

# Historical Prevalence of Infectious Diseases, Cultural Values, and the Origins of Economic Institutions

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## Abstract

It is widely believed that economic institutions such as competitive markets, the banking system, and the structure of property rights are essential for economic development. But why economic institutions vary across countries and what are their deep origins is still a question that is widely debated in the developmental economics literature. In this study, we provide an empirical test for the provocative hypothesis that the prevalence of infectious diseases influenced the formation of personality traits, cultural values, and even morality at the regional level (the so called Parasite-Stress Theory of Values and Sociality), which then shaped economic institutions across countries. Using the prevalence of pathogens as an instrument for cultural traits such as individualism, we show in a two-stage least squares analysis that various economic institutions, measured by different areas of the index of Economic Freedom by the Heritage Foundation, have their deep origins in the historical prevalence of infectious diseases across countries. The correlations remain significant even after controlling for a number of confounding variables, geographic controls, and for different sub-samples of countries.

**Keywords:** Economic Freedom, Institutions, Pathogens, Parasite-Stress.

**JEL Classification Numbers:** I0, J24, I21, I31.

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# 1 Introduction

What makes some countries rich and others poor? In 1776, Adam Smith (1776), widely considered the father of modern economic thought, asked this question in his celebrated book “An Inquiry into the Nature and Causes of the Wealth of Nations.” More than two hundred years later, this question still remains one of the central topics in the developmental economics literature.

Smith’s theory of growth inspired much of the earlier neoclassical growth models, which explained cross-country differences in economic performance in terms of different paths of factor accumulations (Solow, 1956), preferences (Cass, 1965; Koopmans, 1965), externalities associated with physical and human capital accumulation (Romer, 1986; Lucas, 1988), or investment in new technologies (Romer, 1990). Yet, many of these determinants of economic growth such as innovation, education, or capital accumulation are what most economists describe as economic growth on the first place (Acemoglu et al., 2005). Thus, more recent papers have emphasized the importance of institutions as a fundamental explanation for economic progress (Baumol, 1996; Acemoglu et al., 2005; Dort et al., 2014; Gwartney et al., 2006)

Institutions, as North (1990) defines them, are “the rules of the game in a society, or, more formally, ... the humanly devised constraints that shape human interaction.” In that sense, they “structure incentives in human exchange, whether political, social, or economic.” Economic institutions such as competitive markets, the banking system, or the structure of property rights are especially important for economic progress because they determine the relative rewards from different productive and non-productive economic activities. In this way, they fundamentally influence how society invests in physical and human capital as well as technology, and organizes its production.<sup>1</sup>

Despite the growing body of empirical research that shows that institutions have a strong influence on economic development, it is by now also clear that high quality institutions are as much a result of economic development as they are the cause of it, i.e., they are

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<sup>1</sup>Baumol (1996), for example, suggests that the allocation of entrepreneurial talent — e.g., to productive activities such as technological innovation or unproductive ones such as rent seeking — is largely determined by the relative rewards defined by economic institutions.

endogenous. Better institutions can explain why some countries are richer than others, but richer countries are also the type of places where citizens have the resources and voice to demand better institutions and influence the distribution of political and economic power (Rodrik, 2004; Acemoglu et al., 2005). But how economic institutions evolved on the first place and why they vary across countries is still hotly debated in the field of economic growth and development. Previous theories have explained the variation in economic institutions with differences in ideology (Piketty, 1999), geography (Levine, 2005), settler mortality (Acemoglu and Robinson, 2001; Acemoglu et al., 2005), ethnic fractionalization (Easterly and Levine, 1997), legal origins (La Porta et al., 2000), and social conflict (North, 1981).

In this paper, we offer another possible explanation for the deep origins of economic institutions – the historical prevalence of infectious diseases. Specifically, we contribute to the literature by empirically testing the provocative hypothesis that regional variation in infectious diseases influenced cultural traits such as xenophobia, openness, and ethnocentrism, which led to the formation of social values associated with collectivism-individualism (Fincher et al., 2008), which, in the next stage, shaped economic institutions at the regional level. In that sense, our theory relies on a causal mechanism that is rooted in evolutionary theory and is based on a rich literature in psychology and biology that has identified the instrument a priori (Thornhill and Fincher, 2014).

Our analysis suggests that individualistic values are strongly and positively correlated with economic freedom. In our 2SLS analysis, we further show that parasitic stress is strongly and negatively correlated with individualistic values, which, in the next stage, are a strong determinant of economic freedom and its various sub-areas. These results hold even when we control for a number of confounding factors, geographic dummies, and for different sub-samples of countries.

Thus, this paper contributes to the literature on the determinants of economic institutions in three ways. First, while previous studies use settler mortality as an instrument for economic institutions, to the best of our knowledge, we are the first to test if the historical prevalence of infectious diseases, which influenced mortality rates, shaped the formation of economic institutions through the channel of collective cultural values. In this way, our story enriches previous theories and provides a deeper understanding of the processes that lead to

the formation of different types of economic institutions. Second, we provide evidence for a number of economic institutions – from the structure of property rights and corruption to financial and labour freedoms. Finally, we advance the literature methodologically by suggesting a potential new instrument that can be used to examine the effect of a wide range of cultural values (e.g., social trust, religiosity, ethnolinguistic fractionalization) on numerous economic, social, and political outcomes. This is important since many recent studies document a strong correlation between institutions and cultural values such as social trust ([Berggren and Nilsson, 2013](#)), morality ([James, 2015](#)) or attitudes toward fertility and childbearing ([Basso, 2015](#)), to mention a few.

