ECONOMIC FREEDOM & HAPPINESS INEQUALITY: FRIENDS OR FOES?

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Abstract

This paper examines the relationship between economic freedom and happiness inequality for a large sample of countries. We find that economic freedom is negatively associated with happiness inequality and robust to several alternative measures of happiness inequality, including the standard deviation, mean absolute difference, coefficient of variation, and Gini coefficient. Among the economic freedom areas, legal system and sound money are negatively correlated with happiness inequality. Drawing on the Engerman-Sokoloff hypothesis, we use a measure of factor endowments as an instrument for economic freedom to provide a further robustness test, finding a negative association between economic freedom and happiness inequality.

Keywords: Economic Freedom, Factor Endowments, Happiness Inequality, Institutions.

Life Satisfaction

JEL Codes: (I31), (J6), (O12), (P16)

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I. INTRODUCTION

A substantial literature examining the causes and correlates of happiness has emerged over the past several decades. The World Database of Happiness, for instance, reports that more than 9,000 happiness studies have been undertaken, about half of which have been empirical papers covering up to 164 countries (Veenhoven 2015). The majority of these studies have focused on the correlates of the level of happiness within and across countries and over time, with only a handful of studies examining how happiness is distributed across individuals or within one's lifetime. In this paper, we contribute to the latter line of research by examining how happiness inequality within countries is influenced by the institutions and policies that are consistent with the principles of economic freedom.

Studying the determinants of the distribution of happiness is relevant for several reasons. First, looking at levels (or averages) could be misleading, especially when it comes to economic and social policy. For example, Stevenson and Wolfers (2008) and Dutta and Foster (2013) show that even though average happiness in the United States has remained relatively flat since the 1970s, the inequality of happiness has substantially decreased with a large number of people moving from the lowest happiness category "not very happy" to the middle category "pretty happy."[3] Similarly, Clark et al. (2015) show that economic growth is systematically correlated with lower happiness inequality, measured by the standard deviation of different happiness metrics both across and within countries.

These findings may cast doubt on the widely accepted view that economic growth does not lead to greater happiness over time (Easterlin 1974, 1995, 2010), although it is conceptually possible for the mean happiness level of society to remain constant in response to a changing distribution. They further reveal important socio-economic trends that other more conventional measures of social inequality have not been able to capture. This last point comes in view of the rapid increase of income inequality in the US over the same time period. Similarly, Ott (2005, 2010) documents that cross-national patterns of income inequality differ widely from patterns of happiness

[3] Using data from the General Social Study, Clark et al. (2015) show that even though happiness inequality in the US has decreased since the 1970s, it increased steadily in the early 2000s but has recently began to decline again.

inequality, and Veenhoven (2005) finds declining happiness inequality in EU countries over the period 1973-2001, despite rising income inequality.

Second, policymakers may be interested not only in maximizing the average level of happiness, but also in promoting a more equal distribution of happiness across individuals and over time.[4] A large experimental and empirical literature supports the view that people are inequality averse and have preferences for a more equal distribution of income.[5] This literature is largely based on lab experiments of small groups of people, but recent studies using self-reported data on happiness have provided additional evidence of more representative global samples (e.g., Alesina et al. 2004). In the U.S., resentment over socio-economic inequality recently played a significant role in the Occupy Wall Street movement.

Finally, happiness inequality may be an important determinant of many socio-economic outcomes. Recent research shows that while an overwhelming majority of Americans have a preference for a more egalitarian society; most Americans also significantly underestimate the actual level of income inequality (Norton and Ariely 2011). This puzzling observation could very well be a reflection of declining happiness inequality in the U.S. over the past several decades. Such attitudes about social mobility, perception of fairness, and economic inequality may be determined to some extent by people's perception of the distribution of happiness and not just by the distribution of income inequality. Veenhoven (2005) suggests that social inequality cannot be measured appropriately using indicators of inequality that use specific inputs such as income or education.

So far, however, the economic discourse has mostly focused on the causes and correlates of economic inequality and little is known about the determinants of happiness inequality. In this paper, we examine how the policies and institutions consistent with the principles of economic freedom are related to the distribution of happiness in countries. Our paper is most closely related to studies by Ott (2005), Veenhoven (2005), Clark et al.

[4] Classical economists long ago recognized that human behavior is driven not only by self-interest, but also by a multitude of psychological motives such as the happiness of others. In the Theory of Moral Sentiments, for instance, Adam Smith (1759, p.1) notes: "*How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it*."

[5] See e.g., Ferrer-i-Carbonell and Ramos (2013) for a survey of this literature.

(2015), and Bjørnskov and Tsai (2015). These studies are summarized in section 2 below. The current study contributes to this line of research in four ways.

First, the limited evidence on the relationship between institutions and happiness inequality is primarily based on bivariate correlations. We control for the level of economic development, social capital and other macroeconomic variables. This allows us to test if the impact of economic freedom is independent of these variables and captures processes associated with procedural utility and people's intrinsic motivations that can possibly reduce happiness inequality through the economic freedom channel. Using fixed-effects estimations allows us to also control for some time-invariant unobserved factors. We furthermore show that economic development is correlated with lower levels of happiness inequality even after controlling for a rich set of institutional variables. In that sense, we show that the results by Clark et al. (2015) are not driven by omitted variables associated with institutions.

Second, we test if the results are sensitive to the choice of happiness inequality measure by testing five alternative metrics: (1) the standard deviation, (2) the mean absolute difference in happiness,[6] (3) the interquartile range, (4) the Gini coefficient, and (5) the coefficient of variation. Our choice of inequality measure is informed by Kalmijn and Veenhoven (2005), who find that the standard deviation is the best performing statistic in the context of happiness inequality research. As Clark et al. (2015) note, if economic growth increases happiness and happiness is bound by some upper limit, then economic growth will decrease the variance of happiness by construction. Using the standard deviation metric helps us to avoid the problem of finding an artificial statistical relationship between the two variables.

Third, the Fraser Institute's economic freedom (EFW) index is a complex composite indicator that has multiple dimensions that can theoretically affect happiness inequality in opposite directions. We examine how the major areas of the index—government size, legal system, sound money, international trade, and regulation—are related to the inequality of happiness across countries.

Lastly, we use an instrument that has been identified by a prolific historical literature *a priori* (Engerman and Sokoloff 1997; Sokoloff and Engerman 2000), the

[6] The mean absolute deviation is the average absolute distance from the mean, $\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})$.

measure of the suitability of land for growing wheat relative to sugarcane, as a source of exogenous variation as a further robustness test of the relationship between happiness inequality and economic freedom.[7]

Our findings suggest that economic freedom is significantly correlated with lower inequality of happiness after controlling for economic development, social capital, religiosity, regional effects, and constant happiness trends over time. If causal, our results suggest that the magnitude of the effect is substantial: a 3-point increase in the EFW index decreases happiness inequality by more than a standard deviation. These results are robust to the four alternative measures of happiness inequality that we employ in the analysis. Decomposing the EFW index, we find that the legal system and sound money areas are correlated with lower levels of happiness inequality. Finally, the results from our two-stage least squares (2SLS) estimates suggest a strong negative correlation between economic freedom and happiness inequality.

