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JEL codes: O20, O51, R58, H70
Key Words: economic freedom, employment, development

Abstract

We extend earlier models of economic growth and development by exploring the effect of economic freedom on U.S. state employment growth. We find that states with greater economic freedom – defined as the protection of private property and private markets operating with minimal government interference – experienced greater rates of employment growth. In addition, we find that less restrictive state and national government labor market policies have the greatest impact on employment growth in U.S. states. Except for labor market policies, we find that state employment growth is influenced by state and local government policies, but not the policies of all levels of government, including the national government. Our results suggest that policy-makers concerned with employment should seriously consider the degree to which their own labor market policies, as well as those of the national government, may be limiting economic growth and development in their respective states.

The views expressed here are those of the authors and not the views of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

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I. Introduction

It is common knowledge that large differences exist in the economic growth and development of countries around the world. An extensive literature finds numerous factors that, taken together, explain why certain countries experience greater rates of income and employment growth than others. The most cited factors contributing to economic growth include the stock of human capital, investment in technology, trade specialization and foreign direct investment, and low levels of political corruption.[1] In addition to these factors, a more recent literature has explored the role of economic and political institutions in the economic growth of countries. Studies have shown that countries with greater economic freedom – meaning the protection of private property and private markets operating with minimal government interference – have greater rates of economic growth than countries with lower levels of economic freedom (Cole, 2003; Strum and DeHann, 2001; Powell, 2003; Gwartney, 2009).[2]

Differences in economic growth also exist across subnational jurisdictions (e.g., states, provinces). For example, average annual employment growth in the United States from 1960 to 2008 was nearly 2 percent, but the employment growth experience of individual states was much different – employment growth ranged from 0.8 percent (New York) to nearly 5.5 percent (Nevada). Also consider that average annual per capita income growth for the 10 Canadian provinces from 1981 to 2008 was 4.3 percent, but the growth rates for individual provinces

[1] See Barro (1997, 2001) and Barro and Sala-i-Martin (2004) for a review of the literature on cross-country economic growth. See also Billger and Goel (2009), Chatterjee and Turnovsky (2007), and Blankenau and Simpson (2004).

[2] In *Economic Freedom of the World,* Gwartney and Lawson (2009) derive a single economic freedom index number for each country that places each country on a continuum from zero to 10, where 10 represents the highest degree of reliance on free-market capitalism. The index considers five categories: the size of government, property rights and the legal system, trade freedom, sound money, and minimal regulation.

ranged from a low of 3.8 percent in British Columbia to a high of 5.3 percent in Newfoundland and Labrador.[3]

Many factors that explain differences in cross-country growth also explain differences in state economic growth. Crain and Lee (1999) and Garrett, Wagner, and Wheelock (2007) have shown that income growth is higher in U.S. states with greater industrial diversity, a greater percentage of the population with a college degree, a greater percentage of the population in the labor force, and state government as a smaller share of gross state product (GSP). Tomljanovich (2004) demonstrated that higher state tax rates reduce state economic growth (measured by per capita GSP) for several years following a tax increase.[4] Similarly, Nickell, Nunziata, and Ochel (2005) and Daveri and Tabellini (2000) found that higher labor taxes reduced employment. Finally, Quan and Beck (1987) and Nistor (2009) found that states and counties with greater human capital investment had lower unemployment rates and greater employment growth.

It is reasonable that differences in economic freedom across states may explain variation in the growth of U.S. states as well. Economic and political institutions, such as business regulation, taxation, and government spending, differ across state governments just as they do across national governments. To date, however, empirical models of state economic growth have essentially ignored the potential role of state economic and political institutions in state-level economic growth.

In this paper, we augment prior models of state economic growth by examining the effect of economic freedom on U.S. state employment growth. We use the state-level economic freedom indices in Karabegovic and McMahon's (2008) *Economic Freedom of North America*

[3] U.S. employment data are from the Bureau of Labor Statistics. Canadian data are from Statistics Canada.
[4] See also Dye (1980) and Wasylenko and McGuire (1985).

2008. The overall index, described in more detail later, considers three areas of state-level economic freedom – the size of government, taxation, and labor market freedom. The paper's testable hypothesis is that states with greater economic freedom (i.e., smaller government, less taxation, and more labor market freedom) have higher rates of employment growth. More economic freedom in a state can lead to greater employment growth through two channels: (i) by encouraging higher levels of entrepreneurial activity and small business creation (Kreft and Sobel, 2005) and (ii) by reducing the costs, both financial and regulatory, on existing businesses in the state (Karabegovic and McMahon, 2008).

We conduct several empirical exercises using different measures of economic freedom. It is reasonable to believe that the three areas of economic freedom do not exert equal influences on state employment growth. This belief is motivated by the fact that each area of economic freedom has been found to have a different impact on other state-level economic variables, such as entrepreneurship and income inequality (Kreft and Sobel, 2005; Ashby and Sobel, 2008). Thus, we test not only for the effect of aggregate economic freedom in our employment growth models, but we also consider how each of the three areas of aggregate economic freedom influences state employment growth. This provides an opportunity to determine which economic and political factors (the size of government, taxation, or labor market freedom) have the greatest impact on state employment growth.

Because federal economic policies (e.g., minimum wage legislation, federal personal and corporate income taxes, federal government transfers to states) influence the economic and political climate in individual states, our empirical models consider state-level economic freedom indices based on state and local government policies as well as economic freedom indices for

national, state, and local government policies. This allows us to determine which level(s) of government policy have the greatest impact on state employment growth.