## 2 The Parasite-Stress Theory of Values

Parasitic (infectious=pathogenic) stress is the most important cause of evolutionary change, accounting for more evolutionary action across the human genome than any other environmental factor including climate, geography, diet or subsistence strategies ([Fumagalli et al., 2011](#)). In human evolutionary history, infectious diseases were a major source of morbidity and thus of natural selection ([Volk and Atkinson, 2013](#)). There are two ways in which humans adapted to pathogenic stress. The first one is the physiological immune system at the cellular level. The second one is the adaptation of the behavioral immune system, which consisted of changes in psychology and behavior that helped humans avoid infectious diseases and manage their contagion ([Schaller and Duncan, 2007](#); [Fincher and Thornhill, 2008](#)). Examples of adaptation in the behavioral immune system include adaptive feelings (e.g., disgust), cognition (e.g., worry about contagion), and values about the behavior towards out-group and in-group members (e.g., prejudice against people who are perceived unfamiliar, unhealthy, or unclean) ([Thornhill and Fincher, 2014](#)).

There is by now convincing evidence that host-parasite arm races were geographically localized ([Fincher et al., 2008](#)). One implication of this phenomenon is that host defense works most effectively against local parasite genotypes and less so against those evolving in out-group hosts. The so called parasite-stress theory of values (PSTV), which was first introduced by [Thornhill and Fincher \(2014\)](#), suggests that regions with high prevalence of

infectious diseases (parasitic stress) are more likely to favor the natural selection of personality traits such as xenophobia, ethnocentrism, and, more generally, values that disregard the rights, liberties, and well-being of out-group members, including those at the lower end of the socio-economic ladder.<sup>2</sup> Societies with high prevalence of infectious diseases would then be more likely to develop cultural values and ideologies associated with collectivist values (Fincher et al., 2008) that view negatively ideas that threaten the established social norms and legitimize authoritarian social outcomes (Thornhill et al., 2009). From an evolutionary standpoint, this strategy played an important role to prevent the spread of infectious diseases.

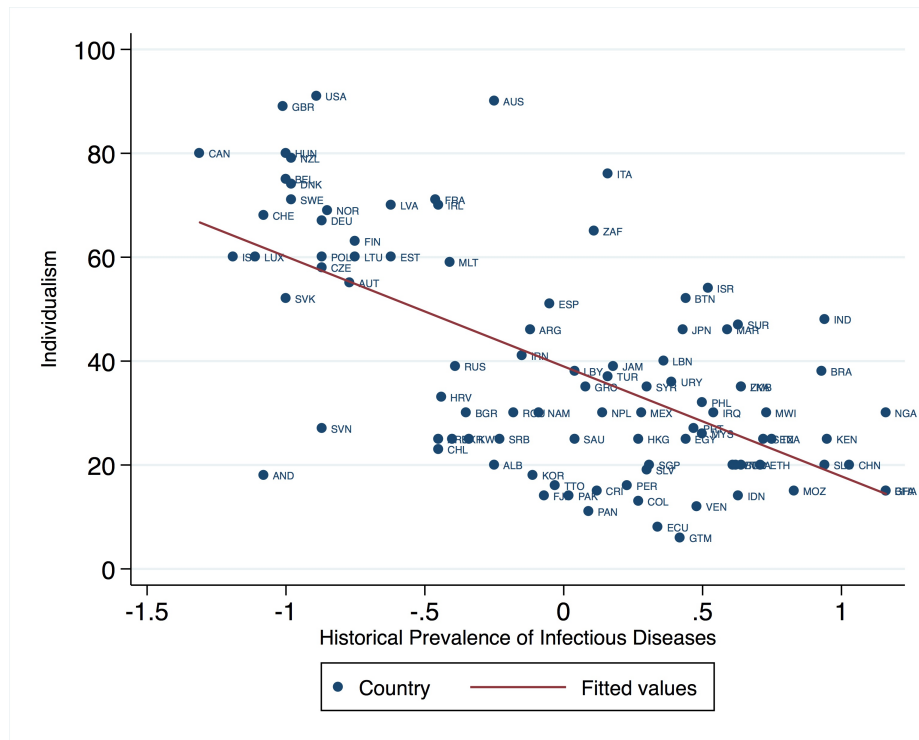


Figure 1: Individualism and Historical Prevalence of Infectious Diseases

On the other hand, low parasite stress promotes the development of a value system associated with tolerance, validity, and trust of out-groups (Fincher et al., 2008). Societies with low parasite stress develop values that favor inclusiveness and emphasize the rights and freedoms not only of the ruling majority, but also of those with differences in social class,

<sup>2</sup>Xenophobia, for example, reduces economic transactions between groups and across-regions, and neophobia rewards conformity and obedience of traditional values and discourages new ideas. As a consequence, corruption, in-group favoritism, and authoritarianism are more likely social outcomes (Thornhill et al., 2009)

religion, or ethnicity. This ideology is associated with openness to new ideas, even if the ideas come from out-groups. In evolutionary history, this strategy was successful because it provided benefits by encouraging the free exchange of goods and services, promoting specialization of labor, and increasing the formation of social alliances for cooperation with out-groups that promoted the diffusion of new knowledge. Figure 1 shows the strong correlation between the historical prevalence of infectious diseases and individualistic values ( $r = -.63$ ;  $p = 0.000$ ).

