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Free to Be Happy: Economic Freedom and Happiness in US States

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Abstract While the measurement of subjective well-being and its usefulness as a policy objective is a matter of contention, a burgeoning field of happiness economics is emerging. This paper examines the relationship between the institutions of economic freedom and happiness as reported by respondents to the Generalized Social Survey (GSS) in the United States. GSS responses are matched via geocode to state of residence. This allows individual responses in the GSS to be matched to institutional characteristics of the state of residence. A novel contribution of this study is that analysis of the effect of economic freedom on reported happiness is conducted both at the individual level and using state averages. It is found that the level of economic freedom in US states has a positive effect on both individual reported happiness and state average happiness. Dynamic panel analysis is also conducted both as a robustness check and in an effort to control for endogeneity. This confirms the relationship as positive and is suggestive of a causal positive impact of economic freedom on average state happiness.

Keywords Economic freedom · Happiness · Institutions · Well-being

1 Introduction

Frey and Stutzer (2000) examine the relationship between reported happiness and institutions. They "argue that institutional conditions with regard to the extent and form of democracy have systematic and sizeable effects on individual well-being, in addition to demographic and economic factors." The analysis of happiness and institutions hasn't just focused on political institutions but has also been extended to institutions of economic

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freedom (Veenhoven 2000; Welsch 2003; Lelkes 2006; Inglehart et al. 2008; Gropper et al. 2011; Gehring 2013; Graafland and Compen 2015; Nikolaev 2014; Spruk and Kešeljevic 2015). Measures of subjective well-being (life satisfaction, happiness) in this area have come from a variety of sources including the World Values Survey (WVS). Most of the existent work has made use of cross-country variation to estimate the impact of institutions and economic freedom on measures of subjective well-being. The exceptions being Belasen and Hafer (2012, 2013) who make use of data from US states. The results in this area are mixed with the majority finding that increased economic freedom coincides with greater happiness.

The Generalized Social Survey (GSS) conducted by the NORC has asked a question on general happiness starting in 1972. The question is: *Taken all together, how would you say things were these days— would you say that you are very happy, pretty happy, or not too happy?* This project matches individual GSS responses with geocoded data to look at determinates of general happiness while controlling for a variety of individual and state level characteristics including economic freedom.

The main objective of this study is to uncover the relationship, if any, between general happiness and economically free institutions. We borrow the definition of economic freedom as provided by Gwartney et al. (2015) who say "economic freedom is present when individuals are permitted to choose for themselves and engage in voluntary transactions as long as they do not harm the person or property of others."

Rather than provide an exhaustive review of the literature on economic freedom and subjective well-being, as such reviews already exist in the literature (Graafland and Compen 2015; Spruk and Kešeljević 2015), only the key papers on the topic are briefly reviewed. Spruk and Kešeljević (2015) explore the connection between happiness and institutions with a particular focus on the institutions of economic freedom. Their research is significant in two key ways. Firstly, the depth of analysis of institutions is unparalleled including economic, political, religious, and social dimensions. However, this in depth analysis is limited to a cross-sectional analysis with the unit of observation at the country level. In cross county studies with only cross sectional variation the potential for omitted variable bias and endogeneity issues is large. Secondly, they provide an extended analysis of happiness and economic freedom using panel data methods including a difference GMM approach that controls for endogeneity. Their dynamic panel analysis reveals a negative relationship between economic freedom and happiness. This reveals a tension: in cross-sectional analysis a clear positive relationship between economic freedom and happiness is established yet the sign is reversed in a dynamic panel analysis. One of the two approaches taken by this paper is likely to be flawed and clearly the door is open to further research.

Economic freedom and subjective well-being has been studied using US state data previously in the works of Belasen and Hafer (2012) and Belasen and Hafer (2013). Their research uses a well-being index developed by Pesta et al. (2010) as the dependent variable. This index produces a well-being score for each US state for the year 2005. Using a cross-sectional econometric model Belasen and Hafer find that there is no relationship between economic freedom and well-being when economic freedom is measured using levels. However, when the change in economic freedom over a time range is used the relationship is positive and statistically significant. They find that increases in economic freedom are positively and significantly correlated with higher levels of state well-being. They further explore the effects of the components of economic freedom on well-being which reveals most of the effect is coming from the "size of government" and "takings and discriminatory taxation" components with no significance on the "labor market

freedom" component. As their analysis is limited in scope there is still much need for further research on the effect of economic freedom and well-being in US states.

Verme (2009) uses individual level observations from the European and World Value Surveys to study the link between happiness and freedom. However the variable of interest in that study is not an institutional or economic freedom score but is the individual's subjective ranking of the *"freedom of choice and control you feel you have over the way your life turns out."* While an individual's perception of freedom of choice is likely to be related to the institutions of economic freedom in which the individual makes choices within, the institutions of economic freedom are themselves more objective in substance rather than subjective. Verme's study and findings are significant but asks a fundamentally different question than that of this paper. The finding that perception of freedom of choice leads to higher subjective well-being establishes a possible causal connection between institutions of economic freedom and subjective well-being.

This study contributes to the existent body of knowledge in three distinct ways. Firstly, this study is the first to examine the relationship between economic freedom and happiness using individuals as the unit of observation. Secondly, the present study follows a trend in the related literature on economic freedom and growth (Compton et al. 2011) and more recently from the literature on economic freedom and social capital (Jackson et al. 2015) to focus on variation in economic freedom across US states. As such we rely on the Economic Freedom of North America index published by the Fraser Institute as our measure of economic freedom. So far only two studies (Belasen and Hafer 2012, 2013) have explored the relationship between economic freedom and happiness with a focus on US states. This study will be the first to do so using panel data methods. Lastly, this study is able to make use of dynamic panel data methods which generates a set of instruments which can purge endogeneity in the data. This was previously done by Spruk and Kešeljević (2015) in a cross country panel analysis. Our study finds that economic freedom has a positive impact on happiness with both individual and state average being the unit of measurement.

