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The Agricultural Origins of Time Preference*

Oded Galor† and Ömer Özak‡

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Abstract

This research explores the origins of the distribution of time preference across regions. It advances the hypothesis, and establishes empirically that geographical variations in the natural return to agricultural investment have had a persistent effect on the distribution of time preference across societies. In particular, exploiting a natural experiment associated with the expansion of suitable crops for cultivation in the course of the Columbian Exchange, the research establishes that pre-industrial agro-climatic characteristics that were conducive to higher return to agricultural investment, triggered selection and learning processes that had a persistent positive effect on the prevalence of long-term orientation in the contemporary era.

Keywords: Time preference, Delayed Gratification, Economic Growth, Culture, Agriculture, Economic Development, Evolution, Comparative Development, Human Capital, Education, Smoking

JEL Classification: D14, D9, E2, I12, I25, J24, J26, O1, O3, O4, Z1

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1 Introduction

"Patience is bitter, but its fruit is sweet." – Aristotle

The rate of time preference has been largely viewed as a pivotal factor in the determination of human behavior. The ability to delay gratification has been associated with a variety of virtuous outcomes, ranging from academic accomplishments to physical and emotional health.[1] Moreover, in light of the importance of long-term orientation for human and physical capital formation, technological advancement, and economic growth, time preference has been widely considered as a fundamental element in the formation of the wealth of nations. Nevertheless, despite the central role attributed to time preference in comparative development, the origins of variations in time preference across societies have remained obscured.[2]

This research explores the origins of the distribution of time preference across regions. It advances the hypothesis, and establishes empirically that geographical variations in the natural return to agricultural investment have had a persistent effect on the distribution of time preference across societies. In particular, exploiting a natural experiment associated with the expansion of suitable crops for cultivation in the course of the Columbian Exchange (i.e., the pervasive transfer of crops between the New and Old World; Crosby, 1972), the research establishes that pre-industrial agro-climatic characteristics that were conducive to higher return to agricultural investment, triggered selection and learning processes that had a persistent positive effect on the prevalence of long-term orientation in the contemporary era.

The proposed theory generates several testable predictions regarding the effect of the natural return to agricultural investment on the rate of time preference. The theory suggests that in societies in which the ancestral population was exposed to a higher crop yield (for a given growth cycle), the rewarding experience in agricultural investment triggered a gradual increase in the representation of traits for higher long-term orientation in the population. Thus, descendants of individuals who resided in such geographical regions are characterized by higher long-term orientation. Moreover, the theory further proposes that societies that benefited from the expansion in the spectrum of suitable crops in the post-1500 period experienced further gains in the degree of long-term orientation.

The empirical analysis exploits an exogenous source of variation in potential crop yield and growth cycle across the globe to analyze the effect of higher pre-industrial crop yields on various measures of long-term orientation at the country, region, and individual levels. Consistent with the predictions of the theory, the empirical analysis establishes that indeed higher potential crop yield experienced by ancestral populations during the pre-industrial era, increased the long-term orientation of their descendants in the modern period. The analysis establishes this result in five layers: (i) a cross-country analysis, that accounts for the confounding effects of a large number of geographical controls, the onset of the Neolithic Revolution, as well as continental fixed effects;

[1] The consequences of the ability to delay gratification and to exert self-control has been studied byAyduk et al. (2000); Dohmen et al. (2010); Mischel and Ebbesen (1970); Mischel et al. (1988, 1989); Shoda et al. (1990).

[2] The effect of time preference on intertemporal choice, the evolutionary forces that that underline time-discounting and the consequences for human behaviors have been widely explored (Fawcett et al., 2012; Frederick et al., 2002; Laibson, 1997; Loewenstein and Elster, 1992; Rosati et al., 2007; Stevens and Hauser, 2004).

(ii) a within-country analysis across second-generation migrants, that accounts for host country fixed effects, geographical characteristics of the country of origin, as well as migrants' individual characteristics, such as gender, age, and education, (iii) a cross-country individual-level analysis that accounts for the country's geographical characteristics as well as individuals' characteristics, such as income and education; (iv) a cross-regional individual-level analysis that accounts for the region's geographical characteristics, individuals' characteristics, such as income and education, and country fixed-effects; and (v) a cross-regional analysis that accounts for the confounding effects of a large number of geographical controls, as well as country fixed-effects.

The research constructs novel global measures of potential caloric yield and growth cycle for crops in grids with cells of size $5' \times 5'$. In order to capture conditions prevalent during the pre-industrial era, while mitigating possible endogeneity concerns, the analysis focuses on estimates of potential (rather than the actual) caloric yield per hectare per year, under low level of inputs and rain-fed agriculture – cultivation methods that presumably characterized early stages of development. Moreover, the estimates are based on agro-climatic constraints that are largely orthogonal to human intervention removing potential concerns that estimates of caloric yield reflect endogenous choices that could be correlated with long-term orientation.

The analysis accounts for a wide range of potentially confounding geographical factors that might have directly and independently affected the reward for a longer planning horizon, and hence, the formation of time preferences. In particular, it controls for the effects of absolute latitude, average elevation, terrain roughness, distance to navigable water, as well as islands and landlocked regions. Moreover, it accounts for climatic variability, and thus, the risk associated with fluctuations in food supply, as well as for geographical factors that may affect trade, and therefore the planning horizon. Furthermore, unobserved continent-specific geographical, cultural, and historical characteristics may have codetermined the global distribution of time preference. Hence, the analysis accounts for these characteristics by the inclusion of a complete set of continental fixed effects, and when the sample permits country fixed-effects.

The research exploits a natural experiment associated with the Columbian Exchange (i.e., the changes in the spectrum of potential crops in the post-1500 period) to overcome possible concerns relating to the historical nature of the effect, omitted regional characteristics, and sorting of high long-term individuals into high yield regions during the pre-1500 era. First, the analysis establishes the historical nature of the effects of these geographical characteristics as opposed to a potential contemporary link between geographical attributes, development outcomes and the rate of time preference. In particular, restricting the attention to crops that were available for cultivation in pre-1500CE era permits the identification of the historical nature of the effect.

Second, the Columbian Exchange generates a change in potential crop yield and growth cycle if and only if the potential yield of some newly introduced crop is larger than the potential yield of the originally dominating crop. Hence, by construction, conditional on pre-1500CE crop yield and growth cycle, the assignment of crops associated with this natural experiment is independent of any other attributes of the grid, and the estimated causal effect of the change in potential crop yield, is unlikely to be driven by omitted characteristics of the country.

Third, although the theory emphasizes the effects of crop yield on selection and learning, the results could also be attributed to the sorting of high long-term individuals into high yield regions during the pre-1500 era. While this sorting process would not affect the nature of the results, (i.e. variations in the return to agricultural investment across the globe would still be the origin of the differences in time preferences), the natural experiment associated with the Columbian Exchange reinforces the viewpoint that these geographical conditions had an effect on the evolution of time preference independent of possible initial sorting. Furthermore, the causal effect of changes in crop yield in the course of the Columbian Exchange is unlikely to capture the effect of sorting in the post-1500 era since the analysis accounts for cross-country migrations over this period.

The first part of the empirical analysis examines the effect of crop yield on the rate of time preference across countries. Using the average level of long-term orientation of individuals living in a country during the late twentieth century, as proxy for the country's rate of time preference (Hofstede, 1991), the analysis establishes that, conditional on crop growth cycles, higher pre-industrial caloric yield has a positive effect on the levels of long-term orientation in the modern period. The findings are robust to the inclusion of continental fixed-effects, a wide range of confounding geographical characteristics, and the years elapsed since the country transitioned to agriculture. In particular, the estimates suggest that a one-standard deviation increase in potential crop yield increases a country's long-term orientation by about half a standard deviation.

Moreover, accounting for the potential effect of higher crop yield on pre-industrial population density, urbanization, and GDP per capita, and their potentially persistent effect on contemporary development does not affect the qualitative results, suggesting that indeed crop yield had primarily a direct effect on time preferences rather than an indirect one via the process of development. Furthermore, while effective crop yield might have been affected by climatic risks, spatial diversification, and trade, the results are robust to proxies for these additional factors.

Reassuringly, the estimated effect of crop yield on the rate of time preference is stronger if rather than estimating the effect of crop yield in the contemporary geographical location, one accounts for migration flows in the post-1500 period and thus estimates the effect on the contemporary rate of time preference of the potential crop yield to which the ancestors of contemporary populations were exposed. These results suggest that indeed the portable, culturally-embodied, components of potential crop yield, rather than the persistent geographical attributes correlated with crop yield, are the ones that have a long-lasting effect on the rate of time preference.

Additionally, the empirical analysis establishes that long-term orientation is the main cultural characteristic determined by potential crop yield. Crop yield has largely insignificant effects on country-level measures of individualism or collectivism; internal cooperation or competition; tolerance and rigidness; hierarchy and inequality of power; trust, and uncertainty avoidance. Moreover, the effect of crop yield on long-term orientation is not mediated by other cultural characteristics.

The second part of the empirical analysis examines the effect of the crop yield in the parental country of origin on the long-term orientation of second-generation migrants. This analysis accounts for host country fixed-effects and, thus, mitigates a possible concern about the effect of country-specific characteristics (e.g., institutions, such as the social security system, that mitigate individuals' concern about their future well-being) on the estimated effects in the first part of the analysis. This setting assures that the effect of crop yield on long-term orientation captures cultural elements that have been transmitted across generations, rather than the persistent geographical attributes at the country of origin, or the direct effect of an omitted characteristic of the host country (Fernández, 2012; Giuliano, 2007; Guiso et al., 2004). In line with the theory, these findings suggest that higher crop yields in the parental country of origin have a positive, statistically and economically significant effect on the long-term orientation of second-generation migrants. This effect is robust to host country fixed effects, individual characteristics, a wide range of geographical characteristics of the parental country of origin, as well as the number of years since the country of origin transitioned to agriculture. Furthermore, the analysis establishes the significant effect of potential crop yield on saving and smoking behavior.

The third part of the empirical analysis explores the effect of crop yield on individual's long-term orientation in the World Values Survey, both across countries as well as across regions within a country. The results lend further support for the proposed theory. In particular, they show that the probability of having long-term orientation increases for individuals who live in a region with higher crop yields. This result is robust to the inclusion of continental or country fixed effects, a wide range of confounding regional geographical as well as individual characteristics.

Finally, in light of the plausible association between long-term orientation and comparative development, using ethnic level data the analysis establishes that societies whose ancestral populations were exposed to higher crop yields in the pre-1500 era had a higher probability of adopting major technological innovations. Moreover, the analysis suggests that higher crop yields are positively correlated with investment in human capital across countries.

This research constitutes the first attempt to decipher the biogeographical origins of variations in time preference across the globe. Moreover, it sheds additional light on the geographical and biocultural origins of comparative development (e.g., Ashraf and Galor, 2013; Diamond, 1997; Spolaore and Wacziarg, 2013), and the persistence of cultural characteristics (e.g., Alesina et al., 2013; Belloc and Bowles, 2013; Bisin and Verdier, 2000; Fernández, 2012; Nunn and Wantchekon, 2011).

2 The Model

This section develops a dynamic model that captures the evolution of time preference during the agricultural stage of development – a Malthusian era in which individuals that generated more resources had larger reproductive success (Ashraf and Galor, 2011; Dalgaard and Strulik, 2015; Vollrath, 2011). The evolution of time preference is based on four elements: occupational choice, learning, reproductive success, and intergenerational transmission. First, individuals characterized by higher long-term orientation choose agricultural practices that permit higher but delayed return. Second, the engagement of individuals with long-term orientation in profitable investment ventures mitigates their tendency to discount the future and reinforces their ability to delay gratification. Third, the superior economic outcomes of individuals with long-term orientation increases their reproductive success. Fourth, since time preference is transmitted intergenerationally, the engagement in occupations associated with higher yields and, thus, with higher reproductive success, gradually increases the representation of high long-term orientation individuals in the population. Thus, societies characterized by greater return to agricultural investment are also characterized by higher long-term orientation in the long run.

Consider an overlapping-generations economy in an agricultural stage of development. In every time period the economy consists of three-period lived individuals who are identical in all respects except for their rate of time preference. In the first period of life - childhood - agents are economically passive and their consumption is provided by their parents. In the second and third periods of life, individuals have access to identical land-intensive production technologies that allow them to generate income by hunting, fishing, herding, and land cultivation. Some of the available modes of production require investment (e.g., planting) and delayed consumption, and thus, in the absence of financial markets, individuals' occupational choices reflect their rate of time preference.

The composition of the population in terms of the rate of time preference evolves endogenously. Time preference is transmitted from parents to children and it is enhanced by rewarding investment decisions during the individual's life time.[3] Differences in reproductive success across households, therefore, affect the evolution of the average rate of time preference in the economy and its long-run level. In particular, given the positive effect of resources on reproductive success in the agricultural (Malthusian) stage of development, a low rate of time preference and its effect on the undertaking of profitable investment decisions, increases income and thus reproductive success, leading to the propagation of this trait in the population.

2.1 Production

Adult individuals face the choice between two modes of agricultural production: an endowment mode and an investment mode. The endowment mode exploits the existing land for hunting, gathering, fishing, herding, and subsistence agriculture. It provides a constant level of output, $R^0 > 1$, in each of the two working periods of life. The investment mode, in contrast, is associated with planting and harvesting of crops. It requires an investment in the first working period, leaving the individuals with 1 unit of output, but it provides a higher level of resources, R^1, in the second working period. In particular, $\ln(R^1) > 2\ln(R^0)$.[4]

Hence, depending on the choice of production mode, the income stream of member i of generation t (born in period $t-1$) in the two working periods of life, $(y_{i,t}, y_{i,t+1})$, is

$$(y_{i,t}, y_{i,t+1}) = \begin{cases} (R^0, R^0) & \text{under endowment mode} \\ (1, R^1) & \text{under investment mode.} \end{cases} \tag{1}$$

[3] Bowles (1998), Bisin and Verdier (2000), Galor and Moav (2002), Rapoport and Vidal (2007), Doepke and Zilibotti (2008), and Galor and Michalopoulos (2012) explore additional mechanisms that may govern the evolution of preferences. Moreover, Dohmen et al. (2012) establish empirically the presence of intergenerational transmission of risk aversion and trust and the importance of socialization in this transmission process.

[4] For simplicity, agricultural productivity is constant over time. Constant productivity of labor reflects a Malthusian-Boserupian economy in which the adverse effect of population on the labor productivity is mitigated by the advancement in technology generated by the scale of the population.

2.2 Preferences and Budget Constraints

In each period t, a generation consisting of L_t individuals becomes economically active. Each member of generation t is born in period $t-1$ to a single parent and lives for three periods. Individuals generate utility from consumption in each period of their working life and from the number of their children. The preference of a member i of generation t is represented by the utility function:

$$u^{i,t} = \ln c_{i,t} + \beta_t^i[\gamma \ln n_{i,t+1} + (1-\gamma)\ln c_{i,t+1}]; \qquad \gamma \in (0,1), \tag{2}$$

where $c_{i,t}$ and $c_{i,t+1}$ are the levels of consumption in the first and the second working periods of member i of generation t and $n_{i,t+1}$ is the individual's number of children. Furthermore, $\beta_t^i \in (0,1]$ is individual i's discount factor, i.e., $\beta_t^i \equiv 1/(1+\rho_t^i)$, where $\rho_t^i \geq 0$ is the rate of time preference of member i of generation t.

In the first working period, in the absence of financial markets and storage technologies, member i of generation t consumes the entire income, $y_{i,t}$. Hence, consumption of member i of generation t in the first working period, $c_{i,t}$, is $c_{i,t} = y_{i,t}$. In the last period, member i of generation t allocates her income, $y_{i,t+1}$, between consumption, $c_{i,t+1}$, and expenditure on children, $\tau n_{i,t+1}$, where τ is the resource cost of raising a child. Hence, the budget constraint of individual i of generation t in the last period of life is $\tau n_{i,t+1} + c_{i,t+1} = y_{i,t+1}$.

2.3 Allocation of Resources between Consumption and Children

Members of generation t allocate their last period income between consumption and child rearing so as to maximize their utility function subject to the budget constraint. Given the homotheticity of preferences, individuals devote a fraction $(1-\gamma)$ of their last period income to consumption and a fraction γ to child rearing. Hence, the level of last period consumption and the number of children of member i of generation t, $c_{i,t+1}$ and $n_{i,t+1}$, are $c_{i,t+1} = (1-\gamma)y_{i,t+1}$ and $n_{i,t+1} = \gamma y_{i,t+1}/\tau$. Given these optimal choices, the level of utility generated by member i of generation t is therefore, $v^{i,t} = \ln y_{i,t} + \beta_t^i[\ln y_{i,t+1} + \xi]$, where $\xi \equiv \gamma \ln(\gamma/\tau) + (1-\gamma)\ln(1-\gamma)]$.

2.4 Occupational Choice

Each member i of generation t chooses the desirable mode of production that maximizes life time utility, $v^{i,t}$. Differences in the desirable mode of production across individuals reflect variations in their rate of time preference.

Given the discount factor, β_t^i, the life time utility of a member i of generation t, $v^{i,t}$, under each of the two modes of production is

$$v^{i,t} = \begin{cases} \ln R^0 + \beta_t^i[\ln R^0 + \xi] & \text{under endowment mode} \\ \ln 1 + \beta_t^i[\ln R^1 + \xi] & \text{under investment mode.} \end{cases} \tag{3}$$

Hence, since $\ln(R^1) > 2\ln(R^0)$, there exists an interior level of the discount factor, $\hat{\beta}$, such that an individual who possesses this discount factor is indifferent between the endowment and the investment modes of production:[5]

$$\hat{\beta} = \frac{\ln R^0}{\ln R^1 - \ln R^0} \in (0,1). \tag{4}$$

The segmentation of the population between the investment and the endowment modes of production is determined by $\hat{\beta}$. In particular, member i of generation t is engaged in the endowment mode if $\beta_t^i \leq \hat{\beta}$, and in the investment mode if $\beta_t^i > \hat{\beta}$. Furthermore, the threshold level of the discount factor above which individuals are engaged in the investment mode is lower if the return to agricultural investment, R^1, is higher, i.e.,

$$\frac{\partial \hat{\beta}}{\partial R^1} = \frac{-\ln R^0}{R^1[\ln R^1 - \ln R^0]^2} < 0. \tag{5}$$

2.5 Time Preference, Income and Fertility

The income stream of member i of generation t in the two working periods, $(y_{i,t}, y_{i,t+1})$, is determined by the threshold level of the discount factor, $\hat{\beta}$. In particular,

$$(y_{i,t}, y_{i,t+1}) = \begin{cases} (R^0, R^0) & \text{if} \quad \beta_t^i \leq \hat{\beta} \\ (1, R^1) & \text{if} \quad \beta_t^i > \hat{\beta}. \end{cases} \tag{6}$$

Consequently, the number of children of member i of generation t is determined by the threshold level of the discount factor, $\hat{\beta}$, such that

$$n_{i,t+1} = \frac{\gamma y_{i,t+1}}{\tau} = \begin{cases} \frac{\gamma}{\tau} R^0 \equiv n^E & \text{if} \quad \beta_t^i \leq \hat{\beta}; \\ \frac{\gamma}{\tau} R^1 \equiv n^I & \text{if} \quad \beta_t^i > \hat{\beta}. \end{cases} \tag{7}$$

Hence, since $R^1 > R^0$, the number of children of individuals engaged in the investment mode of production, n^I, is larger than that of individuals engaged in the endowment mode, n^E, i.e., $n^I > n^E$.[6]

[5] The assumption that $\ln(R^1) > 2\ln(R^0)$ assures that the investment mode is profitable for some but not all individuals. Nevertheless, the qualitative analysis will not be altered if all individuals choose the investment mode.

[6] Consistent with various interpretations of the nature of the endowment mode in the model (e.g., subsistence agriculture, hunting and gathering), empirical evidence suggests that fertility rates in the post-Neolithic era are higher than among hunter and gatherers. In particular, The *Neolithic Demographic Transition* was associated with "a sharp increase in birthrates as populations [...] adopted sedentary lifestyles and food storage, reduced their birth intervals, and came to depend increasingly on food production as opposed to foraging." (Bocquet-Appel and Bar-Yosef, 2008). Moreover, in post-Neolithic societies fertility rates are positively related to income (Clark and Hamilton, 2006; Lee, 1997).

2.6 The Evolution of Time Preference

2.6.1 Evolution of Time Preference within a Dynasty

Suppose that time preference is transmitted across generations. Suppose further that the rate of time preference is affected by the experience of individuals over their life time.[7] In particular, individuals who are engaged in the endowment mode of production maintain their inherited time preference, β_t^i, and transmit it to their offspring, whereas those who are engaged in the investment mode learn to delay gratification and transmit to their offspring an augmented discount factor that reflects this acquired tolerance.[8] Unlike the experience of individuals who are engaged in the endowment mode of production that has no impact on their rate of time preference, the experience of individuals who are engaged in the investment mode provides a positive reinforcement to their patience, enhancing their ability to delay gratification.

The degree of long-term orientation transmitted by individuals of the investment type to their offspring, $\phi(\beta_t^i; R^1)$, reflects their inherited time preference, β_t^i, as well as their acquired patience due to the reward to their investment, R^1. The higher is the reward to investment, the more gratifying is the experience with delayed gratification (reflected by higher income and reproductive success), and thus, the higher is the degree of long-term orientation that they transmit to their offspring. Moreover, the higher is the inherited time preference, the higher is the degree of long-term orientation transmitted to the offspring. Indeed, evidence suggests that larger rewards to delayed gratification reinforce the ability to delay gratification even further (Dixon et al., 1998; Mazur and Logue, 1978; Newman and Bloom, 1981; Rung and Young, 2015). Furthermore, children become more long-term oriented when observing a long-term oriented adult (Bandura and Mischel, 1965). Thus, if the contribution of the parental inherited time preference to the long-term orientation of the offspring is characterized by the law of diminishing returns, $\phi(\beta_t^i; R^1)$ is an increasing, strictly concave function of the parental inherited time preference, β_t^i.

Hence, as depicted in Figure 1, the time preference that is inherited by a member i of generation $t+1$, β_{t+1}^i, is

$$\beta_{t+1}^i = \begin{cases} \beta_t^i & \text{if} \quad \beta_t^i \le \hat{\beta} \\ \phi(\beta_t^i; R^1) & \text{if} \quad \beta_t^i > \hat{\beta}, \end{cases} \tag{8}$$

where for any β_t^i, $\beta_t^i \le \phi(\beta_t^i; R^1) < 1$; $\phi(\hat{\beta}; R^1) > \hat{\beta}$; $\phi_\beta(\beta_t^i; R^1) > 0$; $\phi_R(\beta_t^i; R^1) > 0$; $\phi_{\beta\beta}(\beta_t^i; R^1) < 0$.

