

SUBNATIONAL ECONOMIC FREEDOM AND PERFORMANCE IN THE UNITED STATES AND CANADA

Daniel L. Bennett

During his illustrious career spanning more than half a century, Richard Vedder has tirelessly advocated for limited government and free enterprise. Much of his scholarship has focused on examining how fiscal and labor market policies consistent with the principles of economic freedom are associated with economic and social benefits such as stronger economic performance (Vedder 1981, 1990), lower unemployment (Vedder and Gallaway 1996, 1997), and poverty alleviation (Vedder and Gallaway 2002). Vedder has also examined the impact of government policy on income inequality (Vedder 2006; Vedder and Gallaway 1986, 1999; Vedder, Gallaway, and Sollars 1988), an area that he and I have collaborated to study (Bennett and Vedder 2013, 2015). Thus, Vedder's scholarship has contributed to our understanding of the impact that economic freedom exerts on economic outcomes.

Vedder's research has primarily examined the effects of individual policies such as the structure of taxation and barriers in the labor market, but a mounting body of academic research links aggregate measures of economic freedom to a variety of positive

Cato Journal, Vol. 36, No. 1 (Winter 2016). Copyright © Cato Institute. All rights reserved.

Daniel L. Bennett is Assistant Professor of Economics and Director of the Economics and Business Analytics Program at Patrick Henry College. He thanks Richard Vedder for mentorship and encouragement, Joshua Hall, two anonymous referees, and participants at the 2014 Association of Private Enterprise Education conference for providing useful comments on an earlier version of this article.

economic, political, and social outcomes. Hall and Lawson (2014) and Hall, Stansel, and Tarabar (2016) provide recent surveys of this literature. This article builds on my previous work with Vedder and contributes to the growing body of research on the effects of economic freedom by examining the relationship between subnational economic freedom and various measures of economic performance for a panel of U.S. states and Canadian provinces over the period 1980–2010.

Existing theory and empirical evidence suggest that economic freedom is positively associated with economic development and labor market outcomes, which the evidence presented here further corroborates, but the relationship between economic freedom and inequality is not well understood. It is important to examine how economic freedom affects inequality because income inequality has been heralded as the “defining challenge of our time” by influential public figures and economists. Free-market capitalism is often blamed for rising inequality, and the prescribed solution is typically freedom-reducing government interventions. Pope Francis (2013: 48), for instance, describes market capitalism as a system of exclusion and inequality that is “unjust at its roots.” Paul Krugman (2013) points to U.S. financial deregulation and entitlement reform as factors in driving higher U.S. income disparities. President Barack Obama has repeatedly expressed a desire to raise the federal minimum wage and increase the progressivity of the income tax structure as means to stem the tide of rising inequality. Thomas Piketty (2014: 1) argues that without corrective political intervention, capitalist economies inevitably produce rates of return on capital that exceed the growth rates of income and output, a process that “automatically generates arbitrary and unsustainable inequalities.”

While free-market capitalism is heralded as the villainous perpetrator of inequality, existing theory and evidence on the relationship between economic freedom and inequality is largely inconclusive (Bennett and Nikolaev 2015b). By necessity, institutional and policy reforms intended to reduce inequality through government intervention reduce economic freedom, potentially undermining the other positive effects associated with economic freedom such as economic development and improved employment opportunities, both of which enhance economic well-being. The results presented here suggest that subnational economic freedom is associated with higher levels of income per capita, lower rates of unemployment, and higher

income inequality across subnational economies in the United States and Canada.

