for this, we adopt the specification:

$$Y_{i,t} = \mu_i + \sum_{j=1}^{n} Y_{i,t-j} + \beta X_{i,t} + \alpha FREE_{i,t} + \varepsilon_{i,t}.$$

Now $Y_{i,t}$ depends on n lags as well as the controls from the previous section. As Nickell (1981) shows, the inclusion of a lagged dependent variable makes the fixed effects estimator biased. To deal with this bias, we follow Compton, Giedeman, and Hoover (2011) and use GMM to estimate the system. In particular, we use the Arellano–Bond approach (Arellano and Bond 1991).[9] The results are contained in Table 16.[10] Again, the results are qualitatively similar, although the estimated coefficient

9. See Arellano and Bond (1991) for details

10. We increase the number of lags until we fail to reject the hypothesis that there is zero autocorrelation in the first-differenced errors at the second order.

TABLE 14
Results with Lagged Values of Freedom Index

	GERR	NECR	GJRR	NJCR
OVER ALL(−1)	0.799*** (0.204)	0.815*** (0.249)	0.671* (0.388)	0.746** (0.312)
RGDP	−0.011 (0.016)	0.132** (0.042)	−0.058** (.027)	0.263*** (0.050)
% Bachelor's	0.102*** (0.035)	−0.008 (0.029)	0.067 (0.061)	−0.097* (0.051)
100 Psqm	1.390*** (0.489)	−0.106 (0.334)	0.626 (0.524)	0.470* (0.403)
% Metro	−0.028* (0.016)	−0.033*** (0.011)	−0.028 (0.023)	−0.033** (0.013)
% Black	−0.002 (0.037)	−0.002 (0.027)	−0.078 (0.058)	−0.000 (0.000)
% Hispanic	−.030 (.033)	−.011 (.023)	−0.166*** (.047)	−0.036 (0.027)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
State FE	X	X	X	X
Time FE	X	X	X	X
R^2	.905	.608	.890	.652
Obs	1,558	1,558	1,558	1,558

Notes: Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

TABLE 15
Results with Three Year Averaged Dependent Variable

	GERR	NECR	GJRR	NJCR
OVERALL	0.756*** (0.196)	0.643*** (0.226)	0.571 (0.392)	0.439 (0.268)
RGDP	−0.001 (0.009)	0.126*** (0.027)	0.006 (0.015)	0.206*** (0.027)
% Bachelor's	0.124*** (0.033)	−0.028 (0.022)	0.118 (0.060)	−0.098** (0.043)
100 Psqm	1.43*** (0.463)	−0.327 (0.323)	0.645 (0.552)	0.040 (0.374)
% Metro	−0.029* (0.016)	−0.028*** (0.009)	−0.024 (0.022)	−0.021** (0.010)
% Black	0.007 (0.027)	0.007 (0.017)	−0.062 (0.062)	0.015 (0.035)
% Hispanic	−0.039 (0.033)	−0.012 (0.022)	−0.149*** (0.047)	−0.030 (0.029)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
State FE	X	X	X	X
Time FE	X	X	X	X
R^2	.927	.743	.917	.716
Obs	1,500	1,500	1,500	1,500

Notes: Standard errors are clustered at the state level and are displayed in parentheses. FE, fixed effects; Psqm, people per square mile; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

on OVER is larger in the NJCR regression compared to Table 9.

Finally, we use a weighted regression to address concerns over outliers. We rerun the regression shown in Tables 6–9 and the results remain qualitatively unaltered. The results are available upon request.

VI. CONCLUSION

Job creation and destruction and establishment entry and exit play a fundamental role in any economy. We have shown that these variables are positively associated with the level of economic freedom. In our baseline estimation that includes state and time fixed effects and a variety of control variables, the value of the economic freedom index is always positive and statistically significant at the 1% level in three of the four measures. In terms of magnitudes, a one standard deviation increase in the freedom index is associated with a 0.71 increase in the net entry rate of new establishments and a 1.02 increase in the net job creation rate. The relationship is robust to a large number of controls and alternative specifications.