The paper is organized in the following manner. The conceptual framework linking economic freedom to happiness is described in Sect. 2. Section 3 describes the data used for the study while Sect. 4 presents the empirical models used to analyze the data. Section 5 presents the results with Sect. 6 offering discussion. Section 7 then concludes.

2 Conceptual Framework

In the sections that follow I first describe the concept of economic freedom as it is used in the present analysis. The connection between economic freedom and happiness is then discussed in the section following.

2.1 Economic Freedom

Any interpretation of economic freedom must be made based upon its assigned definition. Here we borrow the definition provided by Gwartney et al. (1996).

> Individuals have economic freedom when (a) property they acquire without the use of force, fraud, or theft is protected from physical invasions by others and (b) they are free to use, exchange, or give their property as long as their actions do not violate the identical rights of others. Thus, an index of economic freedom should measure

the extent to which rightly acquired property is protected and individuals are engaged in voluntary transactions. (Gwartney et al. 1996: 12)

There are several competing measures of economic freedom currently being produced but the most heavily cited indices are those produce by the Fraser Institute.[1] The Economic Freedom of the World Index was first reported in Gwartney et al. (1996) cited above and has been recalculated and updated many times since. The current index provides a measure of economic freedom for some 157 countries and territories. This index is also the most widely used in cross country studies of economic freedom and happiness.

More recently the Fraser Institute has also produced an Economic Freedom of North America index (EFNA). EFNA produces a measure of economic freedom at the subnational level with individual scores available at the state and province level. Bueno et al. (2012) reports the EFNA giving each state a score between 0 and 10 (higher numbers indicating more economic freedom) for each of the years from 1981 to 2010. We make use of the index which includes the influence of government activity at all levels (federal, state, and local) on the economic freedom in the individual states. The report produces an index of the overall economic freedom in a state and also breaks this down into three components: size of government, takings and discriminatory taxation, and labor market freedom. The overall index score is the simple average of the three component scores. One of the key features that has led to a broad acceptance of the EFW and EFNA indices in academic research is that there are no value judgements used in constructing the indices as they merely record actual institutional features. I now describe the three components used to calculate the EFNA.

The size of government measure operates under the premise that as the government grows larger it crowds out the private individual choices of the people. This, in turn, is measured by three subcomponents. The first subcomponent is general consumption expenditures by government as a percentage of state GDP. "In other words, government spending, independent of taxation, by itself reduces economic freedom once this spending exceeds what is necessary to provide a minimal level of protective and productive functions. Thus, as the size of government consumption grows, a jurisdiction receives a lower score in this component." (Bueno et al. 2012) The second is transfers and subsidies as a percentage of GDP. The third subcomponent is social security payments as a percentage of GDP.

The takings and discriminatory taxation component recognizes that as the burden of taxation grows the freedom of private individuals to spend their resources as they wish is diminished. This component is measured by four subcomponents: total tax revenue as a percentage of GDP, top marginal income tax rate and the income threshold at which it applies, indirect tax revenue as a percentage of GDP, and sales taxes collected as a percentage of GDP.

Labor market freedom pertains to the ability of individuals and firms to accept/offer employment contracts as they wish. It also recognizes that employment in the public sector can restrict the ability of those in the private sector to contract freely as "employers looking to hire have to bid against their own tax dollars to obtain labor". (Bueno et al. 2012) Labor market freedom has three subcomponents which are: minimum wage legislation, government employment as a percentage of total state employment, and union density.

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[1] The Fraser Institute is headquartered in the Canadian city of Vancouver. It is a public policy think tank that is widely known for its affiliation with a libertarian viewpoint.

2.2 Connections to Happiness

Why would we believe there could be a connection between the institutions of economic freedom and happiness to begin with? I posit several arguments: economic freedom expands the choice set for individuals, people are happy when they provide for themselves, economic freedom is correlated to a variety of factors that are linked to happiness.

The standard microeconomic theory of choice based on constrained utility maximization demonstrates how economic freedom can increase happiness succinctly. With very few assumptions it can be shown that a consumer, who maximizes her utility subject to her budget constraint, will be made no worse off if offered a new budget set which contains her previous budget set as a subset. All choices available in the smaller budget set are also available to her in the expanded budget set. Therefore, when she chooses her optimum in the expanded budget set her previous optimum is still available and she is able to minimally guarantee attainment of the same utility level and is quite likely to have improved upon it.

Institutions of economic freedom make choice sets bigger in several ways. Firstly, economic freedom grants individuals the ability to autonomously choose how they will organize their economic life. Economically free individuals choose with whom they will contract and what products and services they will purchase without being coerced. An individual who lacks in economic freedom will find that much of their resources are removed from their autonomous control and they may be forced into certain non-voluntary contracts or prevented from entering into certain voluntary contracts. Economic freedom directly increases the choice set of the individual. Secondly, institutions of economic freedom have been shown to create wealth and economic growth (Compton et al. 2011; Easton and Walker 1997). This increases the purchasing power of individuals by putting more monetary resources into their disposal which expands the budget constraints and choice sets of individuals.

Ryan and Deci (2001) review literature demonstrating the importance of autonomy in goal pursuit for subjective well-being. "The relative autonomy of personal goals has, accordingly, been shown repeatedly to be predictive of well-being outcomes controlling for goal efficacy at both between person and within-person levels of analysis (Page 157)". These results hold regardless of sex or whether one is a collectivist. The positive relationship between subjective well-being and autonomy was more recently confirmed by Howell et al. (2011) and is also the essence of Verme (2009) who finds that people are happier when they have greater freedom of choice. As institutions of economic freedom lead to greater autonomy in day to day decisions this in turn causes individuals to experience greater happiness.