Our results reveal that economic freedom is a significant factor in state employment growth in addition to the more traditional determinants of growth such as industrial diversity and human capital. We find that the effect of economic freedom on state employment growth varies depending on the time period studied and which economic freedom index is used. Insightful differences are found when we individually consider each of the three areas of economic freedom and when we consider economic freedom based on state government policies versus state and national government policies. The results have important policy implications for all those concerned with subnational economic growth and development.

II. Economic Freedom in U.S. States

The state-level economic freedom indices used in this paper are from *Economic Freedom of North America 2008* (Karabegovic and McMahon, 2008).[5] The indices are "an attempt to gauge the extent of the restrictions on economic freedom imposed by governments in North America" (Karabegovic and McMahon, 2008, page 3). The intuition behind the indices is that once state governments reach a certain size in terms of taxing, spending, and regulation, additional government intervention in the private sector reduces economic growth. Although the optimal size of each state government in terms of maximizing private-sector economic growth (through government spending on infrastructure, eliminating externalities, and so on) is unclear, the myriad of government actions and policies in force today, as well as academic research, certainly suggests that the size of state governments is greater than the optimal level as defined

[5] *Economic Freedom of North America 2008* can be accessed at www.freetheworld.com/efna.html.

above.[6] Thus, on the margin, it is expected that states with relatively greater government intrusion in the private sector (i.e., lower economic freedom indices) will experience lower economic growth.

The economic freedom indices are constructed on a 10-point scale, with a higher value denoting greater economic freedom. Economic freedom is evaluated using two levels of government – the subnational level (state and local governments) and the "total" government level (national, state, and local governments).[7] Overall freedom indices for the two levels of government are each based on three areas of government intervention, namely the size of government (Area 1), takings and discriminatory taxation (Area 2), and labor market freedom (Area 3). A higher index for each of the three areas implies a smaller state government, less taxation, and greater labor market freedom, respectively. Each area has its own economic freedom index, and the overall index is an equally weighted average of the three areas. The indices are constructed using data on each of the components (Table 1), and each economic freedom index for a particular state is relative to that of all other states by construction.[8]

[Table 1]

Figure 1 illustrates the variation in overall economic freedom (subnational level) across the continental U.S. states for 2005. Economic freedom ranged from a low of 5.5 in West Virginia to a high of 8.3 in Delaware, with an average value of 6.9. States in the Southeast and the Midwest tend to have a higher level of economic freedom than states on the West Coast and in the Northeast. Although not shown here, the level of economic freedom in each state is

[6] See Mitchell (2005) for a detailed literature review of the literature on the optimal size of government.
[7] Although not used in this paper, provincial economic freedom indices are available for the Canadian provinces.
[8] See Karabegovic and McMahon (2008, pages 77-80) for a discussion of how the economic freedom indices are calculated.

similar in proximal years, but large differences in the level of economic freedom in a state over time do exist.[9]

[Figure 1]

The primary advantage of the economic freedom index is that it provides a concise, summary measure of government restrictions on free-market activity.[10] As a result, not only have dozens of studies explored the impact of economic freedom on various measures of economic growth, but additional studies also have explored how the economic freedom index correlates with other variables, such as health (Norton, 1998; Esposito and Zaleski, 1999), migration (Melkumian, 2004), income inequality (Ashby and Sobel, 2008), the productivity of investment (Dawson, 1998), and entrepreneurship (Ovaska and Sobel, 2005; Kreft and Sobel, 2005).

Although the economic freedom index has been used in many studies, it is not without critics (Hanson, 2003). One criticism is that the index, because it is a summary measure, is less precise in measuring economic freedom than many of the component variables used to create the index, thus generating specification bias in empirical models. One way to mitigate this problem (as we do in this paper) is to estimate regression models using the economic freedom index for each of the three areas (see Table 1) in addition to the overall freedom index (Heckelman, 2005). A second criticism is that there is simultaneity (both in levels and in growth rates) between the economic freedom index and economic outcomes such as GDP and income.[11] Studies have

[9] Annual state-level economic freedom indices from 1980 to 2005 are available at http://www.freetheworld.com/efna.html.

[10] An econometric advantage of using the economic freedom index in empirical modeling rather than the set of variables in Table 1 is that many of the variables in Table 1 are highly correlated, thus likely decreasing the precision of the coefficient estimates. The use of a single measure of economic freedom eliminates this potential problem.

[11] If economic freedom is a normal good, then wealthier countries would demand more economic freedom.

regressed future growth on the contemporaneous economic freedom index to minimize this problem, which is the methodology we follow in this paper. A final criticism of the economic freedom index is that it entails ideological bias because the index is created by a free-market organization – namely, the Fraser Institute. Ashby and Sobel (2008) argue, however, that even if an ideological bias exists, this bias actually ensures that the index does capture the desired measurements.

Despite some controversy surrounding the economic freedom index, we assume that the index approach is valid. We leave it to future research to show whether the index is an appropriate gauge of economic freedom. As discussed in the following section, we design our empirical models to ensure that the potential econometric problems surrounding the economic freedom index – namely, specification bias and simultaneity – are taken into account.