As depicted in Figure 1, if the time preference of member i of generation 0 is below the threshold $\hat{\beta}$, the individual chooses the endowment mode and the time preference of each member of the individual's dynasty remains at β_0^i. In particular, if $\beta_0^i \le \hat{\beta}$ then $\lim_{t\to\infty} \beta_t^i = \beta_0^i$. In contrast, if $\beta_0^i > \hat{\beta}$, then member i of generation 0 chooses the investment mode and the evolution of time preference within individual i's dynasty converges to a unique steady-state level $\bar{\beta}^I(R^1) > \hat{\beta}$, such that $\bar{\beta}^I = \phi(\bar{\beta}^I; R^1)$. Hence, $\lim_{t\to\infty} \beta_t^i = \bar{\beta}^I(R^1)$.

[7]Evidence suggests that time preference is transmitted intergenerationally (Anderson and Nevitte, 2006; Arrondel, 2009; Cronqvist and Siegel, 2013; Knowles and Postlewaite, 2005; Webley and Nyhus, 2006) and is affected by individual's experience (Bowles, 1998)

[8]Allowing horizontal transmission across types would reinforce the mechanism highlighted in this paper.

2.6.2 Evolution of Time Preference Across Generations

Suppose that the time preferences of individuals in period 0 are characterized by a continuous distribution function with support $[0, \bar{\beta}^I(R^1)]$ and density $\nu(\beta_0^i)$.[9] Suppose further that the initial size of the population of generation 0 is $L_0 = 1$, i.e.,

$$L_0 = \int_0^{\bar{\beta}^I} \nu(\beta_0^i) d\beta_0^i = 1. \tag{9}$$

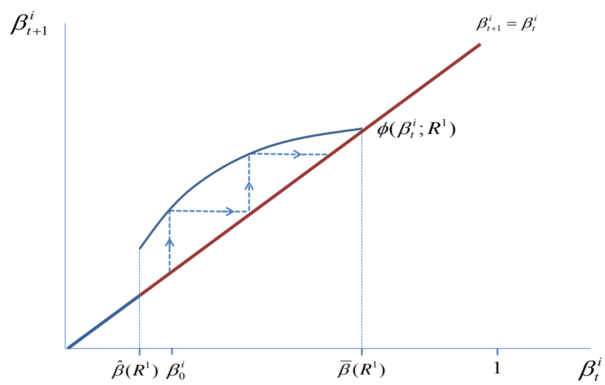


Figure 1: The Evolution of Time Preference within a Dynasty

Given the threshold level of the discount factor, $\hat{\beta}$, above which the investment mode of production is beneficial, the size of the population of generation 0 that is engaged in the endowment mode of production, L_0^E, and the size of the population of generation 0 that is engaged in the investment mode of production, L_0^I, are

$$L_0^E = \int_0^{\hat{\beta}} \nu(\beta_0^i) d\beta_0^i \qquad \text{and} \qquad L_0^I = \int_{\hat{\beta}}^{\bar{\beta}^I} \nu(\beta_0^i) d\beta_0^i. \tag{10}$$

Since the critical level, $\hat{\beta}$, is stationary over time, it follows from (8), that the distribution of β_t^i across individuals with a discount factor below $\hat{\beta}$ is unchanged over time. Additionally, income and therefore the number of children are constant over time for each group (i.e., the endowment type, E, and the investment type, I).

Thus, in generation t, the size of the population of each group is determined by its initial level and the number of children per adult:

$$\begin{aligned} L_t^E &= (n^E)^t L_0^E = (\tfrac{\gamma}{\tau} R^0)^t L_0^E; \\ L_t^I &= (n^I)^t L_0^I = (\tfrac{\gamma}{\tau} R^1)^t L_0^I, \end{aligned} \tag{11}$$

where $L_t^E + L_t^I = L_t$.

[9]Since $\hat{\beta} \in (0, \bar{\beta}^I(R^1))$, this initial condition assures that at least some individuals will be engaged in each mode of production in period 0.

The average time preference of generation t, $\bar{\beta}_t$, is therefore the weighted average of the time preference of the endowment type, $\bar{\beta}_t^E$, and of the investment type, $\bar{\beta}_t^I$. The weights are determined by the relative size of the two types in generation t. Hence, the average time preference in society in period t, $\bar{\beta}_t$, is

$$\bar{\beta}_t = \theta_t^E \bar{\beta}_t^E + (1 - \theta_t^E)\bar{\beta}_t^I, \tag{12}$$

where θ_t^E is the fraction of offsprings in generation t who are descendants from individuals engaged in the endowment mode of production in generation 0, i.e.,

$$\theta_t^E \equiv \frac{L_t^E}{L_t^E + L_t^I} = \frac{(R^0)^t}{(R^0)^t + (R^1)^t (L_0^I / L_0^E)}. \tag{13}$$

Thus, the fraction of individuals of the endowment type declines asymptotically to zero (i.e., $\lim_{t\to\infty} \theta_t^E = 0$), reflecting their lower reproductive success.

2.7 Steady-State Equilibrium

As the economy approaches a steady-state equilibrium, the fraction of individuals of the endowment type in each generation declines asymptotically to zero. Hence, it follows that the steady-state level of the average time preference in the economy, $\bar{\beta}$, is equal to steady-state level of time preference among individuals engaged in the investment mode of production, i.e., $\bar{\beta} = \bar{\beta}^I(R^1)$ where $\partial\bar{\beta}/\partial R^1 > 0$.[10] Although R^0 affects the allocation of the population between the investment and the endowment modes of production, since individuals of the investment type entirely dominate the population asymptotically, and since their time preference converges to the same long-run steady-state level, $\bar{\beta}^I(R^1)$, which is independent of R^0, the steady-state level of time preference in the economy, $\bar{\beta}$, is independent of R^0.

Moreover, while an increase in the rate of return to investment, R^1, lowers the threshold level of the discount factor above which individuals will chose the investment mode of production, the gradual increase in the ability to delay gratification among individuals of the investment type, and the increase in their relative share in the population (due to higher resources and thus reproductive success) brings about an increase in steady-state level of long-term orientation in society.

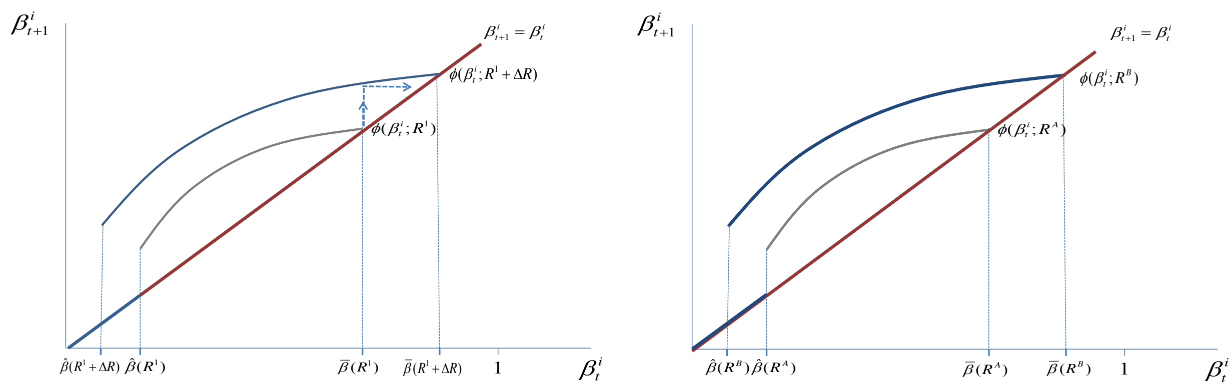
Thus, since R^0 has no persistent effect on time preference in the long-run, while R^1 has a persistent positive effect on the steady-state level of time preference, the empirical investigation of the deep determinants of contemporary time preference ought to focus on variations in R^1 across countries and regions, while disregarding potential variations in R^0 across the globe.[11]

[10]The results are robust to the inclusion of a range of investment modes. In particular, the most patient individuals will be engaged in the most productive investment mode and thus given their higher reproductive success, their time preference would dominate the population in the long-run.

[11]While in the steady-state, for a given R^1, there is no heterogeneity in time preference within a given geographical location, regional variations in agricultural returns within a country will contribute to the observed heterogeneity in long-term orientation across regions withinn a country.

2.7.1 Independence of the Steady-State Time Preference from its Initial Distribution

As previously established, the steady-state level of time preference in the economy, $\bar{\beta}$, is independent of the initial distribution of time preference in the population as long as the support of the distribution function is $[0, \bar{\beta}]$. Thus, changes in the initial distribution can only have temporary effects on time preference, as long as the support of the distribution function remains $[0, \bar{\beta}]$. In particular, if sorting occurs, and individuals with high long-term orientation sort themselves into environments in which the return to agricultural investment is higher, this sorting would affect the level of time preference during the transition to the steady state, but would not affect the long run time preference in the economy.



(a) Effect of the Introduction of New Potential Crops (b) Time Preference Across Countries $R^{1B} > R^{1A}$

Figure 2: Comparative Dynamics

2.7.2 The Effect of an Increase in Crop Yield on Time Preference

Suppose that after the economy reaches the steady-state equilibrium, $\bar{\beta}^I(R^1)$, new crops are introduced and the return to the investment mode increases from R^1 to $R^1 + \Delta R$. As depicted in Figure 2(a), the economy gradually transitions to a higher steady-state equilibrium $\bar{\beta}^I(R^1 + \Delta R)$. Hence, the introduction of new crops will be associated with an increase in long-term orientation. Moreover, consider two countries, A and B, identical in all respects except for their return to the investment mode of production. Suppose $R^A < R^B$, then as depicted in Figure 2(b), the high return country, B, will have a higher long-term orientation in the steady-state (i.e., $\bar{\beta}(R^B) > \bar{\beta}(R^A)$).

2.7.3 The Effect of an Increase in Crop Growth Cycle on Time Preference

While the waiting period in the basic model is equal to one by construction, a simple extension of the model would capture the effect of an increase in the waiting period on the rate of time preference. Suppose that the rate of time preference that is transmitted intergenerationally by parents of the investment type is affected by their inherited time preference, their acquired patience due to the reward to their investment, as well as the length of the delay in the reward that is associated with this investment. In particular, suppose that the subjective reward from this investment, R, is a positive function of the actual resources generated by this investment, R^1, and a decreasing function of the waiting period, θ, i.e., $R = \xi(R^1, \theta)$, where $\partial\xi/\partial R^1 > 0$ and $\partial\xi/\partial\theta < 0$.[12]

Generalizing the transmission of the time preference across generations who are engaged in the investment mode, to account for the effect of the duration of the waiting period, it follows that

$$\beta^i_{t+1} = \phi(\beta^i_t, \xi(R^1, \theta), \theta), \tag{14}$$

where $\partial\phi/\partial j > 0$ for $j = \beta^i_t, R, \theta$. In particular, holding the subjective reward from investment constant, R, the longer is the waiting period, θ, the higher is the acquired tendency to delay gratification (i.e., $\partial\phi/\partial\theta > 0$).

Thus, an increase in the duration of the waiting period has conflicting effects on the evolution of time preference for individuals of the investment type. In particular,

$$\frac{d\beta^i_{t+1}}{d\theta} = \frac{\partial\phi(\beta^i_t, \xi(R_1, \theta), \theta)}{\partial R}\frac{\partial R}{\partial\theta} + \frac{\partial\phi(\beta^i_t, \xi(R_1, \theta), \theta)}{\partial\theta} \gtreqless 0. \tag{15}$$

On the one hand, an increase in the waiting period, holding R^1 constant is equivalent to a decrease in the subjective reward, and hence it reduces the rewarding effect of investment on the individual's ability to delay gratification. However, the unavoidable increase in the waiting period that is associated with this higher reward, on the other hand, mitigates the aversion from delayed consumption.

Thus, following the analysis in section 2.7 the economy's average rate of time-preference converges to a steady-state level, $\bar{\beta}(R^1, \theta)$, where $\partial\bar{\beta}(R^1)/\partial R^1 > 0$ and $\partial\bar{\beta}(R^1, \theta)/\partial\theta \gtreqless 0$.

2.8 Testable Predictions

The model generates several testable predictions regarding the relationship between crop yield and time preference. First, the theory suggests that across economies identical in all respects except for their return to agricultural investment, the higher the crop yield, the higher the long-term orientation in the long-run. In particular, given the crop growth cycle, the higher is the crop yield, the higher is the average level of long-term orientation. Second, the theory suggests that the expansion in the spectrum of potential crops in the post-1500 period, generated an additional increase in the degree of long-term orientation in society, beyond the initial level generated by the pre-1500 crops. Third the theory suggests that an increase in the crop growth cycle generates conflicting effects on the rate of time preference. On the one hand, an increase in the crop growth cycle, holding the crop yield constant, is equivalent to a reduction in the return on investment, and hence it reduces the effect of rewarding investment experience on the ability to delay gratification. However, the increase in the duration of the investment, on the other hand, mitigates the aversion from delayed consumption. Thus, the overall effect is ambiguous.

[12] For instance, if R is the daily return to agricultural investment, i.e., if $R = R^1/\theta$, an increase in R^1 increases the daily return whereas an increase in θ decreases the daily return.

3 Data and Empirical Strategy

This section presents the empirical strategy developed to analyze the effect of the return to agricultural investment on contemporary variations in the rate of time preference. It introduces novel global measures of historical potential crop yield and growth cycles that are employed in order to examine their effect on a range of proxies for time preference, at the individual, regional, and national levels.[13]

3.1 Identification Strategy

The analysis surmounts significant hurdles in the identification of the causal effect of historical crop yield on long-term orientation. First, long-term orientation may affect the choice of technologies and therefore actual crop yields. Hence, to overcome this concern about reverse causality, this research exploits variations in potential (rather than actual) crop yields associated with agro-climatic conditions that are orthogonal to human intervention.

Second, the results may be biased by omitted geographical, institutional, cultural, or human characteristics that might have determined long-term orientation and are correlated with potential crop yield. Thus, several strategies are employed to mitigate this concern: (i) The analysis accounts for a large set of confounding geographical characteristics (e.g., absolute latitude, elevation, roughness, distance to the sea or navigable rivers, average precipitation, percentages of a country's area in tropical, subtropical or temperate zones, and average suitability for agriculture). (ii) It accounts for continental fixed effects, capturing unobserved time-invariant heterogeneity at the continental level. (iii) It accounts for confounding individual characteristics (e.g., age, gender, education, religiosity, marital status, and income). (iv) It conducts regional-level analyses of the effect of potential crop yield on long-term orientation, accounting for country fixed effects and thus unobserved time-invariant country-specific factors. (v) It explores the determinants of time-preference in second-generation migrants, accounting for the host country fixed effects, and thus time-invariant country-of-birth-specific factors, (e.g., geography, institutions, and culture), thus permitting the identification of the effect of the portable, culturally-embodied, component of geography.

Third, geographical attributes that had contributed to crop yield in the past are likely to be conducive to higher crop yield in the present. In particular, the correlation between past crop yield and contemporary time preference may therefore reflect the direct impact of invariant geographical attributes on contemporary economic outcomes that may be correlated with the rate of time preference. Thus, to mitigate this concern, this research exploits the potential yield in the pre-1500 period (i.e., prior to the expansion in the spectrum of potential crops in the course of the Columbian Exchange) to identify the persistent effect of historical crop yield on long-term orientation, lending credence to the hypothesis that it is the portable, culturally-embodied, components of potential crop yield, rather than persistent geographical attributes, that affect time preference.

Fourth, the natural experiment associated with the Columbian Exchange, and the differential assignment of superior crops to different regions of the world, further mitigates potential concerns

[13]Three different measures of long-term orientation at the country, region, and individual level are employed. Tables B.92 and B.93 show that these measures are highly correlated.

about omitted variables. In particular, in each grid, the Columbian Exchange generates a change in potential crop yield and growth cycle if and only if the potential yield of a newly introduced crop is larger than the potential yield of the originally dominating crop. This natural experiment is based on the identifying assumption that, conditional on the pre-1500 distribution of potential crop yield and growth cycle, the change in the potential crop yield and growth cycle resulting from the introduction of new crops is distributed randomly, independently of any other attributes of the grid. Reassuringly, the evidence presented in Appendix B.2 indicates that this assumption is valid.

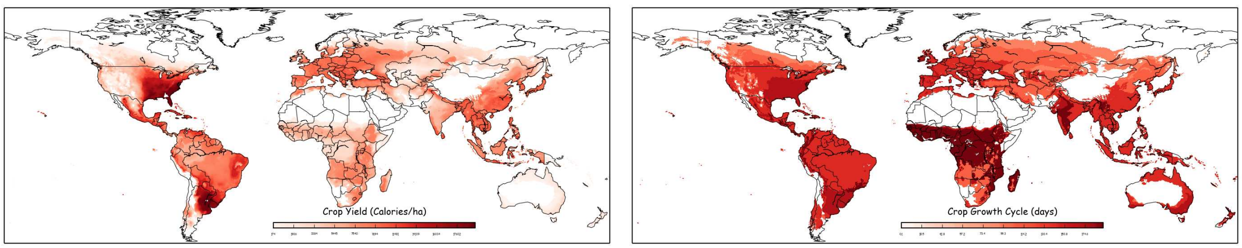
Fifth, the natural experiment associated with the Columbian Exchange sheds light on the contribution of the forces of cultural evolution to the formation of time preference, as opposed to the sorting of high long-term orientation individuals into geographical regions characterized by higher agricultural return. While this sorting process would not affect the nature of the results (i.e., variations in the return to agricultural investment across the globe would still be the origin of the contemporary regional distribution of time preferences), this natural experiment provides an essential element that permits the separation of the effect of crop yield on the cultural evolution of time preference from the conceivable sorting of high long-term orientation individuals into regions with high yields. Thus, the differential assignment of superior crops to indigenous populations across the globe in the course of the Columbian Exchange mitigates concerns about sorting. In particular, the causal effect of changes in crop yield is unlikely to capture the effect of sorting in the post-1500 era since the analysis accounts for cross-country migrations over this period.

Finally, superior historical crop-yield could have positively affected past economic outcomes, such as population density, urbanization and income per capita, which may have affected the observed rate of time preference. Hence, accounting for historical population density, urbanization as well as GDP per capita, permits the analysis to isolate the portable, culturally-embodied, components of potential crop yield, from the effect of the persistence of past economic prosperity.

3.2 Independent Variables: Potential Crop Yield and Growth Cycle

This subsection introduces the novel global measures of historical potential crop yield and growth cycles that are central to the analysis. These measures properly represent potential crop yield across the globe, as captured by calories (per hectare per year), rectifying deficiencies associated with weight-based measures of agricultural yield. The measures hinge on: (i) estimates of potential crop yield and growth cycle under low level of inputs and rain-fed agriculture – cultivation methods that characterized early stages of development, and (ii) agro-climatic conditions that are orthogonal to human intervention. Furthermore, in light of the expansion of crops amenable for cultivation in the course of the Columbian Exchange (Crosby, 1972), these measures account for the changes in crop yield and growth cycles in the post-1500 period.

The historical measures of crop yield and growth cycles are constructed based on data from the Global Agro-Ecological Zones (GAEZ) project of the Food and Agriculture Organization (FAO). The GAEZ project supplies global estimates of crop yield and crop growth cycle for 48 crops in grids with cells size of $5' \times 5'$ (i.e., approximately 100 km^2). For each crop, GAEZ provides estimates for crop yield based on three alternative levels of inputs – high, medium, and low - and two possible sources of water supply – rain-fed and irrigation. Additionally, for each input-water source category, it provides two separate estimates for crop yield, based on agro-climatic conditions, that are arguably unaffected by human intervention, and agro-ecological constraints, that could potentially reflect human intervention. The FAO dataset provides for each cell in the agro-climatic grid the potential yield for each crop (measured in tons, per hectare, per year). These estimates account for the effect of temperature and moisture on the growth of the crop, the impact of pests, diseases and weeds on the yield, as well as climatic related "workability constraints". In addition, each cell provides estimates for the growth cycle for each crop, capturing the days elapsed from the planting to full maturity.



(a) Crop Yield

(b) Crop Growth Cycle

Figure 3: Potential Crop Yield and Growth Cycle for pre-1500CE Crops

The proposed measures are based on the agro-climatic estimates under low level of inputs and rain-fed agriculture. These restrictions remove the potential concern that the level of agricultural inputs, the irrigation method, and soil quality, reflect endogenous choices that could be potentially correlated with time preference.

In order to capture the nutritional differences across crops, and thus to ensure comparability in the measure of crop yield, each crop's yield in the GAEZ data (measured in tons, per hectare, per year) is converted into caloric yield (measured in millions of kilo calories, per hectare, per year). This conversion is based on the caloric content of crops, provided by the United States Department of Agriculture Nutrient Database for Standard Reference.

In light of the expansion in the set of crops that were available for cultivation in each region in the course of the Columbian Exchange, the constructed meaures distinguish between the caloric suitability in the pre-1500 period and in the post 1500 period. In particular, the pre-1500 estimates are based on the subset of 48 crops in the GAEZ/FAO data set, which were available for cultivation in each region of the world before 1500CE, as documented in Table A.2 (Crosby, 1972; Diamond, 1997).[14] In the post 1500CE period, in contrast, all regions could potentially adopt the 48 crops for agricultural production.[15]

[14]The presence of Asian varieties of rice (Oryza sativa) in Subsaharan Africa in the pre-1500CE period has been debated. In particular, the assignment of wetland (Oryza japonica) and indica (Oryza indica) rice varieties to Subsaharan Africa prior to 1500CE is debatable. Figures 3 and A.1 are based on the exclusion of Asian crops in Subsaharan Africa in the pre-1500CE period. In contrast, the regression analyses include the Asian crops. Their exclusion magnifies the economic and statistical significance of the effect of crop yield on long-term orientation.

[15]Crosby (1972) argues that indeed many of the crops diffused rapidly between the New and Old Worlds.

Based on these estimates, the analysis assigns to each cell the crop with the highest potential yield among the available crops in the pre- and post-1500CE period.[16] Thus, the research constructs three sets of measures: (i) the yield and growth cycle for the crop that maximizes potential yield before the Columbian Exchange, (ii) the yield and growth cycle for the crop that maximizes potential yield after Columbian Exchange, and (iii) the changes in the yield and growth cycles of the dominating crop in each cell due to the Columbian Exchange.

Using these measures, the research constructs estimates for the average regional crop yield and the average regional crop growth cycle (over grid cells in a region), that reflect the average regional levels of these two variables among crops that maximize the caloric yield in each cell. Since a sedentary community is unlikely to exist in a region in which the caloric yield is zero, the analysis focuses on the averages across cells where the maximum potential crop yield is positive.[17]

Figure 3 depicts the distribution of potential crop yield and growth cycle across global $5' \times 5'$ grids for crops available for cultivation in the pre-1500CE period.[18] Each cell in Figure 3(a) depicts the potential yield (measured in millions of kilo calories, per hectare, per year) generated by the crop with the highest potential yield in that cell. Higher crop yields are marked by darker cells, while lower ones by lighter ones. Similarly, Figure 3(b) depicts the potential crop growth cycle for the crop with the highest potential yield in each cell. Longer growth cycles are marked by darker cells and shorter ones by lighter cells.