Methodology and Data

This article utilizes panel data from the 50 U.S. states and 10 Canadian provinces over the period 1980–2010 to estimate the partial effects of subnational economic freedom on measures of macroeconomic performance, including income per capita, the unemployment rate, and relative income inequality. It does so using the fixed effects specifications given by equation (1):

$$(1) \text{PERFORM}_{r,t} = \alpha_0 + \alpha_1 \text{EF}_{r,t} + \mathbf{X}_{r,t} \boldsymbol{\beta}' + \delta_r + \epsilon_{r,t},$$

where $\text{PERFORM}_{r,t}$, $\text{X}_{r,t}$ and δ_r represent economic performance, economic freedom, a vector of control variables, and a time-invariant state/province unobserved effect, respectively, for state/province r in period t .¹ It is the first study on subnational economic freedom and economic performance that I am aware of that pools subnational data for these two North American countries. Because it does so, the number of variables available to control for is limited because of data availability and comparability.

Economic Freedom Data

Subnational economic freedom measures for the U.S. states and Canadian provinces are from the Fraser Institute's *Economic Freedom of North America* (EFNA) annual report (Stansel and McMahon 2013). The EFNA composite index is comprised of three area indices: size of government (EFNA1); distortionary taxation and takings (EFNA2); and labor market freedom (EFNA3).² The data are available annually over the period 1980–2010. The data

¹In some of the specifications used in this study, the Hausman test suggests that a random effects estimator in a specification including a dummy variable equal to 1 for Canadian provinces is efficient, but in most specifications, the test suggests that the random effects estimator is inconsistent. Because the fixed effects estimates are always consistent and the results are qualitatively similar when using a random effects estimator that includes a Canadian dummy variable, only the fixed effects results are reported.

²For the interested reader, Alberta, Delaware, Texas, Nevada, and Wyoming are the five most economically free subnational economies in the most recent period. Prince Edward Island, Quebec, Nova Scotia, New Brunswick, and Manitoba are the five least economically free subnational economies in the most recent period.

used in this study reflect a five-year average within two years of each period ending in zero and five to minimize short-run fluctuations associated with business cycles. Although the EFNA provides both all-government and subnational government measures, this article utilizes the all-government EFNA data only because it is assumed that incentives created or destroyed by policy interventions are invariant to the level of government instituting policy.

Economic Performance Data

Three measures of economic performance are utilized in this study. First, gross income Gini coefficients are used as the measure of relative income inequality. The Gini coefficient was chosen primarily because of data availability but also because it is widely used in empirical studies. The Gini coefficient is a measure of relative inequality that ranges from 0 (perfect equality) to 1 (perfect inequality). The Gini coefficient data for the United States come from Galbraith and Hale (2008), who estimate family gross income inequality measures annually using between-industry pay inequality data for each state over the period 1978–2004.³ Although the data are available annually, quinquennial data are utilized in this article. Each quinquennial observation reflects the five-year (+/- 2 years of periods ending in 0 and 5) Gini value over the period 1980–2005.⁴ These data are supplemented with the five-year average gross household income Gini values over the period 2008–12 to extend the panel to 2010. The latter data are from the American Community Survey five-year estimates.⁵

Gross family income Gini measures for the Canadian provinces are from the Income Statistics Division of Statistics Canada and are available annually over the period 1980–2011. As with the U.S.

³The data are available annually since 1969, but the subnational economic freedom data are only available since 1980, so the earlier data are not used in the current analysis.

⁴As an illustration, the observation for 2000 is the average over the period 1998–2002.

⁵The 2010 observations are adjusted using a regression technique. The Galbraith and Hale (2008) five-year average Gini measures are regressed on household gross income Gini coefficients from the decennial censuses over the period 1980–2000 and a set of fixed time-effects for 1980, 1990, 2000, and 2010. The R^2 value from the OLS estimates is 0.898. The coefficient estimates are then used to predict the 2010 values.

measures, a five-year average for the period ± 2 years of each quinquennial period are used. The resulting panel of data includes quinquennial measures for each of the 50 U.S. states and 10 Canadian provinces spanning the period 1980–2010 and are referred to in the results as GINI.

Next is the natural log of real income per capita, in constant 2011 U.S. dollars (LRGDPL). Nominal state-level GDP data and population data for the United States are from the Census Bureau. Canadian province-level nominal income and population data are from Statistics Canada.⁶ Third is the unemployment rate, or the number of unemployed persons as a share of the total labor force (UNEMPLOY). These data are from Statistics Canada and the Statistical Abstract of the United States.