Our hypothesis, then, is that high parasite stress will be conducive to the development of cultural values that favor economic institutions that are inconsistent with the principles of economic freedom [e.g., personal choice, voluntary exchange, freedom to enter markets and compete, and security of privately owned property (Gwartney et al., 2014)]. Low parasite stress societies, on the other hand, will be more likely to promote the natural selection of personality traits that favor more inclusive institutions that are characterized by respect for the rights, liberties, and well-being of all members of society. We demonstrate this mechanism with a simple schematic below:

- (1) High Parasitic (= infectious = pathogenic) stress  $\Rightarrow$
- (2) Cultural Values (e.g., xenophobia, ethnocentrism, collectivism)  $\Rightarrow$
- (3) Economic Institutions (protection of private property, free markets)

To test our hypothesis, we use a two stage least squares (2SLS) model in which the prevalence of infectious diseases is used as a source of regional exogenous variation for cultural values, which then predict differences in economic institutions across countries. We proxy cultural values by a multifaceted value system of individualism-collectivism. Collectivism is characterized by strong values placed on tradition and conformity while individualism is defined by greater tolerance for deviations from the status quo (Oishi et al., 1998). As a measure of economic institutions we use the index of Economic Freedom (EF) published by the Heritage Foundation and its various sub-areas such as rule of law and regulatory efficiency. Since the index of EF is a complex composite indicator that has ten sub-areas, we further investigate how different economic institutions are affected by the historical prevalence of pathogenic stress.

## 3 Data

In this section, we provide a brief description of the main variables used in this study and discuss our main data sources.

### 3.1 Economic Freedom

The dependent 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. We use the 2014 Index of Economic Freedom (EF) published by the Wall Street Journal and the Heritage Foundation. EF is measured using 10 quantitative and qualitative factors, which are grouped into four broader categories, or pillars, of economic freedom: (1) Rule of Law (property rights, freedom from corruption), (2) Limited Government (fiscal freedom, government spending), (3) Regulatory Efficiency (business freedom, labor freedom, monetary freedom), and (4) Open Markets (trade freedom, investment freedom, financial freedom). Overall, the index of EF measures these 10 different freedoms in 186 countries. Each one of these areas is rated on a scale of 0-100 that reflects the distribution of the underlying data. A country's level of economic freedom is then calculated by averaging these ten economic freedoms, with equal weight given to each freedom. The data and complete methodology are freely available online at <http://www.heritage.org/index/>

### 3.2 Historical Prevalence of Infectious Diseases

Our main independent variable is the historical prevalence of infectious diseases from [Murray and Schaller \(2010\)](#). In their work, the authors create an index that assesses the intensity of the historical prevalence of disease-causing pathogens for more than 155 countries. The index is based on the prevalence of nine diseases that are destructive to the human reproductive health: leishmanias, trypanosomes, leprosy, schistosomes, filariae, tuberculosis, malaria, dengue, and typhus. In estimating their historical pathogen prevalence index, the authors use epidemiological maps and summaries presented in [Simmons et al. \(1944\)](#). The pathogen scores for each one of these diseases are then standardized by converting them to

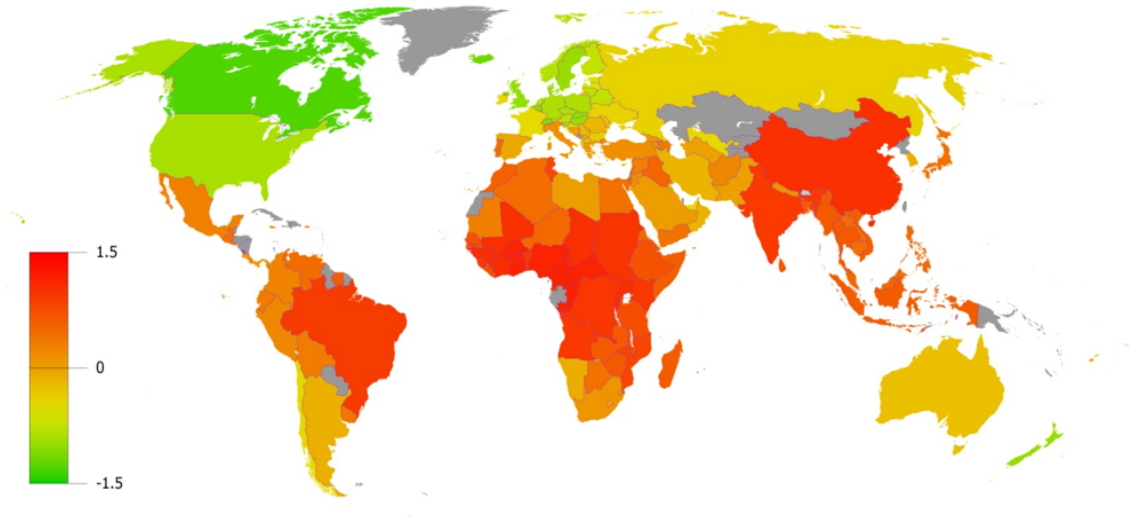


Figure 2: Historical Prevalence of Infectious Diseases

z scores. The composite pathogen prevalence index is estimated as the average of the individual disease z-scores included in the index. Thus, positive values for each country indicate above average disease prevalence while negative values denote that pathogen prevalence is below the mean. The authors show that their index is strongly correlated with a similar index of disease prevalence by [Gangestad and Buss \(1993\)](#). Although the index by [Gangestad and Buss \(1993\)](#) is estimated for only 29 countries, the correlation with the [Murray and Schaller \(2010\)](#) index is 0.87. Fig. 2 shows a heat map of the historical prevalence of infectious diseases for 155 countries.

### 3.3 Individualism-Collectivism

Contemporary research on the economic and political consequences of individualism-collectivism stems largely from [Hofstede \(1980\)](#) who carried out one of the most comprehensive studies of how values in the workplace are shaped by culture. In this and follow up work ([Hofstede and Hofstede, 2001](#)), Hofstede conducted surveys with more than 100,000 IBM employees worldwide. Based on responses for 14 “work goal” questions, he estimated national Individualism-Collectivism (IC) scores for approximately 50 nations. He defined individualistic societies as those “in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family.” Contrary, col-



lectivism is attributed to “societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty” (Hofstede et al., 1991, p.51).