As is evident from Figure 3(a), there are large regional and cross country variations in crop yields. The regions with the highest potential pre-1500CE crop yield are located in the frontier between Argentina, Brazil and Uruguay, and the south east of the United States. Similarly, as is evident from Figure 3(b), there are large regional and cross country variations in potential pre-1500CE crop growth cycles. The regions with the longest growth cycles (i.e., those that require more than 180 days) are concentrated in Africa and regions of India. The cross country distribution of pre-1500CE potential crop yield ranges between 0.5 and 18 (millions of kilo calories per hectare per year), has a mean of 7.2 and a standard deviation of 3.2. On the other hand, the distribution of pre-1500CE crop growth cycle has a mean of 134 days, a standard deviation of 18 days and ranges between 80 and 199 days. The correlation between crop yield and growth cycle pre-1500CE is 0.4 ($p < 0.01$) and post-1500CE is 0.78 ($p < 0.01$). *"Trees that are slow to grow, bear the best fruit"* (Molière).

The use of potential crop yield as a proxy for actual crop yield overcomes possible concerns about reverse causality.[19] Importantly, potential crop yield can serve as a good proxy since it is positively correlated with actual crop yield at the cell level (Figure A.2). Moreover, as established in Appendix B.13, using the Ethnographic Atlas (Murdock, 1967), potential crop yield is positively correlated with the dependence on agriculture, the intensity of agriculture, and the contribution of agriculture

[16]Figure A.1 shows for each cell in the world the highest yield producing crop in the pre- and the post-1500CE era.
[17]The results are robust to the inclusion of cells with no potential yield (Table B.24).
[18]Table A.2 shows the global distribution of crops pre-1500CE.
[19]GAEZ provides data on actual crop yields in the year 2000 for a small subset of crops. Hence, an explicit two-stage least squares or instrumental variable analysis, in which potential crop yield and growth cycles are used as instruments for actual yield and cycles, is not feasible, since it requires unavailable data on actual crop yield and growth cycle in the pre-1500 period.

to subsistence across ethnic groups.

3.3 Additional Controls

As suggested in the empirical strategy section, crop yield is correlated with other geographical characteristics that may have affected the evolution of time preference. Hence, the analysis accounts for the potential confounding effects of a range of geographical factors such as absolute latitude, average elevation, terrain roughness, distance to sea or navigable rivers, as well as islands and landlocked regions.[20] Furthermore, the analysis accounts for continental fixed effects, capturing unobserved continent-specific geographical and historical characteristics that may have codetermined the global distribution of time preference.

The empirical analysis considers the confounding effect of the advent of sedentary agriculture, as captured by the years elapsed since the onset of the Neolithic Revolution, on the evolution of the rate of time preference. The onset of agriculture could have generated conflicting effects on the evolution of time preference. The rise of institutionalized statehood in the aftermath of the transition to agriculture was associated with the taxation of crop yield and thus with a reduction in the incentive to invest (Mayshar et al., 2013; Olsson and Paik, 2013). However, the effect of the Neolithic Revolution on technological advancements and public investment in agricultural infrastructure (Ashraf and Galor, 2011; Diamond, 1997) may have countered this adverse effect on the net crop yield. Thus, the effect of the agricultural revolution on the rate of time preference appears a priori ambiguous.

Moreover, the effect of crop yield on long-term orientation would be stronger in regions that experienced the transition to agriculture earlier, provided this evolutionary process had not matured. However, since all countries in the sample experienced the Neolithic Revolution at least 400 years ago, and the vast majority more than 3000 thousand years ago, it is very likely that this culturally driven evolutionary process has matured and the years elapsed since the Neolithic revolution have an insignificant effect on time preference via this channel.

4 Crop Yield and Long-Term Orientation (Cross-Country Analysis)

4.1 Baseline Analysis

This section analyzes the empirical relation between crop yield, crop growth cycle, and long-term orientation across countries. In particular, it examines the effect of crop yield on the cultural dimension identified by Hofstede (1991) as Long-Term Orientation (LTO). Hofstede et al. (2010) define Long-Term Orientation as the cultural value that stands for the fostering of virtues oriented toward future rewards, perseverance and thrift.[21] This measure is positively correlated with the importance ascribed future profits, savings rates, investment in real estate, and math and science scores (Hofstede

[20]The summary statistics and description of all variables used in the analysis is provided in the Appendix.

[21]Hofstede (1991) based his original analysis on data gathered from interviews of IBM employees across the world. This original data was later expanded using the data from the Chinese Values Survey and from the World Values Survey. The Long-Term Orientation (LTO) measure varies between 0 (short-term orientation) and 100 (long-term orientation).

et al., 2010). Indeed, for the sample of countries used in this research, there exists a positive relation between this measure of Long-Term Orientation and income per capita, education, and economic growth (Figure B.12).

In order to explore the effect of crop yield and growth cycle on Long-Term Orientation, the following empirical specification is estimated via ordinary least squares (OLS):

$$LTO_i = \beta_0 + \beta_1 \text{yield}_i + \beta_2 \text{growth cycle}_i + \sum_j \gamma_{0j} X_{ij} + \gamma_1 \text{YST}_i + \sum_c \gamma_c \delta_c + \epsilon_i, \tag{16}$$

where LTO_i is the level of Long-Term Orientation in country i as identified by Hofstede et al. (2010), crop yield and crop growth cycle of country i are either the pre- or post-1500CE measures constructed in the previous section, X_{ij} is geographical characteristic j of country i, YST_i are the years elapsed since country i transitioned to agriculture, $\{\delta_c\}$ are a complete set of continental fixed effects, and ϵ_i is the error term of country i. The theory suggests that $\beta_1 > 0$.

The effect of potential crop yield and growth cycle on Long-Term Orientation based on the full set of available crops in the contemporary era are shown in Table 1. Column (1) establishes the relationship between crop yield and Long-Term Orientation, accounting for continental fixed effects and therefore for unobserved time-invariant omitted variables at the continental level. The estimated coefficient is positive and statistically significant at the 1% level, implying an economically significant effect of crop yield as suggested by the theory. In particular, an increase of one standard deviation in crop yield increases Long-Term Orientation by 0.3 standard deviations (i.e., 7.4 percentage points).

Column (2) accounts for other confounding geographical characteristics of the country. In particular, absolute latitude, mean elevation above sea level, terrain roughness, mean distance to the sea or a navigable river, and dummies for being landlocked or an island. Accounting for the effects of geography and unobserved continental heterogeneity, a one standard deviation increase in crop yield increases Long-Term Orientation by 9.8 percentage points or equivalently 0.4 standard deviations. This is the largest effect of any of the variables included in the analysis. In particular, most geographical characteristics have no significant effect on Long-Term Orientation.

Column (3) considers the confounding effect of the advent of sedentary agriculture, as captured by the years elapsed since the onset of the Neolithic Revolution, on the evolution of the rate of time preference. Reassuringly, the coefficient on crop yield remains statistically significant at the 1% level and implies that a one standard deviation increase in crop yield increases Long-Term Orientation by 9.1 percentage points. The effect of other geographical characteristics remains smaller than the effect of crop yield. Additionally, the effect of the timing of transition to the Neolithic is negative and statistically significant at the 5% level. Thus, one additional standard deviation in the number of years since the transition to the Neolithic (approximately 2350 years) lowers Long-Term Orientation by 6.5 percentage points.

Column (4) accounts for the effect of crop growth cycle on Long-Term Orientation. As suggested by the theory the coefficient on crop yield remains positive and statistically significant at the 1% level, while the coefficient on crop growth cycle is negative, though not statistically different from zero. The estimated coefficient on crop yield implies that a one standard deviation increase on

Table 1: Crop Yield, Growth Cycle, and Long-Term Orientation

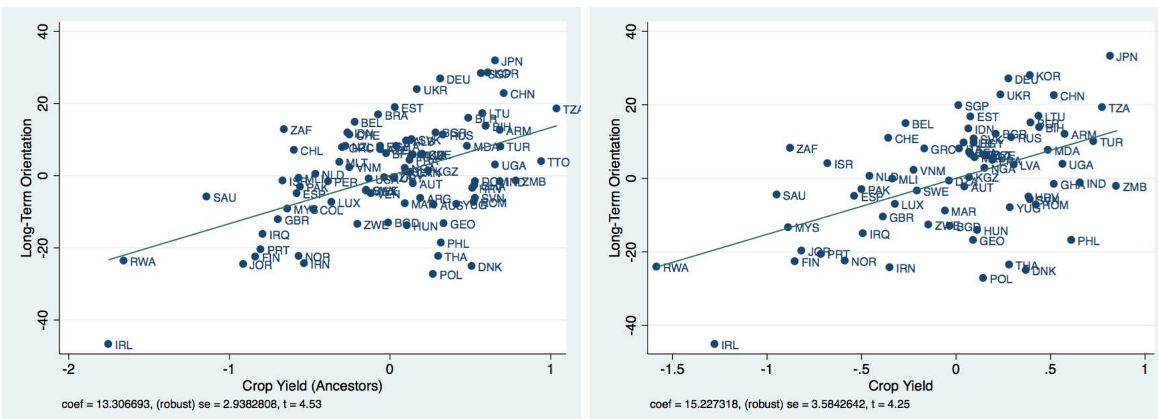
	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	7.43***	9.84***	9.06***	9.46***		-7.07	13.26***	15.23***
	(2.48)	(2.88)	(2.62)	(3.41)		(6.41)	(2.55)	(3.58)
Crop Growth Cycle				-0.70		10.47		-3.18
				(3.96)		(10.99)		(4.03)
Crop Yield (Ancestors)					13.31***	19.55***		
					(2.94)	(6.69)		
Crop Growth Cycle (Ancestors)					-3.15	-13.41		
					(3.52)	(11.26)		
Absolute Latitude		2.85	1.88	1.68	3.99	4.72	4.76	3.87
		(4.05)	(3.85)	(4.33)	(3.63)	(3.88)	(4.15)	(4.71)
Mean Elevation		4.98*	5.97**	6.09**	5.96**	5.47**	4.58	4.87
		(2.87)	(2.96)	(3.03)	(2.46)	(2.54)	(2.99)	(3.03)
Terrain Roughness		-6.24**	-5.72**	-5.72**	-6.72***	-6.56**	-6.40**	-6.29**
		(2.51)	(2.75)	(2.75)	(2.49)	(2.54)	(2.83)	(2.82)
Neolithic Transition Timing			-6.46**	-6.31**		-3.24	-4.75*	-4.08
			(2.87)	(3.06)		(7.22)	(2.60)	(2.66)
Neolithic Transition Timing (Ancestors)					-4.31*	-1.70		
					(2.30)	(6.24)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.54	0.60	0.62	0.61	0.66	0.65	0.61	0.61
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes the positive, statistically, and economically significant effect of a country's potential crop yield, measured in calories per hectare per year, on its level of Long-Term Orientation measured on a scale of 0 to 100, accounting for continental fixed effects and other geographical characteristics. Additional geographical controls include distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

crop yield increases Long-Term Orientation by 9.5 percentage points. It should be noted that the estimated effects of crop yield on Long-Term Orientation in columns (1)-(4) are remarkably stable.

The proposed hypothesis suggests that the evolution of time preference reflected the exposure of the ancestral population of contemporary societies to higher crop yield. However, migration of individuals in the post-1500 period could generate a mismatch between the crop yield in the country of residence and the crop yield to which the ancestral populations were exposed. Thus, in order to analyze the effect that migration might have had on the estimated effect, column (5) adjusts crop yield, growth cycle, and timing of transition to agriculture to account for the ancestral composition of the contemporary populations (Putterman and Weil, 2010). These ancestry adjusted measures capture the geographical attributes that existed in the homeland of the ancestral population of each contemporary country. In particular, for each country the adjusted crop yield is the weighted average of crop yield in the countries where the ancestral populations resided. This adjustment permits the analysis to capture the culturally embodied transmission rather than the direct effect of geography.

As established in column (5), the estimated effect of crop yield is 50% larger, reinforcing the notion that the effect of these geographical attributes is culturally embodied. Moreover, as reported in column (6), in a horse race between the ancestry adjusted and unadjusted measures of crop yield and crop growth cycle, only the adjusted measure of crop yield remains economically and statistically significant, reinforcing the hypothesis about the culturally embodied transmission. The estimates in column (5) imply that accounting for continental fixed effects, other geographical characteristics, the ancestry adjusted timing of transition to the Neolithic, and the ancestry adjusted crop growth cycle, a one standard deviation increase in the crop yield experienced by the ancestral populations of contemporary countries increases current levels of Long-Term Orientation by 0.53 standard deviations (i.e., 13.3 percentage points). Figure 4(a) depicts the partial correlation plot for the specification in column (5).



(a) Ancestry Adjusted (b) Old World

Note: This figure illustrates the positive effect of potential crop yield on Long-Term Orientation in the whole world (panel a) and the Old World (panel b). The depicted relationships account for the full set of controls in Table 1.

Figure 4: Potential Crop Yield and Long-Term Orientation

Additionally, columns (7) and (8) establish that the effect of crop yield on Long-Term Orientation is much larger in the Old World, where intercontinental migration and population replacement were less prevalent. One standard deviation increase in crop yield increases Long-Term Orientation by 13.3 and 15.2 percentage points (0.52 and 0.60 standard deviations), respectively. Figure 4(b) depicts the partial correlation between crop yield and Long-Term Orientation for the specification in column (8).

The results based on ancestry adjusted attributes and the Old World sample mitigate concerns that the positive effect of crop yield on Long-Term Orientation captures the country's geographical attributes rather than the culturally embodied transmission highlighted in the proposed theory.

4.2 Natural Experiment: The Columbian Exchange

The natural experiment generated by the Columbian Exchange provides an essential ingredient in overcoming three unsettled issues regarding the observed association between crop yield and Long-

Term Orientation: (a) the role of omitted variables at the country level, (b) the comparative role of cultural evolution and the sorting of high long-term oriented individuals into high yield regions, and (c) the historical, as opposed to the contemporary, link between crop yield and long-term orientation.

Table 2: Crop Yield, Growth Cycle, and Long-Term Orientation:
Accounting for the Columbian Exchange

	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	5.67**	5.98***	7.28***	8.82***		-3.76	12.23***	15.21***
	(2.40)	(2.09)	(2.29)	(3.13)		(5.41)	(2.84)	(3.51)
Crop Yield Change (post-1500)		7.88**	8.77***	9.83***		2.50	7.95***	10.53***
		(3.08)	(2.69)	(3.11)		(7.00)	(2.56)	(3.30)
Crop Growth Cycle (pre-1500)				-3.77		4.46		-7.65
				(4.17)		(10.20)		(4.80)
Crop Growth Cycle Change (post-1500)				0.16		-8.61		0.31
				(1.90)		(6.85)		(1.73)
Crop Yield (Ancestors, pre-1500)					10.56***	14.05***		
					(2.35)	(5.01)		
Crop Yield Change (Anc., post-1500)					9.86***	8.60		
					(2.28)	(5.68)		
Crop Growth Cycle (Anc., pre-1500)					-7.31**	-12.61		
					(3.59)	(10.09)		
Crop Growth Cycle Ch. (Anc., post-1500)					0.77	8.74		
					(1.60)	(6.08)		
Neolithic Transition Timing			-7.05**	-6.15**		5.84	-5.06*	-3.46
			(2.90)	(2.96)		(7.46)	(2.73)	(2.77)
Neolithic Transition Timing (Anc.)					-4.27*	-8.11		
					(2.23)	(6.14)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.50	0.55	0.63	0.63	0.68	0.68	0.61	0.62
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and the post-1500CE change in this yield in the course of the Columbian Exchange on the country's level of Long-Term Orientation, accounting for continental fixed effects and other geographical characteristics. Geographical controls include absolute latitude, mean elevation, terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

In order to explore the effect of crop yield, growth cycle and their changes on Long-Term Orientation, the following empirical specification is estimated via ordinary least squares (OLS):

$$\begin{aligned} LTO_i = &\beta_0 + \beta_1^{1500}\text{yield}_i + \beta_1^{ch}\Delta\text{yield}_i + \beta_2^{1500}\text{growth cycle}_i + \beta_2^{ch}\Delta\text{growth cycle}_i \\ &+ \sum_j \gamma_{0j} X_{ij} + \gamma_1 \text{YST}_i + \sum_c \gamma_c \delta_c + \epsilon_i, \end{aligned} \tag{17}$$

where LTO_i is the level of Long-Term Orientation in country i, yield_i and growth cycle_i are the pre-1500CE levels of these measures, Δyield_i and Δcycle_i are their post-1500 changes generated in the course of the Columbian Exchange, X_{ij} is geographical characteristic j of country i, YST_i are the years elapsed since country i transitioned to agriculture, $\{\delta_c\}$ are a complete set of continental fixed effects, and ϵ_i is the error term of country i. The theory suggests that $\beta_1^{1500} > 0$ and $\beta_1^{ch} > 0$.

Table 2 examines the effect of pre-1500CE crop yields and growth cycles and their changes in the course of the Columbian Exchange on Long-Term Orientation. Accounting for continental fixed effects column (1) establishes that a one standard deviation increase in the pre-1500CE crop yield generates a 5.7 percentage points increase in Long-Term Orientation. Column (2) shows that the expansion of crops available for cultivation in the post-1500CE period generates and additional increase in Long-Term Orientation. In particular, a one standard deviation increase in pre-1500 crop yield increases Long-Term Orientation by 6 percentage points, while the change in crop yield increases it by 7.9 percentage points. Column (3) establishes that accounting for the confounding effects of additional geographical characteristics and the time elapsed since the transition to agriculture, increases the estimated effect of pre-1500 crop yield and its change in the post-1500CE period. Column (4) accounts for the effect of pre-1500CE growth cycle and its change in the course of the Columbian Exchange. Reassuringly, the effect of pre-1500CE crop yield and its change are higher than before and remain statistically and economically significant. Column (5) accounts for migration and population replacement adjusting for the ancestral composition of contemporary populations. The estimated effect of pre-1500CE crop yield increases by 25% , reinforcing the notion that the effect of these geographical attributes is culturally embodied. Moreover, as reported in column (6), in a horse race between the ancestry adjusted and unadjusted measures of crop yield and crop growth cycle and their changes, only the adjusted level of pre-1500 crop yield remains economically and statistically significant, reinforcing the hypothesis that the effect of crop yield on Long-Term Orientation operated through culturally embodied transmission. Columns (7) and (8) establish that the effect of crop yield on Long-Term Orientation is much larger in the Old World, where intercontinental migration and population replacement were less prevalent. In particular, the estimated effects in column (8) imply that a one standard deviation increase in pre-1500CE crop yield increases Long-Term Orientation by 15.2 percentage points, while a one standard deviation increase in the change in yield in the course of the Columbian Exchange increases Long-Term Orientation by 10.5 percentage points.

4.2.1 Mitigating Concerns about Omitted Variables

The natural experiment associated with the Columbian Exchange, and the differential assignment of superior crops to different regions of the world, mitigates potential concerns about omitted variables. In particular, this natural experiment is based on the identifying assumption that, conditional on the pre-1500 distribution of potential crop yield and growth cycle, the change in the potential crop yield and growth cycle resulting from the introduction of new crops is distributed randomly, independently of any other attributes of the grid. More formally, the identifying assumption is that the changes in crop yield and growth cycle, conditional on their pre-1500 levels, are orthogonal to the error term ϵ_i in equation (17). The evidence presented in Appendix B.2 suggests that this assumption is valid.

Moreover, using statistics on the selection on observables and unobservables (Altonji et al., 2005;

Bellows and Miguel, 2009; Oster, 2014), Tables B.17 and B.23 establish that the degree of omitted variable bias is very low and is unlikely to explain the size of the estimated effect of crop yield and its change. In particular, omitted factors would need to be 3-6 times more strongly correlated with the change in crop yield than all the controls accounted for in order to explain the estimated effect of the change in crop yield on Long-Term Orientation. Similarly, omitted factors would need to be at least 50 percent more strongly negatively correlated with pre-1500 yield in order to explain the size of the coefficient, suggesting that the estimated coefficient should be considered a lower bound of the true effect. Indeed, in all specifications, the bias-adjusted estimated effect of pre-1500 crop yield is strictly positive and larger than the OLS estimate (Oster, 2014).

4.2.2 Sorting vs. Cultural Evolution

This subsection examines the relative contributions of cultural evolution and sorting to the observed relation between crop yield, growth cycle and Long-Term Orientation. The theory highlights the effect of crop yield on the gradual propagation of traits for higher long-term orientation due to the forces of natural selection and cultural evolution. A-priori, however, the positive association between higher crop yield and Long-Term Orientation could have been partly generated by the sorting of high long-term individuals into high yield regions. While the existence of this sorting process would not affect the nature of the results (i.e., variations in the return to agricultural investment across the globe would still be the origin of the spatial differences in time preferences), it would affect the interpretation of the results, regarding the comparative role of cultural evolution in this association.

The natural experiment associated with the Columbian Exchange provides the necessary ingredients to assess the relative contribution of the forces of cultural evolution and sorting in the post-1500 era. While sorting could have been an important force in the pre-1500 period, and in particular during the demic diffusion of the Neolithic revolution across the globe, the results in Tables 2 and B.19 suggest that it is an insignificant force in the post-1500 period. Moreover, as suggested in the theory, if during the thousands of years elapsed since the onset of the Neolithic Revolution (and prior to the Columbian Exchange), the composition of time preference had plausibly reached the proximity of its long-run steady-state equilibrium, then sorting would have had a negligible effect on Long-Term Orientation in the pre-1500 period and the relationship between Long-Term Orientation and crop yield, even in the pre-1500 era, would reflect primarily the forces of either cultural or genetic evolution.

This research employs two strategies to establish the importance of cultural evolution relative to sorting in the determination of Long-Term Orientation in the post-1500 period. First, restricting the analysis to countries that were not subjected to large inflows of migrants in the post-1500 period, but nevertheless experienced a change in their crop yield and growth cycle, the research isolates the effects of cultural evolution on Long-Term Orientation from the potential effect of sorting.[22] In

[22] While 350-500 years (i.e., 18-25 generations), which is the time elapsed in different regions of the world from 1500 until the decline in the significance of the agricultural sector, is perhaps a short (but not implausible) period for genetic changes in the composition of traits, it is a sufficient time period for cultural evolution of traits, reflecting the process of learning to delay gratification as well as the vertical and horizontal transmission of long-term orientation. In

particular, restricting the analysis to the Old World sample, as established in columns (7) and (8) of Table 2, changes in crop yield in the post-1500 period have a positive and significant effect on Long-Term Orientation. Additionally, for a sample of countries where at least 90 percent of the population descends from individuals that were native to the location in 1500, the positive effect of changes in crop yield in the post-1500 period on Long-Term Orientation is even larger (Table B.19). These results suggest that cultural evolution is a significant force in the determination of Long-Term Orientation during the post-1500 period.