III. Data and Empirical Methodology

We estimate our models of state employment growth for three separate time periods (1980-1990, 1990-2000, and 2000-2005) using data for the 50 U.S. states. We perform the analysis for the three periods to assess the temporal robustness of the relationship, if any, between economic freedom and state employment growth.[12] We run several empirical specifications that each consider one of the several economic freedom indices discussed earlier – namely, the overall index, the index for each of the three areas (see Table 1), and the indices for subnational government (state and local) policies and total government (national, state, and local) policies.

[12] The economic freedom index is not available before 1981. Thus, our models of employment growth over the 1980-1990 period use the economic freedom index for 1981.

Our empirical models are designed to examine the degree to which differences in economic freedom across states in the initial year of each 10-year and 5-year period can explain differences in state employment growth over the period.[13] Two reasons exist for choosing this framework. First, regressing future employment growth on an initial value of the economic freedom index minimizes any simultaneity and endogeneity between the economic freedom index and state employment growth that exists over time (Heckleman, 2005). Second, a lag exists between the time when government policies are implemented and when their effects are known or realized, so it is reasonable to model future employment growth as a function of past government policies.[14]

Although there is little disagreement that fiscal policy and government regulation work with lags, we have no *a priori* hypothesis as to the exact lag to consider in our empirical models. Previous studies have considered lag lengths ranging from several years to several decades. To ensure consistency with many previous studies, we have chosen to explore the effect of economic freedom on state employment growth over two 10-year periods and one 5-year period. Our results are, of course, specific to the starting years chosen and the length of time in which we specify employment growth.

Previous studies on state economic growth serve as a guide for the variables to include in our models. Of the dozen or so variables we could have included, we chose the variables that were found to be significant determinants of economic growth in many earlier studies. To

[13] Our empirical specification is similar to that used in the convergence literature. Implicit in the empirical specification is the idea that each economy has a steady-state growth path that follows a time trend. Quah (1993) provides cross-country evidence on income growth that refutes this assumption. Durlauf (2001) raises other potential problems, such as nonlinearities, a disconnect between growth theory and empirical modeling (i.e., which variables should be included in growth models and the potential problem of simultaneity) and, finally, heterogeneous parameters. We argue that differences across states in terms of heterogeneous parameters and different growth paths are likely to be significantly less than across countries because political systems and components of government revenue and spending are much more similar across states than across countries.

[14] See Auerbach and Gale (2009).

alleviate likely simultaneity between state employment growth and each of the independent variables, some of the variables in our models (described below) are specified as growth rates whereas the levels of other variables are included for the initial year (1980, 1990, or 2000).[15]

We account for the human capital of a state by including the percentage change in the share of the state population older than age 25 that has obtained a bachelor's degree or higher (Quan and Beck, 1987; Nistor, 2009).[16] Our expectation is that states with greater growth in the share of the population with a college degree will have greater rates of employment growth.

State population density (persons per square mile) for the initial year is included to capture the effects of agglomeration on state economic growth. Haughwout (1999), Blumenthal, Wolman, and Hill (2009), and Puga (2010) have demonstrated that areas with greater agglomeration experience greater rates of growth.[17] Assuming a concave path for state economic growth as suggested by the convergence literature (Carlino and Mills, 1996; Webber, White, and Allen, 2005), we expected that states with greater population density in the initial year would have lower rates of future employment growth.

To control for industry mix, we include for each initial year of a study period manufacturing employment and service sector employment, each as a percentage of total employment (Nistor, 2009).[18] The expected sign on each variable is unclear. Generally, manufacturing has been a declining share of total employment in U.S. states, whereas the service sector has been an increasing share of total employment. States with a greater share of

[15] We considered several variables in addition to the variables used in the final empirical models. Specifically, we considered human capital spending, the share of a state's population between 18 and 64 years of age, and the measure of industrial diversity suggested by Crain and Lee (1999). We considered these variables in levels and in percent changes. The coefficients on these variables were statistically insignificant in most regression specifications, and there was little change in the size and sign of the remaining coefficients. We thus chose to drop these variables from our final specifications.

[16] Data are from the U.S. Census.

[17] State population and area data were obtained from the U.S. Census.

[18] Employment share data were calculated using industry employment data from the Bureau of Economic Analysis.

employment in manufacturing in the initial year may have experienced slower total employment growth if employment growth in other sectors, including services, was insufficient to offset any decline in manufacturing. Similarly, states with a greater share of employment in services in the initial year may have experienced greater employment growth if service sector growth offset declining growth in other sectors. In short, the sign on each variable depends on the relative size of each sector in the initial year and the employment dynamics in all other sectors (Elhorst, 2003).

Descriptive statistics for the variables used in the analysis are shown in Table 2. A few comments regarding the data are noteworthy. Employment growth across the states averaged 21 to 23 percent for the 1980s and 1990s and 2.5 percent in the early 2000s. Overall economic freedom averaged slightly above 7.0 in each of the three years. Economic freedom in Area 1 and Area 2 decreased over time, whereas economic freedom for Area 3 increased over time. The standard deviations of the economic freedom indices suggest that variation in economic freedom across the states generally decreased over time.

[Table 2]

IV. Results

The empirical results for each time period are shown in Tables 3 through 5. All regressions included the economic freedom index at the state and local government level. In addition, all regressions included a set of nine regional dummy variables based on Census regions to control for heterogeneity in growth rates across regions.