Data for Control Variables

Because this article pools subnational data for the United States and Canada, the selection of control variables is limited by data that is relatively comparable across the two countries. Several variables are controlled for that potentially influence economic performance, including the adult four-year college attainment rate (COLLEGE), the share of the labor force employed in the manufacturing sector (MFG), the dependency ratio (DEP2LAB), the female share of the population (FEMALE), and the natural log of population density (LPOPDEN).⁷ The source for the Canadian data is Statistics Canada. With the exception of the MFG data, which is from the Bureau of Economic Analysis, all of the state-level data are from the

⁶Nominal state-level income figures before 1997 pertain to SIC industrial classifications, while post-1997 figures reflect NAICS classifications. An average of the SIC and NAICS estimates is used for 1997. Population figures are only available annually after 2000, and in census years before then. Intercensal populations were interpolated using compound growth rates between the 1980–90 and 1990–2000 censuses. State-level income per capita figures are converted to real 2011 figures using the CPI–U. Province-level nominal income figures are available annually over the period 1984–2010. Observations for 1980–83 are extrapolated using provincial-level average annual growth rate over the period 1985–89. The nominal income per capita figures are converted to current U.S. dollars using purchasing power parity factors from the World Bank International Comparison Program database. The current U.S. dollar-denominated provincial figures are then adjusted to constant 2011 figures using the CPI–U.

⁷DEP2LAB is defined as the ratio of the number persons under age 15 and above age 65 to the number of persons between ages 15–64.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	Mean	Std. Dev.	Min	Max	N
LRGDPL	3.68	0.26	3.05	4.79	420
UNEMPLOY	7.04	2.68	2.72	19.02	420
GINI	40.11	2.64	33.79	49.23	420
EFNA	6.29	0.96	2.94	8.28	420
EFNA1	6.93	1.11	3.05	9.30	420
EFNA2	5.83	1.02	2.74	8.88	420
EFNA3	6.10	1.34	0.95	8.16	420
LPOPDEN	3.47	1.31	-1.27	6.13	420
DEP2LAB	46.20	12.18	14.81	66.39	420
FEMALE	50.81	0.84	47.00	52.50	420
COLLEGE	2.12	5.29	0.10	26.74	400

U.S. Census Bureau. Table 1 provides summary statistics for all of the variables used.

Economic Freedom and Income Per Capita

Institutions and policies consistent with economic freedom promote competition, incentivize investment, and encourage entrepreneurship, providing an efficient economic environment for growth and prosperity. Although much of the empirical literature has focused on the positive relationship between economic freedom and economic growth (De Haan, Lundström, and Sturm 2006; Doucouliagos 2005; Faria and Montesinos 2009), a number of studies also provide evidence that economic freedom is a key determinant of income per capita across countries (Bennett et al. 2015; Cebula and Clark 2014; Cebula, Clark, and Mixon 2013; Easton and Walker 1997; Gwartney, Holcombe, and Lawson 2004) and subnational economies (Ashby, Bueno, and Martinez 2013; Basher and Lagerlof 2008; Wiseman and Young 2013).

Table 2 provides additional empirical evidence that subnational economic freedom is positively related to income per capita in North America by reporting the fixed effects estimates of equation (1) using LRGDPL as the measure of economic performance. Column 1 reports the results using the composite EFNA index. Columns 2, 3,