II. ECONOMIC FREEDOM & HAPPINESS INEQUALITY

How does economic freedom influence the distribution of happiness in a country? There is sparse theoretical or empirical evidence to draw upon to answer this question. A limited number of studies have examined the relationship between economic freedom and the average level of happiness across countries, finding a strong positive relationship between the two (Bjørnskov et al. 2010; Rode 2013; Gehring 2013), but it is not clear whether economic freedom is more beneficial for those at the top of the happiness distribution or those at the bottom. Some initial evidence (Ott 2005, 2010) indicates that countries with better democratic quality and government effectiveness tend to have a more equal distribution of happiness. Bjørnskov and Tsai (2015) use happiness data from the World Values Survey to construct four happiness categories: misery, moderately dissatisfied, moderately satisfied, and happy. Using a split distribution estimation strategy that relies on seemingly unrelated regression, they show that legal quality, as measured by area 2 of the EFW index, is correlated with a lower proportion of people in misery and

[7] Bennett and Nikolaev (2016) use the suitability of land for growing wheat relative to sugar as an instrument for the rule of law and estimate the potential causal impact of the latter on income inequality, finding a robust negative relationship.

a larger proportion with happiness, potentially reducing the skewness of happiness across countries.[8]

[INSERT FIGURE 1]

[INSERT FIGURE 2]

The upper part of Figure 1 shows that people who live in countries with higher levels of economic freedom report, on average, higher levels of life satisfaction. The lower part of Figure 1 shows that happiness inequality, measured by the standard deviation of life satisfaction, is significantly lower in more economically free countries. Figure 2 shows the distribution of answers to the life satisfaction question from the World Values Survey by EFW quartile. The figure suggests that as countries become more economically free, more people move from the bottom and top of the happiness distribution towards its upper middle part. Of course, the evidence in these figures is very preliminary and could be attributable to a third factor such as economic growth that is correlated with both happiness inequality (Clark et al. 2015) and economic freedom (De Haan et al. 2006; Hall and Lawson 2014; Wiseman 2016).

Providing a more definitive answer is challenging because institutions shape the relative rewards of different economic activities. As Baumol (1990) notes, institutions alter the relative costs and benefits for pursuing productive economic activities (e.g., starting a business, inventing a new product, or pursuing more education) vis-à-vis unproductive ones (e.g., lobbying government for special favors or subsidies). This can affect a variety of socio-economic outcomes such as job creation, economic growth, income inequality, or social capital, which are important macroeconomic variables that may also influence individual happiness.

It is also not clear what is the optimal size of government that maximizes social welfare and reduces social inequality, given that two of the most salient features of modern governments are redistributing income and promoting equality of opportunity (Mueller 2003). Public choice scholars are quick to note, however, that beyond some optimal level, larger government, which is inversely related to economic freedom, can be welfare reducing (e.g., Bjørnskov et al. (2007) find that government consumption is

[8] Respondents to the WVS report their level of happiness on a scale of 1-10. The authors define their happiness categories as follows: misery (1-3), moderately dissatisfied (4-5), moderately satisfied (6-7), happy (8-10).

negatively associated with life satisfaction) and create even larger disparities in equality of opportunity and outcome because most political actors have a vested interest in larger government, not optimal government. Politicians and bureaucrats, driven by their own self-interest, are susceptible to political capture by special interest groups in search of favorable regulations, policies, and/or subsidies that provide them with an economic advantage over other groups or competitors, distorting the efficiency of the economy (Downs 1962; Niskanen 1971; Olson 1965; Tullock 1998) and potentially creating greater economic and political inequality (Bennett and Cebula 2015; Stiglitz 2012).[9] This is perhaps the mechanism that Milton Friedman (1980, p. 148) had in mind when he famously hypothesized that "A society that puts equality before freedom will get neither." Thus, the optimal size of the government to maximize social welfare, and whether it is attainable in practice, are unresolved questions.

Below we outline some channels through which economic freedom may impact happiness inequality to help guide our analysis, which is followed by empirical tests in section 4. We argue that there are four possible channels through which economic freedom can influence the distribution of happiness inequality: (1) economic outcomes, (2) social capital, (3) procedural utility, and (4) intrinsic motivations.

2.1 Economics Outcomes

There is by now a large theoretical and empirical literature that shows that economic freedom is correlated with many positive economic outcomes such as economic growth (De Haan et al. 2006; Wiseman 2016), greater investment in human and physical capital (Dawson 1998; Gwartney et al. 2006; Hall et al. 2010), lower rates of unemployment (Feldmann 2007; Heller and Stephenson 2014), higher levels of entrepreneurial activity (Bjørnskov and Foss 2008; Hall et al. 2013), lower poverty rates (Azman-Saini et al. 2010), and greater international trade (Sonora 2014), among others. As a consequence, people in more economically free societies face greater real opportunities on the labor and product markets, and therefore perceive greater control over their lives (Nikolaev and Bennett 2016). A critical question here is whether economic opportunities will be more

[9] Some groups and individuals, often driven by a free market philosophy, lobby for reforms (e.g., deregulation, lower taxes, less government spending) that, if implemented, could also have distributional effects.

evenly distributed in more economically free societies. A small but growing literature on the relationship between economic freedom and economic inequality has thus far produced ambiguous results (Apergis et al. 2015; Bennett and Vedder 2013; Bennett and Nikolaev 2015). Two competing hypotheses, as described below, are therefore possible, suggesting that effect of economic freedom on happiness inequality through the economic outcomes channel is theoretically ambiguous.

Hypothesis 1: Economic freedom reduces happiness inequality since material gains and economic opportunities are more valuable for people at the bottom of the economic distribution than to those at the top. Even if economic freedom creates a more unequal distribution of economic opportunities, there is still overwhelming evidence that individuals at the bottom of the economic distribution are better off in more economically free societies compared to their counterparts in less economically free societies. And according to the law of diminishing marginal utility, we should anticipate that improvements in material living standards to generate greater happiness gains to those at the bottom of the income distribution than those at the top, leading to an overall reduction in happiness inequality. Frey and Stutzer (2000), for example, find that beyond a $10,000 level of "subsistence" income, more money does not buy more happiness.[10]

Hypothesis 2: More choices may alternatively raise the material aspirations of people, especially those at the bottom of the economic distribution, leading to higher levels of happiness inequality (Duesenberry 1949; Frank 1999; Scitovsky 1976; Stutzer 2004). If more economically free societies provide greater opportunities for economic rewards, the benchmark for social comparison may be set higher. If relatively poor people compare themselves to those at the top of the economic distribution, they may experience more frequent feelings of disappointment and resentment, even if they face greater economic opportunities. Furthermore, this could lead to positional arms races that can reduce social welfare (Frank 1999, 2005;

[10] Using data for the U.S., Kahneman and Deaton (2010) find this to be true only for hedonic happiness, and estimate the threshold point to be around $75,000.

Layard 1980). The end result will be greater happiness inequality, despite greater material opportunities.

2.2. Social Capital

There is also an emerging literature that shows that good institutions, and in particular institutions consistent with the principles of economic freedom, are linked to many positive social outcomes. Previous studies, for example, find that economic freedom is associated with higher levels of tolerance (Berggren and Nilsson 2013) and higher levels of social trust (Berggren and Jordahl 2006), cultivating an environment of peacefulness (De Soysa and Fjelde 2010) and less crime (Bjørnskov 2015). Furthermore, Nikolaev and Bennett (2016) show that people in more economically free societies are more likely to feel connected with each other, which can translate to less frequent feelings of loneliness. By promoting more inclusive markets and higher levels of social capital, economic freedom can increase people's sense of relatedness and narrow differences in happiness as those at the bottom of the income distribution, or traditionally discriminated minorities, feel more connected to the rest of society. We therefore anticipate that economic freedom promotes less happiness inequality through its positive impact on social capital.

2.3. Procedural Utility

There is increasing evidence in the economics of happiness literature that people care not only about different socio-economic outcomes, but also about the processes that lead to these outcomes (Frey et al. 2004). Thus, while the extent to which people feel unhappy with the level of inequality in a country may depend on their own position in the economic (or happiness) distribution, it can also depend on how they view the processes that generate the distribution. Alesina et al. (2004), for example, show that Americans are less inequality averse compared to Europeans, mostly because they perceive the economic system of the U.S. to embody a greater degree of procedural fairness. Thus, institutions may provide an additional source of utility, procedural utility, because they determine not only different socio-economic outcomes, but also how these outcomes are generated. In this sense, even if a person is at the bottom of the income distribution, they

may experience higher levels of happiness if they believe that the institutional environment in their country provides a fair chance for everyone to experience socio-economic mobility. Nikolaev and Bennett (2016) provide evidence that people who live in more economically free countries are more likely to report higher perceptions of procedural fairness and social mobility. In this respect, economic freedom may reduce happiness inequality.