In addition to expanding the choice sets and autonomy of individuals, economic freedom is related to happiness through the many other correlates of economic freedom. Economic freedom is correlated to social trust and social capital (Berggren and Jordahl 2006; Graafland and Compen 2015) which is in turn correlated to happiness (Bjørnskov 2008; Helliwell 2003). Economic freedom has also been shown to be correlated with increased income inequality (Carter 2007; Compton et al. 2014) which leads to decreased happiness (Alesina et al. 2004; Oishi et al. 2011). Both theoretically and empirically there are reasons that the effects of economic freedom on happiness could be positive or negative. The question then remains primarily as an empirical one.

3 Data

Very little of the prior literature has examined the connection between economic freedom and happiness at the subnational level instead focusing on cross-country variations. The exceptions to this are Belasen and Hafer (2012, 2013) who make use of the well-being index for US states created by Pesta et al. (2010). While their index has many strengths it does have some major shortcomings relevant to this study. Firstly, it does not give any measures of individual well-being. Secondly, it is only estimated for one point in time eliminating the ability to make use of the panel data methods employed in this paper. This study makes use of responses to the happiness question in the GSS to study the effect of economic freedom on happiness at both the individual level and on state averages.

Respondents to the GSS are asked to give a response to the question: "Taken all together, how would you say things were these days—would you say that you are very happy, pretty happy, or not too happy?" We score the responses so that responses of "not too happy" receive a (1), "pretty happy" receive a (2), and "very happy" receive a (3). This single item measure of happiness has a major drawback compared to the similar question in the WVS where the response scale is a 10-point Likert. Because of scale differences the responses to the WVS reveal much more information than the 3-point scale measured in the GSS. This study made use of geocoded information to map individual responses to the state of residence of the respondent.

The Economic Freedom of North America report gives an overall score of economic freedom for each US state from 1981 to 2010 (Bueno et al. 2012). The EFNA Index is calculated each year in two separate ways: (1) limiting the index to measurements of government involvement at the state and local level, (2) including involvement of the Federal Government. The overall scores (*Freedom*) are further broken down into measures of: size of government (*Size*), takings and discriminatory taxation (*Tax*), and labor market freedom (*Labor*). The EFNA index varies over both time and space and has been used for panel analysis in many studies. Figure 1 shows the variation across states in a
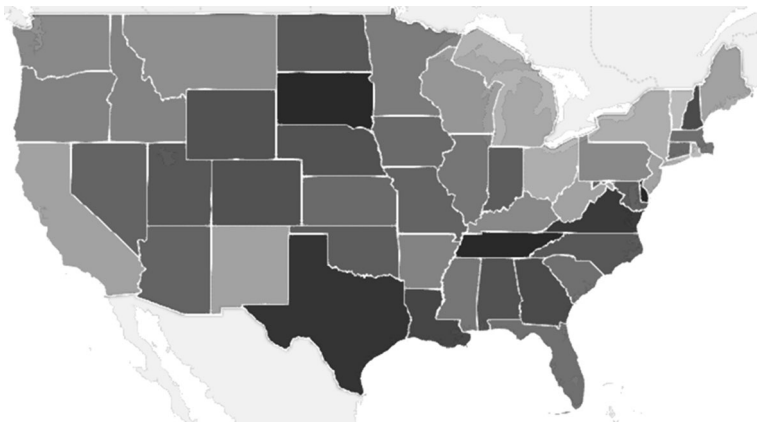
Fig. 1 EFNA 2010. This map was made using the overall EFNA index values in 2010 as reported by Bueno et al. (2012). Higher levels of the EFNA index are given *darker colors*

heat map of the overall EFNA index for 2010 as reported by Bueno et al. (2012). The darker shading in the figure represents a higher economic freedom score.

At the individual level we also use responses in the GSS for real income (*Income*), age (*Age*), number of children (*Children*), and years of education (*Education*). We also include indicators for demographics such as gender, race, marital status, and work status. Descriptive statistics of the individual variables studied are given in Table 1.

When examining state level variation in average happiness we calculated the average reported happiness in the GSS for each state and year. In order to facilitate comparisons to other literature we also gathered the log of real state GDP from the Bureau of Economic Analysis. Descriptive statistics of state level data are given in Table 2.

Table 1 Individual summary statistics

	N	Mean	SD	Min	Max
Happy	38,281	2.185	0.630	1	3
Freedom	40,967	6.771	0.532	4.530	8.250
Size	40,967	7.462	0.674	4.261	9.097
Tax	40,967	6.151	0.698	3.508	8.228
Labor	40,967	6.701	0.847	3.562	8.336
Income	38,257	31,658	29,638	259	146,154
Age	42,819	45.89	17.44	18	89
Child	42,838	1.899	1.748	0	8
Education	42,848	13.01	3.098	0	20
Gender					
Male	42,967	0.436	0.496	0	1
Female	42,967	0.564	0.496	0	1
Race					
White	42,967	0.796	0.403	0	1
Black	42,967	0.145	0.352	0	1
Other	42,967	0.0584	0.235	0	1
Marital status					
Married	42,948	0.507	0.500	0	1
Widowed	42,948	0.0978	0.297	0	1
Divorced	42,948	0.140	0.347	0	1
Separated	42,948	0.0356	0.185	0	1
Never married	42,948	0.220	0.414	0	1
Employment status					
Full time	42,954	0.508	0.500	0	1
Part time	42,954	0.107	0.309	0	1
Employed/not working	42,954	0.0207	0.143	0	1
Unemployed	42,954	0.0325	0.177	0	1
Retired	42,954	0.140	0.347	0	1
Student	42,954	0.0305	0.172	0	1
Keeping house	42,954	0.139	0.346	0	1
Other	42,954	0.0214	0.145	0	1