Second, comparing the whole world sample, where migration is prevalent, to the previous subsamples, in which migration is low, facilitates the analysis of the potential contribution of sorting to Long-Term Orientation. In particular, if sorting had taken place, high long-term oriented individuals would have migrated to locations with higher yields, and thus, one would observe a stronger association between changes in the crop yield and Long-Term Orientation in the whole world sample than the one observed in the subsamples with low migration. But, as established in columns (4) and (5) of Table 2, the estimated effect of changes in crop yield in the whole world sample is smaller than the estimated effect in the Old World sample as well as in the native sample, even after adjusting for the ancestral composition of contemporary populations. This suggests that sorting played an insignificant role in the determination of Long-Term Orientation in the whole world sample during the post-1500 era.

4.2.3 Accounting for the Persistence of Historical Geographical Attributes

This subsection examines the relative contributions of cultural evolution and the persistence of geographical characteristics in the formation of Long-Term Orientation. The natural experiment associated with the Columbian Exchange provides the necessary ingredients to assess the relative contribution of historical geographical characteristics to the formation of Long-Term Orientation, as opposed to a potential contemporary association between geographical attributes, development outcomes and the rate of time preference.

Focusing on crops that were available for cultivation in pre-1500CE era permits the identification of the historical nature of the effect. Indeed, as established in Table 2, crop yield in the pre-1500 era has a significant effect on the contemporary level of long-term orientation. Moreover, the historical experience with high yields remains in effect even after migration, suggesting again that this trait is culturally-embodied and does not capture other geographical characteristics of a country. Furthermore, constraining the analysis to cells in which the dominating crop had changed in the post-1500CE period does not qualitatively alter the results (Appendix B.2).

particular, a wide body of evidence about the convergence of cultural traits among immigrants suggests that changes and convergence in cultural traits can occur within few generations, indicating that in the presence of proper economic incentives changes in cultural traits can occur rather rapidly.

4.3 Robustness

4.3.1 Persistence of Development

This subsection demonstrates that the effect of crop yield on Long-Term Orientation is unaffected by the plausible effect of historical crop yields and their changes in the course of the Columbian Exchange on pre-industrial population density, urbanization, and GDP per capita, and their conceivable persistent effect on contemporary development (Ashraf and Galor, 2011; Nunn and Qian, 2011). In particular, accounting for historical population density as well as urbanization and GDP per capita, permits the analysis to isolate the portable, culturally-embodied, components of potential crop yield, from the persistent effect of past economic prosperity.

Table 3 establishes that accounting for historical levels of population density, urbanization, and GDP per capita, the coefficients on crop yield, growth cycle and their changes remain statistically and economically significant.[23] Furthermore, the partial and semi-partial R^2 analysis suggest that the explanatory power of crop yield and growth cycle, as well as their changes, is significantly larger than alternative geographical and economic factors.[24] Moreover, the results are not simply capturing the positive effect of agricultural productivity on Long-Term Orientation. First, as shown in Appendix B.2, the changes in yields and growth cycles are orthogonal to conventional measures of agricultural suitability. Furthermore, using principal component analysis (Appendix B.5) the research establishes that the variations in crop yield and growth cycle, which are orthogonal to agricultural productivity, are the ones generating the variation in Long-Term Orientation.

4.3.2 Alternative Cultural Characteristics

This subsection establishes that the effect of potential crop yield on Long-Term Orientation does not capture its effect on a wide range of other cultural characteristics (Hofstede et al., 2010).[25] In particular, as demonstrated in Table 4, crop yield and growth cycle do not affect Uncertainty Avoidance (the level of tolerance and rigidness of society); Power Distance (the level of hierarchy and inequality of power); Individualism (how individualistic as opposed to collectivistic a society is); Masculinity (level of internal cooperation or competition); and Generalized Trust.[26] Furthermore, as established

[23] A potential concern is the presence of measurement errors in the added historical controls, which might underestimate their contribution to long-term orientation. However, these historical controls (with the exception of population density in 1500) are uncorrelated with Long-Term Orientation and their inclusion does not alter the quantitative results.

Moreover, as established in Table B.37, the results remain qualitatively unchanged if only grids that experienced a change in the dominating crop is used in the analysis.

[24] The partial and semi-partial R^2 analysis assess the importance of the various independent variables in the determination of the dependent variable. In particular, the partial R^2 of an independent variable x measures the fraction of the *residual* variation in the dependent variable, y (after partialling out the contribution of all other independent variables to y), that is explained by x (after partialling out the contribution of all other independent variables to x). On the other hand, the semi-partial R^2 of an independent variable x measures the fraction of the *total* variation in the dependent variable, y, that is explained by x (after partialling out the contribution of all other independent variables to x). See Cohen and Cohen (2003).

[25] Long-Term Orientation is uncorrelated with these measures of culture (Table B.55).

[26] Hofstede (1991) presents a second measure that could capture some elements of time preference, namely Restraint vs. Indulgence. As discussed in Appendix B.11 it is an inferior measure of time preference in comparison to Long-Term Orientation.

Table 3: Crop Yield, Growth Cycle and Long-Term Orientation:
Accounting for the Persistence of Development

	Long-Term Orientation							
	Population Density		Urbanization				GDP per capita	
	1500CE		1500CE		1800CE		1870CE	1913CE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Anc., pre-1500)	11.05***	11.52***	10.01***	11.08***	11.54***	11.54***	14.19***	12.66**
	(2.53)	(2.33)	(3.68)	(3.68)	(3.18)	(3.22)	(5.08)	(5.02)
Crop Yield Change (post-1500)	10.76***	10.40***	8.77**	9.96***	10.05***	10.22***	15.55***	14.92***
	(2.89)	(2.78)	(3.35)	(3.35)	(3.23)	(3.37)	(3.22)	(3.29)
Crop Growth Cycle (Anc., pre-1500)	-8.06*	-10.43***	-5.06	-7.30	-8.60*	-8.75*	-12.58*	-10.28
	(4.06)	(3.63)	(5.28)	(5.37)	(4.68)	(4.84)	(6.44)	(6.46)
Crop Growth Cycle Ch. (post-1500)	-0.46	-1.06	1.06	0.55	0.07	0.03	2.14	3.31
	(1.72)	(1.84)	(2.91)	(2.95)	(2.37)	(2.41)	(3.38)	(3.35)
Population density in 1500 CE		3.76**						
		(1.86)						
Urbanization rate in 1500 CE				1.90				
				(2.24)				
Urbanization rate in 1800 CE						-0.57		
						(1.22)		
GDP per capita 1870							10.57***	
							(3.65)	
GDP per capita 1913								10.99***
								(3.53)
	Partial R^2							
Crop Yield (Anc., pre-1500)	0.23***	0.25***	0.11***	0.12***	0.20***	0.20***	0.25***	0.21**
Crop Yield Change (post-1500)	0.16***	0.16***	0.08**	0.09***	0.12***	0.12***	0.27***	0.26***
Crop Growth Cycle (Anc., pre-1500)	0.06*	0.09***	0.02	0.03	0.06*	0.06*	0.12*	0.09
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
Population density in 1500 CE		0.05**						
Urbanization rate in 1500 CE				0.01				
Urbanization rate in 1800 CE						0.00		
GDPpc 1870							0.16***	
GDPpc 1913								0.17***
	Semi-Partial R^2							
Crop Yield (Anc., pre-1500)	0.08***	0.09***	0.04***	0.04***	0.07***	0.07***	0.09***	0.07**
Crop Yield Change (post-1500)	0.05***	0.05***	0.03**	0.03***	0.04***	0.04***	0.10***	0.09***
Crop Growth Cycle (Anc., pre-1500)	0.02*	0.03***	0.00	0.01	0.02*	0.02*	0.04*	0.03
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Population density in 1500 CE		0.01**						
Urbanization rate in 1500 CE				0.00				
Urbanization rate in 1800 CE						0.00		
GDPpc 1870							0.05***	
GDPpc 1913								0.05***
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.65	0.67	0.60	0.60	0.63	0.62	0.59	0.59
Observations	87	87	65	65	79	79	50	50

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield, growth cycle and their post-1500CE changes in these values in the course of the Columbian Exchange on the country's level of Long-Term Orientation, accounting for continental fixed effects, other geographical characteristics, and pre-industrial development (population density, urbanization rates, and GDP per capita). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

in Table B.35, accounting for the confounding effect of these additional cultural characteristics does not alter the effect of crop yield on Long-Term Orientation. In particular, while crop yield has a marginally significant negative effect on Trust (Table 4) accounting for Trust does not alter the effect of crop yield on Long-Term Orientation.

Table 4: Crop Yield, Growth Cycle, and Other (Cultural) Traits

	Cultural Indices					
	Long-Term Orientation	Trust	Individualism	Power Distance	Cooperation	Uncertainty Avoidance
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Anc., pre-1500)	10.78***	-7.64*	-11.69	7.19	-8.17	3.25
	(3.27)	(4.00)	(7.09)	(6.36)	(6.43)	(5.97)
Crop Yield Ch. (Anc., post-1500)	9.03***	-0.53	-3.05	2.50	-1.51	-0.39
	(2.16)	(3.48)	(2.62)	(2.18)	(2.23)	(2.21)
Crop Growth Cycle (Anc., pre-1500)	-8.32**	0.48	3.06	-3.47	4.87	5.65
	(3.82)	(4.83)	(5.32)	(5.71)	(5.77)	(6.02)
Crop Growth Cycle Ch. (Anc., post-1500)	-0.77	1.96	-3.72	-0.89	3.00	-0.05
	(1.60)	(2.09)	(3.18)	(2.90)	(2.51)	(3.24)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes
Agr. Suitability & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.46	0.68	0.39	0.46	0.60
Observations	85	83	60	60	60	60

Notes: This table analyzes the relation between various societal preferences and cultural indices and pre-1500CE potential crop yield, growth cycle and their changes in the post-1500CE period as experienced by the country's ancestral populations. All columns account for continental fixed effects, geographical controls, and the land suitability and the timing of transition to agriculture experienced by the ancestral populations of the country. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

4.3.3 Risk, Trade and Other Potential Channels

This subsection demonstrates that the effect of crop yield on Long-Term Orientation is robust to a large set of alternative theories and confounding factors (Appendix B). In particular, it accounts for the effect of climatic risks, spatial diversification, and trade, on Long-Term Orientation.

First, accounting for proxies of the extent of trade has no qualitative effect on the analysis. In particular, as established in Tables B.42, B.43 and B.44, the inclusion of the existence of pre-industrial medium of exchange and transportation technologies, the location of pre-industrial trade routes, the extent of pre-industrial trade and the area of a country does not alter the effect of crop yield on Long-Term Orientation.

Second, accounting for the climatic risk associated with agricultural investment has no bearing on the result. Agriculture may be a risky investment - a drought or other calamities may affect the actual return to agricultural investment and may capture the effect of crop yield on risk aversion rather than long-term orientation. Nevertheless, accounting for the effect of precipitation volatility, temperature volatility, and the potential for spatial diversification of risk due to precipitation and temperature does not alter the qualitative results (Table B.44). Moreover, these risk factors have no effect on Long-Term Orientation. Furthermore, as established in Table 4, crop yield and growth cycle do not have an effect on Uncertainty Avoidance and Uncertainty Avoidance does not alter the effect of crop yield and growth cycle on Long-Term Orientation.

Third, a large number of additional pre-industrial and contemporary confounding factors that might be correlated with Long-Term Orienation, crop yield, and growth cycles do not have a qualitative effect on the analysis. In particular, as established in Tables B.39, B.40, B.41, B.44, B.45 and B.47, accounting for the structure of languages (Chen, 2013), the availability of the plough (Alesina et al., 2013), income inequality, population's age structure, life-expectancy, and religious composition, does not alter the results. Moreover, the the analysis is robust to the correction of standard errors for spatial autocorrelation (Tables B.22-B.23).

5 Crop Yield and Long-Term Oriented Behavior (2nd-Generation Migrants)

This section analyzes the effect of pre-1500CE crop yield, growth cycle and their changes in the course of the Columbian Exchange on the Long-Term Orientation and long-term oriented behavior of second-generation migrants in Europe and the United States.[27] In particular, it analyses the effect of crop yield on Long-Term Orientation and Saving Behavior as reported in the European Social Survey (ESS),[28] and on smoking behavior (habitual smoker or having ever smoked) as reported in the General Social Survey (GSS).

The analysis of second-generation migrants accounts for time invariant unobserved heterogeneity in the host country (e.g., geographical and institutional characteristics). Moreover, since crop yield in the parental country of origin is distinct from the crop yield in the country of residence, the estimated effect of crop yield in the country of origin captures the culturally embodied, intergenerationally transmitted effect of crop yield on long-term orientation, rather than the direct effect of geography.

5.1 Crop Yield and Long-Term Orientation

This subsection analyzes the effect of pre-1500CE crop yield, growth cycle and their changes in the course of the Columbian Exchange on the Long-Term Orientation of second-generation migrants in

[27]The sample of second-generation migrants is composed of all respondents who were born in the country where the interview was conducted, and at least one of their parents was not born in that country. The inclusion of individuals with at least one foreign born parent, irrespective of which parent it is, might lower the estimated effect of the culturally embodied and intergenerationally transmitted effect of crop yield, but increases the sample size nearly fivefold. As established below and in Appendix B.14, the results are robust to constraining the sample to individuals whose parents are both foreign born (either in the same or different country).

[28]The measure of Long-Term Orientation used in this section is based on the answer to the question "Do you generally plan for your future or do you just take each day as it comes?". The original answers were renormalized so that Long-Term Orientation is measured between 0 (short term-orientation) and 100 (Long-Term Orientation). Saving Behavior is based on the answer to the question "Please think about all types of savings such as bank accounts, investments, private and company pensions as well as property. Are you currently saving or have you saved in the past specifically in order to live comfortably in your old age?". Original answers have been recoded so that "Yes=1" and "No=0".

Europe. The effect of potential crop yield on Long-Term Orientation is estimated via ordinary least squares (OLS).

$$LTO_{ic} = \beta_0 + \beta_1^{1500}\text{yield}_{ip} + \beta_1^{ch}\Delta\text{yield}_{ip} + \beta_2^{1500}\text{growth cycle}_{ip} + \beta_2^{ch}\Delta\text{growth cycle}_{ip} + \sum_j \gamma_{0j}X_{ipj} + \gamma_1\text{YST}_{ip} + \sum_j \gamma_{2j}Y_{ij} + \sum_c \gamma_c\delta_{ic} + \epsilon_i, \quad (18)$$

where LTO_{ic} is the Long-Term Orientation of second-generation migrant i in country c, yield_{ip}, Δyield_{ip}, growth cycle_{ip} and $\Delta\text{growth cycle}_{ip}$ are measured in the country of origin of parent p of individual i, X_{ipj} is geographical characteristic j of the country of origin of parent p of individual i, YST_{ip} are the years since the country of origin of parent p of individual i transitioned to agriculture, Y_{ij} is characteristic j of individual i (sex, age, education, marital status, health status, religiosity),[29] δ_{ic} is the country of birth fixed effect of individual i, and ϵ_i is the error term. The theory predicts a positive effect of pre-1500 crop yield and its change on Long-Term Orientation (i.e. $\beta_1^{1500} > 0$ and $\beta_1^{ch} > 0$).

Table 5: Crop Yield, Growth Cycle, and Long-Term Orientation of Second-Generation Migrants

	Long-Term Orientation							
	Either Parent		Mother		Father		Both	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Ancestors, pre-1500)	2.29***	2.61***	2.99***	3.44***	2.70**	3.34***	5.63**	6.11**
	(0.80)	(0.97)	(1.10)	(1.30)	(1.04)	(1.13)	(2.43)	(2.54)
Crop Yield Change (post-1500)	0.52	0.65	0.32	0.87	0.57	0.52	1.83	2.15
	(0.65)	(0.61)	(0.71)	(0.77)	(0.85)	(0.89)	(1.29)	(1.76)
Crop Growth Cycle (Ancestors, pre-1500)		-0.82		-1.17		-1.84		-2.07
		(1.00)		(1.56)		(1.32)		(2.54)
Crop Growth Cycle Change (post-1500)		-0.10		-0.92		0.48		-0.07
		(0.63)		(0.68)		(0.78)		(1.33)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.06	0.05	0.05	0.05	0.06	0.06	0.04	0.04
Observations	2584	2584	1596	1596	1686	1686	568	568

Notes: This table establishes that second generation migrant's Long-Term Orientation is positively affected by pre-1500CE crop yield in the parental country of origin. All columns account for country of birth fixed effects, individual characteristics (age, gender, education, religiosity, health status) and geographical controls from the parental country of origin (absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Heteroskedasticity robust standard error estimates clustered at the parental country of origin level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table 5 establishes the positive statistically and economically significant effect of crop yield on Long-Term Orientation.[30] The estimated effect implies that increasing pre-1500CE crop yield in the parental country of origin by one standard deviation increases the Long-Term Orientation of second-

[29]The inclusion of individuals' incomes does not alter the results but reduces the sample size by nearly 50%.

[30]This measure of long-term orientation and the respondent's completed number of years of schooling and total household income are strongly positively correlated (Tables B.66-B.67).

generation migrants between 3 and 6 percentage points. This result accounts for country of birth fixed effects, individual characteristics, and other geographical characteristics of the parental country of origin. Moreover, focusing on individuals who have at least one foreign-born parent (columns 1 and 2), foreign-born mother (columns 3 and 4) or foreign-born father (columns 5 and 6), or whose mother *and* father were born in the same foreign country, does not alter the results. Furthermore, the results are robust to the estimation method (i.e. OLS vs. ordered probit), a wide range of controls, and various weighting schemes (Appendix B.14).

Table 6: Crop Yield, Growth Cycle, and Saving of Second-Generation Migrants

	Saving							
	Either Parent		Mother		Father		Both	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Ancestors, pre-1500)	0.04**	0.06**	0.04*	0.06**	0.05**	0.07**	0.02	0.03
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Crop Yield Change (post-1500)	0.03*	0.04**	0.04***	0.04**	0.02	0.04**	0.08***	0.07**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Crop Growth Cycle (Ancestors, pre-1500)		-0.04		-0.03		-0.05		-0.03
		(0.03)		(0.04)		(0.04)		(0.04)
Crop Growth Cycle Change (post-1500)		-0.01		0.00		-0.02		0.02
		(0.02)		(0.01)		(0.02)		(0.02)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.15	0.15	0.15	0.15	0.15	0.15	0.18	0.18
Observations	2559	2559	1582	1582	1665	1665	562	562

Notes: This table establishes that second generation migrant's saving behavior is positively affected by pre-1500CE crop yield in the parental country of origin. All columns account for country of birth fixed effects, individual characteristics (age, gender, education, religiosity, health status) and geographical controls from the parental country of origin (absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Heteroskedasticity robust standard error estimates clustered at the country of origin of parents level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

5.2 Crop Yield, Growth Cycle, Saving and Smoking

This subsection examines the effect of pre-1500 potential crop yield, growth cycle and their changes on saving and smoking behavior of second-generation migrants, in light of the conjectured positive association between long-term orientation and saving, and the negative association between long-term orientation and smoking.

Table 6 establishes a positive statistically and economically significant effect of pre-1500CE crop yield and its change in the course of the Columbian Exchange on saving behavior of second-generation migrants. In particular, the estimated OLS effect suggests that a one standard deviation increase in pre-1500CE crop yield raises the probability of saving by about 6 percentage points. Similarly, a one standard deviation increase in the change in crop yield in the post-1500CE period raises the probability of saving by about 4 percentage points.

Table 7 establishes a negative statistically and economically significant effect of pre-1500CE crop yield and its change on smoking behavior of second-generation migrants in the US. In particular, it establishes that the probability of being a habitual smoker would have been 4 percentage points lower if pre-1500CE crop yield in the parental country of origin had been one standard deviation higher. Similarly, the probability of having ever smoked decreases by about 8 percentage points if crop yield in the country of parental origin increased by one standard deviation.

Table 7: Crop Yield, Growth Cycle, and Smoking Behavior of Second-Generation Migrants

	Smoking							
	Either Parent						Both	
	Habit					Ever	Habit	Ever
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Ancestors, pre-1500)	-0.02**	-0.02***	-0.02**	-0.03**	-0.04***	-0.08***	-0.05***	-0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)
Crop Yield Change (post-1500)			-0.02**	-0.00	-0.00	0.06	-0.01	-0.02
			(0.01)	(0.01)	(0.02)	(0.04)	(0.03)	(0.03)
Crop Growth Cycle (Ancestors, pre-1500)					0.02	0.04**	0.02	0.10***
					(0.01)	(0.02)	(0.02)	(0.03)
Crop Growth Cycle Change (post-1500)					-0.00	0.00	-0.00	0.04*
					(0.02)	(0.04)	(0.03)	(0.03)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	No	No	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.06	0.07	0.07	0.07	0.07	0.11	0.07	0.15
Observations	1561	1561	1561	1561	1561	935	817	496

Notes: This table establishes that second generation migrant's smoking behavior is positively affected by pre-1500CE crop yield in the parental country of origin. All columns account for country of birth fixed effects, individual characteristics (age, gender, education, religiosity, health status) and geographical controls from the parental country of origin (absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Heteroskedasticity robust standard error estimates clustered at the country of origin of parents level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Thus, as posited by the theory, individuals whose ancestors experienced higher crop yields have higher Long-Term Orientation and exhibit more long-term oriented behavior. Moreover, the focus on second generation migrants suggest that the effect of crop yield is culturally embodied and intergenerationally transmitted.

6 Crop Yield and Long-Term Orientation (Across Individuals and Regions)

6.1 Country-Level Analysis

This section uses the World Values Survey (WVS) to analyze the effect of crop yield and crop growth cycle on: (i) individuals' Long-Term Orientation, and (ii) the share of long-term oriented individuals in a region.[31] Given that the dependent variable in the individual-level analysis is binary, the empirical analysis estimates the effect of crop yield and crop growth cycle using both the linear probability and probit models. In particular, the empirical specification is:

$$\begin{aligned} LTO_{icw} =& \beta_0 + \beta_1^{1500}\text{yield}_c + \beta_1^{ch}\Delta\text{yield}_c + \beta_2^{1500}\text{growth cycle}_c + \beta_2^{ch}\Delta\text{growth cycle}_c \\ &+ \sum_j \gamma_{0j} X_c + \gamma_1 \text{YST}_c + \sum_j \gamma_{2j} Y_{icwj} + \sum_{cw} \gamma_{cw}\delta_{cw} + \epsilon_{icw}, \end{aligned} \tag{19}$$

where $LTO_{icw} \in \{0,1\}$ denotes the Long-Term Orientation of individual i in country c during wave w of the WVS; yield_c and growth cycle_c are the pre-1500 crop measures in country c; Δyield_c and $\Delta\text{growth cycle}_c$ are the change in the crop measures in country c caused by the Columbian Exchange; X_c are other geographical characteristics in country c; YST_c are the years since country c transitioned to agriculture; Y_{icwj} is characteristic j (sex, age, education, income) of individual i in country c during wave w; δ_{cw} is a complete set of continent and wave fixed effects; and ϵ_{icw} is the error term. The theory predicts a positive effect of crop yield and its change on Long-Term Orientation (i.e., $\beta_1^{1500} > 0$ and $\beta_1^{ch} > 0$).