Our results are primarily driven by labor market freedom and, to a lesser extent, the size of government. That is, states with more labor market freedom and smaller governments have more dynamism. Higher union densities, minimum wages, and proportion of the labor force working in the public sector are all associated with less dynamism. At the same time, lower taxes are not associated with more dynamism. In fact, in many specifications, less freedom for taxation is associated with more dynamism.

Our work highlights several avenues of future research. If economic freedom primarily influences dynamism through labor market regulation, it would be interesting to understand which policies affect dynamism. We have already discussed the three economic variables contained in the index, but there are many others that are omitted. For instance, the size and duration of unemployment benefits could influence the search effort of workers and ultimately the number of jobs created in equilibrium. Finding plausible exogenous variation is of course a challenge but is key to more accurately understanding how freedom influences dynamism. Second, firms with particular characteristics beyond their size and age could be more acutely affected by changes in economic

TABLE 16
Results with Lagged Dependent Variable

	GERR	NECR	GJRR	NJCR
OVERALL	0.440*	1.564***	0.560	3.512***
	(0.256)	(0.273)	(0.379)	(0.500)
RGDP	0.023	0.099***	−0.058**	0.188***
	(0.018)	(0.036)	(0.025)	(0.063)
% Bachelor's	−0.174***	−0.159**	−0.249***	−0.055
	(0.057)	(0.063)	(0.071)	(0.082)
100 Psqm	−1.338	−1.598	−1.601	−1.167
	(1.910)	(2.799)	(3.513)	(3.145)
% Metro	0.052***	−0.016	0.027	−0.028
	(0.015)	(0.014)	(0.021)	(0.023)
% Black	−0.082	−0.074	0.046	−0.068
	(0.087)	(0.062)	(0.126)	(0.097)
% Hispanic	−0.010	−0.098	−0.251**	−0.128
	(0.067)	(0.123)	(0.104)	(0.108)
Demographic controls	X	X	X	X
Industry controls	X	X	X	X
AR(1)	0.000	0.024	0.000	0.000
AR(2)	0.606	0.264	0.187	0.636
Instruments	52	52	52	50
Obs	1,507	1,507	1,507	1,423

Notes: $n = 1$ in the first three columns and 3 in the fourth column. Robust standard errors are displayed in parentheses. Psqm, people per square mile; Obs, observations. The AR(1) and AR(2) rows show the p values for hypothesis that there is zero autocorrelation in first-differenced errors. FE, fixed effects; Psqm, people per square mile; Obs, observations.

*Significant at 10%; **significant at 5%; ***significant at 1%.

freedom. We plan to explore these avenues in future research.

APPENDIX: DATA SOURCES

Our data come from the BEA, the Integrated Public Use Microdata Series (IPUMS), the Fraser Institute, and the Census.

1. **BEA**—We extract the BEA data from their interactive data webpage at http://www.bea.gov. We take the GDP of each state measured in current dollars and the implicit national GDP deflator. State RGDP is state GDP measured in current dollars divided by the implicit price deflator.

2. **IPUMS**—Our demographic data come from the March Current Population Survey portion of the IPUMS available at https://cps.ipums.org/cps/. We download the following variables for each subject in the years 1981–2013: age, race, martial status, Hispanic origin, educational attainment recode, industry (1990 basis), metropolitan central city status, state (FIPS code), supplement weight. The individual data are converted in to state-year observations by taking the weighted mean of all individuals in a given state and year. We follow the CPS guidelines in using the supplement weight for this.

3. **Fraser Institute**—We take the Economic Freedom of North America index published by the Fraser Institute. We use the Overall Score at the state/local level and the size of government, takings and discriminatory taxation, and labor market freedom all at the state/local levels. We use the following tables from the 2015 vintage of data: T3.4c, T3.6c, T3.8c, T3.10c. Additionally for the analysis of the subcomponents, we use the transnational data set for researchers. Sample years are 1981–2013. The data can be downloaded at http://www.freetheworld.com/efna.html.

4. **Census**—We download the data on entry and exit and job creation and destruction from the Business Dynamics Statistics published by the US Census and available at http://www.census.gov/ces/dataproducts/bds/data.html. Data years are 1981–2013. We use the state establishment characteristics data tables. The variables we use are establishment entry rate, establishment exit rate, job creation rate, and job destruction rate.

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