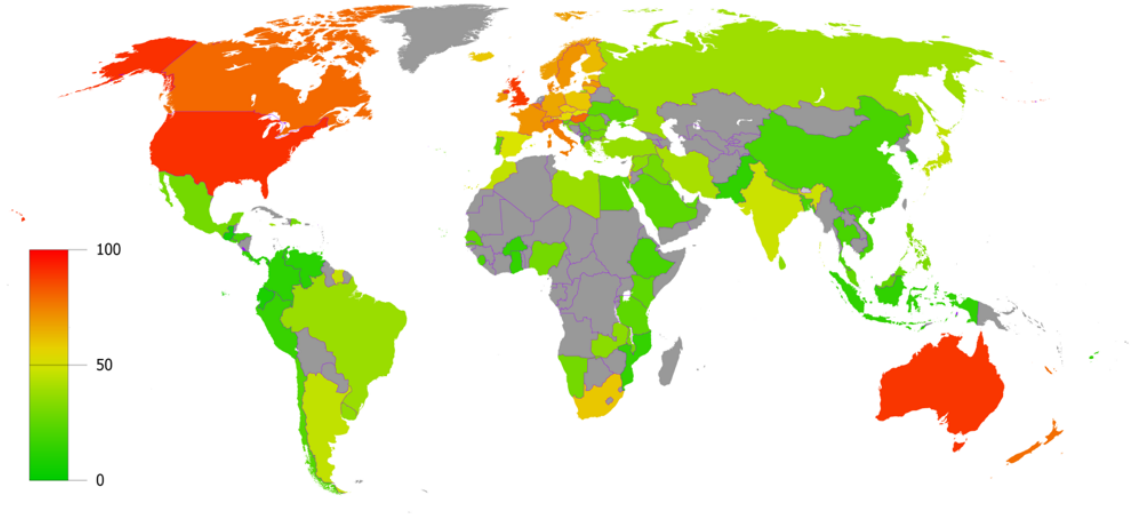


Figure 3: Individualism-Collectivism Values

The related literature has successfully linked individualism/collectivism with social capital (Allik and Realo, 2004), economic development (Ball, 2001) and antecedents of long run economic growth (Gorodnichenko and Roland, 2011). In this study, we rely on the most recently updated dataset of IC scores for more than 100 countries from Hofstede et al. (1991). The IC scores are standardized and rescaled from 0 (most collectivistic) and 100 (most individualistic). Figure 3 shows a heat map for IC scores around the world.

### 3.4 Other Controls

To address potential omitted variable bias we add a vector of control variables that have previously been found to be correlated with economic freedom. These additional controls include GDP per capita, legal origins, and various geographical controls (Rodrik, 2004; Acemoglu et al., 2005; Piketty, 1999; Levine, 2005; La Porta et al., 2000; Easterly, 2007; Johnson, 1998; Ashby and Sobel, 2008; Nattinger and Hall, 2012). Descriptive statistics are presented in Table 1.

[Table 1 around here]

## 4 Empirical Results

In this section we report our empirical estimates. First, we present some descriptive evidence using ordinary least squares (OLS) models in which we estimate the relationship between economic institutions and cultural values. Next, we repeat our analysis using a two stage least squares analysis (2SLS) in which we use pathogens as an instrument for cultural values of individualism-collectivism at the country level.

### 4.1 Cultural Values and Economic Institutions: OLS Estimates

We start our analysis by estimating reduced form cross-country OLS equations of the following form:

$$EF_c = \mu + \alpha Individualism_c + Controls_c + \epsilon_c \quad (1)$$

where  $EF_c$  represents the index of EF,  $Individualism_c$  represents our main variable of interest, which captures cultural values associated with greater tolerance for deviation from the status quo and loose family ties where everyone is expected to look after herself or himself, and  $\epsilon_c$  is a random error term. The coefficient of interest in this section is  $\alpha$ , the effect of individualism on economic freedom.

[Table 2 around here]

The results from this exercise are reported in Table 2. Column (1) presents a parsimonious model in which we use individualism as the only regressor for economic freedom and find a strong positive correlation between the two—more individualistic societies are more likely to have institutions consistent with the principles of economic freedom. Figure 4 shows this relationship for our base sample of 95 countries. The R-squared in the regression of column 1 suggests that individualism alone explains approximately 22 percent of the variation in economic freedom. If causal, the estimated coefficient on individualism suggests that one standard deviation increase in the individualism index is associated with close to one half standard deviation increase in the index of EF. The results remain unchanged

qualitatively when we add additional controls for legal origins (column 2) latitude (column 3), log of GDP per capita (column 4), and ethnolinguistic fractionalization (column 5).