Table 8 establishes the positive statistically and economically significant effect of pre-1500CE crop yield on individuals' Long-Term Orientation. The result is robust to the inclusion of wave and continental fixed effects (column 1), geographical characteristics (column 2), the number of years since transition to agriculture (column 3), and individual's gender, age, income, and education levels (column 4). The estimated effect suggests that a one standard deviation increase in pre-1500CE crop yield increases the probability of having Long-Term Orientation by 3.2 percentage points.

Moreover, the change in crop yield generated by the Columbian Exchange has a positive effect on Long-Term Orientation (column 5). The estimated effect of crop yield and its change on Long-Term Orientation is robust to the inclusion of the crop growth cycle and its change (columns 6). Moreover, accounting for the ancestral composition of the contemporary population (column 7) and constraining the sample to the Old World (column 8) increases the estimated effect of pre-1500CE crop yield: a one standard deviation increase in crop yield increases the probability of having Long-Term Orientation by 4.3 and 6.6 percentage points respectively. Additionally, a one standard deviation increase in the post-1500 change in crop yield increases Long-Term Orientation by 4.1 and 5.5 percentage points respectively. The results based on the ancestral composition of the population further suggest that the effect of crop yield is culturally-embodied and that the crop yield faced by the ancestral populations played a crucial role in the determination of the contemporary level of Long-Term Orientation.[32]

Table 8: Crop Yield, Growth Cycle, and Long-Term Orientation (Country-level Analysis based on WVS)

	Long-Term Orientation (OLS)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.025***	0.040***	0.036***	0.032***	0.032***	0.031***		0.066***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Yield Change (post-1500)					0.053***	0.054***		0.055***
					(0.002)	(0.002)		(0.003)
Crop Growth Cycle (pre-1500)						-0.007**		-0.018***
						(0.003)		(0.003)
Crop Growth Cycle Change (post-1500)						0.025***		0.026***
						(0.002)		(0.002)
Crop Yield (Ancestors, pre-1500)							0.043***	
							(0.002)	
Crop Yield Change (Anc., post-1500)							0.041***	
							(0.002)	
Crop Growth Cycle (Ancestors, pre-1500)							-0.005*	
							(0.003)	
Crop Growth Cycle Change (Anc., post-1500)							0.018***	
							(0.002)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	Yes	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.02	0.02	0.02	0.04	0.04	0.04	0.05	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on individual's Long-Term Orientation. All columns include continental and interview-wave fixed effects. Additional geographical controls are distance to coast or river, and landlocked and island dummies. Individual Characteristics are age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table 9: Crop Yield, Growth Cycle, and Long-Term Orientation (Regional-level Analysis based on WVS)

	Share of Individuals in WVS Region with Long-Term Orientation											
	Whole World										Old World	
	Unweighted				Weighted: Area				Weighted: Area Share		Area	Share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Crop Yield	0.049***	0.046***	0.053***		0.097***		0.032**		0.031**		0.039***	0.032**
	(0.012)	(0.013)	(0.017)		(0.033)		(0.012)		(0.013)		(0.015)	(0.013)
Crop Growth Cycle			-0.010		-0.047**		-0.024**		-0.036***		-0.027***	-0.036***
			(0.012)		(0.021)		(0.010)		(0.009)		(0.009)	(0.008)
Crop Yield (Ancestors)				0.077***		0.133***		0.043**		0.041**		
				(0.020)		(0.032)		(0.017)		(0.017)		
Crop Growth Cycle (Ancestors)				-0.012		-0.050***		-0.027***		-0.037***		
				(0.013)		(0.018)		(0.009)		(0.009)		
Absolute Latitude		-0.015	-0.018	-0.003	-0.017	0.010	-0.047	-0.047	-0.005	-0.006	-0.047	-0.055
		(0.020)	(0.020)	(0.020)	(0.043)	(0.043)	(0.057)	(0.056)	(0.037)	(0.036)	(0.063)	(0.036)
Mean Elevation		-0.012	-0.012	-0.013	-0.002	-0.014	0.014	0.015	-0.007	-0.006	0.019	-0.008
		(0.013)	(0.013)	(0.013)	(0.026)	(0.027)	(0.024)	(0.024)	(0.005)	(0.005)	(0.032)	(0.008)
Terrain Roughness		0.016	0.018*	0.006	0.019	0.010	-0.020	-0.021	0.001	0.000	-0.023	0.006
		(0.010)	(0.011)	(0.011)	(0.023)	(0.025)	(0.031)	(0.031)	(0.010)	(0.010)	(0.039)	(0.015)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Country FE	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	No	No	No	Yes	Yes
Weighted by Region Area	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No
Weighted by Region's Share of Area	No	No	No	No	No	No	No	No	Yes	Yes	No	Yes
Adjusted-R^2	0.22	0.25	0.25	0.28	0.28	0.37	0.72	0.72	0.86	0.86	0.72	0.86
Observations	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1143	1143

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the share of individual's with Long-Term Orientation across regions, accounting of country fixed effects. Additional geographical controls are percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Columns (1)-(4) show the unweighted results; columns (5)-(8) weight observations according to the region's area; columns (9)-(10) weight observations according to the region's area as a share of the country's area; and columns (11)-(12) conduct the analysis for the Old World Sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the regional level and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

6.2 Regional-Level Analysis

This section analyzes the determinants of the average level of Long-Term Orientation across regions. As established in columns (1)-(3) in Table 9 crop yield has a positive statistically and economically significant effect on regional Long-Term Orientation, accounting for continental fixed effects, geographical characteristics, and crop growth cycle. The estimated effect of crop yield implies that a one standard deviation increase in a region's crop yield increases its average Long-Term Orientation by 5.3 percentage points. Column (4) accounts for cross-country migration. Adjusting for the ancestral composition of the population increases the absolute size of the estimated effect. In particular, an increase of one standard deviation in the crop yield experienced by a region's ancestral populations increases its average Long-Term Orientation by 7.7 percentage points.

Columns (5) and (6) weigh regions according to their area in order to account for possible measurement errors caused by internal migration. Indeed, assigning higher weights to regions with larger areas, doubles the coefficient on crop yield and generates a five-fold increase in the coefficient on crop growth cycle. Columns (7) and (8) account for time invariant country level unobservable heterogeneity. While the coefficients fall by more then 50% on both crop yield and crop growth cycle, the effect of both variables remains statistically and economically significant. Columns (9) and (10) weigh regions according to their area's share within the country, and the results are qualitatively unchanged. Finally, columns (11) and (12) establish that the results are unaffected by constraining the sample to the Old World.[33]

7 Additional Predictions and Evidence

7.1 Crop Yield, Growth Cycle and Technological Adoption

This subsection explores the reduced form effect of crop yield and growth cycle on technological adoption. In light of the plausible association between long-term orientation and technological adoption, the theory suggests that regions characterized by higher crop yield would be more technologically advanced. Using ethnic level data from the Standard Cross Cultural Sample (Murdock and White, 1969), Table 10 establishes that societies whose ancestral populations were exposed to higher crop yields and shorter growth cycles in the pre-1500 era, and those that were exposed to larger increases in yields and decreases in growth cycles in the post-1500 era, had a higher probability of adopting major technological innovations.[34] While the positive association between crop yield and technological adoption may capture partly the effect of economic development, the adverse effect of crop

[31]The measure of Long-Term Orientation is based on the following question in the WVS: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?" An individual is considered to have Long-Term Orientation if she answered "Thrift, saving money and things".

[32]Estimating a probit model does not alter the results (Table B.74). Similarly, the results are not affected by the inclusion of only those cells that changed crops in the post-1500CE era, or by various weighting schemes (Appendix B.15).

[33]Similar results are obtained using the pre-1500CE crop yield and growth cycle and their changes (Table B.88). Also, individual-level analysis and other robustness tests are performed in Appendix B.15.

[34]Table 10 is based on the Probit regression model. Qualitatively similar results are obtained using a linear probability model (Table B.89).

growth cycle on the adoption of technologies appears orthogonal to the development process and is consistent with the proposed theory. Moreover, pre-1500CE crop yield, growth cycle and their changes have qualitatively similar effects on the number of technologies adopted by these ethnic groups (Table B.90-B.91).

Furthermore, some prominent production processes that are notorious for their lengthy production cycles appear to be located in regions that are characterized by high potential yield. In particular, the Modena and Reggio Emilia balsamic Vinegars (production cycles between 12 and 80 years) and the Parmiggiano-Reggiano cheese (production cycles of at least 2 years) provide interesting anecdotal evidence in support of the theory. These products originated and are still produced in the provinces of Parma, Modena, and Reggio Emilia, located in the Italian region of Emilia-Romagna, which has the highest crop yield among all Italian regions (Figure B.11).

Table 10: Crop Yield, Growth Cycle, and Technological Adoption

	Major Technological Changes (Probit)					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (pre-1500)	0.10**	0.13**	0.15***	0.17**	0.30***	0.29***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)
Crop Yield Ch. (post-1500)			0.06	0.09*	0.16***	0.21***
			(0.05)	(0.05)	(0.04)	(0.06)
Crop Cycle (pre-1500)				-0.13	-0.22***	-0.21**
				(0.08)	(0.08)	(0.09)
Crop Growth Cycle Ch. (post-1500)				-0.12*	-0.23***	-0.19***
				(0.06)	(0.06)	(0.07)
Geographical Controls	No	Yes	Yes	Yes	Yes	Yes
Language Family FE	No	No	No	No	Yes	Yes
Continental FE	No	No	No	No	No	Yes
Pseudo-R^2	0.04	0.13	0.15	0.18	0.43	0.45
Observations	86	86	86	86	86	86

Notes: This table establishes the effect of pre-1500CE crop yield, growth cycle and their changes on technological progress as reflected in the adoption of industrialization, factories, mining, large machinery, etc.. The table reports the average marginal effects of Probit regressions. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Geographical controls include absolute latitude, mean elevation, terrain ruggedness, pre-industrial mobility and agricultural suitability. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

7.2 Crop Yield, Growth Cycle and Population Density

This subsection examines the conjectured effect of crop yield and growth cycle on reproductive success and thus on population density. In particular, the theory suggests that during the Malthusian era individuals with higher Long-Term Orientation had higher reproductive success. Thus, regions characterized by a larger share of individuals with higher Long-Term Orientation would be expected to have higher population density. Consistent with this prediction, Table B.52 establishes that higher crop yield is associated with higher population density in the year 1500. It should be noted that in the post-demographic transition era when reproductive success is no longer correlated with income, the association between Long-Term Orientation and population density will vanish. Instead, Long-Term Orientation would be expected to be correlated with the education of children rather than their number. Indeed, as established in table B.53 education is positively correlated with crop yield in the contemporary period.

8 Concluding Remarks

This research explores the role of evolutionary processes in the emergence and persistence of cultural traits across countries and regions. It advances the hypothesis and establishes empirically that geographical variations in the natural return to agricultural investment have had a persistent effect on the distribution of time preference across societies, highlighting the role of the forces of natural selection and cultural evolution in the propagation of this trait over time. The methodology advanced in this research could be exploited to shed light on the geographical origins of the contemporary distribution of human traits (e.g., risk aversion, cooperation, trust, entrepreneurship, individualism) and their pivotal role in comparative economic development. In particular, the identification of the importance of evolutionary processes in linking initial geographical conditions and contemporary economic outcomes provides a novel angle that can be further exploited in future research to explore the mechanisms through which historical factors have affected differentially the development process across the globe.

Furthermore, the identification of the deep roots of the contemporary distribution of time preference across the globe provides an essential ingredient in the long-standing quest for understanding and quantifying the effect of time preference on comparative economic development. In particular, the agricultural origins of time preference permit the exploration of the reduced form effect of a determinant of long-term orientation on human behavior ranging from human capital formation and saving to smoking and sexual promiscuity.

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Appendix (Online Publication Only)

A Suplemental Material

Table A.1: Caloric content of 48 crops (and their variants)

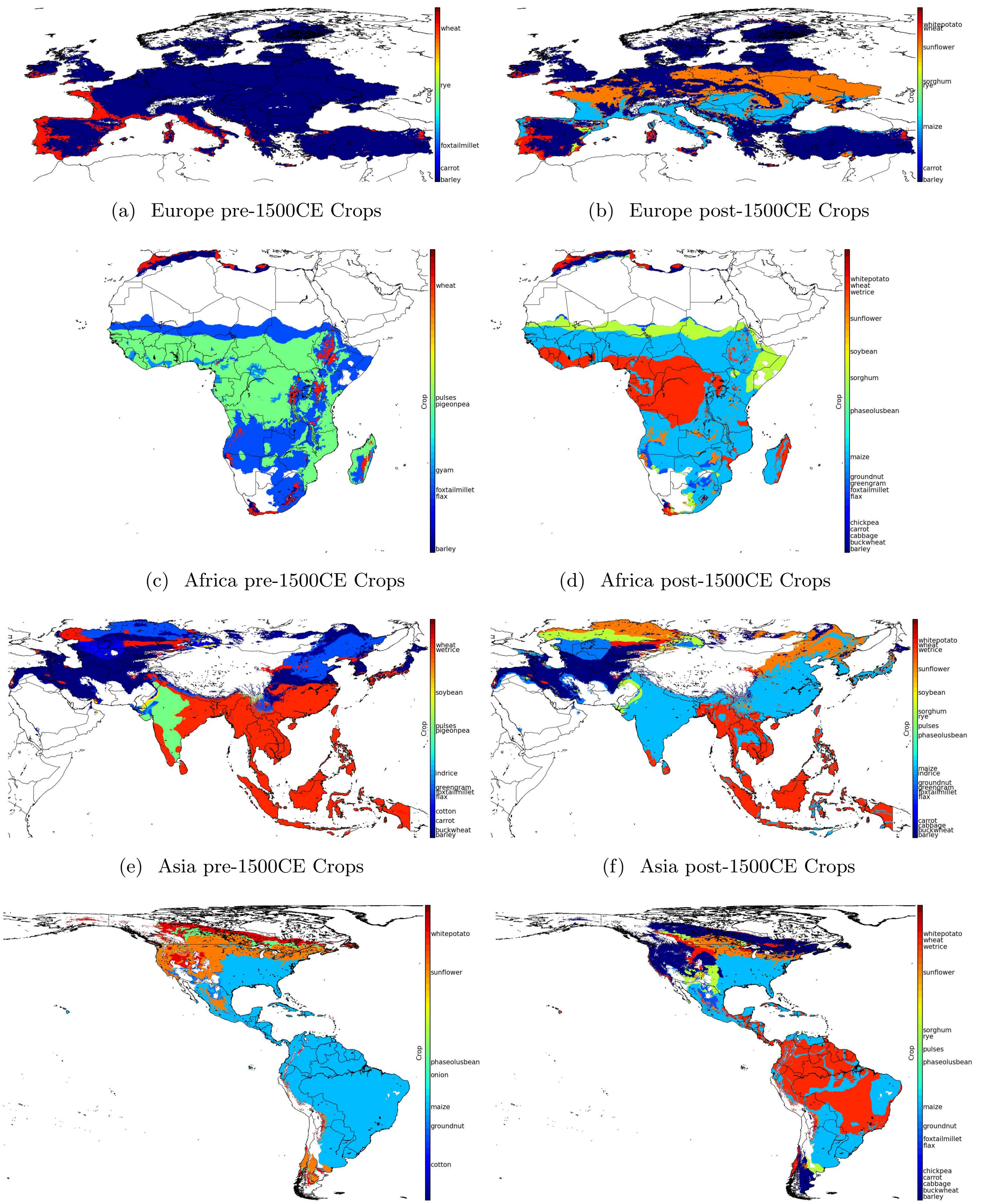
Crop	Energy†	Crop	Energy†
Alfalfa	0.23	Palm Heart	1.15
Banana	0.89	Pearl Millet	3.78
Barley	3.52	Phaseolus Bean	3.41
Buckwheat	3.43	Pigeon Pea	3.43
Cabbage	0.25	Rye	3.38
Cacao	5.98	Sorghum	3.39
Carrot	0.41	Soybean	4.46
Cassava	1.6	Sunflower	5.84
Chick Pea	3.64	Sweet Potato	0.86
Citrus	0.47	Tea	0.01
Coconut	3.54	Tomato	0.18
Coffee	0.01	Wetland Rice	3.7
Cotton	5.06	Wheat	3.42
Cowpea	1.17	Wheat Hard Red Spring	3.29
Dry Pea	0.81	Wheat Hard Red Winter	3.27
Flax	5.34	Wheat Hard White	3.42
Foxtail Millet	3.78	Wheat Soft Red Winter	3.31
Greengram	3.47	Wheat Soft White	3.4
Groundnuts	5.67	White Potato	0.77
Indigo Rice	3.7	Yams	1.18
Maize	3.65	Giant Yams	1.18
Oat	2.46	Sorghum (Subtropical)	3.39
Oilpalm	8.84	Sorghum (Tropical Highland)	3.39
Olive	1.45	Sorghum (Tropical Lowland)	3.39
Onion	0.4	White Yams	1.18

Source: USDA Nutrient Database for Standard Reference (R25). † kilo calories per 1g.

Table A.2: Continental Distribution of 48 crops (and their variants) pre-1500CE

Crop	Continent	Crop	Continent
Alfalfa	Asia, Europe	Palm Heart	North Africa, Subsahara
Banana	Asia, Oceania, North Africa	Pearl Millet	Asia, North Africa, Subsahara
Barley	Asia, Europe, North Africa	Phaseolus Bean	America
Buckwheat	Asia	Pigeon Pea	Asia, Subsahara
Cabbage	Europe	Rye	Europe
Cacao	America	Sorghum	North Africa, Subsahara
Carrot	Asia, Europe	Soybean	Asia
Cassava	America	Sunflower	America
Chick Pea	Europe	Sweet Potato	America
Citrus	Asia, Europe	Tea	Asia
Coconut	America, Oceania	Tomato	America
Coffee	North Africa	Wetland Rice	Asia, Subsahara
Cotton	America, Asia, Europe, North Africa, Subsahara	Wheat	Asia, Europe, North Africa
Cowpea	Asia, North Africa, Subsahara	Wheat Hard Red Spring	Asia, Europe, North Africa
Dry Pea	Europe, North Africa	Wheat Hard Red Winter	Asia, Europe, North Africa
Flax	Asia, Europe, North Africa	Wheat Hard White	Asia, Europe, North Africa
Foxtail Millet	Asia, Europe, North Africa	Wheat Soft Red Winter	Asia, Europe, North Africa
Greengram	Asia, Subsahara	Wheat Soft White	Asia, Europe, North Africa
Groundnuts	America	White Potato	America
Indigo Rice	Asia, Subsahara	Yams	Asia, Subsahara
Maize	America	Giant Yams	Asia, Subsahara
Oat	Europe, North Africa	Sorghum (Subtropical)	North Africa, Subsahara
Oilpalm	North Africa, Subsahara	Sorghum (Tropical Highland)	North Africa, Subsahara
Olive	Europe, North Africa	Sorghum (Tropical Lowland)	North Africa, Subsahara
Onion	America, Asia, Europe, North Africa, Subsahara, Oceania	White Yams	North Africa, Subsahara

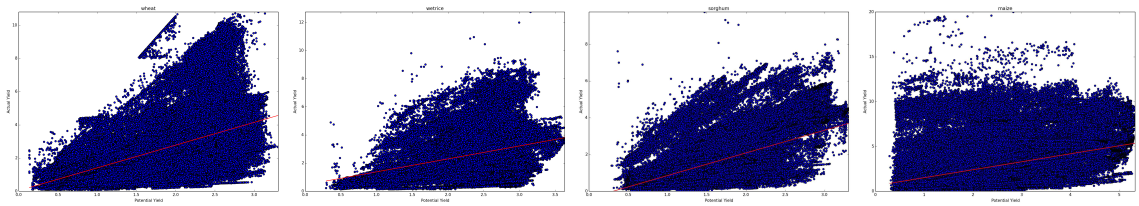
Notes: Taken from various sources, including Crosby (1972) and Diamond (1997).



(a) Europe pre-1500CE Crops
(b) Europe post-1500CE Crops
(c) Africa pre-1500CE Crops
(d) Africa post-1500CE Crops
(e) Asia pre-1500CE Crops
(f) Asia post-1500CE Crops
(g) America pre-1500CE Crops
(h) America post-1500CE Crops

Figure A.1: Potential Crop by Region and Period.

Figure A.1 shows for each cell in the world the highest yield producing crop in the pre- and the post-1500CE era. It is apparent that: (i) few crops dominated each continent in pre-1500CE era, (ii) in the post-1500 era the number of crops expands dramatically, and (iii) the expansion in available crops changes the highest yield producing crop in most regions of the world.[35]



(a) Wheat (b) Wetland Rice (c) Sorghum (d) Maize

Figure A.2: Correlation between Potential and Actual Crop Yields.

B Additional Results

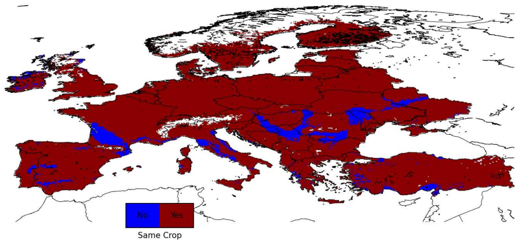
This section presents additional results that were omitted in the main body of the paper. Some of them are referenced there and are presented here in order to avoid unnecessary repetition and due to space limitations.

B.1 Crop Return and Long-Term Orientation

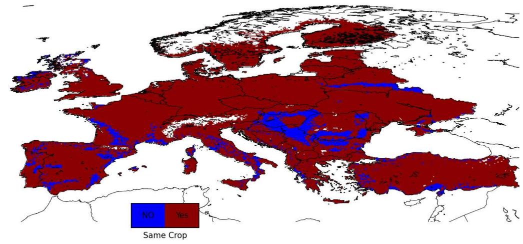
The analysis of section 4 used crop yield as the main independent variable. This captured the insight from the model and directly identified the effect of yield on preferences. But individuals' preferences might have instead reacted to the crop return per day, where the return is given by the ratio of crop yield to crop growth cycle. Figure B.3 shows the cells where the same potential crop generates the highest total yield or highest return. Reassuringly, most cells in the world are allocated the same crop if choosing highest yield or highest return.

Table B.3 replicates the analysis of Table 1, but uses the potential return generated by the crop with highest yield as the the main independent variable. Reassuringly, the qualitative results remain unchanged. Moreover, as established in Tables B.4 and B.5, the results are robust to using the yield or return of the crop that generates the highest return in each cell.