[Table 3]

[Table 4]

[Table 5]

A brief summary of the findings for the other independent variables is warranted before we focus on the economic freedom results.[19] The coefficients on the percentage change in the share of the population with a bachelor's degree are positive, but they are statistically significant only for the 2000-2005 period (and in one specification in the 1990-2000 period). Population density in the initial year is negative and significant for the 1980-1990 and 1990-2000 periods. This finding corresponds to our prior hypothesis that states with higher agglomeration have lower future employment growth rates. The coefficient on the share of total employment in manufacturing is negative and significant for the 2000-2005 period, but the coefficients are generally not significant for the two earlier time periods. The coefficients on the share of total employment in services are positive and significant for the 1980-1990 and 1990-2000 periods, but the coefficient is not significant for 2000-2005.

Our key variables of interest are the economic freedom indices. We first discuss the results regarding the effect of overall economic freedom on state employment growth (column 1 of Tables 3 through 5). In accordance with our hypothesis, the coefficient on the overall economic freedom index is positive and significant in all three time periods. The results indicate that a one-unit increase in the economic freedom index (roughly equal to one standard deviation) in the initial year resulted in increased employment growth of 3.8 percentage points from 1980 to 1990, 4.5 percentage points from 1990 to 2000, and 1.4 percentage points from 2000 to 2005. In terms of explaining the variation in state employment growth, a comparison of the adjusted R^2 from each of the reported models with the adjusted R^2 from unreported models that omit the

[19] We also pooled the three periods to estimate a panel data model. The coefficient estimates from this model were roughly the average of the coefficients estimates from the three separate models. The results from the panel estimation will gladly be provided on request.

economic freedom index (bottom of Tables 3 through 5) reveals that the overall economic freedom index explains roughly 3 percent to 5 percent of the total variation in state employment growth in each of the three periods.

The results for the economic freedom indices for Area 1, Area 2, and Area 3 are shown in columns 2 through 4 of Tables 3 through 5.[20] First, consider the economic freedom index for the size of government (Area 1). The coefficient on this index is positive and significant for all three periods, revealing that employment growth is greater in states with smaller state and local governments as a share of total output. The Area 1 freedom index coefficient is largest for the 1980-1990 period, revealing that a one-unit change in the index resulted in a 5.7-percentage-point increase in state employment growth. A one-unit change in the index for the two remaining periods resulted in a 3.3-percentage-point increase in employment growth (1990-2000) and a 0.9 percentage-point increase in employment growth (2000-2005). Again comparing adjusted R^2s, the inclusion of the Area 1 economic freedom index explains roughly 2 percent to 10 percent of the total variation in state employment growth.

The coefficient estimates for the Area 2 economic freedom indices (takings and discriminatory taxation), although positive, are not statistically significant in any of the three periods. Thus, relative differences in taxation across the states in the initial years do not influence future state employment growth. One reason for this finding may be that the majority of taxes considered by the economic freedom index (see Table 1) are consumer-based taxes, and the taxes levied on businesses may be ultimately borne by consumers. Another explanation may be that the growth periods of 5 and 10 years considered in this paper are longer than the impact

[20] We initially included the three area economic freedom indices in a single regression equation. However, the high correlation between the area freedom indices (average $\rho \approx 0.65$) dramatically decreased the precision of the coefficients estimates and, in some cases, produced improbable results. Thus, despite the recognized potential for omitted variable bias, we chose to estimate separate regressions for each of the area economic freedom indices.

of tax changes on employment growth, as Tomljanovich (2004) showed that tax changes have only short-run impacts on economic growth (within 5 years).

The coefficient estimates on the economic freedom index for Area 3 (labor market freedom) are positive and statistically significant for the 1990-2000 and 2000-2005 periods. A one-unit increase in labor market economic freedom increases employment growth by 4.4 percentage points and 1.8 percentage points for the 1990-2000 and 2000-2005 periods, respectively, and the inclusion of the labor market freedom index explains about 5 percent of the total variation in state employment growth based on each adjusted R^2.

The magnitude of the coefficients is larger for Area 3 than those for Areas 1 and 2 in the 1990-2000 and 2000-2005 periods, thereby suggesting that labor market freedom has a greater impact on state employment growth than does the size of government and taxation in more recent years. This is an intuitive result since business formation and expansion is directly influenced by labor costs, which constitute a significant portion of a firm's total costs. Our finding agrees with that of Kreft and Sobel (2005), who find that, of the three area economic freedom indices, labor market freedom has the largest impact on the number of sole proprietorships across the states.

At this point, a summary of our empirical results regarding the impact of economic freedom on state employment growth is warranted. We find that overall economic freedom has a positive and statistically significant effect on future state employment growth for the three periods. In addition, state labor market policies have the greatest impact on state employment growth, and the size of state governments has some impact as well. There is no evidence that taxation has a significant impact on future state employment growth for the periods considered in this study. Overall, the various economic freedom indices explain roughly 3 percent to 5 percent

of the total variation in state employment growth, on average. This finding, in addition to the significant coefficient estimates, suggests that, at least for our sample periods, economic freedom is a significant factor in state employment growth, but economic freedom explains a relatively small percentage of the across-state variation in state employment growth.

The Economic Significance of Economic Freedom

In this section we highlight the economic significance of the economic freedom coefficient estimates by examining employment growth for the 10 states with the lowest economic freedom ranking for each of the three initial years. Specifically, for the 10 states with the lowest level of economic freedom (i.e., the 10 lowest overall economic freedom indices), we ask what state employment growth would have been if each state had an economic freedom index equal to the average U.S. state freedom index (see Table 2).