2.4 Intrinsic Motivations

The psychological theory of self-determination (Deci and Ryan 2000) suggests one final channel through which economic freedom may affect the distribution of happiness. According to this theory, people strive to satisfy three basic intrinsic needs: (1) autonomy, (2) relatedness, and (3) competence. In this sense, economic freedom may be valuable in and of itself because it emphasizes the importance of human agency and allows individuals to act in a deliberate and purposeful manner, exert power over their environment, and develop their talents by exercising autonomy and self-expression. This can lead to greater feelings of self-worth and human empowerment, especially for the most marginalized members of society who lack economic opportunities. Welzel (2013), for example, develops a theory of emancipation based on the human desire for an existence free from domination. He argues that as freedom grows, people gain control over their lives and society's agenda. Free agency leads to the emergence of emancipative values, which then lead to a higher level of psychological well-being.

Nikolaev and Bennett (2016) show that people who live in countries with greater economic freedom experience more frequent feelings of pride and accomplishment. Furthermore, intrinsic attributes such as autonomy and competence are characterized by the experience of "flow" (Csikszentmihalyi 1991), which is one of the highest feelings of personal happiness that occurs when an individual is completely immersed in a self-selected task or activity. Recent research also finds that the perception of freedom of choice is one of the most important determinants of subjective well-being (Inglehart et al. 2008; Verme 2009). As such, we anticipate economic freedom to exert a negative effect on happiness inequality through its positive impact on intrinsic motivations.

2.5 Summary

The above discussion, which is informed by a number of alternative economic and psychological theories, suggests that economic freedom can impact happiness inequality through four main channels: economic outcomes, social capital, procedural utility, and intrinsic motivations. While we by no means believe that this exhausts all possible channels, it nonetheless provides a useful guide to ascertain the anticipated qualitative relationship between economic freedom and happiness inequality. We anticipate that economic freedom will be negatively associated with happiness inequality through its positive impact on social capital, procedural utility, and intrinsic motivation; however, the association is theoretically ambiguous through the economic outcomes channel. Depending on the relative magnitudes through the various channels, the net correlation could go either way.

III. DATA

The main variables used in this study are described in this section. Table 1 presents summary statistics.

[INSERT TABLE 1]

3.1 Happiness Inequality

Happiness data was collected from the latest aggregated release of the World Values Survey (WVS). Since 1981, the WVS has polled nearly 100 countries, representing almost 90 percent of the world's population. Our main sample contains data on up to 92 countries, spanning the period 1981-2012 with a total of 198 country-year observations. Specifically, data on life satisfaction were collected using the following question: "*All things considered, how satisfied are you with your life these days?*" The recoded scale of possible answers ranged from 1 (*not at all satisfied*) to 10 (*very satisfied*). Thus, our happiness measure is a reflective assessment involving evaluative judgment of one's life and requires an effort to remember and evaluate past experiences.[11]

[11] Self-reported data, by their nature, cannot be validated; however, an extensive literature exists that validates subjective well-being (SWB) data indirectly and shows that SWB metrics are valid, reliable, and psychometrically sound (Diener et al. 2013; Kahneman and Krueger 2006; OECD 2013; Stone and Mackie 2014). Moreover, subjective well-being metrics are commonly used in economic research and policy analysis (Di Tella et al. 2001; Diener et al. 2009).

We use the standard deviation of life satisfaction for each country-year observation as our primary measure of happiness inequality. This choice follows the recommendation by Kalmijn and Veenhoven (2005), who assess the empirical performance of a number of alternative happiness inequality measures using eight different criteria (e.g., sensitivity to degree of inequality, differentiation between more or less unequal distributions, independence of the mean, etc.). They find that the standard deviation is the most appropriate quantification of happiness inequality for empirical analyses. Additionally, Kalmijn and Veenhoven report that the mean absolute difference and the interquartile range are suitable measures of happiness inequality, so we also incorporate these measures into our analysis as a robustness test. Although they find that the Gini coefficient is not a good measure of happiness inequality because it assumes a ratio level of measurement and happiness metrics are best treated at the interval level, we also test the sensitivity of our results to this measure because it is widely recognizable. Finally, we provide an additional test using the coefficient of variation since the standard deviation of happiness and economic freedom may be correlated by construction.

3.2 Economic Freedom

The independent variable of interest is the degree to which a country's institutions and policies are consistent with the concept of economic freedom, which is based on the principles of personal choice, voluntary exchange, freedom to enter markets and compete, and security of privately owned property. Following a large body of empirical literature, we use the Fraser Institute's Economic Freedom of the World index (EFW).[12] The index is comprised of 43 variables, each rated on a 0-10 scale that reflects the distribution of the underlying data.[13] The variables are assigned to five major areas: (A1) Size of Government; (A2) Legal Structure and Security of Property Rights; (A3) Sound Money; (A4) Freedom to Trade Internationally; and (A5) Regulation of Credit, Labor, and Business. The five area ratings reflect the average of the underlying variables, and the

[12] Hall and Lawson (2014) provide a recent survey of this literature.

[13] As described by Gwartney and Lawson (2003) and Gwartney et al. (2014), all of the variables used to construct the EFW index are derived from data provided by reputable third parties sources (e.g, World Bank, the International Monetary Fund, the PRS Group and World Economic Forum), and while the index authors prefer to utilize objectively quantifiable variables, some of the variables used to construct the legal system and regulation areas are based on surveys data provided by these organizations.

composite index reflects the average of the five areas. Data on economic freedom is available in five year intervals prior to 2000 and annually afterwards (Gwartney et al. 2014).

3.4 Factor Endowments

We use the measure of the suitability of land and climate for growing wheat relative to sugar (Wheat-Sugar) developed by Easterly (2007) as a measure of factor endowments. Following Easterly, Wheat-Sugar is measured as the log of the ratio of one plus the share of arable land suitable for growing wheat to one plus the share of arable land suitable for growing sugar, or $\log\left(\frac{1+\text{share land suitable for wheat}}{1+\text{share land suitable for sugarcane}}\right)$.[14] In section 5.2 we provide theoretical justification for the plausible validity of Wheat-Sugar as an exogenous instrument for EFW.

3.5 Other Control Variables

We control for a number of macroeconomic variables such as the level of economic development, the unemployment rate, social trust, religiosity, and perception of freedom. Economic development (log of real GDP per capita) and unemployment data are from the World Bank's World Development Indicators. Data for our measures of social capital (mean level of social trust in a country), religiosity (proportion of people who report being "religious"), and perception of freedom (mean level of perception of freedom in a country) are derived from WVS questions. Social capital and religiosity are important measures of informal institutions (Bjørnskov and Tsai 2015) and have previously been found to be important determinants of the level of happiness in a macro context (e.g., Bjørnskov et al. 2010). Perception of freedom has been found to be a strong predictor of life satisfaction (Verme 2009).

[14] We follow Easterly (2007) in using this measure. Although Easterly does not specifically say so, we assume that he takes the log of the land suitability ratio in order to effectively constrain his sample to the unit interval as a means of simplifying interpretation of his results.

IV. EMPIRICAL RESULTS

4.1 Pooled OLS Estimates

The basic model that we use in this section is given by equation (1), where $Happiness\ Inequality_{ct}$ represents the standard deviation of life satisfaction for country c in year t, EF_{ct} is the Economic Freedom of the World index (or one its five dimensions), X_{ct} is a vector of control variables, γ_t denotes time effects, and ε_{ct} is the i.i.d. error term.

$$Happiness\ Inequality_{ct} = \beta EF_{ct} + \delta X_{ct} + \gamma_t + \varepsilon_{ct} \quad (1)$$

Table 2 presents the estimates of equation (1). All models in this table are estimated using pooled OLS with robust standard errors clustered at the country level and include both regional and time effects. Model 1 is a parsimonious specification that only includes our main variable of interest, the economic freedom index (EFW). Because EFW is hypothesized to correlate with happiness inequality through a variety of channels, including economic development and social capital, the goal here is to get a sense of its overall (direct and indirect) relationship with the distribution of happiness. The EFW variable enters with a negative and highly statistically significant coefficient of -0.101, suggesting that higher levels of economic freedom are associated with a more equal distribution of happiness. If causal, our estimates suggest that a 1-point increase in the EFW index (on a scale from 0-10) decreases the standard deviation of happiness in a country by 0.101 points, all else constant. This correlation is also economically significant given that happiness inequality is distributed with a standard deviation of 0.33 around a mean of 2.17. In other words, a 3-point increase in EFW index is associated with a nearly one standard deviation decrease in happiness inequality.