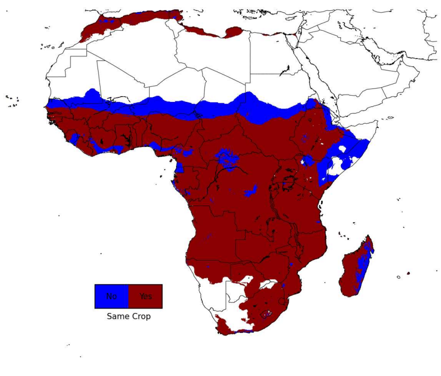
[35] Figure B.5 in the appendix depicts the cells that changed crop for each continent. Figure B.4 shows the set of dominating crops and the cells where the dominating crop changed after the Columbian Exchange. Additionally, Figure B.3 shows that selecting the highest yielding or highest return crop generates similar crop selection.



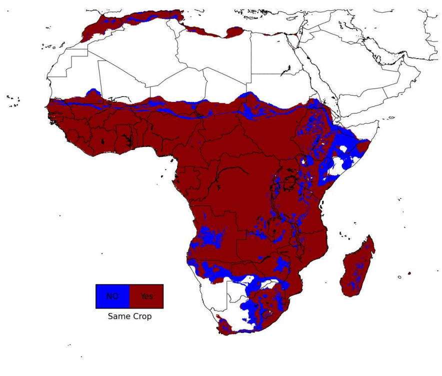
(a) Europe pre-1500CE Crops



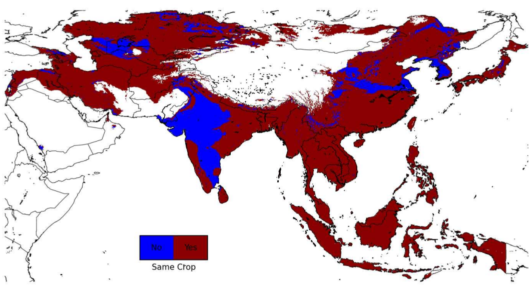
(b) Europe post-1500CE Crops



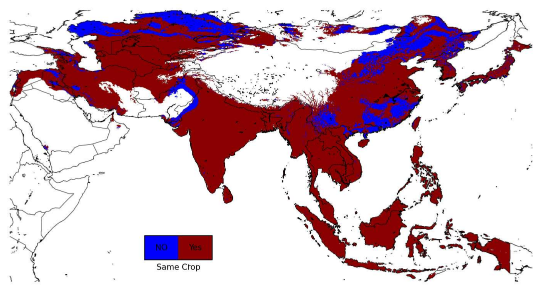
(c) Africa pre-1500CE Crops



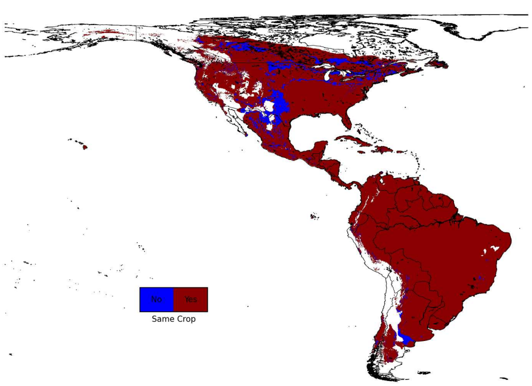
(d) Africa post-1500CE Crops



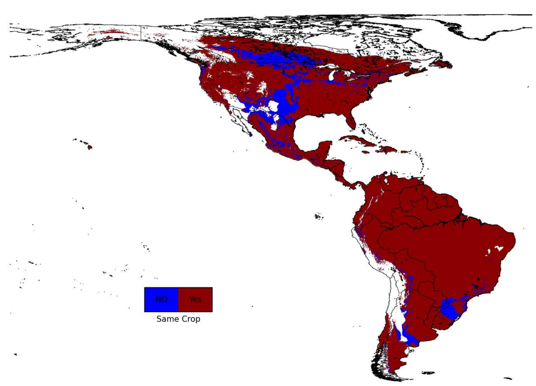
(e) Asia pre-1500CE Crops



(f) Asia post-1500CE Crops



(g) America pre-1500CE Crops



(h) America post-1500CE Crops

Figure B.3: Same Crop Selection under Daily Return and Total Yield .

Table B.3: Potential Daily Crop Return, Crop Growth Cycle, and Long-Term Orientation (Hofstede)

	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Daily Crop Return	5.71**	9.40***	8.39***	7.00***			10.83***	9.28***
	(2.39)	(2.57)	(2.44)	(2.59)			(2.69)	(2.82)
Crop Growth Cycle				4.04				4.57
				(3.58)				(3.85)
Daily Crop Return (Ancestors)					9.00***	7.57***		
					(2.41)	(2.63)		
Crop Growth Cycle (Ancestors)						4.23		
						(3.79)		
Absolute latitude		3.07	2.07	3.32	2.58	4.08	3.40	5.22
		(4.10)	(3.82)	(4.32)	(3.78)	(4.24)	(4.59)	(5.31)
Mean elevation		6.44*	7.19**	6.39*	6.78*	6.07*	5.98	5.32
		(3.38)	(3.47)	(3.42)	(3.42)	(3.26)	(4.11)	(3.84)
Terrain Roughness		-6.66**	-6.09**	-6.10**	-7.05**	-7.08**	-6.15*	-6.46*
		(2.67)	(2.94)	(2.95)	(3.01)	(3.01)	(3.31)	(3.26)
Neolithic Transition Timing			-6.13*	-6.83**			-5.14*	-5.78*
			(3.11)	(3.18)			(2.93)	(2.94)
Neolithic Transition Timing (Ancestors)					-4.87*	-5.41**		
					(2.62)	(2.66)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.51	0.58	0.59	0.60	0.59	0.60	0.55	0.56
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes the positive, statistically, and economically significant effect of a country's potential crop return, measured in calories per hectare per day, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's potential crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. In particular, columns (1)-(3) show the effect of crop yield after controlling for the country's absolute latitude, mean elevation above sea level, terrain roughness, distance to a coast or river, of it being landlocked or an island, and the time since it transitioned to agriculture. Columns (4)-(6) show that the effect remains after controlling for crop growth cycle and the effects of migration. Columns (7)-(8) show that restraining the analysis to the Old World, where intercontinental migration played a smaller role, does not alter the results. Additional geographical controls include distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.4: Potential Crop Yield, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Long-Term Orientation					
	Highest Yield			Highest Return		
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Anc.)	8.20***	11.58***	13.31***	5.32**	9.56***	8.61***
	(2.44)	(2.15)	(2.94)	(2.52)	(2.44)	(3.17)
Crop Growth Cycle (Anc.)			-3.15			1.86
			(3.52)			(4.36)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	No	Yes	Yes
Neolithic	No	Yes	Yes	No	Yes	Yes
Adjusted-R^2	0.56	0.66	0.66	0.51	0.61	0.60
Observations	87	87	87	87	87	87

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential crop yield on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the yield and growth cycle of the crop that generates the highest yield or the highest return generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.5: Potential Crop Return, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Long-Term Orientation					
	Highest Yield			Highest Return		
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Return (Anc.)	5.39**	9.00***	7.57***	9.35***	11.49***	10.36***
	(2.44)	(2.41)	(2.63)	(2.34)	(2.31)	(2.60)
Crop Growth Cycle (Anc.)			4.23			3.06
			(3.79)			(3.50)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	No	Yes	Yes
Neolithic	No	Yes	Yes	No	Yes	Yes
Adjusted-R^2	0.51	0.59	0.60	0.57	0.65	0.65
Observations	87	87	87	87	87	87

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential crop return on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the return of the crop that generates the highest yield or the highest return generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.6: Potential Crop Yield, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Highest Yield				Highest Return			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Anc., pre-1500)	6.11***	8.94***	8.62***	10.56***	3.89*	7.34***	6.73***	10.02***
	(2.28)	(2.36)	(2.01)	(2.35)	(2.32)	(2.44)	(2.29)	(3.22)
Crop Yield Change (Anc., post-1500)			8.03***	9.86***			6.49***	-1.27
			(2.03)	(2.28)			(2.18)	(3.03)
Crop Growth Cycle (Anc., pre-1500)				-7.74**				-2.00
				(3.80)				(2.98)
Crop Growth Cycle Ch. (Anc., post-1500)				3.82**				8.65***
				(1.83)				(3.07)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Neolithic	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adjusted-R^2	0.52	0.59	0.66	0.68	0.49	0.56	0.61	0.63
Observations	87	87	87	87	87	87	87	87

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential crop yield on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the yield and growth cycle of the crop that generates the highest yield or the highest return generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.7: Potential Crop Return, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Long-Term Orientation							
	Whole World					Old World		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. Crop Yield	8.72***	11.33***	10.83***	12.00***			12.52***	15.50***
	(2.59)	(2.75)	(2.47)	(3.56)			(2.59)	(3.98)
Avg. Crop Growth Cycle				-2.96				-7.07
				(5.85)				(6.65)
Avg. Crop Yield (Anc.)					11.96***	14.55***		
					(2.42)	(3.30)		
Avg. Crop Growth Cycle (Anc.)						-6.52		
						(5.06)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.55	0.61	0.64	0.63	0.65	0.66	0.60	0.60
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential average crop yield on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the average yield and growth cycle across all crops generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.8: Potential Crop Return, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. Crop Return (post-1500)	10.17***	12.57***	11.68***	10.91***			13.59***	13.59***
	(2.60)	(2.81)	(2.58)	(3.04)			(2.74)	(3.42)
Avg. Crop Growth Cycle (post-1500)				1.69				-0.01
				(3.41)				(3.88)
Avg. Crop Return (Anc., post-1500)					12.47***	12.43***		
					(2.55)	(2.82)		
Avg. Crop Growth Cycle (Anc., post-1500)						0.09		
						(2.74)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.58	0.62	0.64	0.64	0.66	0.65	0.61	0.60
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential average crop return on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the average return and growth cycle across all crops generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.9: Pre-1500CE Potential Crop Return, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. Crop Yield (pre-1500)	8.33***	9.00***	10.83***	12.06***			14.68***	17.83***
	(2.80)	(2.67)	(2.47)	(3.62)			(3.18)	(4.36)
Avg. Crop Yield Change (post-1500)		5.20*	7.83***	8.44***			1.96	2.03
		(2.66)	(2.64)	(3.01)			(4.72)	(5.28)
Avg. Crop Growth Cycle (pre-1500)				-2.20				-4.71
				(4.72)				(5.05)
Avg. Crop Growth Cycle Change (post-1500)				-0.19				2.43
				(2.91)				(4.02)
Avg. Crop Yield (Anc., pre-1500)					10.90***	13.33***		
					(2.56)	(3.26)		
Avg. Crop Yield Change (Anc., post-1500)					4.65*	5.73*		
					(2.55)	(2.88)		
Avg. Crop Growth Cycle (Anc., pre-1500)						-4.68		
						(3.57)		
Avg. Crop Growth Cycle Change (Anc., post-1500)						-0.12		
						(2.03)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.54	0.55	0.64	0.63	0.65	0.65	0.60	0.60
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential average crop yield on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the average yield and growth cycle across all crops generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.10: Pre-1500CE Potential Crop Return, Growth Cycle and Time Preference (Robustness to Crop Choice)

	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. Crop Return (pre-1500)	10.26***	11.79***	13.33***	12.74***			16.88***	16.97***
	(3.01)	(3.00)	(2.95)	(3.55)			(3.35)	(3.88)
Avg. Crop Return Change (post-1500)		7.08**	8.28***	8.18**			2.64	2.11
		(2.79)	(2.74)	(3.09)			(5.12)	(5.46)
Avg. Crop Growth Cycle (pre-1500)				1.66				0.68
				(3.90)				(4.01)
Avg. Crop Growth Cycle Change (post-1500)				1.88				4.83
				(2.90)				(3.70)
Avg. Crop Return (Anc., pre-1500)					13.48***	13.56***		
					(2.91)	(3.15)		
Avg. Crop Return Change (Anc., post-1500)					5.39**	6.24**		
					(2.58)	(2.99)		
Avg. Crop Growth Cycle (Anc., pre-1500)						-0.38		
						(2.93)		
Avg. Crop Growth Cycle Change (Anc., post-1500)						1.79		
						(2.05)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.56	0.57	0.64	0.63	0.65	0.65	0.60	0.60
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes robustness of the positive, statistically, and economically significant effect of a country's potential average crop return on its level of Long-Term Orientation to the crop choice used in the computations. In particular, it establishes that using the average return and growth cycle across all crops generates similar results. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.2 The Natural Experiment generated by the Columbian Exchange

The analysis in the main body of the paper exploits the natural experiment generated by the Columbian Exchange in order to overcome the potential issues of selection of high long-term orientation individuals into high yield areas, of possible omitted variable bias, and in order to differentiate the historical and contemporaneous effects of geography. This section further explains and delves into the analysis of the natural experiment.

The natural experiment is based on the expansion of available crops and the changes in potential yields and growth cycles generated by the Columbian Exchange (Crosby, 1972). In particular, table A.2 shows for the 48 crops in the GAEZ/FAO data set, which ones were known in each region of the world before 1500CE (Crosby, 1972; Diamond, 1997). After 1500CE all crops became known in all regions, and thus, all 48 crops could potentially be adopted into agricultural production.[36] Figure B.5 shows all cells in the world where this expansion in crops generated a potential change in the crop yielding the maximum potential number of calories according to agro-climatic conditions. As in the initial analysis, the allocation of crops and changes in yield and growth cycles is based on agro-climatic potentials, and are thus orthogonal to any human intervention. So, the expansion in crops and the changes in yields and growth cycles should be seen as an "intention-to-treat" (Dunning, 2012), since even if new crops could potentially be used, in reality they might not have been. Hence, the natural experiment generated by the Columbian Exchange generated a random allocation of new crops, with different potential yields and growth cycles to all regions in the world.

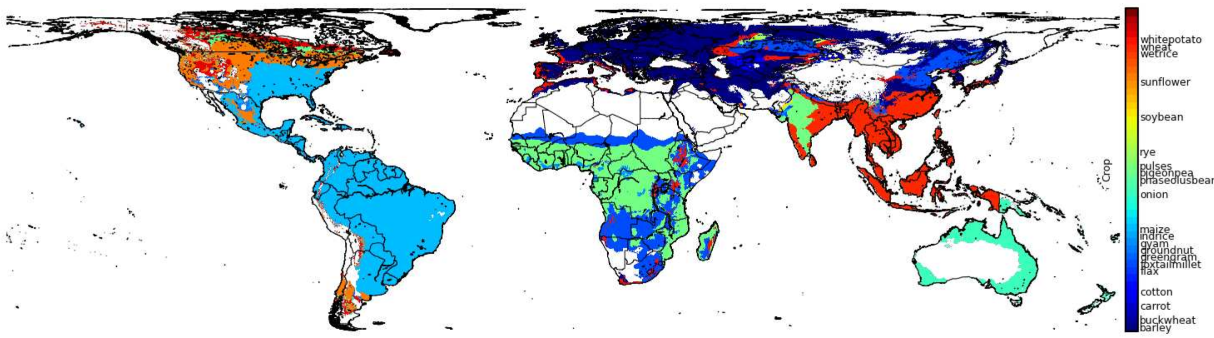
Notice that by construction, the change in potential crops, their yields and growth cycles generated by the Columbian Exchange is orthogonal to the characteristics of the individuals inhabiting any region in the world. Still, it is not immediate that these changes are not correlated with other characteristics of a region. Clearly, if a region is "treated" with a new crop that generates higher potential yields, the change in yields and growth cycles depends on their values pre-1500CE. It is to be expected that conditional on being treated, a region's change in yield and growth cycle will be larger the lower the pre-1500CE yield and the longer the growth cycle are. Tables B.11-B.16 show the correlation between the change in potential yield and growth cycles and a large list of geographical characteristics. As can be seen there, and as should be expected, pre-1500CE crop yield and growth cycle are strongly correlated with the changes, while reassuringly other geographical characteristics are not. These results hold for the sample of countries analyzed in the main body of the text, are even stronger for the subsample that excludes Africa, and even hold for the full sample of countries for which all geographical controls are available. This suggests, that selection on observables does not seem to drive the results in the text. In particular, exploiting the lack of a statistically significant correlation between the changes in yields and growth cycles with other geographical characteristics in the subsample that excludes Africa, table B.25 in the next section shows that using this subsample does not alter the results.

These results suggest that it is unlikely that other omitted regional characteristics are biasing the results. In fact, table B.17 follows Altonji et al. (2005), Bellows and Miguel (2009), and Oster (2014) to analyze the possibility of bias generated by selection on unobservables. The results shown in the table imply that the selection on unobservables would have to be 2 or more times stronger than selection on observables in order to explain the results in the paper. Furthermore, even following Oster (2014) and assuming that unobservables are equally strongly correlated as observables, and that all the variation in Long-Term Orientation can be explained, the estimated coefficient on the change of crop yield remains strictly positive and economically significant.

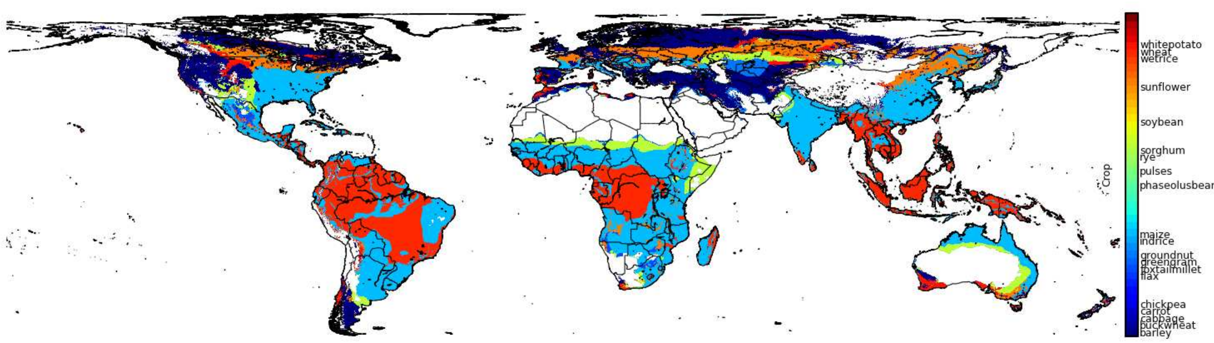
Thus, the natural experiment overcomes any possible concerns generated by the selection of high long-term orientation individuals into regions that generated higher yields. Additionally, it suggests

[36] In fact, as Crosby (1972) shows, many of the crops were quickly transplanted between the Old and New Worlds.

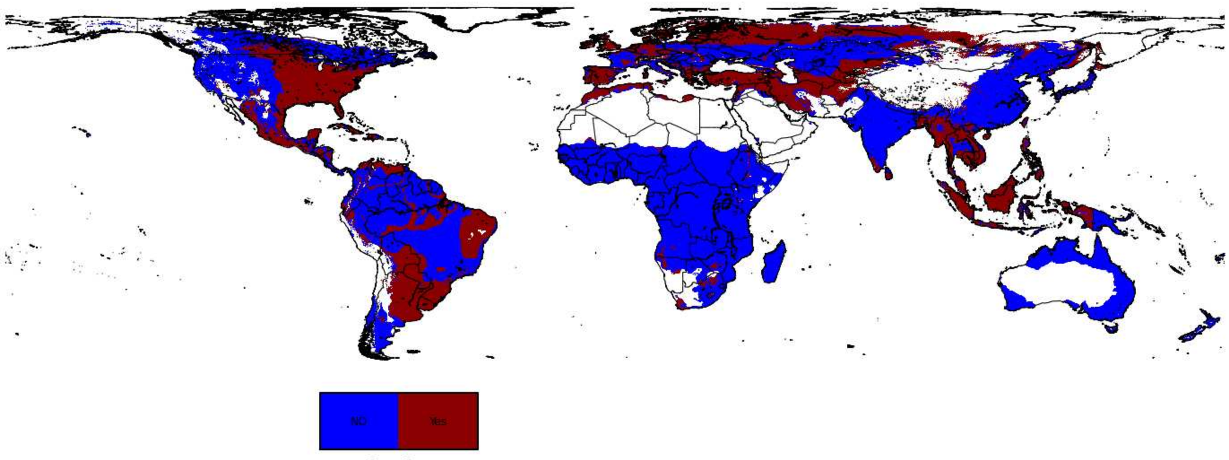
that neither selection on observables nor unobservables drive the results of the paper, overcoming any possible concerns due to possible omitted variables. Furthermore, since the changes in yields and growth cycles are orthogonal to regions' invariant geographical characteristics, their effect does not capture the effect of these invariant factors on long-term orientation. Finally, the change in crop post-1500 allows the analysis to differentiate the effect of historical crop yield from any contemporary effect it might have due to its correlation with other geographical characteristics.



(a) World pre-1500CE Crops

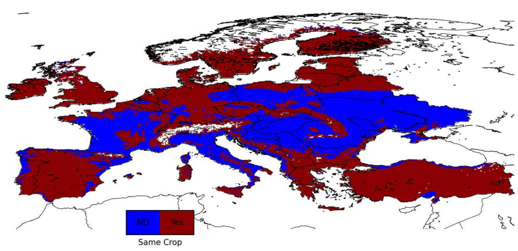


(b) World post-1500CE Crops

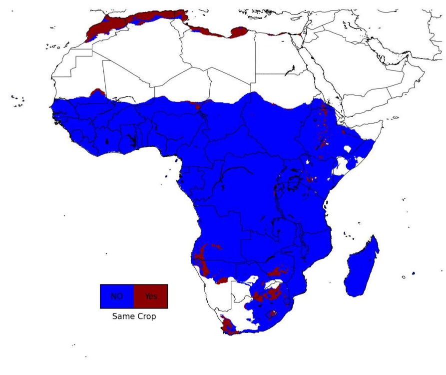


(c) Same Crop pre- and post1500CE

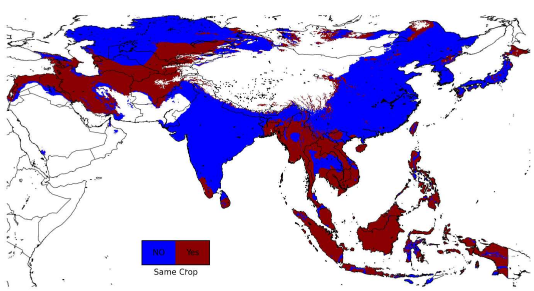
Figure B.4: Potential Crop pre- and post-1500CE.



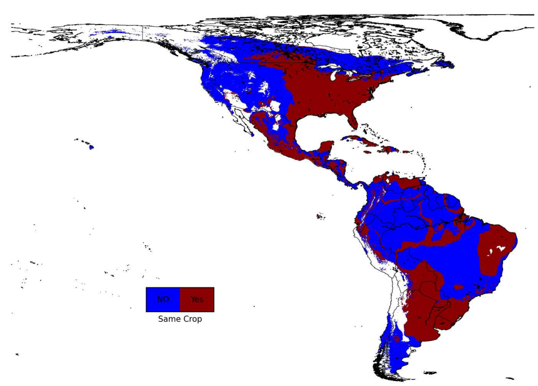
(a) Europe



(b) Africa



(c) Asia



(d) America

Figure B.5: Change in Potential Crop after Columbian Exchange.