Table 2 Panel summary statistics

	N	Mean	SD	Min	Max
Happy	770	2.196	0.147	1.500	3
Freedom	755	6.679	0.569	4.530	8.250
Size	755	7.311	0.792	4.261	9.097
Tax	755	6.189	0.765	3.508	8.228
Labor	755	6.537	0.825	3.562	8.336
GDP	755	−3.348	0.255	−3.923	−2.508

4 Empirical Model

One of the main contributions of this study relative to those in the existent literature is that the effect of economic freedom on happiness can be evaluated using the individual as the unit of observation. This is done with ordinary least squared regression of an individual's response to the happiness question ($Happy_i$) in the GSS on the economic freedom score of the state of residence (F_i) as given in regression Eq. (1). In this equation X_i is a matrix of individual reported characteristics from the GSS (listed in Table 1). The matrix D_i includes state dummies and a separate time trend for each state. The individual level error term is ε_i.

$$Happy_i = \alpha + \beta_1 F_i + \gamma' X_i + \lambda' D_i + \varepsilon_i \qquad (1)$$

Each equation is estimated using the overall score of economic freedom for a state (*Freedom*), size of government score (*Size*), takings and discriminatory taxation score (*Tax*), and labor market freedom score (*Labor*). All economic freedom measures reported in this study include involvement of all three tiers of government: federal, state, and local.[2]

Equation (2) gives the estimation equation for a fixed effects model of state average happiness at time t ($Happy_{jt}$) as it depends on economic freedom (F_{jt}) and a matrix of controls (X_{jt}) at state j. The fixed effects term is given by η_j with ε_{jt} being the error term.

$$Happy_{jt} = \alpha + \beta_1 F_{jt} + \gamma' X_{jt} + \eta_j + \varepsilon_{jt} \qquad (2)$$

Panel specifications of the happiness equation are superior to purely cross-sectional estimates as the methods applied control for any variables that could cause higher average happiness that don't vary with time. To the extent that culture and social norms are constant over time, their effects are completely accounted for in Eq. (2). However, some aspects of culture and social norms have likely changed over time leaving their effects to enter through the error term. To better account for the aspects of omitted variables that do change over time I also estimate specifications which include a time trend. The time trend controls for those aspects of culture, social norms, and other omitted variables which follow a trend over time in an identical pattern across states.

Finally, we follow Spruk and Kešeljević (2015) by estimating a dynamic panel model such as in Eq. (3) which includes one lag of average state happiness ($Happy_{jt-1}$) as a control. Happiness is likely to exhibit persistence as all of the factors that cause a person to be happy in time period $t - 1$ could also lead to that individual being happy in time period t. The dynamic model includes state (η_j) and time effects (δ_t) with ε_{jt} being the error term.

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[2] While only results for economic freedom measured accounting for government at the Federal, state, and local level are reported, results limiting measured economic freedom to the state and local level generated similar results and are therefore omitted for brevity. Tables of these results are available by request.

$$Happy_{jt} = \alpha + \beta_1 Happy_{jt-1} + \beta_2 F_{jt} + \gamma' X_{jt} + \eta_j + \delta_t + \varepsilon_{jt} \qquad (3)$$

While the standard panel specification accounted for a great deal of potentially omitted variables the dynamic panel model of Eq. (3) accounts for much more. The addition of the time effects term additionally accounts for the effect of any shock that influences each state identically in any time period even if it doesn't follow a time trend. The combination of fixed effects, time effects, and a time trend together account for a vast number of potentially omitted variables. Likewise, inclusion of a lagged dependent variable controls for the effect on happiness in time t from any factor that influenced happiness in time $t - 1$. While it is impossible to account for all possible omitted variable bias, one of the benefits of a panel analysis using variation across units and time within one country, as performed in in this study, as opposed to variation across countries, as performed by Spruk and Kešeljević (2015), is that it is much more plausible that culture, social norms, formal and informal institutions, and other omitted factors are controlled for by the fixed effects, time effects, and time trend.

The approach outlined above has a number of advantages and disadvantages compared to the existent work focusing on international variation. Firstly, all national level institutions are the same for all respondents to the GSS. This allows our study to not be concerned with a host institutional variables that must be accounted for in an international study in efforts to limit omitted variable bias. Thus focusing attention on variation in the variable of interest: economic freedom. Unfortunately, this also lines out a potential flaw in the study as a focus on US states may limit the type and extent of variation in economic freedom that is correlated with reported happiness. However, the Economic Freedom of North America index has been used successfully in a number of studies and does exhibit variation both over time and cross-sections.

5 Results

We now present the results of regression analysis of each of our three regression equations in turn.

5.1 Individual Happiness

Tables 3, 4 and 5 give results to the estimation of individual happiness as described by Eq. (1). Table 3 constrains all coefficients in γ to be zero. Table 4 relaxes this also estimating the effect of real income on individual happiness. Table 5 relaxes this assumption for all control variables.

In all three tables, the signs for all economic freedom measures are positive with standard errors indicating statistical significance at the 1 % level. While economic freedom measures get high statistical significance the magnitude of the effects are relative small. Using the coefficient estimate on *Freedom* in Table 5, a one standard deviation increase in *Freedom* will produce an increase in individual happiness of .031. This is only 4.9 % of a standard deviation in individual happiness.