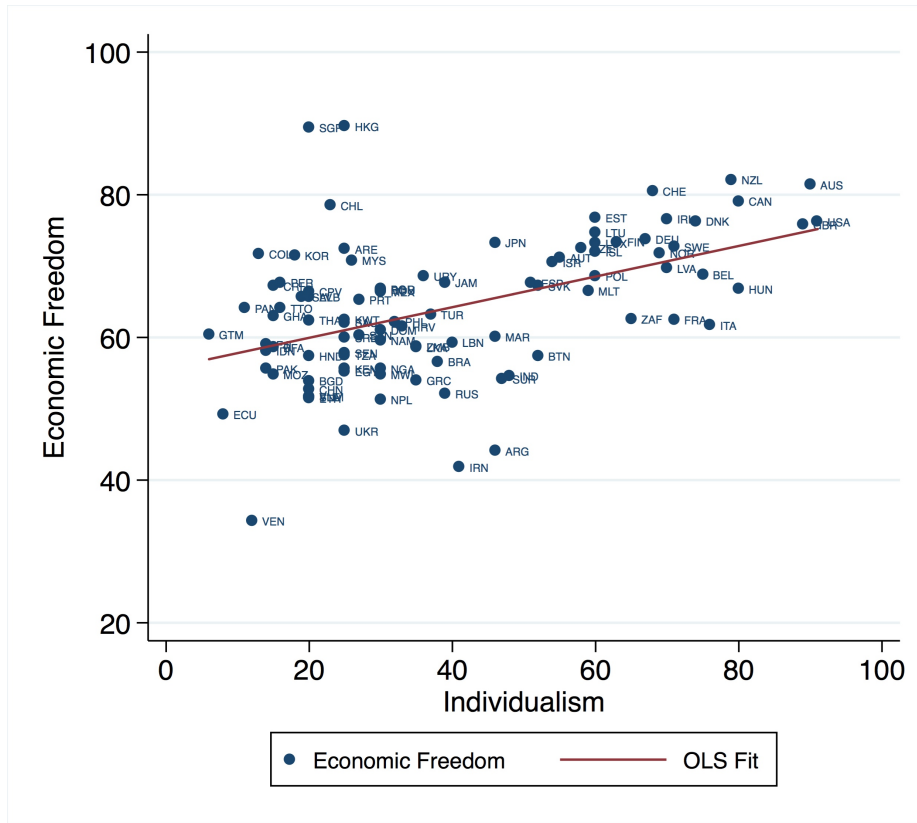


Figure 4: Economic Freedom and Individualism

Overall, the results in Table 2 show a strong correlation between cultural values of individualism and economic institutions. However, these results should not be interpreted as casual for variety of important reasons. For example, countries with higher level of economic freedom naturally promote economic and social institutions that emphasize more individualistic values. In such societies people also have more opportunities to succeed on their own and it might be more natural for individualistic values to develop. More importantly, however, there could be many important omitted variables that are correlated with both individualism and economic freedom. Thus, the analysis introduces a positive bias which can be solved if we had an instrument for individualism. Such instrument should be a strong determinant of cultural values but have no direct effect on economic institutions.

## 4.2 Two Stage Least Squares Regressions

In this section, we use the historical prevalence of infectious diseases as an instrument for cultural values of individualism, which then predict economic freedom in the second stage. Section 2 provides an overview of the Parasite-Stress Theory of Values, which suggests that the historical prevalence of infectious diseases can influence economic institutions but through the channel of cultural values. It is also highly unlikely that the level of economic freedom today will have an effect on the prevalence of infectious diseases in the past.

Equations (2) and (3) describe the first and second-stages of our model, where  $Controls_c$  is a set of control variables such as legal origins, geography, and log GDP per capita that potentially impact economic institutions,  $\widehat{Values}_c$  is the predicted value for the individualism index from the first stage estimates.

$$Values_c = \beta Pathogens_c + Controls_c + \epsilon_c \quad (2)$$

$$\sum EFW_c = \alpha \widehat{Values}_c + Controls_c + \nu_c \quad (3)$$

The 2SLS results are reported in Table 3. In these regressions, individualism is treated as an endogenous correlate of economic freedom and instrumented with the historical prevalence of infectious diseases, which provide exogenous variation for cultural values. Panel A of Table 3 shows the second stage regression estimates while Panel B provides the first stage results. In all models we find evidence that supports our hypothesis: pathogens are significantly and negatively correlated with individualistic values in the first stage, which then are a strong and significant determinant of economic freedom in the second stage.

[Table 3 around here]

Column (1) shows the results for a bivariate regression where only the instrumented individualism index is included on the right hand side. As before, individualism is statistically significantly and positively correlated with economic freedom. If causal, the results suggest that one standard deviation increase in the individualism index increases overall economic freedom by close to one standard deviation. Similar to the OLS results in Table 2, we next

add dummy variables for legal origins in column 2. The estimates for the instrumented individualism index do not change, while majority of the legal origins dummy variables are statistically insignificant. Columns (3) and (4) further include two important antecedents of economic institutions to the vector of control variables: latitude and the log of GDP per capita. The IC index remains statistically significant as well as the pathogens index in the first stage, which is a strong predictor of individualistic values. Finally, in column (5) we control for ethnolinguistic fractionalization and find that our results remain unchanged qualitatively.

At the bottom of Table 3, we report the IV F-test statistic for the relevance of the instruments. In the case of a single instrument and a single endogenous regressor, the t-value of the instrument should be greater than 3.2, i.e., the rule of thumb is that the F-statistic of a joint test whether all excluded instruments are significant should be greater than 10. This is the case in all five models, which provides confidence for the choice of instrument in our study.

### **4.3 Decomposing the Index of Economic Freedom**

Since the index of Economic Freedom is a complex composite indicator, in this section we re-estimated our main model from Table 3 (column 4) to examine the effect of individualism on the main sub-components of the index: property rights, freedom from corruption, fiscal freedom, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom and financial freedom. We report these results in Table 4. In most instances, individualism is strongly and positively correlated with the various economic freedom sub-areas. The only notable exception is the coefficient on individualism in column 3, which is negatively correlated with fiscal freedom. This is a puzzling result since more individualistic societies should, in theory, prefer smaller government. We furthermore find that individualism has the strongest impact on property rights and corruption, which are two institutions that change slowly over time. Overall, our results are consistent with our findings in the previous section.