Table B.11: Changes in Crop Yield and Growth Cycle and their Correlates

	Change Yield					Change Growth Cycle				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (pre-1500)	-0.41*	-0.80***	-0.34*	-0.82***	-0.46**	0.95	1.99*	2.44	2.57	2.87
	(0.21)	(0.17)	(0.19)	(0.19)	(0.21)	(0.96)	(1.16)	(1.56)	(1.71)	(2.04)
Crop Growth Cycle (pre-1500)		1.18***	0.61**	1.18***	0.79**		-3.15*	-3.09	-4.84**	-4.01
		(0.21)	(0.25)	(0.30)	(0.32)		(1.73)	(2.22)	(1.96)	(2.97)
Absolute Latitude				-0.67	-0.47				-5.58	-8.52*
				(0.61)	(0.51)				(4.31)	(5.07)
Mean Elevation				0.12	-0.18				4.64	3.48
				(0.32)	(0.34)				(2.82)	(2.86)
Terrain Roughness				-0.19	0.07				-0.98	-0.68
				(0.21)	(0.21)				(1.44)	(1.37)
Distance to Coast or River				0.05	-0.01				-0.64	-0.76
				(0.15)	(0.12)				(1.25)	(1.29)
Landlocked				0.10	-0.06				-1.85	-2.29
				(0.12)	(0.11)				(1.18)	(1.49)
Island				-0.01	-0.20				1.17	1.16
				(0.22)	(0.18)				(0.88)	(1.05)
Pct. Land in Tropics				-1.37**	-1.08**				-6.79	-6.60
				(0.52)	(0.46)				(4.63)	(4.31)
Pct. Land in Temperate Zone				0.31	0.13				4.21	2.78
				(0.29)	(0.29)				(2.70)	(2.82)
Pct. Land in Tropics and Subtropics				1.60***	1.09*				4.46	3.84
				(0.57)	(0.62)				(4.16)	(4.44)
Precipitation				-0.24	-0.15				0.18	-0.39
				(0.25)	(0.28)				(1.60)	(2.49)
Temperature				-0.41	-0.50				-0.30	-3.62
				(0.46)	(0.50)				(3.82)	(4.95)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	0.05	0.33	0.61	0.46	0.63	-0.00	0.05	0.03	0.19	0.16
Observations	87	87	87	87	87	87	87	87	87	87

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.12: Changes in Crop Yield and Growth Cycle and their Correlates (Ancestors)

	Change Yield (Anc.)					Change Growth Cycle (Anc.)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (Ancestors, pre-1500)	-0.05	-0.29**	-0.17	-0.26*	-0.28*	0.16	0.26*	0.36*	0.35	0.31
	(0.13)	(0.14)	(0.14)	(0.15)	(0.15)	(0.12)	(0.16)	(0.18)	(0.25)	(0.28)
Crop Growth Cycle (Ancestors, pre-1500)		0.77***	0.56***	0.59***	0.69***		-0.32	-0.36	-0.54**	-0.40
		(0.19)	(0.19)	(0.20)	(0.24)		(0.24)	(0.26)	(0.26)	(0.36)
Absolute Latitude				-0.74*	-0.74*				-1.00*	-1.24**
				(0.40)	(0.42)				(0.52)	(0.62)
Mean Elevation				0.03	-0.22				0.43	0.36
				(0.24)	(0.25)				(0.30)	(0.30)
Terrain Roughness				-0.15	-0.02				-0.19	-0.20
				(0.15)	(0.16)				(0.15)	(0.14)
Distance to Coast or River				0.04	-0.05				-0.01	-0.04
				(0.12)	(0.10)				(0.14)	(0.15)
Landlocked				0.08	-0.01				-0.24*	-0.21
				(0.10)	(0.08)				(0.14)	(0.16)
Island				-0.11	-0.12				0.17	0.14
				(0.13)	(0.15)				(0.11)	(0.14)
Pct. Land in Tropics				-0.80*	-0.59*				-0.77	-0.69
				(0.46)	(0.35)				(0.52)	(0.48)
Pct. Land in Temperate Zone				0.19	0.12				0.38	0.48
				(0.17)	(0.16)				(0.31)	(0.31)
Pct. Land in Tropics and Subtropics				0.78	0.48				0.25	0.27
				(0.52)	(0.47)				(0.49)	(0.51)
Precipitation				-0.04	-0.07				0.17	0.05
				(0.17)	(0.20)				(0.17)	(0.25)
Temperature				-0.29	-0.67				-0.31	-0.59
				(0.36)	(0.41)				(0.47)	(0.61)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	-0.01	0.24	0.52	0.40	0.53	0.01	0.05	0.03	0.21	0.18
Observations	87	87	87	87	87	87	87	87	87	87

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.13: Changes in Crop Yield and Growth Cycle and their Correlates (Excluding Africa)

	Change Yield					Change Growth Cycle				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (pre-1500)	-0.24	-0.47***	-0.15	-0.43***	-0.16	0.10	0.19*	0.18	0.38**	0.38**
	(0.15)	(0.14)	(0.14)	(0.15)	(0.15)	(0.10)	(0.11)	(0.13)	(0.18)	(0.19)
Crop Growth Cycle (pre-1500)		0.64***	0.35*	0.59**	0.31		-0.26*	-0.14	-0.57***	-0.44
		(0.17)	(0.19)	(0.23)	(0.24)		(0.13)	(0.18)	(0.19)	(0.28)
Absolute Latitude				-0.27	-0.47				-0.34	-0.72
				(0.40)	(0.32)				(0.36)	(0.48)
Mean Elevation				0.05	0.02				0.11	0.05
				(0.20)	(0.18)				(0.33)	(0.31)
Terrain Roughness				-0.03	0.03				0.04	0.04
				(0.14)	(0.11)				(0.19)	(0.18)
Distance to Coast or River				-0.04	-0.09				0.07	0.05
				(0.07)	(0.09)				(0.13)	(0.13)
Landlocked				-0.05	-0.10				-0.16	-0.20
				(0.08)	(0.07)				(0.14)	(0.15)
Island				0.06	-0.06				0.09	0.08
				(0.14)	(0.10)				(0.10)	(0.11)
Pct. Land in Tropics				-1.17	-1.01				-1.38*	-1.16
				(0.76)	(0.88)				(0.70)	(0.70)
Pct. Land in Temperate Zone				0.05	0.16				0.15	0.05
				(0.18)	(0.21)				(0.24)	(0.27)
Pct. Land in Tropics and Subtropics				1.19	1.21				0.71	0.58
				(0.76)	(0.85)				(0.74)	(0.73)
Precipitation				-0.07	-0.19				0.19	0.05
				(0.18)	(0.18)				(0.17)	(0.25)
Temperature				-0.28	-0.46				0.24	-0.13
				(0.28)	(0.34)				(0.34)	(0.47)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	0.06	0.31	0.44	0.32	0.50	-0.00	0.04	0.08	0.15	0.14
Observations	74	74	74	74	74	74	74	74	74	74

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.14: Changes in Crop Yield and Growth Cycle and their Correlates (Excluding Africa, Ancestors)

	Change Yield (Anc.)					Change Growth Cycle (Anc.)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (Ancestors, pre-1500)	0.07	-0.11	-0.04	-0.02	-0.10	0.13	0.22*	0.30*	0.54***	0.48**
	(0.10)	(0.15)	(0.17)	(0.16)	(0.18)	(0.11)	(0.13)	(0.15)	(0.16)	(0.18)
Crop Growth Cycle (Ancestors, pre-1500)		0.46**	0.46*	0.21	0.43		-0.21	-0.20	-0.59***	-0.43
		(0.20)	(0.23)	(0.23)	(0.30)		(0.15)	(0.21)	(0.22)	(0.30)
Absolute Latitude				-0.53	-0.77*				-0.71*	-0.88*
				(0.37)	(0.41)				(0.39)	(0.46)
Mean Elevation				0.07	-0.02				0.10	0.05
				(0.21)	(0.20)				(0.32)	(0.29)
Terrain Roughness				-0.05	-0.06				-0.10	-0.12
				(0.14)	(0.14)				(0.18)	(0.18)
Distance to Coast or River				-0.02	-0.07				0.19*	0.15
				(0.10)	(0.11)				(0.10)	(0.12)
Landlocked				-0.09	-0.08				-0.20	-0.19
				(0.08)	(0.08)				(0.13)	(0.13)
Island				0.05	-0.01				0.14	0.12
				(0.11)	(0.13)				(0.12)	(0.12)
Pct. Land in Tropics				-1.50	-1.04				-1.33*	-1.03
				(0.97)	(0.99)				(0.71)	(0.66)
Pct. Land in Temperate Zone				0.08	0.24				0.11	0.20
				(0.15)	(0.17)				(0.21)	(0.25)
Pct. Land in Tropics and Subtropics				1.42	1.15				0.45	0.26
				(1.01)	(0.98)				(0.74)	(0.68)
Precipitation				0.01	-0.16				0.29**	0.19
				(0.18)	(0.21)				(0.14)	(0.21)
Temperature				-0.27	-0.65				0.08	-0.16
				(0.33)	(0.43)				(0.33)	(0.45)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	-0.01	0.11	0.17	0.24	0.24	0.01	0.02	0.06	0.24	0.21
Observations	74	74	74	74	74	74	74	74	74	74

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.15: Changes in Crop Yield and Growth Cycle and their Correlates (Full sample)

	Change Yield					Change Growth Cycle				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (pre-1500)	-0.13*	-0.49***	-0.25***	-0.62***	-0.42***	-0.09	0.12	0.22	0.35*	0.40
	(0.08)	(0.09)	(0.08)	(0.11)	(0.09)	(0.09)	(0.15)	(0.21)	(0.21)	(0.24)
Crop Growth Cycle (pre-1500)		0.49***	0.32***	0.43***	0.35***		-0.29*	-0.36*	-0.38**	-0.41**
		(0.08)	(0.07)	(0.07)	(0.07)		(0.17)	(0.21)	(0.17)	(0.19)
Absolute Latitude				-0.27	0.13				-0.93**	-0.95*
				(0.25)	(0.25)				(0.46)	(0.49)
Mean Elevation				0.29**	0.15				0.20	0.07
				(0.13)	(0.13)				(0.20)	(0.22)
Terrain Roughness				-0.25***	-0.06				-0.01	0.06
				(0.09)	(0.08)				(0.12)	(0.12)
Distance to Coast or River				-0.02	-0.08				0.14	0.13
				(0.07)	(0.07)				(0.17)	(0.17)
Landlocked				0.03	-0.01				-0.01	-0.04
				(0.07)	(0.06)				(0.11)	(0.12)
Island				0.11	-0.02				0.05	0.08
				(0.09)	(0.07)				(0.08)	(0.07)
Pct. Land in Tropics				-0.68***	-0.61***				-0.85***	-0.88***
				(0.20)	(0.18)				(0.29)	(0.30)
Pct. Land in Temperate Zone				0.43***	0.23				0.31	0.19
				(0.14)	(0.14)				(0.21)	(0.27)
Pct. Land in Tropics and Subtropics				0.92***	0.80***				0.02	-0.02
				(0.22)	(0.22)				(0.30)	(0.30)
Precipitation				-0.04	-0.07				0.22	0.26
				(0.12)	(0.10)				(0.19)	(0.19)
Temperature				0.02	0.07				-0.11	-0.43
				(0.23)	(0.25)				(0.36)	(0.40)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	0.01	0.26	0.51	0.42	0.58	0.00	0.05	0.06	0.24	0.24
Observations	162	162	162	162	162	162	162	162	162	162

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.16: Changes in Crop Yield and Growth Cycle and their Correlates (Full sample, Ancestors)

	Change Yield (Anc.)					Change Growth Cycle (Anc.)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (Ancestors, pre-1500)	-0.05	-0.45***	-0.34***	-0.64***	-0.60***	-0.08	0.23	0.35*	0.39*	0.39*
	(0.09)	(0.10)	(0.10)	(0.14)	(0.13)	(0.10)	(0.17)	(0.21)	(0.22)	(0.23)
Crop Growth Cycle (Ancestors, pre-1500)		0.68***	0.54***	0.59***	0.61***		-0.52**	-0.60*	-0.54**	-0.54*
		(0.13)	(0.13)	(0.11)	(0.13)		(0.26)	(0.31)	(0.26)	(0.29)
Absolute Latitude				-0.53*	-0.11				-1.06**	-1.09**
				(0.27)	(0.30)				(0.47)	(0.52)
Mean Elevation				0.28*	0.14				0.21	0.19
				(0.15)	(0.16)				(0.20)	(0.22)
Terrain Roughness				-0.23**	-0.06				-0.12	-0.11
				(0.10)	(0.11)				(0.11)	(0.13)
Distance to Coast or River				-0.10	-0.16**				0.09	0.09
				(0.08)	(0.08)				(0.15)	(0.16)
Landlocked				0.08	0.03				-0.09	-0.09
				(0.08)	(0.07)				(0.11)	(0.11)
Island				0.03	0.02				0.19**	0.20*
				(0.09)	(0.11)				(0.09)	(0.10)
Pct. Land in Tropics				-0.70***	-0.66***				-0.90***	-0.92***
				(0.24)	(0.21)				(0.28)	(0.29)
Pct. Land in Temperate Zone				0.46***	0.21				0.02	0.03
				(0.15)	(0.15)				(0.22)	(0.25)
Pct. Land in Tropics and Subtropics				0.96***	0.84***				-0.08	-0.08
				(0.26)	(0.25)				(0.29)	(0.30)
Precipitation				-0.01	0.04				0.31*	0.31*
				(0.14)	(0.14)				(0.17)	(0.19)
Temperature				-0.15	-0.16				-0.37	-0.45
				(0.26)	(0.28)				(0.37)	(0.43)
Continental FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Adjusted-R^2	-0.00	0.26	0.45	0.44	0.52	-0.00	0.12	0.11	0.30	0.27
Observations	158	158	158	158	158	158	158	158	158	158

Notes: This table studies the orthogonality of the changes between crop yield and growth cycles and a country's geographical characteristics. The results confirm that only the pre-1500CE crop yield and growth cycle are correlated with the changes. This provides support to the as-if random treatment assumption and suggests that no other omitted geographical characteristics might drive the results in the main tables of the paper. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.17: Changes in Crop Yield, Crop Growth Cycle and Long-Term Orientation (Selection on Unobservables)

	Long-Term Orientation					
	Whole World				Old World	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield Change (post-1500)	11.28***	9.51***				
	(2.92)	(2.92)				
Crop Growth Cycle Change (post-1500)	-0.67	-1.51				
	(1.84)	(1.81)				
Crop Yield Change (Anc., post-1500)			10.20***	8.83***	11.25***	8.39***
			(2.50)	(2.36)	(2.72)	(2.88)
Crop Growth Cycle Change (Anc., post-1500)			0.79	-0.73	0.16	-1.45
			(1.75)	(1.78)	(1.87)	(1.93)
Crop Yield (Ancestors, pre-1500)	10.03***	10.74***	9.90***	11.31***	10.46***	12.18***
	(2.31)	(2.76)	(2.30)	(2.70)	(2.43)	(3.05)
Crop Growth Cycle (Ancestors, pre-1500)	-11.29***	-6.47	-11.59***	-6.85*	-12.27***	-5.69
	(3.22)	(3.90)	(3.23)	(3.65)	(3.38)	(4.24)
	Change Crop Yield					
AET		5.38		6.43		2.93
δ		2.13		2.51		1.45
β^*		6.21		6.25		3.32
	Change Crop Growth Cycle					
AET		-1.81		-0.48		-0.90
δ		-0.94		-0.25		-0.49
β^*		-3.06		-3.58		-4.29
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	No	Yes	No	Yes	No	Yes
Old World Subsample	No	No	No	No	Yes	Yes
R^2	0.65	0.77	0.67	0.78	0.62	0.76
Adjusted-R^2	0.61	0.70	0.62	0.71	0.58	0.67
Observations	87	87	87	87	72	72

Notes: This table shows the robustness of the results to selection by unobservables. It presents the Altonji et al. (2005) AET ratio as extended by Bellows and Miguel (2009). Additionally, it presents the δ and $\beta^*(1,1)$ statistics suggested by Oster (2014). All statistics suggest that the results are not driven by unobservables. Heteroskedasticity robust standard errors in round parenthesis. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.2.1 Natural Experiment: Country-Level Results on Grids that Experienced a Change in Crops

This section replicates the analysis of the natural experiment associated with the Columbian Exchange using only crops available pre-1500CE and grids that experienced changes in the best crop post-1500CE. Thus, taking into account only locations where the treatment by this natural experiment caused a strictly positive increase in yields. Reassuringly, the results of the main body of the paper remain unaltered qualitatively. In particular, there is a positive, statistically and economically significant effect of pre-1500CE crop yield and its change on Long-Term Orientation.

In particular, a possible concern with the approach in the main body of the paper is that by construction at least some part of the effect is generated by locations within a country for which the best crop did not change, potentially confounding the difference between the pre- and post-1500 experience. The analysis in table 2 should not be affected by this concern since it accounts for the pre-1500CE conditions, ensuring that the change in yield and growth cycle capture only the effect of the treatment in the natural experiment. Still, in order to show robustness to this potential concern, table B.18 constrains the analysis to include only the crop data for cells in each country where the crop used before and after 1500 changed. In particular, for each cell in each country the best crop in use before and after 1500 are compared. If a new crop is used, then the crop yield pre-1500 and the change in crop yield due to the change in crop in that cell should capture better the pre-1500 and post-1500 effects. The new crop yield measure is the average across all cells for which crop use changed in a country.

Additionally, table B.18 expands the set of geographical controls by including precipitation and the shares of land in tropical, subtropical, and temperate climate zones. By controlling for this larger set of geographical controls and using only data for locations that changed crop use, the analysis increases the confidence that the effect of crop yield pre-1500 and its change post-1500 on Long-Term Orientation is in fact capturing the effects proposed by the theory, and is not generated by selection of high time preference individuals into regions with high yields, by unchanging or contemporary geographical characteristics or by some omitted variable that correlates with these.

Reassuringly, the estimates on crop yield pre-1500 and crop yield change post-1500 in all columns of table B.18 are positive, and statistically and economically significant. The estimates imply that conditional on a country's geographical characteristics, its timing of transition to the Neolithic, and its crop growth cycle pre-1500 and its change post-1500, an increase of one standard deviation in crop yield pre-1500 increased Long-Term Orientation by 7.9 percentage points. Similarly, an increase of one standard deviation in crop yield change post-1500 increased Long-Term Orientation by 7.3 percentage points.

Table B.18: Natural Experiment: Pre-1500CE Potential Crop Yield, Growth Cycle, and Long-Term Orientation, for Grids that Experienced Change in Crop post-1500.

	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	4.97**	8.52***	7.40***	6.65**			7.75***	7.97**
	(2.28)	(2.46)	(2.58)	(2.98)			(2.81)	(3.66)
Crop Yield Change (post-1500)			4.36*	5.81**			5.58*	7.59**
			(2.46)	(2.55)			(2.83)	(2.93)
Crop Growth Cycle (pre-1500)				0.06				-1.55
				(2.58)				(3.97)
Crop Growth Cycle Change (post-1500)				-4.50**				-4.87**
				(2.18)				(2.36)
Crop Yield (Ancestors, pre-1500)					8.21***	7.85**		
					(2.34)	(3.26)		
Crop Yield Change (Ancestors, post-1500)					6.09***	7.31***		
					(2.13)	(2.25)		
Crop Growth Cycle (Ancestors, pre-1500)						-0.95		
						(3.16)		
Crop Growth Cycle Ch. (Anc., post-1500)						-3.44		
						(2.27)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.51	0.64	0.64	0.66	0.67	0.69	0.58	0.61
Observations	87	87	87	87	87	87	72	72

Notes: This table establishes the positive, statistically, and economically significant effect of a country's potential crop yield, measured in calories per hectare per year, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. In particular, columns (1)-(3) show the effect of potential crop yield after controlling for the country's absolute latitude, mean elevation above sea level, terrain roughness, distance to a coast or river, of it being landlocked or an island, the time since it transitioned to agriculture, percentage of land in temperate, tropical and subtropical climate, and average precipitation. Columns (4)-(6) show that the effect remains after controlling for potential crop growth cycle and the effects of migration. Columns (7)-(8) show that restraining the analysis to the Old World, where intercontinental migration played a smaller role, does not alter the results. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, mean temperature, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.2.2 Sorting vs. Cultural Evolution

As explained in section 4.2.2, the natural experiment associated with the Columbian Exchange can be used to assess the relative contributions of cultural evolution and sorting to the process of formation of Long-Term Orientation. This section establishes the robustness of the results of Table 2 in section 4.2.2 to constraining the sample to countries with populations that are mostly descendants of their indigenous populations. By focusing on countries with large shares of descendants from indigenous populations, the analysis constrains any effects of sorting on Long-Term Orientation in the post-1500 era. Thus, the positive statistically and economically significant effect of changes in crop yield shown in Table B.19 should mostly capture the effect of cultural evolution as opposed to the effect of sorting during the post-1500 era.

Table B.19: Pre-1500CE Potential Crop Yield, Growth Cycle, and Long-Term Orientation (Hofstede)
Natural Experiment in Countries with High Share of Natives

	Long-Term Orientation			
	Old World			
	(1)	(2)	(3)	(4)
Crop Yield (pre-1500)	8.49**	8.58***	13.78***	17.55***
	(3.44)	(3.05)	(3.47)	(3.93)
Crop Yield Change (post-1500)		9.62***	9.95***	13.36***
		(3.53)	(3.30)	(3.76)
Crop Growth Cycle (pre-1500)				-8.86*
				(5.01)
Crop Growth Cycle Change (post-1500)				1.03
				(2.19)
Neolithic Transition Timing			-2.84	-1.17
			(4.47)	(4.38)
Continent FE	Yes	Yes	Yes	Yes
Geography	No	No	Yes	Yes
Adjusted-R^2	0.43	0.52	0.58	0.60
Observations	46	46	46	46

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield, potential crop growth cycle and their changes on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics on the sample of countries where at least 90 percent of the contemporary population are descendants of the aboriginal population in 1500. Geographical controls include absolute latitude, mean elevation, terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.2.3 Cultural Transmission and Ancestry Adjustments

This section provides additional support to the idea that the effect of crop yield captures the forces of cultural evolution. In particular, Tables B.20 and B.21 establish that in a horse race between the ancestry adjusted and the unadjusted measures of (pre-1500) crop yield, growth cycle and their changes, only the ancestry adjusted measures remain statistically and economically significant. Thus, these results provide supporting evidence for a culturally embodied effect of crop yield on Long-Term Orientation.