[INSERT TABLE 2]

Model 2 adds the log of GDP per capita (Log GDP) as an additional control variable. Recall from section 2.1 that the anticipated direction of the correlation between economic outcomes and happiness inequality is ambiguous. Log GDP enters negatively and is significant statistically at the 5 percent level. Although the magnitude of the EFW coefficient declines (in absolute value) to -0.062, it is also statistically significant at the 5 percent level. Given that economic freedom has been shown to be a strong positive

determinant of economic development (Bennett et al. 2015, 2016; Faria and Montesinos 2009), this suggests that EFW is negatively associated with happiness inequality both directly and indirectly through the economic development channel.

Model 3 adds social trust, religiosity and (net) income inequality as additional control variables. Consistent with the findings of Bjørnskov and Tsai (2015), we find the social trust is negatively and significantly associated with happiness inequality and that income inequality is not significantly correlated with happiness inequality. Unlike Bjørnskov and Tsai (2015), who find that religiosity is strongly negative and significantly correlated with happiness inequality, we do not find religiosity to be statistically significant. Model 4 adds an additional variable that measures people's perception of freedom of choice and control over their life. This variable enters positively but is not significant statistically.

The coefficient on Log GDP is negative and statistically significant throughout models 2-4, suggesting that happiness is distributed more evenly in countries with higher levels of economic development, providing some evidence in favor of hypothesis 1 (see section 2.1). More importantly, EFW remains negative and is statistically significant at the 5 percent level or better in these specifications. These results suggest that there may be a direct relationship between EFW and happiness inequality in addition to an indirect relationship through the channels of economic development, social trust and perception of freedom.

Models 5 through 7 test several alternative hypotheses. First, model 5 includes a number of time-invariant controls such as a country's latitude, the proportion of land area located in a tropical region, and a dummy that takes a value of 1 if a country is classified as having French legal origins. Although these variables have not been previously tested in the context of happiness inequality, we include them as controls because previous studies have found them to be correlated with income inequality (see e.g., Atkinson and Bourguignon (2015) for a review of this literature). None of these additional controls, however, is statistically significant and our main findings remain intact.

In model 6, we control for the lagged level of happiness because happier people tend to perform better in multiple domains of life such as health, income, marriage, and even creativity (see Lyubomirsky, King and Diener (2005) for a review of this literature),

and happiness may be contagious (Christakis and Fowler 2009). As such, a higher level of happiness in a previous period may lead to an even greater level of current happiness. If the effect is stronger for those who were previously less happy, we may see a decline in happiness inequality. The results in column 6 suggest that while negative, the coefficient on the lagged level of happiness has no significant effect on the distribution of happiness in a country.

Finally, in model 7 we test whether the relationship between economic freedom and happiness inequality is moderated by the level of social capital. In countries where social capital is high, economic freedom may exert a stronger effect on the distribution of happiness. To test this hypothesis, we use the mean level of social trust as a proxy for social capital, which is common in the literature. Although the interaction and two constitutive terms are jointly significant (p=0.043), none of the terms are individually significant statistically at conventionally accepted levels and the conditional partial correlations of EFW over the range of social trust values (-0.056 to -0.043) are similar to the unconditional point estimates obtained in the previous specifications.[15] The results also suggest that the partial correlation of social trust on happiness inequality may be mitigated in the context of high levels of economic freedom.[16]

In online appendix Table A1, we show that the results in Table 2 are robust to the use of two-way clustered standard errors around country and year.

4.2 Accounting for Unobserved Heterogeneity

Overall, the results from Table 2 are consistent with previous findings that good institutions are associated with less happiness inequality (Bjørnskov and Tsai 2015; Clark et al. 2015; Ott 2005). However, these findings are based on pooled cross-sectional data. It is possible that unobserved country characteristics (e.g., cultural norms) that are correlated with both economic freedom and happiness inequality may be driving the results. To explore this possibility, column 1 of Table 3 reports results from a pooled

[15] The partial effect of EFW is -0.059+0.022*social trust. Social trust takes values ranging from 0.15 – 0.74 in the sample, suggesting that the partial effect of EFW is -0.056 for the lowest level of social trust and -.043 for the highest level.

[16] The partial effect of social trust is -0.613+0.022*EFW. EFW takes values ranging from 3.03 to 8.98 in the sample, suggesting that the partial effect of social trust is -0.0546 for the lowest level of EFW and -0.415 for the highest level.

OLS model and tests the sensitivity of the relationship between EFW and happiness inequality. For this specification, we only control for those variables that were statistically significant in our exploratory analysis in Table 2 (Log GDP and Social Trust), and religiosity because Bjørnskov and Tsai (2015) found it to be a robust correlate in their analysis. We also control for regional and wave fixed effects.

Following Oster (2013) and using the user-written Stata command *psacalc*, we calculate a statistic, δ, that allows us to evaluate the effect of unobservable variables on the coefficient of EFW by examining movements in R^2 as a result of the inclusion of additional control variables. The main assumption here is that the selection of observable variables is proportional to the selection of unobservable ones. When δ=1, the observed and unobserved variables exert the same effect on happiness inequality. For our analysis, we compare the coefficient on EFW with and without observables and find δ=0.314. Assuming that the maximum value of R^2=1, we then calculate β*, which represents the coefficient on EFW adjusted for bias attributable to unobservables.[17] We find β*=-0.047, which is similar to, albeit somewhat smaller in magnitude, than the pooled OLS estimate of -0.058. It is important to note that β* is the beta that would occur if selection bias based on unobservables would be as strong as the selection bias on observables.

[INSERT TABLE 3]

The results in column 1 of Table 3 suggest that unobserved heterogeneity may bias the OLS point estimates. Model 2 reports fixed effects (FE) estimates to exploit the panel dimension of our dataset and account for time-invariant country-specific effects (e.g., geography, slowly changing social norms, legal origins). Standard errors are clustered at the country level. Although the results from a Hausman test (p-value = 0.000) suggest that the FE specification is preferable to a random effects (RE) one, we also report the RE estimates in model 3 as a robustness check and to preserve some of variation across countries. Finally, it is likely that the contemporary level of happiness inequality is affected by the distribution of happiness in the past and the Baltagi LBI test statistic for the modified Durbin Watson test suggests that the error terms are positively correlated. Models 4 and 5 therefore report the results for FE and RE models with AR(1)

[17] To calculate β* we use the following formula $\beta^* = \tilde{\beta} - \delta \frac{(\beta' - \tilde{\beta})(Rmax - R)}{(\tilde{R} - R')}$. See Oster (2014, p. 9-11) for additional information.

correction for serial correlation.[18] In models 2-5, the coefficient on the EFW variable is negative, ranging from -0.055 to -0.132, and is statistically significant at 10 percent or better.

[INSERT TABLE 4]

4.3 Alternative Measures of Happiness Inequality

Table 4 replicates the baseline FE model (Table 3, model 2) using four alternative measures of happiness inequality. For comparison purposes, model 1 replicates the baseline estimates. Models 2, 3, 4, and 5 utilize the mean difference, interquartile range, Gini coefficient, and the coefficient of variation as alternative measures of happiness inequality, respectively. In all models we find that EFW is negatively correlated with happiness inequality, and with the exception of model 3 that uses the interquartile range, EFW is statistically significant at conventionally accepted levels. Table A2 in the online appendix replicates Table 4 using a RE model and finds that when we exploit some of the cross-country variation, even the coefficient on the interquartile range is significantly and negatively correlated with happiness inequality. Thus, the results from this exercise are qualitatively similar to the baseline estimates and suggest that the negative and statistically significant relationship between EFW and happiness inequality is not sensitive to the choice of inequality measure.

4.4 Decomposing the EFW Index

Next, we decompose the EFW index into its five main areas and report the results in Table 6.[19] The baseline model (Table 3, model 2) is again reported as model 1 for comparison. Model 2 simultaneously controls for all five areas. With the exception of the international trade area (A4), all five areas have a negative sign; however, only the areas associated with legal system (A2) and sound money (A3) are statistically significant. Because inclusion of all five areas of the index in the same model likely introduces significant multi-collinearity (the 5 areas are highly correlated as indicated in Table 5), models 3-7 control for each of the EFW areas one at a time. Although all five areas have

[18] AR(1) models estimated using Stata command *xtregar with fe/re rhotype(tscorr)*.