TABLE 2
FIXED EFFECTS ESTIMATES: LRGDPL IS THE
DEPENDENT VARIABLE

	(1)	(2)	(3)	(4)	(5)
EFNA	0.180*** (0.018)				
EFNA1		0.120*** (0.019)			0.084*** (0.021)
EFNA2			0.088*** (0.017)		0.028 (0.019)
EFNA3				0.129*** (0.013)	0.078** (0.023)
COLLEGE	0.014** (0.005)	0.015* (0.006)	0.022** (0.007)	0.026*** (0.007)	0.014** (0.005)
MFG	-0.016*** (0.002)	-0.031*** (0.002)	-0.018*** (0.003)	-0.009** (0.003)	-0.018*** (0.003)
DEP2LAB	-0.008** (0.003)	-0.015*** (0.004)	-0.010* (0.004)	0.003 (0.004)	-0.007 (0.004)
FEMALE	-0.114* (0.046)	-0.08 (0.044)	-0.145* (0.062)	-0.131* (0.063)	-0.100* (0.038)
LPOPDEN	0.042 (0.072)	0.235*** (0.061)	0.11 (0.088)	-0.068 (0.088)	0.047 (0.050)
Constant	8.714*** (2.441)	7.157** (2.292)	10.818** (3.296)	9.693** (3.313)	7.873*** (1.997)
R ²	0.755	0.716	0.686	0.712	0.763
Observations	400	400	400	400	400
Cross-Sections	60	60	60	60	60

NOTES: Fully robust standard errors in parentheses; p*** < 0.01; p** < 0.05; p* < 0.1.

and 4 report results using each of the three economic freedom areas: size of government (EFNA1), distortionary taxation (EFNA2), and market freedom (EFNA3). Column 5 includes all three area measures simultaneously.

With one exception, all of the economic freedom variables enter positively and statistically significant at the 1 percent level throughout Table 2. Because the log of income per capita is used, the coefficients can be interpreted as semi-elasticities, but this does not allow

comparison of the magnitude of the partial effects of the independent variables. Among the freedom variables, EFNA and EFNA3 have the most economically significant partial correlation with the level of development, as a standard deviation increase in overall economic freedom and labor market freedom are both associated with a two-thirds standard deviation increase in LRGDPL.⁸ Meanwhile, standard deviation increases in EFNA1 and EFNA2 are associated with an approximately half and third standard deviation increase in income per capita, respectively. In column 5, EFNA1 and EFNA3 both enter positively and are statistically significant at the 1 percent level, while EFNA2 is not statistically significant. In this specification, standard deviation increases in the size of government and labor market freedom areas are associated with an approximately one-third and half standard deviation increase in income per capita, respectively.

Among the control variables, COLLEGE is positive and statistically significant at 10 percent or better in all but one specification, while MFG, DEP2LAB, and FEMALE are all negative and statistically significant in most specifications. The specifications in Table 2 jointly explain 69 to 76 percent of the variation in income per capita.

Economic Freedom and Unemployment

Economic freedom has also been linked to positive labor market outcomes. Studies by Heller and Stephenson (2014) and Garrett and Rhine (2011) find that state-level economic freedom is associated with lower unemployment and greater employment growth, respectively, while Feldmann (2007) and Stansel (2013) find country-level and U.S. metro area economic freedom to be associated with lower unemployment, respectively. Hall et al. (2013) find that state-level economic freedom is positively associated with entrepreneurial startups, which create new jobs for the economy.

⁸Standardized coefficients are reported in the text for comparability of the magnitudes of the partial effects of the independent variables. Standardized coefficients ($\bar{\beta}$) are computed as follows: $(\bar{\beta}) = \beta \times \left(\frac{s_{EF}}{s_{perf}} \right)$, where β and s_{EF} denote the partial effect and standard deviation of the economic freedom variable, and s_{perf} represents that standard deviation of the economic performance measure.

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Table 3 provides additional empirical evidence that economic freedom exerts a positive impact on labor market outcomes by reporting the fixed effects estimates of equation (1) using the unemployment rate as the measure of economic performance. As with Table 2, the economic freedom variables enter one at a time in columns 1 to 4, while column 5 controls simultaneously for all three area measures.