[Table 4 around here]

#### 4.4 Robustness with Additional Controls

Next, in Table 5 we test the robustness of our results by re-estimating our main model (Table 3) by including a number of additional and alternative variables in a stepwise fashion. First, we re-estimate our baseline model from Table 3 by using GDP growth as a proxy for successful implementation of economic policies instead of the level of GDP (column 1). Next, we add an additional control for trade openness, which measures the sum of exports and imports of goods and services measured as a share of gross domestic product (column 2). Since recent studies document the interrelationship between democracy, economic institutions, and growth (Peev and Mueller, 2012), in column 3, we add an additional control for democracy, which is a simple average of civil rights and political freedoms. In column 4, we add continental/regional dummies for Asia, Europe, Oceania, and North and South America. In the final column 5, we include all variables from the previous regressions. In all regressions, individualism remains strongly correlated with the index of economic freedom and pathogens is negatively and significantly correlated with individualism in the first stage.

[Table 5 around here]

#### 4.5 Robustness with Sub-samples

As a final robustness test, we re-estimate our main model (Table 3) for different sub-samples of countries and excluding influential observations. In columns (1) and (2) of Table 6, we drop 3 countries with the highest and lowest levels of EF. Column (3) reports the results when we exclude countries with a population of less than 3 million citizens. In column (4) we remove the countries that are “lying outside” the typical relationship between individualism and economic freedom: Singapore and Luxembourg. We then re-estimate our main model by excluding African (column 5), Asian (column 6) and European (column 7) countries. Again, the results are very similar to our baseline estimates.

[Table 6 around here]

## 5 Concluding Remarks

It is by now widely accepted that high quality institutions have a strong and positive impact on economic development and can explain the large differences in income per capita across countries. But how economic institutions evolved in the first place and why they vary across countries is still debated in the developmental economics literature. Previous studies explain the variation in economic institutions with differences in ideology (Piketty, 1999), geography (Levine, 2005), settler mortality (Acemoglu and Robinson, 2001; Acemoglu et al., 2005), ethnic fractionalization (Easterly and Levine, 1997), legal origins (La Porta et al., 2000), and social conflict (North, 1981).

In this paper, we contribute to the literature by empirically testing another possible hypothesis for the deep origins of economic institutions, namely, that the historical prevalence of infectious diseases influenced cultural traits such as xenophobia, openness, and ethnocentrism, which then shaped cultural values associated with collectivism (Fincher et al., 2008), which, in turn, led to the development of economic institutions that are inconsistent with the principles of economic freedom—protection of privately owned property, voluntary exchange, free trade, etc. Our theory relies on a causal mechanism that is rooted in evolutionary theory and is based on a rich literature in psychology and biology that has identified the instrument a priori (Thornhill and Fincher, 2014).

Our findings provide suggestive evidence that parasitic stress is strongly correlated with economic institutions through the channel of cultural values. Specifically, using a 2SLS analysis we show that the historical prevalence of infectious diseases is strongly and significantly correlated with collectivist values, which, in the next stage, are a strong determinant of economic freedom and its various sub-areas. These results hold even when we control for a number of confounding factors, numerous geographical controls, and for different subsamples of countries.

These findings enrich previous theories and provide a deeper understanding of the processes that lead to the formation of different types of economic institutions and advance the literature methodologically by suggesting a potential new instrument that can be used to examine the effect of a wide range of cultural values (e.g., social trust, religiosity, ethnolin-

guistic fractionalization) on numerous economic, social, and political outcomes.

It is important to note that our findings do not imply that institutions today are pre-determined by the historical prevalence of infectious diseases alone. Rather, our results suggest that the prevalence of pathogens is only one of the many factors that could have shaped the cross-country differences in institutional quality today. Many other studies treat institutions as a “black box,” i.e., institutions lead to faster economic growth, but how to improve institutions is not often discussed in the literature. Our study suggests one possible channel—societies with lower level of pathogenic stress are more likely to promote the natural selection of personal traits that favor more inclusive institutions that are characterized by respect for the rights, liberties and well-being of all members of society. This could particularly important for African countries which today still deal with high rates of infectious diseases and poor quality institutions.

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## 7 Appendix

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Economic Freedom	176	60.70	10.34	29.6	89.6
Pathogens	155	0.15	0.66	-1.31	1.17
Individualism	100	39.17	22.07	6	91
Legal origins: Socialist	201	0.17	0.38	0	1
Legal origins: French	201	0.43	0.50	0	1
Legal origins: UK	201	0.34	0.47	0	1
Legal origins: Scandinavian	201	0.02	0.16	0	1
Latitude	206	19.06	24.22	-41.81	74.73
Log GDP per capita	192	9.19	1.22	6.34	11.81
Ethno	186	0.44	0.26	0	0.93
Growth	202	4.06	2.75	-10.05	15.30
Trade	185	95.10	53.21	24.73	444.90
Democracy	192	3.67	1.97	0	10
Dummy: Asia	206	0.24	0.43	0	1
Dummy: Europe	206	0.21	0.41	0	1
Dummy: Oceania	206	0.09	0.28	0	1
Dummy: N America	206	0.15	0.35	0	1
Dummy: S America	206	0.06	0.23	0	1

Table 2: OLS Estimates

Variables	Dependent Variable: Index of Economic Freedom				
	(1)	(2)	(3)	(4)	(5)
Individualism	0.215*** (0.036)	0.179*** (0.038)	0.179*** (0.046)	0.092** (0.045)	0.090** (0.045)
Legal origins: Socialist		-8.869*** (2.156)	-8.870*** (2.196)	-4.827** (1.983)	-4.463* (2.252)
Legal origins: French		-10.181*** (2.090)	-10.176*** (2.086)	-7.232*** (1.894)	-6.653*** (2.090)
Legal origins: UK		-6.637*** (2.191)	-6.630** (2.755)	-3.579 (2.214)	-2.665 (2.705)
Legal origins: Scandinavian		-3.789** (1.646)	-3.792** (1.772)	-1.214 (1.697)	-1.428 (1.880)
Latitude			0.000 (0.057)	-0.085** (0.037)	-0.088** (0.035)
Log GDP				5.388*** (1.047)	5.073*** (1.010)
Ethno					-4.067 (3.806)
Constant	55.660*** (1.908)	64.974*** (2.366)	64.968*** (2.631)	15.770* (9.245)	20.027** (9.173)
Observations	95	95	95	94	94
Adj. R-squared	0.222	0.255	0.247	0.480	0.481