To answer this question, we first use the previous regression estimates (column 1 of Tables 3 through 5) to predict employment growth using the state's actual level of economic freedom. Next, we predict each state's employment growth using the mean level of economic freedom across the states and then we compare the two predictions of employment growth. Finally, with the predictions of state employment growth at the mean level of economic freedom, we can use the level of employment in each of the three initial years to assess the increase in state employment. The results of this exercise are shown in Table 6.

Let us consider some findings shown in Table 6.[21] Employment growth from 1980 to 1990 in New York would have been over 7 percentage points higher (column 3 vs. column 2) if

[21] A caveat is that, because the economic freedom index is a relative index, in reality the economic freedom index for one state cannot change without changing the index for all other states. Thus, a state cannot simply move to the mean economic freedom level because most likely the mean level of economic freedom will change. Nevertheless,

the level of economic freedom in New York (5.00) was equal to the U.S. state average (7.05). This translates into over 550,000 jobs (column 4). For Montana, the state with the lowest level of economic freedom in 1990, employment growth would have been 6.5 percentage points higher (about 19,300 jobs) if economic freedom in Montana equaled the average of U.S. states. Finally, for the 2000-2005 period, employment growth in Vermont would have been positive (0.7 percent, 2,900 jobs) if economic freedom in the state was equal to the U.S. state average.

[Table 6]

In sum, comparing predicted employment growth based on the actual economic freedom index with the average U.S. state freedom index reveals that, on average across the 10 states, the states with the lowest level of economic freedom would have experienced employment growth roughly 5 percentage points higher over each 10-year period if the states had economic freedom equal to that of the average state. Employment growth would have been about 2 percentage points higher, on average, over the period 2000 to 2005.

National and State Economic Freedom Indices

The previous analysis considered economic freedom at the state and local government levels. In this section, we consider how economic freedom at the national, state, and local levels of government (i.e., "total government") influences state employment growth. To do so, we re-estimated all regressions in Tables 3 through 5 using the total government economic freedom indices found in Karabegovic and McMahon (2008). The coefficients on the total government economic freedom indices can be compared with the state and local government economic

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the exercise does reveal how much greater employment growth would have been if the low-freedom states had an economic freedom index equal to the mean of all U.S. states.

freedom coefficients to assess the marginal effect of national government policies on state employment growth. For the sake of brevity, in Table 7 we present only the coefficient estimates for the economic freedom indices.[22]

[Table 7]

The results in Table 7 generally reveal that economic freedom at the total government level has no impact on state employment growth. The majority of the coefficients on economic freedom, although positive in sign, are statistically insignificant. In only 3 of the 12 specifications is the effect of the freedom index statistically significant. These results, compared with the earlier results, generally suggest that relative differences in state and local government policy influence state employment growth, whereas relative differences in total government policies do not have a significant influence on state employment growth.

The one clear exception is labor market policies. Area 3 (labor market freedom) is significant for the 1990-2000 and 2000-2005 periods, as is the overall index for 1990 to 2000. The coefficients on labor market freedom are greater than those obtained with state-level labor market freedom indices, thus indicating the cumulative increase in employment growth as a result of considering national-level labor market policies in addition to state-level policies (6.7 vs. 4.4 for 1990-2000 and 2.4 vs. 1.8 for 2000-2005). In addition, the relative increase in the size of the coefficients for total government labor market policies compared with state-level policies is less than the size of the coefficients when state-level labor market policies are considered. This indicates that state-level labor market policies influence state employment growth more than national-level labor market policies.

[22] Our complete results will gladly be provided on request.

We explored the interesting finding that economic freedom at the total government level does not explain state employment growth except in the case of labor market policies. A look at the raw data reveals that, on average, the economic freedom indices at the total government level are generally smaller than those at the state and local levels and, more importantly, the indices have significantly smaller standard deviations. For example, the average 1990 state and local government freedom index is 7.06 and has a standard deviation of 0.69, whereas the average 1990 total government freedom index is 7.02 with a standard deviation of 0.52. Thus, across states, there is much less variation in total government economic freedom than there is in state and local economic freedom. This does not imply, however, that total government economic freedom does not necessarily influence state employment growth in a single state, but rather that differences in state and local government policy, and not total government policy, explain the variation in employment growth across U.S. states.

V. Summary and Conclusion

Explaining differences in the economic growth and development of countries and regions around the world has been the focus of a wide body of research. Human capital, technology, trade specialization, and economic freedom – meaning the protection of private property and private markets operating with minimal government interference – are generally considered the principal determinants of economic growth and development. A more recent line of research has attempted to explain economic growth and development across subnational jurisdictions as well. To date, however, empirical models of subnational economic growth have ignored the importance of economic freedom in explaining differences in the economic growth of sub-national jurisdictions.

In this paper, we augmented previous models of subnational economic growth by considering the role of economic freedom in explaining differences in employment growth in U.S. states. We considered employment growth over three time periods: 1980-1990, 1990-2000, and 2000-2005. For each period, we find that states with greater overall economic freedom have greater rates of employment growth. Generally, a one-unit increase in the economic freedom index (roughly equal to one standard deviation) increases employment growth by 1 to 4 percentage points depending on specification. In addition, roughly 2 to 5 percent of the variation in employment growth across the states is explained by economic freedom.