The control variables also highlight some interesting findings. Real income (*Income*) has a positive and highly significant coefficient regardless of the presence of other explanatory variables. However, the magnitude of the effect of real income on happiness falls by about half after the number of control variables is expanded beyond just real

Table 3 Individual no controls

	(1) OLS	(2) OLS	(3) OLS	(4) OLS
Freedom	0.0653*** (0.0111)			
Size		0.0597*** (0.0107)		
Tax			0.0260*** (0.00634)	
Labor				0.0532*** (0.0109)
Observations	36,483	36,483	36,483	36,483
R-squared	0.007	0.007	0.006	0.007

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 4 Individual with real income

	(1) OLS	(2) OLS	(3) OLS	(4) OLS
Freedom	0.0627*** (0.0115)			
Size		0.0541*** (0.0112)		
Tax			0.0265*** (0.00656)	
Labor				0.0504*** (0.0113)
Income	4.08e−06*** (1.19e−07)	4.08e−06*** (1.19e−07)	4.09e−06*** (1.19e−07)	4.08e−06*** (1.19e−07)
Observations	32,635	32,635	32,635	32,635
R-squared	0.042	0.042	0.041	0.042

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

income. Both education and age of the respondent result in statistically significant increases in happiness reported but number of children (*Children*) is correlated with a statistically significant decrease in reported happiness. The effect of income, age, and education in our study are all consistent with those of Kahneman and Deaton (2010). Kahneman and Deaton (2010) found that the presence of children leads to higher happiness which contradicts our findings here.[3] However, our findings on the effect of children on well-being are consistent with the findings of the meta-analysis conducted by Luhmann et al. (2012). The magnitude of the effect of age and number of children, in standard deviations, is less than that of the overall freedom score. However, a one standard deviation in years of education results in an increase in individual happiness of .37 which is 5.9 % of a standard deviation in happiness. The effect of real income, even in the presence

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[3] Kahneman and Deaton (2010) use an indicator type taking a value of zero for no children or one indicating the presence of children. Our measure is the number of children for which values are correlated with lower happiness.

Table 5 Individual with full set of controls

	(1) OLS	(2) OLS	(3) OLS	(4) OLS
Freedom	0.0578*** (0.0112)			
Size		0.0525*** (0.0109)		
Tax			0.0245*** (0.00641)	
Labor				0.0435*** (0.0111)
Income	1.99e−06*** (1.34e−07)	1.99e−06*** (1.34e−07)	2.00e−06*** (1.34e−07)	2.00e−06*** (1.34e−07)
Age	0.00138*** (0.000303)	0.00139*** (0.000302)	0.00136*** (0.000303)	0.00139*** (0.000303)
Children	−0.00499** (0.00239)	−0.00500** (0.00239)	−0.00497** (0.00239)	−0.00498** (0.00239)
Education	0.0119*** (0.00131)	0.0119*** (0.00131)	0.0119*** (0.00131)	0.0119*** (0.00131)
Observations	32,494	32,494	32,494	32,494
R-squared	0.092	0.092	0.092	0.092

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

of additional controls as in Table 5, on happiness is of greater magnitude than either economic freedom or education. A one standard deviation increase in real income results in an increase in happiness of .059 which is 9.4 % of a standard deviation in happiness.

At the individual level, economic freedom and indeed all of its components have a positive relationship to self-reported happiness. These positive relationships are robust to the inclusion of a large set of control variables. The largest effects come from the size of government and labor market freedom components.

5.2 Panel Happiness

Table 6 gives results to the estimation of Eq. 2 with freedom being measured by the overall score (*Freedom*). Tables 7, 8, and 9 give estimation results for the size of government (*Size*), takings and discriminatory taxation (*Tax*), and labor market freedom (*Labor*) components respectively. In each of Tables 6, 7, 8 and 9 estimates from 8 separate specification are reported. Odd columns give OLS estimates while results including fixed effects are given in even numbered columns. Columns also report results with different combinations of controls included: columns (1) and (2) include only freedom variables, columns (3) and (4) include a time trend, columns (5) and (6) include the log of state real GDP per capita (*GDP*), and, columns (7) and (8) include both a time trend and the log of state real GDP per capital.

Table 6 reveals a consistent positive and statistically significant relationship between the overall score of economic freedom and state average reported happiness. The relationship between the size of government measure of economic freedom and happiness is weak generating mostly positive coefficient estimates but also with little significance

Table 6 Panel overall freedom

	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE	(7) OLS	(8) FE
Freedom	0.027***	0.022*	0.036***	0.039***	0.043***	0.044***	0.039***	0.034*
	(0.010)	(0.012)	(0.010)	(0.015)	(0.010)	(0.016)	(0.010)	(0.018)
GDP					−0.062**	−0.074**	−0.019	0.046
					(0.027)	(0.034)	(0.038)	(0.109)
Year			−0.002***	−0.002**			−0.001*	−0.003
			(0.001)	(0.001)			(0.001)	(0.002)
Observations	755	755	755	755	755	755	755	755
R-squared	0.013	0.131	0.025	0.139	0.022	0.138	0.025	0.139

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 7 Panel size of government

	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE	(7) OLS	(8) FE
Size	0.016**	0.022*	0.013	0.018	0.017**	0.021	0.012	−0.007
	(0.007)	(0.013)	(0.008)	(0.014)	(0.007)	(0.013)	(0.010)	(0.026)
GDP					−0.020	−0.007	0.006	0.198
					(0.025)	(0.025)	(0.046)	(0.170)
Year			−0.001	−0.000			−0.001	−0.005
			(0.001)	(0.001)			(0.001)	(0.004)
Observations	755	755	755	755	755	755	755	755
R-squared	0.008	0.132	0.010	0.132	0.009	0.132	0.010	0.135

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 8 Panel takings and discriminatory taxation

	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE	(7) OLS	(8) FE
Tax	0.018***	0.012	0.022***	0.017**	0.020***	0.016*	0.021***	0.014*
	(0.007)	(0.008)	(0.007)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)
GDP					−0.024	−0.036	0.034	0.134
					(0.026)	(0.026)	(0.036)	(0.091)
Year			−0.002**	−0.001*			−0.002**	−0.004*
			(0.001)	(0.001)			(0.001)	(0.002)
Observations	755	755	755	755	755	755	755	755
R-squared	0.010	0.130	0.019	0.135	0.012	0.133	0.021	0.138

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

which is completely erased in the presence of a time trend. There is support for a positive and statistically significant relationship between happiness and both the takings and discriminatory taxation and labor market freedom measures regardless of the presence of a time trend. The relationship between reported happiness and the log of real state GDP per capita appears to be negative but very weak. Any statistical significance of estimates on log of real GDP per capita disappears with the inclusion of the time trend as a control variable.