All of the economic freedom variables enter negatively and statistically significant at the 1 percent level when controlled for individually. Economically, EFNA3 has the strongest correlation

TABLE 3
FIXED EFFECTS ESTIMATES: UNEMPLOY IS THE
DEPENDENT VARIABLE

	(1)	(2)	(3)	(4)	(5)
EFNA	-2.587*** (0.316)				
EFNA1		-1.226** (0.355)			-0.444* (0.266)
EFNA2			-1.125*** (0.134)		0.148 (0.124)
EFNA3				-2.683*** (0.228)	-2.612*** (0.273)
COLLEGE	-0.013 (0.066)	-0.083 (0.063)	-0.136* (0.062)	-0.140* (0.053)	-0.098 (0.054)
MFG	-0.089** (0.032)	0.094* (0.041)	-0.054 (0.028)	-0.289*** (0.042)	-0.246*** (0.047)
DEP2LAB	0.069 (0.070)	0.152* (0.070)	0.101 (0.064)	-0.153** (0.055)	-0.124* (0.056)
FEMALE	-0.265 (0.746)	-0.543 (0.748)	0.161 (0.587)	-0.025 (0.510)	-0.237 (0.568)
LPOPDEN	3.215** (1.113)	0.676 (1.137)	2.138** (0.759)	6.396*** (0.731)	5.932*** (0.833)
Constant	23.506 (37.883)	32.589 (38.288)	-5.942 (29.685)	13.703 (25.533)	25.903 (28.558)
R ²	0.389	0.183	0.193	0.525	0.538
Observations	400	400	400	400	400
Cross-Sections	60	60	60	60	60

NOTES: Fully robust standard errors in parentheses; p*** < 0.01; p** < 0.05; p* < 0.1.

among the freedom variables, as a standard deviation increase in labor market freedom is associated with a 1.34 standard deviation decline in the unemployment rate. The specification that uses EFNA3 jointly explains 53 percent of the variation in the unemployment rate. The composite economic freedom index also exhibits an economically strong correlation, as a standard deviation increase in EFNA is associated with a 0.93 standard deviation decrease in the unemployment rate.

Meanwhile, standard deviation increases in EFNA1 and EFNA2 are associated with approximately half a standard deviation drop in the unemployment rate. In column 5, EFNA1 and EFNA3 both enter negatively and significantly significant at the 10 percent level or better. A standard deviation increase in the size of government area is associated with one-fifth standard deviation decline in UNEMPLOY, while a standard deviation increase in labor market freedom is associated with a nearly three-fifths standard deviation decline in the unemployment rate, all else equal. EFNA2 is not statistically significant.

Among the control variables, COLLEGE is negative and LPOP-DEN positive when statistically significant at 10 percent or better. MFG and DEP2LAB are both statistically significant in more than half of the specifications, but the sign of their coefficient is inconsistent. FEMALE is never statistically significant. The specifications in Table 3 jointly explain 18 to 54 percent of the variation in the unemployment rate. The specifications that account for labor market freedom explain much more of the variation in the unemployment rate than those that do not.

Economic Freedom and Income Inequality

Much less is known about the relationship between economic freedom and inequality. Economic theory does not provide clear guidance on the anticipated qualitative relationship between economic freedom and income inequality. This is largely attributable to the fact that economic freedom is a complex concept that is affected by a number of institutions and policies that may exert a heterogeneous impact on the distribution of income.

Using a static two-agent framework, Berggren (1999) attempts to show that economic freedom impacts inequality through a variety of institutions and policies, but concludes that, with the exception of

government redistribution, which reduces both economic freedom and inequality, the impact of economic freedom on inequality through its various channels is theoretically ambiguous. Berggren's theoretical result that government redistribution reduces inequality depends, however, on two simplifying assumptions that may not hold in practice.

First, it assumes redistribution from high to low income individuals. The rent-seeking literature suggests that income is often redistributed in practice to middle- or high-income groups, resulting in a positive or ambiguous effect on inequality (Olson 1982; Vedder and Gallaway 1986). Second, it assumes that changes in fiscal policy do not affect economic performance, which is contrary to the so-called equity-efficiency hypothesis (Okun 1975; Vedder 2006; Vedder and Gallaway 1999). If redistribution negatively affects economic performance, it is possible that lower income persons are disproportionately impacted such that measured inequality does not change or rises if the relative loss of market income is not offset by income transfers. Vedder, Gallaway, and Sollars (1988) and Acemoglu et al. (2013) discuss additional theoretical reasons why redistribution may not reduce inequality. Even the conclusion that government redistribution reduces inequality is not theoretically generalizable, although Clark and Lawson (2008) and Scully (2002) find empirical evidence that progressive tax and redistribution policies are associated with less inequality.