Further results suggest that labor market freedom and a smaller state government, which are two components of overall economic freedom, are important determinants of employment growth across U.S. states, with the former factor the more important. Different tax policies across states do not have a significant effect on state employment growth, however. We also provide the interesting result that, in most cases, differences in employment growth across states can be partly explained by state and local government policies, but not policies of all levels of governments. We do find, however, that labor market freedom at the state and national levels is a significant determinant of state employment growth, and state-level labor market policies appear to be more influential than national-level policies. This finding serves as an important policy implication for officials concerned with increasing economic growth.

Of note, the limitations of our study also serve as areas for future research. First, our results regarding the impact of economic freedom on employment growth are specific to the three time periods we studied. Although we would generally expect a positive relationship between employment growth and economic freedom, there is no reason to assume that the magnitudes of our coefficient estimates are not time-period specific. Future research could

extend our work by considering different time periods, as well as shorter and longer durations, such as 3 years or 20 years. Second, because economic freedom is measured as an index, it is somewhat difficult to precisely implement policy based on our results given that the index is an aggregate of 10 government policy variables. The specific effect of each policy variable on the economic freedom index is unclear. Rather than considering only the overall freedom index and the index for each of the three components (size of government, taxation, labor market freedom), future research might implement a freedom index for each of the 10 government policy variables.

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Figure 1: Economic Freedom in U.S. States (2000)

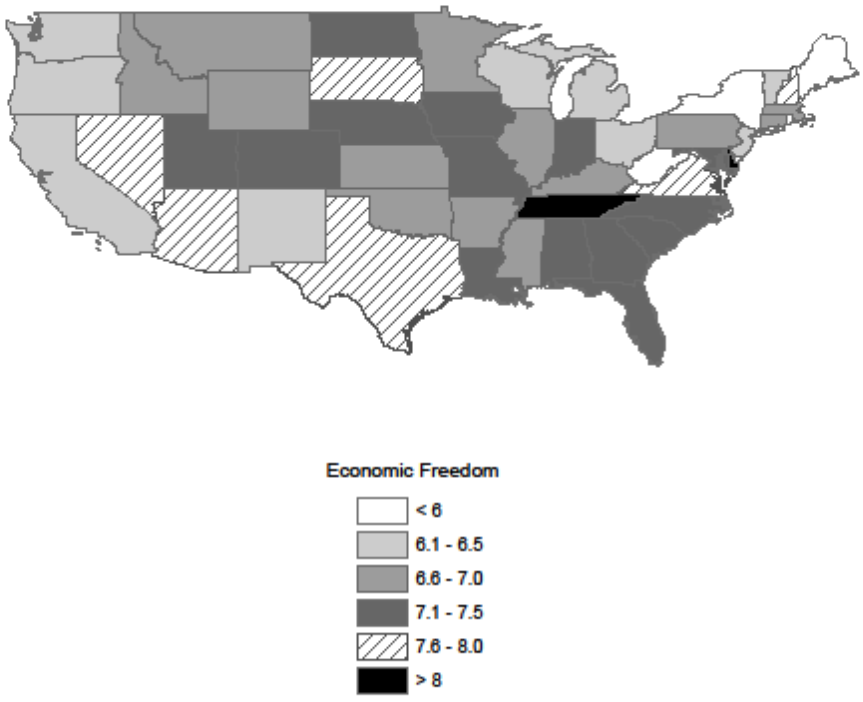

Table 1: Area and Components of State-level Economic Freedom

Area 1: Size of Government

1A: General consumption expenditures by government as a percentage of GDP
1B: Transfers and subsidies as a percentage of GDP
1C: Social security payments as a percentage of GDP

Area 2: Takings and Discriminatory Taxation

2A: Total tax revenue as a percentage of GDP
2B: Top marginal income tax rate and the income threshold at which is applies
2C: Indirect tax revenue as a percentage of GDP
2D: Sales taxes collected as a percentage of GDP

Area 3: Labor Market Freedom

3A: Minimum wage legislation
3B: Government employment as a percentage of total employment
3C: Union density

Source: *Economic Freedom of North America 2008* (Karabegovic and McMahon, 2008).

Table 2- Descriptive Statistics

Variable	Mean	Standard Deviation
Percent change in employment$_{1980\text{-}1990}$	21.53	12.62
Percent change in employment$_{1990\text{-}2000}$	23.20	12.09
Percent change in employment$_{2000\text{-}2005}$	2.56	4.63
Economic Freedom$_{1981}$	7.052	0.942
Economic Freedom$_{1990}$	7.060	0.688
Economic Freedom$_{2000}$	7.010	0.692
Economic Freedom$_{1981}$ (Area 1)	7.702	0.988
Economic Freedom$_{1990}$ (Area 1)	7.616	0.800
Economic Freedom$_{2000}$ (Area 1)	7.330	0.938
Economic Freedom$_{1981}$ (Area 2)	7.228	1.036
Economic Freedom$_{1990}$ (Area 2)	6.938	0.739
Economic Freedom$_{2000}$ (Area 2)	6.988	0.786
Economic Freedom$_{1981}$ (Area 3)	6.220	1.161
Economic Freedom$_{1990}$ (Area 3)	6.638	0.907
Economic Freedom$_{2000}$ (Area 3)	6.742	0.811
Percent change in Bachelor's Degree$_{1980\text{-}1990}$	22.87	7.52
Percent change in Bachelor's Degree$_{1990\text{-}2000}$	20.65	4.35
Percent change in Bachelor's Degree$_{2000\text{-}2005}$	10.91	2.73
Population Density$_{1980}$	154.87	222.60
Population Density$_{1990}$	166.19	235.35
Population Density$_{2000}$	181.90	250.15
Percent in Service$_{1980}$	27.30	4.47
Percent in Service$_{1990}$	34.48	4.66
Percent in Service$_{2000}$	38.98	4.56
Percent in Manufacturing$_{1980}$	21.24	8.27
Percent in Manufacturing$_{1990}$	15.68	5.85
Percent in Manufacturing$_{2000}$	13.06	4.83

Note: The sample size is 50 for 1980, 1990, and 2000. The economic freedom index is for the state and local government level.