[19] Decomposition of the EFW index has precedent in the empirical economic freedom and growth literature (e.g. Carlsson and Lundström 2002; Dawson 2003; Heckelman and Knack 2009)

a negative coefficient, only the sound money (A3) area is statistically significant.[20] Table A3 in the online appendix replicates the results from Table 6 using a RE model. The RE estimates suggest that both the legal system (A2) and sound money (A3) areas are negative and statistically significant correlates of happiness inequality. These results are generally consistent with those of Bjørnskov and Tsai (2015), who find that the quality of the legal system, as measured by EFW area 2, is associated with significant movement of people out of the lowest happiness category to the higher ones.

[INSERT TABLE 5]

[INSERT TABLE 6]

V. 2SLS ESTIMATES

Although the analysis in section 4 suggests that economic freedom is negatively associated with happiness inequality, the estimates cannot be viewed as causal given the potential for endogeneity. In this section, we use an instrument developed by Easterly (2007), the suitability of land for growing wheat relative to sugarcane (WheatSugar), as a source of exogenous variation to investigate the potential causal impact of economic freedom (EFW) on happiness inequality. The analysis utilizes a two-stage least squares (2SLS) model similar to that used by Bennett and Nikolaev (2016), who estimate the potential causal impact of legal intuitions on long-run income inequality.[21]

Equations (2) and (3) describe the first and second-stages of the model, where *HappyIneq* is the standard deviation of happiness, X_c a set of control variables that potentially influence happiness inequality, *EFW* the observed values of economic freedom in country *c*, and $\widehat{EFW}$ the predicted value of economic freedom from the first

[20] In a working version of this paper, we repeat the exercise from Table 6 using several indexes from the World Bank Governance Indicators as a robustness test. Our results are consistent with our main findings so far—better quality of institutions is strongly and negatively correlated with happiness inequality. For example, lower levels of corruption and strong legal system are associated with lower happiness inequality across nations. Among the six measures of governance—control of corruption, government effectiveness, rule of law, regulatory quality, and voice & accountability—the most robust institutional variable that is correlated with lower levels of happiness inequality is government effectiveness. This measure captures perceptions about the quality of public and civic services, policy formulation and implementation, and the credibility of government commitment to such policies.

[21] While Easterly (2007) shows that WheatSugar is negatively correlated with income inequality in reduced form OLS estimations, Bennett and Nikolaev (2016) show that this instrument works through the economic freedom channel.

stage estimate. For this part of the analysis, we use long-run averages of all variables, lagging independent variables relative to happiness inequality to reduce the risk of reverse causality. As such, the analysis is based on a cross-section of up to 62 countries. Table 7 provides descriptions and summary statistics for all of the variables used in this section.

$$EFW_c = \delta X_c + \vartheta WheatSugar_c + \varepsilon_c \quad (2)$$

$$HappyIneq_c = \beta X_c + \delta \widehat{EFW_c} + \epsilon_c \quad (3)$$

The rationale for using Wheat-Sugar as an instrument for economic freedom rests on the endowment theory of institutional origins, and specifically the so-called Engerman-Sokoloff hypothesis (Engerman and Sokoloff 1997; Sokoloff and Engerman 2000). According to the endowment hypothesis, a country's climate, geography, and natural resources "shaped the initial formation of property rights and the initial systems for defining, defending and interpreting property rights [and] have had long-lasting ramifications on property rights and private contracting today (Levine 2005, p. 75-76)." Engerman and Sokoloff stress that natural resources related to mining and agriculture shaped the development of economic and legal institutions in the Americas following European colonization and that areas endowed with land and climate suitable for the production of cash crops such as sugarcane, tobacco and coffee, as well as with large unskilled native populations, gave European colonizers the incentive to establish large slave plantations to take advantage of economies of scale.[22] As a consequence, an elite class of landowners emerged that instituted policies that protected their interests and created political inequality, which in turn perpetuated economic inequality over time. Easterly (2007) refers to this perpetuation of economic inequality through non-market means as structural inequality.

[INSERT TABLE 7]

[22] The settlement conditions hypothesis advanced by Acemoglu et al. (2001) similarly suggests that the geographic and climate conditions faced by European settlers influenced institutional and economic development in the colonies. When conditions were favorable for large scale settlement, the Europeans established inclusive institutions, providing widespread economic opportunities. When conditions were unfavorable for mass settlement, the colonizers established extractive institutions, limiting economic opportunities to the landed elite. Their endowment theory is applicable to all former European colonies and not just the Americas, which is the focus of Engerman and Sokoloff's work. Additionally, Easterly (2007) argues that factor endowments across a wide section of countries has shaped inequality and his empirical results hold when he excludes countries in the Western Hemisphere.

Meanwhile, areas endowed with climates and land suitable for the production of grains such as wheat and relatively unpopulated by natives gave rise to an economic environment conducive to smaller-scale family farming. Most adult male immigrants to these regions became land owners and established family farms, giving rise to a sizeable middle-class since the majority of immigrants became independent land owners. Because the initial distribution of economic and political power was far more equal, more egalitarian economic and legal institutions were developed that provided widespread protection of property rights and enforcement of contracts. Thus we use WheatSugar, which is a measure for the suitability of climate and land endowments for the growing wheat relative to sugarcane, as a source of exogenous variation in economic and legal institutions, which we proxy for by economic freedom.

For WheatSugar to be a valid instrument for institutions to estimate their potential causal impact on happiness inequality, WheatSugar should be correlated with EFW but not with the error term in equation (3). In other words, WheatSugar must only correlate with happiness inequality through the economic freedom channel. Endowments may have influenced the level and distribution of happiness if, for instance, independent small scale farmers or business owners are happier than employees of larger commercial farms or corporations. Any such happiness effects of endowments are likely indirect and work through the institutional channel, which shapes the creation and evolution of industry structure and composition of the labor force. Given that the suitability of land and climate influenced the development of institutions, which we found in section 4 are negatively correlated with happiness inequality, and the lack of any economic or psychological theory suggestive that land and climate endowments impact happiness inequality directly or through alternative channels, WheatSugar is a plausibly valid instrumental variable.[23]

[23] Although the IV assumption cannot be formally tested, in reduced form OLS estimates (not reported), we find that WheatSugar does not exert a statistically significant effect on happiness inequality when controlling for economic freedom. It is feasible that economic inequality, which is correlated with WheatSugar, is correlated with happiness inequality, but we do not control for economic inequality because Bennett and Nikolaev (2016) provide evidence that WheatSugar impacts economic inequality only through the former's impact on legal institutions. We argue in section 2 that one of the channels through which economic freedom affects happiness inequality is economic outcomes. Economic inequality would fall under this channel. To the extent that WheatSugar may influence happiness inequality through the economic inequality channel, our theory is that this is channeled through WheatSugar's influence on institutions.

Table 8 presents the main results of the 2SLS estimates. Columns 1a and 1b report the first and second-stage estimates from a parsimonious model that does not include any control variables. The coefficient on WheatSugar in the first stage is positive and statistically significant at the 1 percent level. In the second-stage, the -0.112 coefficient on EFW is statistically significant at the 5 percent level.

In columns (2a)-(2b) and (3a)-(3b), we repeat this exercise by adding additional control variables (see Table 7 for descriptions). In columns (2a)-(2b) we add a measure of geography, the share of population living within 100 km of the coast (Pop100km), and a dummy equal to one for countries with French civil law heritage (LegorFR). In columns (3a)-(3b), we furthermore add a measure of human capital, the average educational attainment of the population above age 15 (AYS15), and measures for average growth of the economy (Growth) as well as government size (GovSize). In both models, WheatSugar is positive and statistically significant in the first stage, while EFW is negative and statistically significant in the second stage. None of the additional controls are statistically significant in the second stage estimates. Overall, the results in Table 8 confirm our hypothesis that institutions consistent with economic freedom are associated with lower levels of happiness inequality. The magnitude of the estimated 2SLS coefficients range from -0.239 to -0.269, suggesting that a standard deviation increase in EFW ($\sigma_{EFW} = 1.01$) is associated a two-thirds to three-quarters standard deviation reduction of happiness inequality ($\sigma_{HappyIneq} = 0.36$).