Bergh and Nilsson (2010) offer further theoretical insights on how the five main areas of economic freedom are expected to impact inequality,⁹ suggesting that sound monetary policy is associated with less inequality, while limited government and private property rights are associated with more inequality. However, their empirical results concerning the relationships between these three areas of economic freedom and inequality are statistically insignificant. Easterly (2007) argues that one channel through which extreme inequality is perpetuated is through weak private property rights and rule of law, an argument further developed and supported with empirical evidence by Bennett and Nikolaev (2015a).

⁹ The Fraser Institute's *Economic Freedom of the World* index includes five main areas of economic freedom: (1) size of government; (2) legal institutions and property rights; (3) sound money; (4) international trade freedom; and (5) freedom from regulation of business, credit, and labor markets (Gwartney, Lawson, and Hall 2013).

Bergh and Nilsson (2010) suggest that standard international trade theory predicts that freedom to trade internationally is associated with more and less inequality in economically developed and undeveloped nations, respectively. Their empirical findings, which are based on a sample of predominantly middle- and high-income countries, suggest that international trade freedom is positively associated with inequality. Berggren (1999) finds a negative relationship between trade openness and inequality. Bergh and Nilsson are agnostic on the anticipated relationship between the regulatory environment and inequality, but find a positive empirical relationship. Blythe, Hopkin, and Werfel (2012) and Hopkin and Blythe (2012) argue that there is a parabolic relationship between regulatory freedom and income inequality, and provide empirical evidence supporting their hypothesis.¹⁰

Given that the relationship between economic freedom and inequality is theoretically ambiguous, several studies have examined the relationship between the two variables empirically, although the results have been mixed. Berggren (1999), Clark and Lawson (2008), and Scully (2002) find that country-level economic freedom is associated with less income inequality, while Bergh and Nilsson (2010) find a positive relationship between the two variables. Carter (2006) provides evidence of a U-shaped relationship between the economic freedom and inequality across a set of developed nations. Bennett and Nikolaev (2015b) find that the inconsistent results from cross-country analyses are attributable to a number of factors such as the econometric specification, measure of inequality, sample of countries, and/or time period used, suggesting that none of the empirical cross-country results from the literature are robust.

The above-referenced studies have all examined the relationship between economic freedom and inequality across countries. Several studies have also examined the relationship between subnational economic freedom, as measured by the Frasier Institute's EFNA index, and inequality across the 50 U.S. states. Each of these studies has used a different econometric approach, but the results have been more consistent than those of the cross-country studies, in general pointing toward a negative relationship between economic freedom and inequality.

¹⁰Regulation from freedom is used as a proxy for economic efficiency, and the authors argue that low and high levels of efficiency are associated with high levels of inequality, but intermediate levels of efficiency are associated with low levels of efficiency.

As discussed above, the EFNA index only accounts for heterogeneity among states in the size of government, distortionary taxation, and labor market policies (Stansel and McMahon 2013). National institutions measured by the Economic Freedom of the World index, such as the regulatory environment, monetary policy, international trade policy, and private property rights, are relatively homogenous among states. These macro-level institutions may nonetheless influence the distribution of income at the subnational level such that results from state-level analyses are not directly comparable to those from country-level analyses because the margins at which institutions are operating at the subnational and national level differ. Nonetheless, the findings of subnational studies do provide additional evidence to help enhance our understanding of the relationship between economic freedom and inequality.