Note: All models are estimated with OLS with robust standard errors (reported in parentheses). See Table 1 for description of variables.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3: Two Stage Least Squares (2SLS) Estimates

	(1)	(2)	(3)	(4)	(5)
Panel A: 2SLS Results		Dependent Variable: Index of Economic Freedom 2014			
Individualism	0.364*** (0.067)	0.364*** (0.074)	0.407*** (0.088)	0.219** (0.097)	0.230** (0.095)
Legal origins: Socialist		-7.189 (4.707)	-6.559 (4.872)	-4.368 (3.680)	-4.078 (3.710)
Legal origins: French		-7.055 (4.586)	-8.512* (4.758)	-7.227** (3.580)	-6.741* (3.641)
Legal origins: UK		-4.624 (4.486)	-6.688 (4.780)	-4.427 (3.719)	-3.851 (3.845)
Legal origins: Scandinavian		-6.855 (5.919)	-6.101 (6.082)	-2.63 (4.656)	-2.931 (4.672)
Latitude			-0.0787 (0.056)	-0.118*** (0.046)	-0.123*** (0.045)
Log GDP				4.450*** (1.157)	4.096*** (1.171)
Ethno					-3.031 (3.885)
Observations	92	92	92	91	91
R-squared	0.122	0.156	0.109	0.48	0.475
IV F-stat	68.88	56.31	42.88	19.92	21.05
Panel B: First Stage		Dependent Variable: Individualism Index			
Pathogens	-22.41*** (2.700)	-23.66*** (3.153)	-21.67*** (3.309)	-19.13*** (4.286)	-19.82*** (4.320)
Legal origins: Socialist		-7.758 (8.419)	-8.338 (8.322)	-6.957 (8.574)	-6.223 (8.581)
Legal origins: French		-1.817 (8.219)	1.184 (8.292)	1.422 (8.335)	3.127 (8.450)
Legal origins: UK		5.167 (8.256)	8.769 (8.402)	9.776 (8.477)	12.09 (8.699)
Legal origins: Scandinavian		5.481 (10.570)	3.544 (10.500)	4.338 (10.620)	3.473 (10.620)
Latitude			0.154* (0.087)	0.167* (0.092)	0.156* (0.093)
Log GDP				1.845 (2.410)	0.707 (2.602)
Ethno					-10.32 (8.988)
Observations	92	92	92	91	91
R-squared	0.434	0.479	0.498	0.506	0.513

Note: Panel A reports the two-stage least squares estimates with the index of Economic Freedom in 2014. Panel B reports the corresponding first stage. See Table 1 for description of variables.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4: Decomposing the Index of Economic Freedom

	Dependent Variables (Sub-area of the Index of Economic Freedom)								
	Prop Rights	Corruption	Fiscal	Business	Labor	Monetary	Trade	Investment	Financial
Panel A: 2SLS Results									
Individualism	0.698*** (0.202)	0.559*** (0.156)	-0.257** (0.122)	0.327** (0.140)	-0.00902 (0.160)	0.140 (0.0923)	0.227** (0.103)	0.647** (0.281)	0.475** (0.199)
Legal origins: Socialist	-25.70*** (7.712)	-15.07** (5.984)	15.03*** (4.670)	-6.270 (5.369)	-0.479 (6.140)	-2.668 (3.534)	6.079 (3.927)	-7.398 (10.73)	-3.815 (7.593)
Legal origins: French	-23.44*** (7.482)	-16.90*** (5.793)	6.614 (4.531)	-10.39** (5.198)	-10.92* (5.944)	-5.375 (3.421)	0.112 (3.810)	-9.228 (10.41)	-7.223 (7.368)
Legal origins: UK	-19.75** (7.794)	-14.09** (6.044)	13.57*** (4.720)	-4.241 (5.423)	5.013 (6.202)	-8.062** (3.570)	-4.408 (3.969)	-16.00 (10.85)	-7.948 (7.675)
Legal origins: Scandinavian	-2.893 (9.756)	8.317 (7.571)	-5.934 (5.908)	4.031 (6.793)	-3.880 (7.769)	-1.885 (4.472)	1.315 (4.968)	-6.064 (13.57)	-3.187 (9.606)
Latitude	-0.184* (0.0955)	-0.202*** (0.0736)	0.0129 (0.0578)	-0.0770 (0.0660)	-0.172** (0.0755)	-0.0821* (0.0435)	-0.0721 (0.0486)	-0.163 (0.133)	-0.170* (0.0940)
Log GDP	9.061*** (2.424)	7.025*** (1.879)	1.171 (1.468)	5.506*** (1.686)	7.253*** (1.928)	1.831* (1.110)	3.618*** (1.234)	4.356 (3.373)	5.751** (2.387)
Observations	92	93	92	93	93	93	92	92	92
R-squared	0.670	0.670	0.463	0.511	0.393	0.231	0.418	0.238	0.339
IV F-stat	20.18	20.59	20.18	20.59	20.59	20.59	20.18	20.18	20.18
Panel B: First Stage									
	Dependent Variable: Individualism Index								
Pathogens	-19.13*** (4.258)	-19.10*** (4.210)	-19.13*** (4.258)	-19.10*** (4.210)	-19.10*** (4.210)	-19.10*** (4.210)	-19.13*** (4.258)	-19.13*** (4.258)	-19.13*** (4.258)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	92	93	92	93	93	93	92	92	92
R-squared	0.506	0.507	0.506	0.507	0.507	0.507	0.506	0.506	0.506