The magnitude of the effect of overall freedom on average state happiness revealed in Table 6 is higher than was the effect in the estimates using individual data. The best estimates on *Freedom* range from .034 to .044. Given these, the effect of a one standard deviation in the overall freedom score results in an increase in average state happiness of between .019 and .025 which are 13.1 and 17 % of a standard deviation in average state happiness. The results in Table 8 reveal that the magnitude of a standard deviation increase in *Tax* results in an increase in happiness which is between 7.2 and 10.9 % of a standard deviation in average state happiness. The largest magnitude of increases come from labor market freedom as seen in Table 9. A one standard deviation increase in *Labor* results in an increase in average happiness which is between 20.8 and 28.1 % of a standard deviation in average state happiness.

Table 9 Panel labor market freedom

	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE	(7) OLS	(8) FE
Labor	0.009	0.002	0.037***	0.049***	0.021***	0.050**	0.037***	0.049**
	(0.006)	(0.007)	(0.008)	(0.016)	(0.008)	(0.020)	(0.009)	(0.021)
GDP					−0.057*	−0.183**	0.006	−0.000
					(0.033)	(0.077)	(0.038)	(0.117)
Year			−0.004***	−0.004***			−0.004***	−0.004**
			(0.001)	(0.001)			(0.001)	(0.002)
Observations	755	755	755	755	755	755	755	755
R-squared	0.003	0.127	0.028	0.143	0.008	0.136	0.028	0.143

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

The positive relationship between economic freedom and happiness uncovered at the individual level persist to an effect on average state happiness. This is significant as both the fixed effects and time trend control for a host of potentially omitted variables which couldn't be completely accounted for in the individual level regressions. The size of government component has no measureable effect on average state happiness when fixed effects and a time trend are included. The largest effect comes from labor market freedom. This suggests that unionization and minimum wage legislation, along with employment in the government sector, adversely effects average state happiness. This points to a need for further investigation of the effect of labor markets on happiness in future research.

5.3 Dynamic Panel Happiness

While the panel estimates presented in Tables 6, 7, 8 and 9 by themselves represent a contribution to the literature, it is still possible to argue that some of results could be driven by endogeneity limiting the ability to draw any causal inferences. To assist in controlling for endogeneity we conduct system generalized method of moments (SGMM) estimation of the dynamic panel model given in Eq. 3 following the methods developed by Arellano and Bover (1995) and Blundell and Bond (1998). The SGMM method uses past observations in levels and differences to generate a set of instrumental variables which controls for endogeneity in variables while avoiding dynamic panel bias. However, Roodman (2009) identifies a potential problem with the methodology which is often ignored. The standard packages often used to conduct SGMM calculate an extremely large number of instrumental variables. When there are too many instruments the endogenous components of the endogenous variables are not expunged by the instruments as they are overfit. One of the standard test statistics for over-identification necessary for valid instruments is the Hansens-J statistic. As Roodman (2009) point out, researchers want a high p value for this statistic but as the number of instruments increases the power of this statistic is eliminated often resulting in an erroneous p value of 1. Roodman (2009) suggests restrictions on the number of lags used to create instruments as well as collapsing of the instrumental variable matrix as methods to reduce the number of instruments in SGMM analysis to reasonable levels.

The GSS was not conducted in every year across the span of this study. The GSS was administered annually from 1972 to 1994, was not administered in 1979, 1982 or 1992, and from 1994 onward has been conducted in alternating years only. Dynamic panel analysis, in order to create lags of the dependent variable and the instruments required, calls for observations on an annual basis. As such, our dynamic panel regressions makes use of 373 total observations spanning the years 1983–1991 as compared to the 755 observations used in the traditional panel analysis.

In Tables 10, 11, 12 and 13 results from the regression of Eq. 3 are presented. Each table presents results for one measure of freedom. Columns 1–4 disclude a time trend and are directly comparable to the dynamic panel estimation in Table 10 of Spruk and Kešeljević (2015). Columns 5–8 each include a time trend. Columns 1 and 5 give OLS estimates which could suffer from both endogeneity and dynamic panel bias problems. Columns 2 and 6 report results using the full set of SGMM instrumental variables. Columns 3 and 7 make restrictions on the number of lags and columns 4 and 8 further collapse the instrumental variable matrix.

Table 10 demonstrates the strongest support yet for a positive and causal relationship between the overall score of economic freedom in a state and average state happiness. The coefficient estimates for economic freedom are all positive, however the estimates for OLS

Table 10 Dynamic panel overall freedom

	(1) FE	(2) SGMM	(3) SGMM	(4) SGMM	(5) FE	(6) SGMM	(7) SGMM	(8) SGMM
L.Happy	−0.096	0.122*	0.126**	0.145*	−0.095	0.119*	0.119*	0.142**
	(0.064)	(0.065)	(0.063)	(0.076)	(0.064)	(0.064)	(0.061)	(0.066)
Freedom	0.076***	0.058***	0.050**	0.037	0.075***	0.073***	0.065**	0.033
	(0.024)	(0.020)	(0.024)	(0.039)	(0.024)	(0.021)	(0.026)	(0.041)
GDP	−0.177	−0.051	−0.032	−0.117	−0.135	−0.000	0.125	0.048
	(0.108)	(0.089)	(0.099)	(0.190)	(0.163)	(0.113)	(0.132)	(0.360)
Year					−0.001	−0.006*	−0.008***	−0.004
					(0.004)	(0.003)	(0.003)	(0.007)
Observations	373	373	373	373	373	373	373	373
R-squared	0.272				0.272			
# instruments		126	38	6		127	39	7
AR(1)	4.64e−06	5.76e−06	9.93e−06		4.73e−06	7.48e−06	5.78e−06
AR(2)	0.164	0.168	0.169		0.161	0.166	0.151
Hansen	1	0.567	0.580		1	0.571	0.744