Table 3: State & Local Economic Freedom and State Employment Growth, 1980 to 1990

	Dependent Variable: Percent Change in State Payroll Employment 1980 to 1990			
Variable	(1)	(2)	(3)	(4)
Economic Freedom$_{1981}$	3.768* (1.72)	-------	-------	-------
Economic Freedom$_{1981}$ (Area 1)	-------	5.684** (3.23)	-------	-------
Economic Freedom$_{1981}$ (Area 2)	-------	-------	0.953 (0.53)	-------
Economic Freedom$_{1981}$ (Area 3)	-------	-------	-------	2.754 (1.30)
Percent Δ in Bachelor's Degree	0.529 (0.95)	0.536 (1.10)	0.471 (0.80)	0.648 (1.11)
Population Density$_{1980}$	-0.018** (2.27)	-0.016** (2.12)	-0.019** (2.24)	-0.020** (2.41)
Percent in Service$_{1980}$	1.482** (3.04)	1.638** (3.67)	1.446** (2.74)	1.399** (2.79)
Percent in Manufacturing$_{1980}$	0.406 (1.10)	0.589* (1.78)	0.373 (0.98)	0.275 (0.70)
Constant	-50.149* (1.99)	-75.600** (3.23)	-29.471 (1.10)	-37.726 (1.39)
Regional Dummy Variables	Yes	Yes	Yes	Yes
Adjusted R^2	0.274	0.339	0.225	0.263
Adjusted R^2 (omit Freedom Index)	0.240	0.240	0.240	0.240
Observations	50	50	50	50

Notes: * denotes significance at 10 percent, ** at 5 percent. Absolute t-statistics are in parentheses and are based on White's heteroskedasticity consistent standard errors. Area 1 = Size of Government; Area 2 = Takings and Discriminatory Taxation; Area 3 = Labor Market Freedom. See text for a further description of the economic freedom indices.

Table 4: State & Local Economic Freedom and State Employment Growth, 1990 to 2000

Variable	Dependent Variable: Percent Change in State Payroll Employment 1990 to 2000 (1)	(2)	(3)	(4)
Economic Freedom$_{1990}$	4.459** (2.57)	-------	-------	-------
Economic Freedom$_{1990}$ (Area 1)	-------	3.270** (2.10)	-------	-------
Economic Freedom$_{1990}$ (Area 2)	-------	-------	2.187 (1.26)	-------
Economic Freedom$_{1990}$ (Area 3)	-------	-------	-------	4.421** (2.75)
Percent Δ in Bachelor's Degree	0.652 (1.43)	0.456 (1.08)	0.524 (1.11)	0.768* (1.71)
Population Density$_{1990}$	-0.016** (2.60)	-0.016* (2.66)	-0.016** (2.52)	-0.016** (2.39)
Percent in Service$_{1990}$	1.383** (2.15)	1.541** (2.41)	1.532** (2.30)	1.205* (1.71)
Percent in Manufacturing$_{1990}$	0.392 (0.83)	0.517 (1.14)	0.479 (1.03)	0.334 (0.73)
Constant	-71.041** (2.57)	-70.004** (2.55)	-60.517** (2.11)	-61.834** (2.26)
Regional Dummy Variables	Yes	Yes	Yes	Yes
Adjusted R^2	0.619	0.611	0.580	0.627
Adjusted R^2 (omit Freedom Index)	0.572	0.572	0.572	0.572
Observations	50	50	50	50

Notes: * denotes significance at 10 percent, ** at 5 percent. Absolute t-statistics are in parentheses and are based on White's heteroskedasticity consistent standard errors. Area 1 = Size of Government; Area 2 = Takings and Discriminatory Taxation; Area 3 = Labor Market Freedom. See text for a further description of the economic freedom indices.

Table 5: State & Local Economic Freedom and State Employment Growth, 2000 to 2005

Variable	Dependent Variable: Percent Change in State Payroll Employment 2000 to 2005 (1)	(2)	(3)	(4)
Economic Freedom$_{2000}$	1.351* (1.90)	-------	-------	-------
Economic Freedom$_{2000}$ (Area 1)	-------	0.937* (1.72)	-------	-------
Economic Freedom$_{2000}$ (Area 2)	-------	-------	0.546 (1.03)	-------
Economic Freedom$_{2000}$ (Area 3)	-------	-------	-------	1.797** (2.35)
Percent Δ in Bachelor's Degree	0.543** (2.17)	0.5000* (1.96)	0.467* (1.90)	0.591** (2.53)
Population Density$_{2000}$	-0.003 (1.29)	-0.003 (1.38)	-0.003 (1.23)	-0.003 (1.45)
Percent in Service$_{2000}$	-0.064 (0.36)	-0.085 (0.46)	0.022 (0.11)	-0.095 (0.52)
Percent in Manufacturing$_{2000}$	-0.514** (3.77)	-0.533** (3.96)	-0.473** (3.59)	-0.501** (3.46)
Constant	0.282 (0.03)	4.403 (0.50)	1.987 (0.19)	-0.949 (0.11)
Regional Dummy Variables	Yes	Yes	Yes	Yes
Adjusted R^2	0.573	0.570	0.544	0.595
Adjusted R^2 (omit Freedom Index)	0.547	0.547	0.547	0.547
Observations	50	50	50	50