Note: Panel A reports the two-stage least squares estimates with the index of Economic Freedom in 2014. Panel B reports the corresponding first stage. See Table 1 for description of variables.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 5: Robustness Additional Controls

	(1)	(2)	(3)	(4)	(5)
Panel A: 2SLS Results		Dependent Variable: Index of Economic Freedom 2014			
Individualism	0.453*** (0.132)	0.289*** (0.0892)	0.254** (0.107)	0.407*** (0.145)	0.190* (0.100)
Legal origins: Socialist	-7.344 (5.176)	-9.090** (3.800)	-8.540** (3.620)	-7.647 (5.351)	-7.128* (3.639)
Legal origins: French	-8.714* (4.959)	-9.412*** (3.632)	-8.309** (3.476)	-9.983** (4.554)	-8.698*** (3.268)
Legal origins: UK	-7.651 (5.217)	-8.434** (3.830)	-6.953* (3.910)	-9.140* (4.901)	-7.467** (3.649)
Legal origins: Scandinavian	-6.714 (6.452)	-3.944 (4.699)	-3.923 (4.486)	-4.022 (5.809)	-1.986 (4.034)
Latitude	-0.0821 (0.0593)	-0.0854** (0.0435)	-0.0661 (0.0465)	-0.187** (0.0894)	-0.00611 (0.0714)
Growth	0.541 (0.864)	-0.214 (0.608)	0.254 (0.541)	0.611 (0.793)	0.302 (0.530)
Dummy: Asia				8.363** (3.480)	2.883 (2.428)
Dummy: European				8.504 (5.796)	-2.428 (4.371)
Dummy: Oceania				-0.0423 (7.952)	8.243 (5.514)
Dummy: N America				14.10*** (4.513)	6.882* (3.568)
Dummy: S America				0.772 (4.470)	2.851 (3.126)
Trade		0.0718*** (0.0116)	0.0620*** (0.0133)		0.0665*** (0.0127)
Democracy			1.385* (0.817)		2.117** (0.859)
Observations	92	91	90	92	90
R-squared	0.031	0.481	0.503	0.223	0.613
IV F-stat	21.20	25.89	18.01	14.90	17.77
Panel B: First Stage		Dependent Variable: Individualism			
Pathogens	-17.99*** (3.908)	-20.20*** (3.969)	-17.03*** (4.012)	-16.89*** (4.376)	-17.88*** (4.242)
Controls	✓	✓	✓	✓	✓
Observations	92	91	90	92	90
R-squared	0.515	0.545	0.596	0.570	0.662

Note: Panel A reports the two-stage least squares estimates with the index of Economic Freedom in 2014. Panel B reports the corresponding first stage. All first stage regressions include the controls from the second stage, but are not reported to save space. See Table 1 for description of variables.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6: Robustness Sub-samples

	(1)	(2)	(3)	(4)	(5)	(6)	7
Panel A: 2SLS Results		Dependent Variable: Index of Economic Freedom 2014					
Individualism	0.525*** (0.139)	0.493*** (0.162)	0.449*** (0.151)	0.423*** (0.123)	0.431*** (0.136)	0.441*** (0.106)	0.606** (0.286)
Legal origins: Socialist	-7.087 (5.160)	-6.659 (4.805)	-9.834* (5.625)	-7.030 (4.767)	-7.799 (5.302)	-3.260 (5.537)	-16.85 (13.99)
Legal origins: French	-7.202 (4.962)	-8.820* (4.576)	-8.708* (5.217)	-8.653* (4.607)	-10.10** (5.090)	-4.528 (5.518)	-11.59 (9.745)
Legal origins: UK	-9.222* (5.252)	-9.742** (4.893)	-8.352 (5.602)	-8.050* (4.810)	-6.841 (5.379)	-6.882 (5.674)	-13.13 (10.47)
Legal origins: Scandinavian	-6.855 (6.439)	-6.734 (5.966)	-7.157 (7.152)	-6.425 (5.956)	-5.544 (6.525)	-2.945 (6.175)	
Latitude	-0.136** (0.0641)	-0.117 (0.0817)	-0.0708 (0.0586)	-0.0733 (0.0544)	-0.123* (0.0669)	-0.0676 (0.0548)	-0.0371 (0.0783)
Growth	0.788 (0.883)	0.443 (0.811)	0.913 (1.207)	0.268 (0.798)	0.706 (0.977)	0.703 (0.806)	0.637 (1.435)
Observations	89	88	78	90	77	69	59
R-squared			0.063	0.126	0.064	0.214	
IV F-stat	18.54	13.65	19.54	20.30	18.33	25.03	6.735
Panel B: First Stage		Dependent Variable: Individualism					
Pathogens	-17.24*** (4.003)	-14.35*** (3.885)	-17.46*** (3.949)	-18.33*** (4.068)	-19.35*** (4.520)	-22.24*** (4.445)	-13.51** (5.205)
Controls	✓	✓	✓	✓	✓	✓	✓
Observations	89	88	78	90	77	69	59
R-squared	0.516	0.545	0.603	0.511	0.505	0.606	0.306
Excluded Countries	Lowest Economic Freedom	Highest Economic Freedom	Population below 3 million	Outliers: Singapore &Luxemburg	No Africa	No Asia	No Europe

Note: Panel A reports the two-stage least squares estimates with the index of Economic Freedom in 2014. Panel B reports the corresponding first stage. See Table 1 for description of variables. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1