Using income quintile ratios as their measure of inequality, Ashby and Sobel (2008) find that EFNA in 1980 and changes in EFNA over the 1980–2003 period are both associated with less income inequality in the latter period.¹¹ They also find that lower minimum wage levels and lower tax burdens are the best policies for reducing inequality. Using panel data over the period 1979–2004, Bennett and Vedder (2013) find that increases in EFNA are associated with lower levels of income inequality, as measured by the Gini coefficient. They also provide empirical evidence of an inverted U-shaped relationship between EFNA and inequality, opposite Carter's (2006) findings of a U-shaped cross-national economic freedom-inequality curve.¹²

Aspergis, Dincer, and Payne (2014: 74) analyze the relationship between EFNA and state-level income inequality using time-series techniques, finding that economic freedom has a long-run negative impact on inequality, but indicate that Granger causality is bidirectional. Regarding the latter result, they suggest that it is "possible for a state to get caught in a vicious circle of high income inequality and

¹¹Carter (2006) criticized Berggren (1999) for including both the level and change in economic freedom as regressors in the latter's inequality model, suggesting that the results could be interpreted as a distributed lag model such that the short- and long-run effects of economic freedom on inequality are negative and positive, respectively. A similar argument could be made about the results of Ashby and Sobel (2008), although the point estimates suggest that both the short- and long-run effects of EFNA on inequality are negative.

¹²The measures of national and subnational economic freedom differ substantially, providing one possible explanation for these conflicting results.

heavy redistribution” given that “high income inequality may cause states to implement redistributive policies causing economic freedom to decline. As economic freedom declines, income inequality rises even more.”¹³ Although they do not explicitly consider the impact of EFNA on relative inequality, Compton, Giedeman, and Hoover (2014) find that increases in EFNA exert a positive and significant impact on the growth rates of mean household income for the top four quintiles, and a positive but insignificant impact on the bottom income quintile.

Next, additional empirical evidence on the relationship between subnational economic freedom and income inequality is presented. Table 4 reports fixed effects estimates of equation (1), where GINI is the measure of economic performance. Among the economic freedom variables, EFNA, EFNA1, and EFNA3 are statistically significant at the 5 percent level or better, and each enters positively. The 0.65 coefficient estimate for EFNA suggests that a standard deviation increase in economic freedom is associated with an approximately quarter standard deviation increase in GINI, all else equal. The coefficient estimate of 0.38 for EFNA1 suggests that a standard deviation in the size of government area is associated with less than a fifth standard deviation increase in GINI, while the coefficient estimate of 0.853 for EFNA3 suggests that a standard deviation increase in labor market freedom is associated with less than a half standard deviation increase in GINI.

As with Tables 2 and 3, column 5 of Table 4 controls simultaneously for the potential impact of EFNA1, EFNA2, and EFNA3 on inequality. EFNA2 has a coefficient of -0.39 and is statistically significant at the 1 percent level, suggesting that a standard deviation increase in freedom from discriminatory taxation is associated with a 0.15 standard deviation decrease in GINI. EFNA3 has a coefficient of 1.04 and is statistically significant at the 1 percent level, suggesting that a standard deviation increase in labor market freedom is associated with an approximately half standard deviation increase in GINI. It is interesting to note that the partial effects of EFNA2 and EFNA3 are both economically and statistically stronger than the effects when each variable entered individually. EFNA1 remains positive but is not statistically significant in column 5.

¹³Murphy (2015) argues that high levels of inequality may lead policymakers to intervene in the market to reduce inequality, reducing economic freedom.