We report the Kleibergen-Papp F-test statistic for weak identification as F-stat in Table 8. These values should be compared to the Stock and Yogo (2002) critical values to determine the IV bias and test size distortions. The null for each test is that WheatSugar is a weak instrument for EFW. If the F-stat is greater than the critical values for each test, then the null is rejected. The critical values for a 10, 15, 20 and 25 percent maximal IV size bias for a single endogenous regressor are 16.38, 8.96, 6.66 and 5.53, respectively. Because there is a single endogenous regressor, the rule of thumb critical value of 10 can be used to approximate a 5% test that the worst case relative bias is 10% or less. The F-stats range from 7.27 in column 3b to 9.71 in column 2b, suggesting that WheatSugar is a relatively strong instrument for EFW. In addition, we report the p-values of the Durbin test statistic, which tests the hypothesis that the instrument is endogenous. In all models,

the test easily rejects the null hypothesis that WheatSugar is endogenous, suggesting that the instrument provides exogenous variation for EFW.[24]

[INSERT TABLE 8]

VI. DISCUSSION

Despite the rising level of income inequality in the Western world since the 1970s, recent research has documented that happiness inequality has fallen in countries that have experienced economic growth (Veenhoven 2005; Clark et al. 2015). Because there is a growing body of evidence suggestive that institutions consistent with the principles of economic freedom are a robust determinant of economic growth and development (e.g. De Haan et al. 2006; Hall and Lawson 2014), we build on this line of research by investigating the relationship between economic freedom, as measured by the Economic Freedom of the World (EFW) index, and happiness inequality, as measured by the standard deviation of life satisfaction.

We argue that economic freedom has a happiness equalizing effect beyond its positive impact on economic development, social capital and *via* the channel of procedural utility. Our empirical findings support this hypothesis and provide suggestive evidence that a richer and more free world is also a more equal world, at least when it comes to people's own evaluations of how satisfied they are with their lives.

These empirical findings hold across pooled OLS, fixed effects and random effects specifications, and are also robust to several alternative measures of happiness inequality, including the interquartile range, the mean absolute difference, the Gini coefficient, and the coefficient of variation. We also decompose the EFW index into its five main areas and find that the legal system and sound money areas are negatively associated with happiness inequality.

Finally, the Engerman and Sokoloff endowment hypothesis suggests that geographic and climatic conditions shaped a nation's institutions during the colonial era, and in turn have exerted a long-lasting impact on economic outcomes. Following this

[24] We further perform the Wu-Hausman test, which suggests that WheatSugar is exogenous. Results from this test omitted for space. In an earlier version of this paper, we also reported results analogous to those of Bennett and Nikolaev (2016), who instrument WheatSugar for area 2 of the EFW index (legal system) and find that the latter is negatively associated with income inequality. We obtain similar results with respect to happiness inequality.

logic and using the measure of the relative suitability of land and climate endowments for growing wheat relative to sugar developed by Easterly (2007) as an instrument for EFW, we estimate the potential causal effect of EFW on happiness inequality. The results point towards a strong, negative and potentially causal effect of economic freedom on happiness inequality.

In one way, our findings could be purely descriptive as they are consistent with the now widely accepted view that institutions play a vital role in shaping prosperity around the world. Countries in which investors feel secure about their property rights, monetary and fiscal policies promote macroeconomic stability, individuals are uninhibited from starting enterprises and engaging in trade tend to be those that are also economically developed. And while there are alternative theories such as the modernization hypothesis, which suggests that economic development leads to better institutions (Lipset 1959), and the grand transitions hypothesis, which suggests that institutions and development evolve together (Paldam and Gundlach 2008), a growing body of evidence suggests that the arrow of causation goes from economic freedom to prosperity (De Haan et al. 2006; Faria and Montesinos 2009; Bennett et al. 2015, 2016). The results presented here suggest that economic freedom is correlated with a more equal distribution of happiness, at least when it comes to people's subjective evaluation of satisfaction with their lives.

There is of course much work to be done in this emerging field of economic inquiry and this paper should be seen as an initial attempt to explore the relationship between economic freedom and happiness inequality, rather than the final and definitive word on the matter. And while we present some initial evidence that economic freedom may promote greater happiness equality, these results should be viewed as preliminary and serve as a catalyst for additional inquiry.

As more data become available, it would be instructive to examine whether our results hold up in expanded and dynamic panel models. It will also be important to understand to what extent the relationship between economic freedom and happiness inequality is dependent on other macroeconomic variables such as culture, the level of economic development, economic inequality, and political and social institutions. The study of natural experiments such as ex-communist countries that are currently in

transition may provide further insights. This topic will be in the heart of public policy debate in the coming years, given that research in this area has thus far offered a new and brighter outlook that despite average happiness levels remaining flat, happiness inequality tends to be falling.