Notes: * denotes significance at 10 percent, ** at 5 percent. Absolute t-statistics are in parentheses and are based on White's heteroskedasticity consistent standard errors. Area 1 = Size of Government; Area 2 = Takings and Discriminatory Taxation; Area 3 = Labor Market Freedom. See text for a further description of the economic freedom indices.

Table 6: Forecasted Employment Gains from Greater Economic Freedom: The 10 States having the Lowest Economic Freedom

	(1)	(2)	(3)	(4)
		1980-1990		
State	Freedom Score (1980)	Predicted Employment Growth (%)	Predicted Employment Growth at Freedom Mean (%)	Increase in Employment at Freedom Mean
New York	5.00	23.17	30.90	557,240
Michigan	5.20	9.15	16.13	240,264
Rhode Island	5.50	12.70	18.55	23,275
Maine	5.70	23.75	28.84	21,294
West Virginia	5.70	8.31	13.41	32,909
Oregon	5.80	28.16	32.88	49,298
Vermont	5.80	26.55	31.27	9,435
Hawaii	6.00	27.80	31.76	16,014
Minnesota	6.00	13.24	17.20	76,162
California	6.10	36.17	39.76	353,297
		1990-2000		
State	Freedom Score (1990)	Predicted Employment Growth (%)	Predicted Employment Growth at Freedom Mean (%)	Increase in Employment at Freedom Mean
Montana	5.60	37.29	43.80	19,335
New York	5.70	9.00	15.06	498,117
West Virginia	5.80	12.48	18.09	35,396
Michigan	5.90	17.01	22.18	204,104
Maine	6.10	12.65	16.93	22,901
North Dakota	6.20	16.74	20.58	10,200
Minnesota	6.30	23.40	26.79	72,386
Oregon	6.30	25.85	29.24	42,564
Rhode Island	6.30	1.97	5.35	15,385
Washington	6.30	24.62	28.01	72,623
		2000-2005		
State	Freedom Score (2000)	Predicted Employment Growth (%)	Predicted Employment Growth at Freedom Mean (%)	Increase in Employment at Freedom Mean
West Virginia	5.50	1.33	3.37	15,014
Alaska	5.80	7.90	9.53	4,643
Maine	5.80	1.92	3.55	9,857
Rhode Island	5.90	-0.02	1.48	7,153
New York	6.00	2.23	3.59	117,866
Hawaii	6.10	10.31	11.54	6,774
Montana	6.10	9.68	10.91	4,807
New Mexico	6.20	6.90	8.00	8,153
Vermont	6.30	-0.27	0.69	2,868
California	6.40	3.44	4.26	119,397

Note: Column (2) contains the state-specific predicted values from the first regression specification in Table 3, Table 4, and Table 5. Column (3) lists the state-specific predicted values from the first regression specification in Table 3, Table 4, and Table 5 using the mean value of economic freedom (state and local government only): 7.05 for 1980, 7.06 for 1990, and 7.01 for 2000. The data in Column (4) were computed using 1980, 1990, and 2000 employment levels.

Table 7: Total Government Economic Freedom and State Employment Growth

	Dependent Variable: Percent Change in State Payroll Employment 1980-1990			
Variable	(1)	(2)	(3)	(4)
Economic Freedom	1.963	-------	-------	-------
	(0.44)			
Economic Freedom (Area 1)	-------	2.850	-------	-------
		(1.01)		
Economic Freedom (Area 2)	-------	-------	-0.315	-------
			(0.05)	
Economic Freedom (Area 3)	-------	-------		0.985
				(0.29)
	Dependent Variable: Percent Change in State Payroll Employment 1990-2000			
Variable	(1)	(2)	(3)	(4)
Economic Freedom	4.123*	-------	-------	-------
	(1.80)			
Economic Freedom (Area 1)	-------	2.411	-------	-------
		(1.42)		
Economic Freedom (Area 2)	-------	-------	1.933	-------
			(0.87)	
Economic Freedom (Area 3)	-------	-------	-------	6.728**
				(3.10)
	Dependent Variable: Percent Change in State Payroll Employment 2000-2005			
Variable	(1)	(2)	(3)	(4)
Economic Freedom	1.241	-------	-------	-------
	(1.51)			
Economic Freedom (Area 1)	-------	0.783	-------	-------
		(1.24)		
Economic Freedom (Area 2)	-------	-------	0.263	-------
			(0.38)	
Economic Freedom (Area 3)	-------	-------	-------	2.413**
				(2.50)

Notes: * denotes significance at 10 percent, ** at 5 percent. Absolute t-statistics are in parentheses and are based on White's heteroskedasticity consistent standard errors. Area 1 = Size of Government; Area 2 = Takings and Discriminatory Taxation; Area 3 = Labor Market Freedom. See text for further description of the economic freedom indices. Each regression contains the same variables as the state and local economic freedom regressions shown in Table3 through Table 5. The full set of estimates will be provided upon request.