TABLE 4
FIXED EFFECTS ESTIMATES: GINI IS THE
DEPENDENT VARIABLE

	(1)	(2)	(3)	(4)	(5)
EFNA	0.650*** -0.155				
EFNA1		0.380* -0.161			0.201 -0.182
EFNA2			0.123 -0.126		-0.390** -0.128
EFNA3				0.853*** -0.12	1.036*** -0.134
COLLEGE	0.142*** -0.036	0.150*** -0.041	0.189*** -0.041	0.167*** -0.035	0.171*** -0.043
MFG	-0.295*** -0.045	-0.345*** -0.048	-0.316*** -0.049	-0.224*** -0.048	-0.241*** -0.057
DEP2LAB	-0.033 -0.049	-0.058 -0.051	-0.039 -0.055	0.038 -0.045	0.049 -0.048
FEMALE	0.008 -0.378	0.108 -0.421	-0.073 -0.424	-0.053 -0.353	0.097 -0.367
LPOPDEN	2.878*** -0.605	3.550*** -0.617	3.273*** -0.643	1.737** -0.652	1.786** -0.666
Constant	30.429 -18.672	26.243 -20.932	36.971 -20.679	31.987 -17.23	23.628 -18.145
R^2	0.718	0.71	0.702	0.741	0.751
Observations	400	400	400	400	400
Cross-Sections	60	60	60	60	60

NOTES: Fully robust standard errors in parentheses; p*** < 0.01; p** < 0.05; p* < 0.1.

Conclusion

This article builds on previous collaborative work with Richard Vedder and examines how subnational economic freedom impacts economic performance in North America. Specifically, it uses fixed effects regressions to estimate the partial effects of various economic freedom measures on income per capita, the unemployment rate, and relative income inequality across the 50 U.S. states and

10 Canadian provinces. It is the first study that I am aware of that pools data for the 50 U.S. states and 10 Canadian provinces to further account for heterogeneity in economic freedom and its potential impact on subnational economic performance in North America.

The results largely corroborate existing evidence that economic freedom is associated with higher levels of income per capita and lower rates of unemployment. However, they also suggest that economic freedom is associated with modestly more income inequality, a result that is somewhat at odds with the small body of literature that has in general found a negative relationship between subnational economic freedom and income inequality in the United States (Aspergis, Dincer, and Payne 2014; Ashby and Sobel 2008; Bennett and Vedder 2013). This seeming contradiction is unsurprising given the ambiguity of theory concerning the relationship between the two variables and the inconclusiveness of cross-country empirical work (Bennett and Nikolaev 2015b). One possible explanation for the differing qualitative result is that the current study pools data for the United States and Canadian provinces. There is greater variance in inequality and less variance in economic freedom among the states than the provinces.

The economic freedom of North America index is also decomposed to examine how its individual areas affect economic performance. When controlled for individually, all three areas are statistically associated with higher levels of income per capita and lower rates of unemployment. Controlling for all three measures simultaneously, both the limited government and labor market freedom areas are statistically associated with more income per capita, but only labor market freedom is statistically associated with lower unemployment rates. Both the limited government and labor market freedom areas are statistically associated with higher income inequality when controlled for individually, but the distortionary taxation and labor market freedom areas are statistically associated with less inequality in the specification that accounts for all three areas in the same regression.

While the results obtained in this article provide some insight for economic policymakers, they are preliminary and should be interpreted with caution for several reasons. First are the potential problems of omitted variables and multicollinearity, which would bias the coefficients and inflate the standard errors. As with all empirical studies, the choice of control variables is limited by data availability, particularly given that the current study pools data for the United States

and Canadian provinces. The independent variables included in the study are among those routinely included in empirical analyses of economic performance, and they jointly explain a significant amount of the variation in the three measures of economic performance. Any potential bias attributable to omitted variables is therefore relatively small. The risk of multicollinearity is minimized by excluding the alternative measures of economic performance, which are fairly well correlated, as independent variables.

Next is the potential for reverse causality if one or more of the independent variables is endogenous. Aspergis, Dincer, and Payne (2014) provide evidence of bidirectional causality between economic freedom and inequality across the U.S. states, and Murphy (2015) suggests the inequality may hamper economic freedom. While it is recognized that endogeneity may be an issue with the empirical specifications employed here, it is beyond the scope of this article to attempt to establish causality econometrically. That task, however, would be a fruitful area for future research. Disentangling the potential direct and indirect effects of economic freedom on the various measures of economic performance is also a good avenue for future research.

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