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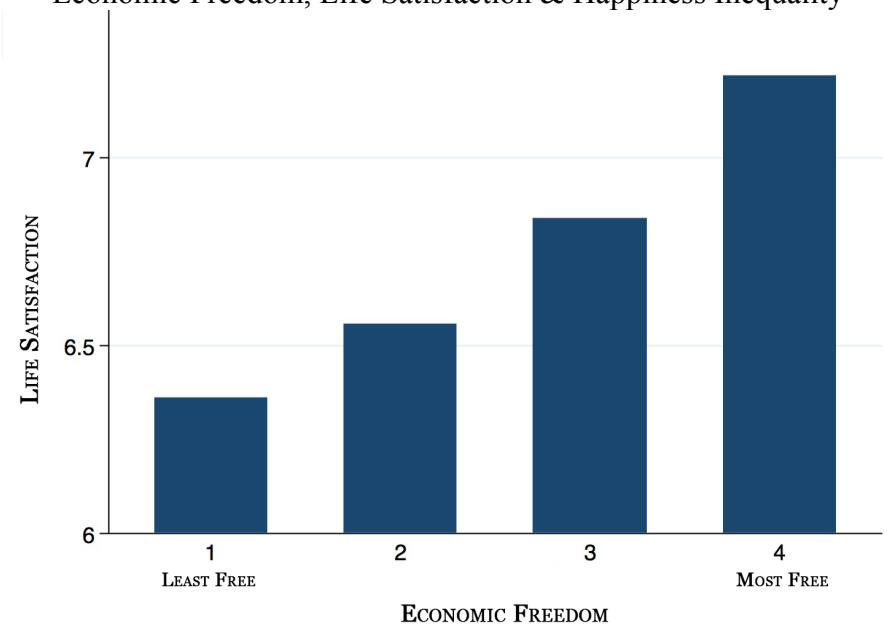
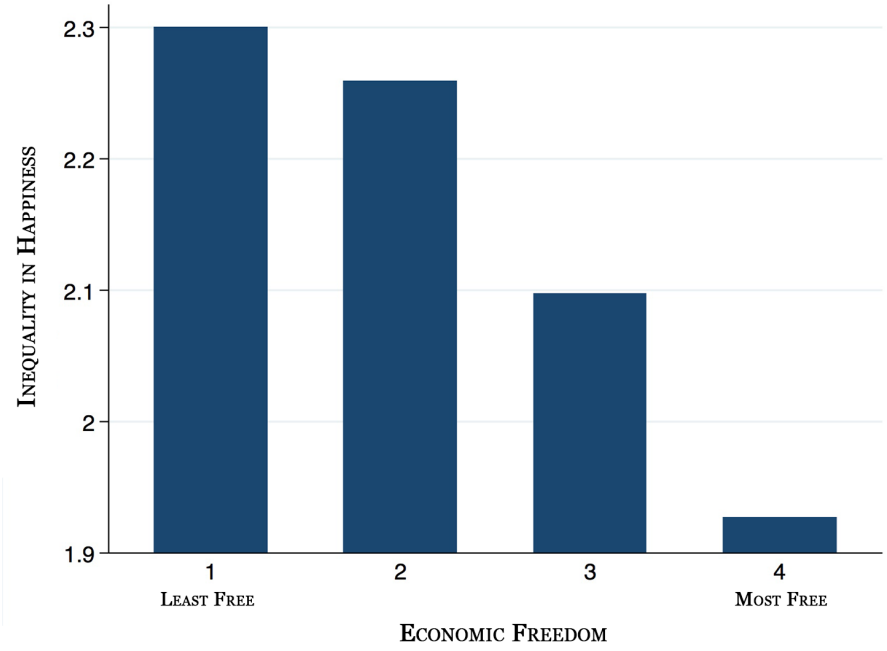
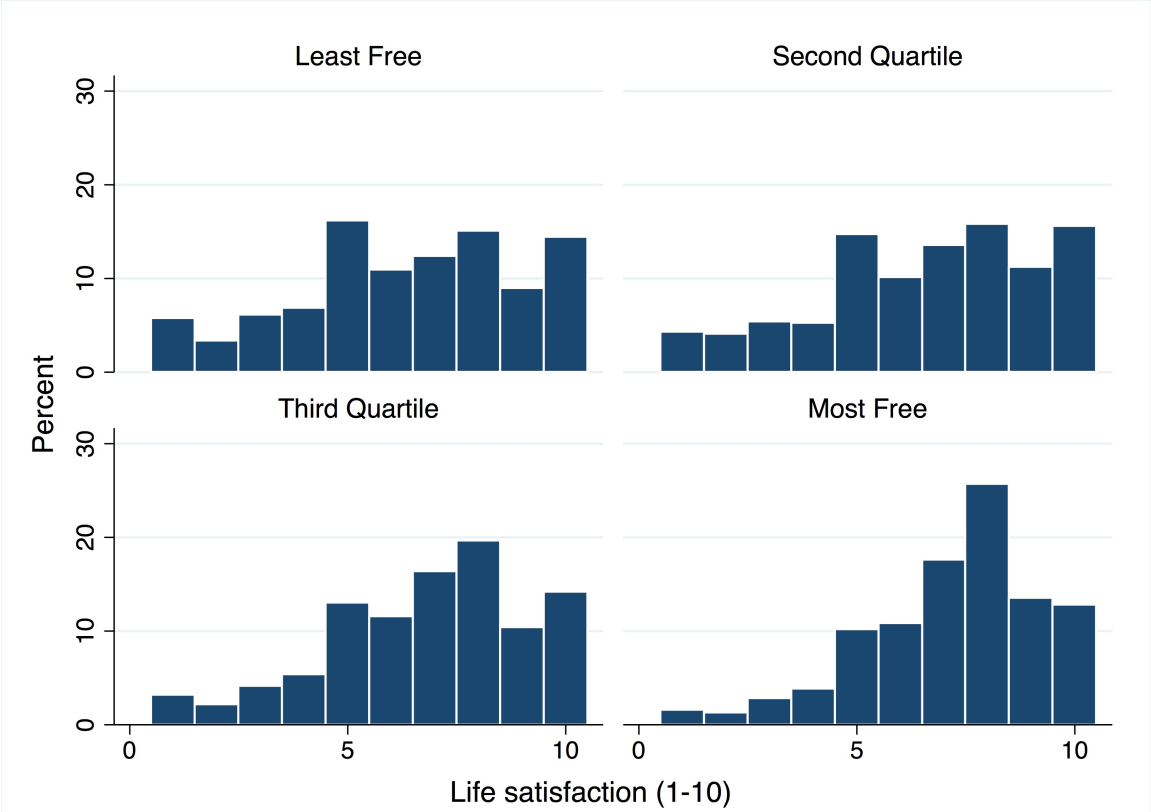
Figure 1
Economic Freedom, Life Satisfaction & Happiness Inequality





Note: Economic freedom is composite index from the Economic Freedom of the World report. Life satisfaction data from the World Values Survey question, ""*All things considered, how satisfied are you with your life these days?*" The recoded scale of possible answers ranged from 1 (*not at all satisfied*) to 10 (*very satisfied*). Happiness inequality is measured by the standard deviation of life satisfaction. *Sources:* World Values Survey, 1981-2012; Gwartney et al. (2014).

Figure 2
Distribution of Life Satisfaction by EFW Quartile



Notes: Data on life satisfaction are collected with the question "*All things considered, how satisfied are you with your life these days?*" The recoded scale of possible answers ranged from 1 (*not at all satisfied*) to 10 (*very satisfied*). Economic freedom is composite index from the Economic Freedom of the World report.
Sources: World Values Survey, 1981-2012. Gwartney et al. (2014).

Table 1
Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Happiness Inequality					
Standard Deviation	230	2.17	0.33	1.35	3.35
Mean Abs Difference	230	1.74	0.32	1.02	3.25
Interquartile Range	230	2.93	0.88	1.00	7.00
Coefficient of Variation	223	0.34	0.09	0.17	0.83
EFW	201	6.68	1.15	3.03	8.98
Area 1: Government	202	6.17	1.49	1.63	9.38
Area 2: Legal System	200	6.12	1.64	2.20	9.29
Area 3: Money	203	7.59	2.17	0.00	9.89
Area 4: International Trade	202	7.01	1.70	1.30	9.91
Area 5: Regulation	202	6.54	1.26	1.58	9.02
Log GDP	207	9.33	1.00	6.74	11.75
Social Trust	231	0.27	0.15	0.03	0.74
Religiosity	219	3.03	0.67	1.28	3.99
Perception of Freedom	224	6.86	0.79	4.68	8.44
Latitude	226	28.49	27.94	-41.80	64.48
Tropics	215	0.17	0.35	0	1
Legal Origins	225	0.59	0.50	0	1
Income Inequality (Net)	209	37.78	8.99	21.94	56.09

See section 3 for description of variables and sources.

Table 2
Pooled OLS Results (Standard Deviation of Happiness is Dependent Variable)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EFW	-0.101***	-0.062**	-0.056**	-0.059**	-0.054*	-0.059*	-0.059
	(0.020)	(0.029)	(0.028)	(0.028)	(0.030)	(0.031)	(0.051)
Lagged Life Satisfaction						-0.037	
						(0.027)	
EFW*Social Trust							0.022
							(0.165)
Log GDP		-0.119**	-0.082*	-0.088*	-0.122**	-0.097*	-0.124**
		(0.046)	(0.048)	(0.048)	(0.051)	(0.050)	(0.060)
Social Trust			-0.499***	-0.550***	-0.462**	-0.361*	-0.613
			(0.154)	(0.183)	(0.192)	(0.193)	(1.187)
Religiosity			0.032	0.020	0.045	0.066	0.043
			(0.057)	(0.061)	(0.068)	(0.066)	(0.074)
Income Inequality (net)			0.004	0.004	0.004	0.003	0.004
			(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Perception of Freedom				0.033	0.009	-0.013	0.009
				(0.050)	(0.054)	(0.046)	(0.054)
Latitude					-0.001	-0.001	-0.001
					(0.001)	(0.001)	(0.001)
Tropics					-0.034	-0.027	-0.036
					(0.138)	(0.135)	(0.144)
Legal Origins					-0.063	-0.063	-0.062
					(0.081)	(0.080)	(0.082)
Regional Effects	Y	Y	Y	Y	Y	Y	Y
Wave Effects	Y	Y	Y	Y	Y	Y	Y
Observations	197	177	164	161	157	156	157
N Countries	91	87	78	78	76	76	76
R-squared	0.414	0.456	0.529	0.528	0.545	0.576	0.545

Notes: All models (1)-(7) are estimated using a pooled OLS with robust Huber-White standard errors clustered at the country level (reported in parenthesis). All models include regional and wave dummies. The set of regional dummies includes dichotomous variables for Europe and Central Asia, Middle East and North Africa, Latin America and Caribbean, South Asia, Sub-Saharan Africa, North America, East Asia and Pacific. The primary motivation to control for regional effects is to account for the well-known Latin America and Post-Communist biases. See section 3 for description of variables and sources. Statistical significance is indicated: *** p<0.01, ** p<0.05, *p<0.1