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 11 Dynamic panel size of government

	(1) FE	(2) SGMM	(3) SGMM	(4) SGMM	(5) FE	(6) SGMM	(7) SGMM	(8) SGMM
L.Happy	-0.088	0.148**	0.144**	0.145*	-0.090	0.143**	0.154**	0.194*
	(0.064)	(0.065)	(0.064)	(0.081)	(0.065)	(0.063)	(0.062)	(0.118)
Size	0.023	0.042	0.020	0.014	0.050	0.042	-0.005	-0.098
	(0.028)	(0.027)	(0.028)	(0.067)	(0.046)	(0.032)	(0.037)	(0.168)
GDP	0.097	-0.105	0.088	0.122	-0.065	-0.102	0.231	0.559
	(0.109)	(0.095)	(0.107)	(0.244)	(0.237)	(0.151)	(0.225)	(0.723)
Year					0.003	0.002	-0.003	-0.009
					(0.004)	(0.003)	(0.004)	(0.012)
Observations	373	373	373	373	373	373	373	373
R-squared	0.257				0.258			
# instruments		109	36	6		110	37	7
AR(1)		1.99e-06	3.92e-06	7.28e-06		2.14e-06	6.13e-06	5.76e-05
AR(2)		0.123	0.129	0.146		0.134	0.114	0.133
Hansen		1	0.484	0.693		1	0.387	0.984

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 12 Dynamic panel takings and discriminatory taxation

	(1) FE	(2) SGMM	(3) SGMM	(4) SGMM	(5) FE	(6) SGMM	(7) SGMM	(8) SGMM
L.Happy	−0.096	0.144**	0.144**	0.153***	−0.094	0.142**	0.139**	0.144**
	(0.064)	(0.063)	(0.063)	(0.077)	(0.063)	(0.063)	(0.062)	(0.064)
Tax	0.030***	0.015**	0.014	0.027*	0.032***	0.028***	0.027***	0.025
	(0.010)	(0.008)	(0.010)	(0.016)	(0.011)	(0.009)	(0.010)	(0.016)
GDP	−0.065	0.083	0.091	−0.141	0.051	0.186*	0.288**	0.164
	(0.085)	(0.077)	(0.098)	(0.155)	(0.140)	(0.105)	(0.141)	(0.273)
Year					−0.004	−0.008***	−0.010***	−0.007
					(0.004)	(0.003)	(0.004)	(0.006)
Observations	373	373	373	373	373	373	373	373
R-squared	0.271				0.273			
# instruments		126	38	6		127	39	7
AR(1)		4.94e−06	5.30e−06	7.65e−06		5.36e−06	7.31e−06	5.41e−06
AR(2)		0.130	0.134	0.146		0.122	0.128	0.129
Hansen		1	0.537	0.303		1	0.285	0.640

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 13 Dynamic panel labor market freedom

	(1) FE	(2) SGMM	(3) SGMM	(4) SGMM	(5) FE	(6) SGMM	(7) SGMM	(8) SGMM
L.Happy	−0.094	0.152**	0.143**	0.191***	−0.092	0.138**	0.120*	0.179**
	(0.064)	(0.066)	(0.062)	(0.069)	(0.064)	(0.068)	(0.066)	(0.071)
Labor	0.039	0.007	0.015	−0.073	0.049	0.035	0.059**	−0.054
	(0.038)	(0.018)	(0.021)	(0.077)	(0.040)	(0.024)	(0.030)	(0.067)
GDP	−0.078	0.063	0.072	0.492	−0.008	0.049	0.090	0.599
	(0.192)	(0.088)	(0.119)	(0.385)	(0.209)	(0.094)	(0.129)	(0.431)
Year					−0.004	−0.005	−0.009***	−0.007
					(0.004)	(0.003)	(0.003)	(0.006)
Observations	373	373	373	373	373	373	373	373
R-squared	0.257				0.259			
# instruments		126	38	6		127	39	7
AR(1)		4.22e−06	4.26e−06	3.63e−05		5.22e−06	7.35e−06	3.08e−05
AR(2)		0.118	0.130	0.115		0.127	0.146	0.103
Hansen		1	0.375	0.593		1	0.356	0.935

Robust standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

are known to be biased in this panel specification. Only columns, 4 and 8 give estimates that fail to generate statistically significant estimates for the effect of economic freedom but this is likely due to increased variance from too few and poor instruments. We see that as we move from the full SGMM model in columns 2 and 5 to the reduced lag models in columns 3 and 6 that the number of instruments falls from 126 to 38 and from 127 to 39 respectively. Further collapsing reduces the count to 6 and 7 respectively. All SGMM specifications get acceptable values for the AR(1) and AR(2) test statistics.[4] However, examination of Hansen statistics shows that the estimates in columns 2 and 5 are likely falling prey to the over proliferation of instruments. In the remaining SGMM specifications with lag restrictions and collapsed instrumental variables matrix, Hansen statistics remain in the acceptable range.[5]

The overall measure of economic freedom also has a significant magnitude in its effect. Using best parameter estimates of .05 and .065 a one standard deviation increase in *Freedom* results in an increase in average state happiness that is between 19.4 and 25.2 % of a standard deviation in average state happiness. This magnitude is larger than was revealed in the non-dynamic panel specification of Table 6 and is also a larger magnitude than what is produced by the lag of average state happiness itself.

The results in Table 10 also show us that average state happiness is itself falling over time and has a positive relationship to a 1 year lag. The effects of the log of real GDP per capita remain insignificant in the dynamic panel regressions.

Tables 11, 12 and 13 reveal that most of the effect of overall freedom on happiness must be coming through the takings and discriminatory taxation channel. Takings and discriminatory taxation is the only component of economic freedom that generates consistently positive and statistically significant results. While size of government and labor market freedom have been shown to be correlated with average state happiness we cannot conclude that the relationship is causal.

The results of the dynamic panel regressions have a striking comparison to those found in Spruk and Kešeljević (2015). Most striking is that the sign on the economic freedom variables is statistically significant in both studies but with opposite signs.[6] This could indicate some fundamental differences in the American experience of happiness and economic freedom versus the rest of the world or could be due to slight methodological[7] and data[8] differences. Throughout the majority of their paper, Spruk and Kešeljević find a positive relationship between economic freedom and happiness. It is only when they

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[4] These statistics are testing for properties that are necessary for the validity of the instruments.

[5] A shortcoming of is that no Hansen, AR(1), or AR(2) test statistics are provided which allow the reader to assess the validity of the model and its assumptions.

[6] Spruk and Kešeljevic (2015) uncover a positive relationship between economic freedom and happiness in standard specifications but the sign is reversed in their dynamic panel regressions.

[7] Spruk and Kešeljević (2015) implemented the Arrellano-Bond procedure, often referred to as difference GMM, while this study uses the system GMM procedure of Arellano and Bover (1995) and Blundell and Bond (1998). System GMM is well known to have better statistical properties than difference GMM. Spruk and Kešeljević (2015) also do not include the necessary test statistics to confirm that the many assumptions required for dynamic panel estimation are indeed met. These include the Arrellano-Bond test for autoregressive error in AR(1) and AR(2) in addition to Sargen/Hansen test statistics for over identifying restrictions.

[8] The economic freedom measure used by Spruk and Kešeljevic (2015) is not the Economic Freedom of the World index of the Fraser Institute. Rather they use the Index of Economic Freedom generated by the Heritage Foundation. This index produced by the Heritage makes some use subjective valuation in creation of the index while the indices created by the Fraser Institute are objectively data driven.

conduct dynamic panel analysis that the sign becomes negative.[9] Conversely, in my study the effect of economic freedom on happiness is found to be uniformly positive across various specifications. The lagged happiness term is also more clearly positive in the present study indicating that current happiness is caused in part by past happiness. The results from the US data do not show any positive causal effect of log real GDP per capita on average happiness as was present using international data.

The positive effect of economic freedom on happiness is evident at the individual level, the state average level, and persists in dynamic panel estimation. As the dynamic panel estimation procedure was created to control for endogeneity in the data and the results from all specifications are systematically positive, strong evidence is found in support of a causal and positive relationship between economic freedom and happiness in US states. Dynamic panel estimates show that takings and discriminatory taxation are a significant driver of the effect of overall economic freedom on average state happiness.

6 Discussion

Happiness economics has increased in its policy relevance as many prominent economists, including Bernanke (2010) speech at the University of South Carolina, have espoused *national* happiness as a better measure to target with policy than the more traditional targets like economic growth (Kahneman et al. 2004). After all, does it matter if the economy is doing great if we're all miserable? I don't wish to debate the merits and flaws of such a plan here but will discuss the policy implications of the results.

Previous literature has concluded that economic freedom is associated, even causally, with many desirable economic outcomes including economic growth (Compton et al. 2011; Easton and Walker 1997). More recently economic freedom has been found to be either not related or positively causally related to items such as social capital (Berggren and Jordahl 2006; Graafland and Compen 2015; Jackson et al. 2015). This demonstrates that the economic benefits of economically free institutions can be enjoyed without fear that the social fabric of society is being eroded. But are people happy in such environments? Our results suggest that they are in fact happier operating inside the parameters of economically free institutions. For many of the normative criteria that one could select, more economically free institutions appear to be superior.

Even yet, economic freedom has many dimensions and its increase can be achieved in a multitude of ways. While the takings and discriminatory taxation component of economic freedom didn't produce the increases in happiness with largest magnitude under any specification, this was the only component which had a positive and statistically significant effect on individual happiness and average state happiness in both panel and dynamic panel specifications. As policy makers search for a component of economic freedom to target with the objective of increasing happiness, targeting a tax policy that promotes economic freedom will surely accomplish this.

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[9] This switch in sign is possibly indicative of a spurious result being driven by a methodological short coming.

7 Conclusion

The relationship between the institutions of economic freedom and economic growth are well known to be positive. While economic growth is a well-accepted measure of well-being for many in the economics profession, it is not necessarily indicative of greater level of subjective well-being or happiness. This study examines the link between economic freedom and reported happiness at the level of US states conducting analysis of responses to the happiness question in the GSS at both the individual level and using state averages.

While this study is not the first to examine the relationship between happiness and the institutions of economic freedom, the contributions made are substantial. No previous study has examined this relationship with observations at the individual level having instead focused on state level, or more commonly on national level, aggregate measures of happiness. Currently, only two other studies (Belasen and Hafer 2012, 2013) examine the link between economic freedom and well-being at the US state level. Both of these studies provide cross-sectional evidence of a positive correlation. Yet, these studies are limited by the nature of cross-sectional methods and do not provide a satisfying remedy to the problems of endogeneity. My study is the first to apply panel methods of analysis to US state data while also exploiting the ability of system GMM dynamic panel regression to control for endogeneity. While Spruk and Kešeljević (2015) also use dynamic panel methods in their analysis they did not further decompose the economic freedom index into its components to offer insight on the differential effects each has.

At the individual level, the correlation between economic freedom and happiness is positive and strong for both overall measures of economic freedom and its components. The correlation persists with inclusion of additional individual characteristics. To take advantage of panel data methods that can control for omitted variables which are constant over time, regressions using average state happiness are also conducted confirming the positive relationship uncovered in the individual data. This relationship is further tested in a dynamic panel setting which also has the advantage of controlling for potential endogeneity issues. The positive effect of economic freedom on happiness persists in the dynamic panel setting lending support to a causal interpretation of the correlation.

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