Table 3
Fixed and Random Effects Estimates (Standard Deviation of Happiness is Dependent Variable)

	(1)	(2)	(3)	(4)	(5)
Variables	Pooled OLS	FE	RE	FE (AR1)	RE (AR1)
EFW	-0.058**	-0.091**	-0.055**	-0.132*	-0.055**
	(0.026)	(0.043)	(0.027)	(0.075)	(0.025)
Log GDP	-0.090**	0.119	-0.047	-0.045	-0.052*
	(0.042)	(0.108)	(0.034)	(0.183)	(0.030)
Social Trust	-0.463***	-0.360	-0.370**	-0.576	-0.381**
	(0.147)	(0.263)	(0.160)	(0.462)	(0.177)
Religiosity	0.054	0.418***	0.131***	0.355*	0.119**
	(0.046)	(0.123)	(0.049)	(0.198)	(0.048)
Wave Effects	Y	Y	Y	Y	Y
Region Effects	Y	N	Y	N	Y
Oster's $\beta^*(\delta)$	-0.047 (0.314)				
Observations	173	173	173	87	173
N Countries	86	86	86	47	86
R-squared	0.515	0.282	0.439	0.378	0.445

Notes: Models (1) is estimated using a pooled OLS with robust Huber-White standard errors clustered at the country level (reported in parentheses). Oster's β^* is the estimated EFW coefficient, taking into account the bias attributable to unobservables, as measured by δ. See section 4 for additional details about this test. Models (2) and (3) estimated using fixed-effects (FE) and random effects (RE) estimators, respectively. A Hausman test (p-value=0.000) suggests that a FE model is more appropriate. Model (4) and (5) correct for first-order autocorrelation of the error term. Time-invariant regional effects are excluded from the FE regressions. See section 3 for description of variables and sources. Statistical significance is indicated: *** p<0.01, ** p<0.05, * p<0.1

Table 4
Robustness to Alternative Measures of Happiness inequality

Variables	(1) St. Dev		(2) Mean Diff.		(3) Inter. Range		(4) Gini Coeff.		(5) Coeff. Var	
EFW	-0.091**	(0.043)	-0.075*	(0.041)	-0.071	(0.147)	-0.027***	(0.007)	-0.016**	(0.007)
Log GDP	0.119	(0.108)	0.141	(0.115)	0.018	(0.600)	0.047**	(0.022)	0.0212	(0.020)
Social Trust	-0.360	(0.263)	-0.300	(0.276)	1.623	(1.049)	-0.036	(0.039)	-0.062	(0.041)
Religiosity	0.418**	(0.123)	0.356***	(0.122)	1.067***	(0.361)	0.003	(0.020)	0.061***	(0.021)
Time Effects	Y		Y		Y		Y		Y	
Observations	173		173		173		173		171	
R-squared	0.282		0.273		0.181		0.551		0.263	
N Countries	86		86		86		86		84	

Notes: All models (1)-(5) are estimated using a FE model with robust Huber-White standard errors clustered at the country level (reported in parentheses). Dependent variables are: (1) standard deviation of happiness; (2) mean difference happiness; (3) interquartile range of happiness; (4) happiness Gini coefficient; (5) happiness coefficient of variation. All models include wave dummies. See section 3 for description of variables and sources. Statistical significance is indicated: *** p<0.01, ** p<0.05, * p<0.1.

Table 5
Correlation Matrix – EFW Variables

	EFW	A1	A2	A3	A4	A5
EFW	1.00					
Area 1: Government Size	0.14	1.00				
Area 2: Legal System	0.74	-0.31	1.00			
Area 3: Sound Money	0.79	-0.06	0.47	1.00		
Area 4: International Trade	0.77	-0.10	0.63	0.45	1.00	
Area 5: Regulation	0.80	0.06	0.52	0.59	0.53	1.00

Table 6
Decomposing the EFW Index

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EFW	-0.091**						
	(0.043)						
A1: Gov Size		-0.014	-0.024				
		(0.026)	(0.025)				
A2: Legal System		-0.045*		-0.000			
		(0.023)		(0.026)			
A3: Sound Money		-0.054***			-0.034***		
		(0.011)			(0.012)		
A4: Int Trade		0.021				-0.003	
		(0.019)				(0.022)	
A5: Regulation		-0.005					-0.022
		(0.033)					(0.029)
Controls	Y	Y	Y	Y	Y	Y	Y
Time Effects	Y	Y	Y	Y	Y	Y	Y
Observations	173	170	174	173	175	174	174
R-squared	0.282	0.326	0.173	0.147	0.233	0.167	0.163
Countries	86	85	86	86	86	86	85

Notes: All models (1)-(7) are estimated using a FE model with robust Huber-White standard errors clustered at the country level (reported in parentheses). All models include controls for log GDP, social capital, religiosity, and time dummies – omitted for space. See section 3 for description of variables and sources. Statistical significance is indicated: *** p<0.01, ** p<0.05, * p<0.1

Table 7
Description and Summary Statistics Variables for 2SLS Analysis

Variable	Description	Mean	SD	Min	Max	N
Happiness Inequality	Standard deviation of life satisfaction in each country of sample. Data on life satisfaction are collected with the question "*All things considered, how satisfied are you with your life these days?*" The recoded scale of possible answers ranged from 1 (*not at all satisfied*) to 10 (*very satisfied*). *Source:* World Values Survey, 1981-2012.	2.12	0.36	1.38	3.22	71
EFW	Economic Freedom of the World Index (EFW) averaged over period 1985-2005. *Source*: Fraser Institute, Gwartney et al. (2013).	6.12	1.01	3.65	8.83	71
Wheat-Sugar	Suitability of climate and land endowments for growth wheat relative to sugar. Measured as: log[(1+share of arable land suitable for wheat)/(1+share of arable land suitable for sugarcane)]. *Source:* Easterly (2007).	0.19	0.16	0.00	0.58	61
Tropics	Proportion of land area located in tropical region. *Source:* Gallup et al. (1999).	0.35	0.46	0.00	1.00	71
Pop100km	Share of the national population living within 100km of the coast. *Source:* Gallup et al. (1999).	0.45	0.33	0.00	1.00	70
LegorFr	Dummy variable equal to one if a country classified as having French legal tradition, and zero otherwise. *Source:* La Porta et al. (1999).	0.47	0.50	0.00	1.00	70
AYS15	Mean years of schooling for population above age 15 over period 1985-2005. *Source:* Barro and Lee (2013).	6.72	2.66	1.09	12.52	70
Growth	Mean 5-year real growth rate of GDP per capita over period 1985-2005. *Source:* Penn World Tables, version 7.1, Heston et al. (2012).	9.80	8.71	-5.32	47.78	71

Table 8
2SLS Estimates

Variables	(1a) First Stage EFW	(1b) Sec Stage St. Dev Life Sat	(2a) First Stage EFW	(2b) Second St. Dev Life Sat	(3a) First EFW	(3b) Second St. Dev Life Sat
Wheat-Sugar	2.114***		2.141***		1.989***	
	(0.784)		(0.687)		(0.708)	
EFW		-0.239**		-0.239**		-0.263**
		(0.0959)		(0.0952)		(0.106)
Pop100km			1.423***	-0.0230	1.363***	0.00646
			(0.347)	(0.166)	(0.363)	(0.173)
LegorFr			-0.560**	0.00665	-0.594**	-0.0113
			(0.229)	(0.0897)	(0.245)	(0.0991)
AYS15					0.0148	-0.00907
					(0.0447)	(0.0133)
Growth					-0.000768	0.00235
					(0.0141)	(0.00418)
Observations	62	62	62	62	61	61
R-squared	0.108	0.459	0.344	0.459	0.342	0.458
IV F-stat		7.273		9.710		7.882
Durbin pval		0.913		0.836		0.705

Notes: Dependent variable in first stage (1a, 2a, and 3a) is the EFW composite index. Dependent variable in second stage (1b, 2b, and 3b) is the standard deviation of life satisfaction. WheatSugar is the excluded instrument. See Table 7 for variable description and summary statistics. Standard errors reported in parentheses. Statistical significance is indicated: ***p<0.01, ** p<0.05, * p<0.1