Table B.20: Pre-CE Crop Yield, Growth Cycle, Ancestry Adjustments and Long-Term Orientation

	Long-Term Orientation			
	(1)	(2)	(3)	(4)
Crop Yield (Ancestors)	13.41***	14.35***	13.46***	18.85***
	(4.52)	(3.87)	(3.56)	(6.22)
Crop Growth Cycle (Ancestors)				-11.38
				(9.07)
Crop Yield	-8.10**	-2.46	-2.03	-5.94
	(3.83)	(2.75)	(2.63)	(5.26)
Crop Growth Cycle				8.21
				(8.38)
Continental FE	No	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes
Adjusted-R^2	0.06	0.64	0.66	0.65
Observations	87	87	87	87

Notes: This table establishes the preeminence of the ancestry adjusted potential pre-1500 yield, growth cycle and their changes over their unadjusted versions on the determination of Long-Term Orientation. Thus, providing additional support for the culturally embodied effect of crop yield on Long-Term Orientation. Geographical controls include absolute latitude, mean elevation, terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.3 Robustness

This subsection shows that the results in the main body of the paper are robust to spatial autocorrelation, selection by unobservables or omitted variables, inclusion of cells with zero yields, exclusion of individual continents, controlling for religion, or division of the sample into Muslim and non-Muslim countries.

Table B.22 shows that the main results of the paper are not affected by spatial correlation. In particular, it presents two versions of the standard errors corrected for spatial autocorrelation. In square brackets it presents the correction for autocorrelation suggested by Conley (1999) and in curly brackets the maximum likelihood estimates suggested by Cliff and Ord (1973, 1981). As can be seen, the results remain unchanged when the standard errors are corrected for spatial autocorrelation, and crop yield remains statistically and economically significant.

Additionally, this table shows that it is very improbable that omitted variables generate the results. In particular, it presents the statistics for selection on unobservables suggested by Altonji et al. (2005), Bellows and Miguel (2009) and Oster (2014). To compute these, columns (1), (3), and (5) are taken as the baseline specifications for various measures and samples. In these columns, the main specification controls for potential crop yield and growth cycle, and includes continental fixed effects. The expanded specification includes a full set of geographical controls (absolute latitude, roughness,

Table B.21: Pre-1500CE Crop Yield, Growth Cycle, Ancestry Adjustments and Long-Term Orientation

	Long-Term Orientation				
	(1)	(2)	(3)	(4)	(5)
Crop Yield (Anc., pre-1500)	12.24***	10.10***	8.65**	10.50***	15.14***
	(3.79)	(3.69)	(3.35)	(3.37)	(4.78)
Crop Yield Ch. (Anc., post-1500)				12.65**	7.04
				(5.80)	(5.80)
Crop Growth Cycle (Anc., pre-1500)					-16.42*
					(8.54)
Crop Growth Cycle Ch. (Anc., post-1500)					6.51
					(4.56)
Crop Yield (pre-1500)	-3.69	-0.49	0.35	-2.17	-5.68
	(3.77)	(2.88)	(2.54)	(2.75)	(4.45)
Crop Yield Change (post-1500)				-5.69	4.01
				(6.64)	(7.44)
Crop Growth Cycle Change (post-1500)					-6.48
					(5.23)
Crop Growth Cycle (pre-1500)					9.02
					(7.67)
Continental FE	No	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes	Yes
Neolithic	No	No	Yes	Yes	Yes
Adjusted-R^2	0.12	0.58	0.59	0.66	0.68
Observations	87	87	87	87	87

Notes: This table establishes the preeminence of the ancestry adjusted potential pre-1500 yield, growth cycle and their changes over their unadjusted versions on the determination of Long-Term Orientation. Thus, providing additional support for the culturally embodied effect of crop yield on Long-Term Orientation. Geographical controls include absolute latitude, mean elevation, terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.22: Potential Crop Yield, Potential Crop Growth Cycle and Long-Term Orientation

	Long-Term Orientation					
	Whole World				Old World	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield	9.67***	10.14***			13.58***	16.57***
	(2.60)	(3.02)			(3.01)	(3.37)
	[3.03]	[3.38]			[3.01]	[2.57]
	{2.46}	{2.65}			{2.88}	{2.95}
Crop Growth Cycle	-3.78	-2.92			-5.26**	-4.07
	(2.47)	(2.95)			(2.61)	(2.90)
	[2.39]	[2.67]			[2.38]	[2.45]
	{2.34}	{2.59}			{2.50}	{2.54}
Crop Yield (Ancestors)			11.35***	14.50***		
			(2.56)	(2.75)		
			[2.60]	[2.46]		
			{2.43}	{2.41}		
Crop Growth Cycle (Ancestors)			-5.05**	-4.65*		
			(2.41)	(2.59)		
			[2.15]	[2.24]		
			{2.28}	{2.27}		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	No	Yes	No	Yes	No	Yes
Old World Subsample	No	No	No	No	Yes	Yes
AET		-21.58		-3.00		-5.53
δ		-4.72		-0.35		-0.66
β^*		11.38		22.02		21.67
R^2	0.59	0.70	0.61	0.75	0.56	0.72
Adjusted-R^2	0.55	0.62	0.57	0.68	0.52	0.64
Observations	87	87	87	87	72	72

Notes: This table shows the robustness of the results to selection by unobservables. It presents the Altonji et al. (2005) AET ratio as extended by Bellows and Miguel (2009). Additionally, it presents the δ and $\beta^*(1,1)$ statistics suggested by Oster (2014). All statistics suggest that the results are not driven by unobservables. Heteroskedasticity robust standard errors in round parenthesis. Spatial auto-correlation corrected standard errors (Conley, 1999) in squared brackets and Cliff-Ord ML in curly brackets. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.23: Potential Crop Yield, Potential Crop Growth Cycle and Long-Term Orientation

	Long-Term Orientation					
	Whole World				Old World	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Ancestors, pre-1500)	7.84***	9.28***	9.21***	11.93***	9.73***	13.26***
	(2.20)	(2.63)	(2.14)	(2.53)	(2.26)	(2.78)
	[2.42]	[2.30]	[1.69]	[2.01]	[1.74]	[1.87]
	{2.09}	{2.31}	{2.00}	{2.18}	{2.13}	{2.39}
Crop Yield Change (Anc., post-1500)			10.20***	9.91***	11.25***	9.99***
			(2.50)	(2.40)	(2.72)	(2.87)
			[2.78]	[2.00]	[2.98]	[2.27]
			{2.33}	{2.07}	{2.56}	{2.46}
Crop Growth Cycle (Ancestors, pre-1500)	-4.40**	-1.48	-8.33***	-6.61**	-8.82***	-6.31**
	(2.18)	(2.56)	(2.32)	(2.62)	(2.43)	(2.97)
	[2.16]	[2.69]	[2.35]	[2.05]	[2.31]	[2.46]
	{2.07}	{2.25}	{2.17}	{2.27}	{2.29}	{2.55}
Crop Growth Cycle Change (Anc., post-1500)			0.79	-0.37	0.16	-0.90
			(1.75)	(1.84)	(1.87)	(1.98)
			[1.56]	[1.13]	[1.47]	[1.26]
			{1.64}	{1.59}	{1.76}	{1.70}
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	No	Yes	No	Yes	No	Yes
Old World Subsample	No	No	No	No	Yes	Yes
AET		-6.47		-4.38		-3.76
δ		-1.45		-0.44		-0.34
β^*		12.79		18.65		21.32
R^2	0.58	0.70	0.67	0.76	0.62	0.74
Adjusted-R^2	0.53	0.61	0.62	0.69	0.58	0.65
Observations	87	87	87	87	72	72

Notes: This table shows the robustness of the results to selection by unobservables. It presents the Altonji et al. (2005) AET ratio as extended by Bellows and Miguel (2009). Additionally, it presents the δ and $\beta^*(1,1)$ statistics suggested by Oster (2014). All statistics suggest that the results are not driven by unobservables. Heteroskedasticity robust standard errors in round parenthesis. Spatial auto-correlation corrected standard errors (Conley, 1999) in squared brackets and Cliff-Ord ML in curly brackets. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

mean elevation above sea level, distance to navigable water, landlocked and island dummies, precipitation, shares of land in tropical, subtropical and temperate climates) and the years since transition to agriculture. Both the AET (Altonji et al., 2005; Bellows and Miguel, 2009) and δ (Oster, 2014) measure how strongly correlated any unobservables would have to be in order to account for the full size of the coefficient on crop yield. As can be seen, in all columns these statistics are different from the critical value of 1. Furthermore, Oster's β^* statistic, which gives the estimated value of the coefficient on crop yield, if unobservables where as correlated as the observables, is always strictly positive and larger than the estimated OLS coefficient. Oster (2014) shows that one can reject the hypothesis that the value of the coefficient is driven exclusively by unobservables, if zero does not belong to the interval created by the estimated value on crop yield and her β^* statistic. This is precisely the case in all columns in this table. Table B.23 shows similar results hold if instead the pre-1500CE crops yields and their changes are used. Thus, these results suggest that the results in the main body of the paper are not driven by unobservables.

Table B.24 replicates the analysis of table 1, but includes all cells in the analysis, including those that are not suitable for producing any calories. Reassuringly, as can be seen there, the effect is a little weaker economically, but still statistically significant at the 1% level. This lower estimate is to be expected, since ancestral populations most likely did not inhabit locations where crop yields were zero. Thus, inclusion of cells with zero caloric yield should generate measurement error and bias the estimate towards zero.

Finally, table B.25 shows the robustness of the results to the inclusion of the share of population of each religious denomination in a country, to splitting the sample between Muslim and Non-Muslim countries, and to the exclusion of Africa or Sub-Saharan Africa. Reassuringly, the results remain qualitatively unchanged. The coefficient on crop yield is statistically the same across specifications and is economically significant in all specifications. Additionally, the estimated coefficient is statistically significant at the 1% in all but columns (3) and (4). In these two columns the statistical significance falls, but this is due to the much smaller sample size, which increases the standard error, though the estimated coefficient is not statistically different from the ones estimated in other columns.

Table B.24: Potential Crop Yield, Crop Growth Cycle, and Long-Term Orientation (Hofstede) Including Grids Not-Suitable for Production

	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	5.26**	9.01***	8.21***	7.11**			11.59***	10.79***
	(2.43)	(2.86)	(2.61)	(3.06)			(2.84)	(3.51)
Crop Growth Cycle				2.18				1.47
				(4.00)				(4.25)
Crop Yield (Ancestors)					9.38***	8.62***		
					(2.43)	(3.11)		
Crop Growth Cycle (Ancestors)						1.52		
						(4.23)		
Absolute Latitude		3.56	2.46	3.01	3.66	4.05	4.98	5.37
		(4.21)	(3.94)	(4.35)	(3.79)	(4.16)	(4.62)	(5.14)
Mean Elevation		6.20*	7.14**	6.63*	6.73**	6.44*	5.86	5.64
		(3.26)	(3.41)	(3.44)	(3.35)	(3.25)	(3.92)	(3.84)
Terrain Roughness		-6.76**	-6.16**	-6.09**	-7.29**	-7.24**	-6.55**	-6.59**
		(2.68)	(2.95)	(2.98)	(3.00)	(3.00)	(3.25)	(3.28)
Neolithic Transition Timing			-6.81**	-7.21**			-5.58*	-5.84*
			(3.05)	(3.20)			(2.84)	(2.94)
Neolithic Transition Timing (Ancestors)					-5.20**	-5.41**		
					(2.53)	(2.63)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.50	0.57	0.60	0.59	0.60	0.60	0.56	0.56
Observations	87	87	87	87	87	87	72	72

Notes: This table replicates the results of table 1 when using the country's average crop measures on all cells, including those which do not produce any calories. It establishes the positive, statistically, and economically significant effect of a country's potential crop yield, measured in calories per hectare per year, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. In particular, columns (1)-(3) show the effect of potential crop yield after controlling for the country's absolute latitude, mean elevation above sea level, terrain roughness, distance to a coast or river, of it being landlocked or an island, and the time since it transitioned to agriculture. Columns (4)-(6) show that the effect remains after controlling for potential crop growth cycle and the effects of migration. Columns (7)-(8) show that restraining the analysis to the Old World, where intercontinental migration played a smaller role, does not alter the results. Additional geographical controls include distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.25: Potential Crop yield, Growth Cycle and Time Preference

	Long-Term Orientation					
	Religion Shares		Muslim - Non-Muslim		Excluding Africa	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Ancestors)	13.31***	10.76***	9.29**	12.09*	14.62***	14.70***
	(2.94)	(3.11)	(3.77)	(6.60)	(3.74)	(3.67)
Crop Growth Cycle (Ancestors)	-3.15	-2.58	-1.39	-6.33	-4.00	-4.71
	(3.52)	(3.43)	(3.26)	(6.79)	(5.15)	(4.86)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes
Religious Shares	No	Yes	Yes	Yes	No	No
Only Sub-Saharan Excluded	No	No	No	No	No	Yes
Adjusted-R^2	0.66	0.67	0.67	0.64	0.60	0.63
Observations	87	87	49	38	74	77

Notes: This table shows the robustness to religious composition and exclusion of Africa of the positive, statistically, and economically significant effect of a country's potential crop return, measured in calories per hectare per day, on its level of Long-Term Orientation measured. All columns control for geographical characteristics, year since transitioning to agriculture, and continental fixed effects. In particular, columns (1)-(2) compare results with and without accounting for the shares of major religions. Columns (3)-(4) split the sample into Muslim and Non-Muslim countries. Columns (5)-(6) show the results of excluding Africa or the Sub-Saharan region. Geographical controls include absolute latitude, average elevation above sea level, terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.4 Long-Term Orientation and Geography

This section shows the results when only one geographical control is included in the analysis of section 4. The results of these horse race regressions are similar to the ones presented in tables 1-B.18.

Table B.26: Geographical Characteristics and Long-term Orientation (Hofstede)

	Long-Term Orientation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield	8.14***	7.74***	7.48***	9.36***	7.32***	7.41***	6.97***
	(2.62)	(2.45)	(2.57)	(2.52)	(2.49)	(2.50)	(2.29)
Absolute latitude	6.26						
	(3.81)						
Mean elevation		2.40					
		(1.91)					
Terrain Roughness			-2.09				
			(2.02)				
Distance to Coast or River				5.79***			
				(1.19)			
Landlocked					2.68**		
					(1.33)		
Island						-1.35	
						(2.59)	
Neolithic Transition Timing							-5.84**
							(2.83)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.56	0.54	0.54	0.58	0.55	0.54	0.56
Observations	87	87	87	87	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's potential crop yield, measured in calories per hectare per year, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects in a horse race regression with other geographical characteristics. Additionally, it shows that a country's potential crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.27: Geographical Characteristics and Long-Term Orientation (Hofstede)

	Long-Term Orientation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (pre-1500)	6.34**	6.02**	5.70**	7.62***	5.45**	5.70**	4.96**
	(2.60)	(2.30)	(2.56)	(2.56)	(2.38)	(2.42)	(2.30)
Absolute latitude	5.68						
	(3.68)						
Mean elevation		2.29					
		(1.99)					
Terrain Roughness			-2.03				
			(1.95)				
Distance to Coast or River				5.28***			
				(1.27)			
Landlocked					2.60**		
					(1.29)		
Island						-1.60	
						(2.70)	
Neolithic Transition Timing							-5.88*
							(3.14)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.52	0.51	0.50	0.53	0.51	0.50	0.52
Observations	87	87	87	87	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield, measured in calories per hectare per year, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects in a horse race regression with other geographical characteristics. Additionally, it shows that a country's potential crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.28: Geographical Characteristics and Long-Term Orientation (Hofstede), for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (pre-1500)	6.06**	4.83**	6.21***	5.48**	4.52*	4.90**	5.27**
	(2.68)	(2.36)	(2.33)	(2.37)	(2.38)	(2.29)	(2.09)
Absolute latitude	6.91						
	(4.48)						
Mean elevation		0.94					
		(2.20)					
Terrain Roughness			-3.85*				
			(2.11)				
Distance to Coast or River				3.80***			
				(1.27)			
Landlocked					1.89		
					(1.33)		
Island						-1.11	
						(2.80)	
Neolithic Transition Timing							-7.25**
							(3.25)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.52	0.50	0.52	0.52	0.51	0.50	0.54
Observations	87	87	87	87	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield on grids that experienced a change in the potential crop post-1500, measured in calories per hectare per year, on its level of Long-Term Orientation measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects in a horse race regression with other geographical characteristics. Additionally, it shows that a country's potential crop growth cycle has a negative and not-statistically significant effect on its Long-Term Orientation. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.5 Long-Term Orientation, Crop Yield and Growth Cycle, and Agricultural Suitability

This section further investigates the effect of crop yield and growth cycle on Long-Term Orientation (LTO), highlighting the difference between the channel proposed in this research from a possible beneficial effect of agricultural suitability on economic development and Long-Term Orientation. In particular, it shows that the variation in pre-1500CE crop yield and growth cycle, and their change, which is orthogonal to agricultural suitability and measures of pre-industrial economic development, is statistically and economically significant as suggested by the theory. This assures that the results in the main body of the paper and in this section are due to the suggested theory, and do not reflect the effects of agricultural suitability. Additionally, it ensures that the results are not simply based on improved measures of agricultural suitability.

Before moving on to more sophisticated analyses, table B.29 shows the correlation between the agricultural suitability experienced by countries' ancestral populations and ancestry adjusted pre-1500CE crop yield, growth cycle and their changes. As can be seen there, ancestry adjusted levels of pre-1500CE yield and growth cycle are correlated with agricultural suitability, although not their changes. This already suggests that the effect of the change in crop yield and growth cycle generated by the Columbian Exchange is orthogonal to agricultural suitability.

Table B.29: Correlation of Agricultural Suitability with Crop Yield and Growth Cycle, and Their Changes

	Correlations				
	Pre-1500CE Crop		Change		Land
	Yield	Growth Cycle	Yield	Growth Cycle	Suitability
Crop Yield (Anc., pre-1500)	1.00				
Crop Growth Cycle (Anc., pre-1500)	0.40***	1.00			
Crop Yield Change	-0.09	0.43***	1.00		
Crop Growth Cycle Ch.	0.14	-0.15	0.11	1.00	
Land Suitability (Anc.)	0.79***	0.50***	0.09	0.18	1.00

*** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

The fact that agricultural suitability is correlated with both ancestry adjusted pre-1500CE crop yield and growth cycle does not imply that the information captured by these variables is the same. In particular, according to the theory, it is crop yield *conditional* on growth cycle, which has a positive effect on Long-Term Orientation. Similarly, only *conditional* on crop yield does growth cycle decrease Long-Term Orientation. Thus, it is this dual relation that ought to drive the empirical relation between Long-Term Orientation and the measures of yield and growth cycle. The main body of the paper used both measures as a way to capture this idea, while section B.1 tackled this idea by using a unique measure, namely the daily crop return. This section uses principal component analysis in order to capture this dual relation and distinguish it from the effects of agricultural suitability.

Table B.30 shows the principal component decomposition of pre-1500CE crop yield and growth cycle into two components. The first principal component PC1 explains 70% of the variability of pre-1500CE crop yield and growth cycle, and is positively correlated with both measures. On the other hand, the second principal component PC2 explains 30% of their variability and is positively correlated with pre-1500CE crop yield and negatively with its growth cycle. Since the theory's testable predictions are that Long-Term Orientation will be positively correlated with crop yield and negatively with crop growth cycle, one should expect the second principal component to capture the channel proposed by the theory.

Table B.30: Principal Components of Pre-1500CE Crop Yield and Growth Cycle

	Principal Components		
	Component 1	Component 2	Unexplained
Crop Yield (Ancestors, pre-1500)	0.71	0.71	0.00
Crop Growth Cycle (Ancestors, pre-1500)	0.71	-0.71	0.00
Eigenvalues	1.40	0.60	
Proportion Variance	0.70	0.30	
Observations	87		

Similarly, table B.31 shows the principal component decomposition of the changes in crop yield and growth cycle generated by the Columbian Exchange. In this case, the first principal component PC1 explains 56% of the variability of changes in crop yield and growth cycle, and is positively correlated with both measures. On the other hand, the second principal component PC2 explains 44% of their variability and is positively correlated with the change in crop yield and negatively with changes in growth cycle. Again, the second principle component should capture the effects predicted by the theory.

Table B.31: Principal Components of Change in Crop Yield and Growth Cycle

	Principal Components		
	Component 1	Component 2	Unexplained
Crop Yield Change (post-1500)	0.71	0.71	0.00
Crop Growth Cycle Change (post-1500)	0.71	-0.71	0.00
Eigenvalues	1.12	0.88	
Proportion Variance	0.56	0.44	
Observations	87		

By construction the principal components of pre-1500CE are orthogonal to each other. Similarly, the principal components of crop change are orthogonal to each other. Additionally, as shown in table B.32 the first principal component of pre-1500CE crop yield and growth cycle, PC1 pre-1500 crop, is orthogonal to both principal components of the changes in yield and growth cycle. On the other hand, the second principal component of pre-1500 crop yield and growth cycle, PC2 pre-1500 crop, is orthogonal to PC1 of changes and highly negatively correlated with PC2 of changes. Finally, the agricultural suitability experienced by a country's ancestral populations is highly correlated with PC1 of pre-1500 crop, weakly with PC2 of pre-1500 crop and PC1 of crop change, and orthogonal to PC2 of crop change. Figure B.6 shows the pairwise scatter plot for all these principal components and agricultural suitability confirming the correlations presented in the table. The results from the table and the figure show that both second principal components PC2 do not correlate with agricultural suitability, and capture elements unrelated to it.

Similar results are shown in table B.33 and figure B.7 for the sample of countries that have data for population density and urbanization in 1500CE, and urbanization in 1800CE. As can be seen there, both second principal components PC2 are uncorrelated with suitability and pre-industrial economic development. Thus, both PC2's capture the variability in pre-1500CE crop yield and growth cycle, and their changes, that is orthogonal to both agricultural suitability and pre-industrial development.

Table B.32: Correlation of Agricultural Suitability with Principal Components of Crop Yield and Growth Cycle

	Correlations				
	PC Pre-1500 Crop		PC Crop Change		Land
	Comp 1	Comp 2	Comp 1	Comp 2	Suitability (Anc.)
PC1 Pre-1500 Crop	1.00				
PC2 Pre-1500 Crop	0.00	1.00			
PC1 Crop Change	0.13	-0.14	1.00		
PC2 Crop Change	0.16	-0.55***	-0.00	1.00	
Land Suitability (Ancestors)	0.77***	0.27**	0.18*	-0.06	1.00

*** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.33: Correlation of Agricultural Suitability and Pre-Industrial Development with Principal Components of Crop Yield and Growth Cycle

	Correlations							
	PC Pre-1500 Crop		PC Crop Change		Land	Pop.	Urbanization	
	Comp 1	Comp 2	Comp 1	Comp 2	Suitability (Anc.)	Dens.	1500 CE	1800 CE
PC1 Pre-1500 Crop	1.00							
PC2 Pre-1500 Crop	0.01	1.00						
PC1 Crop Change	0.14	-0.13	1.00					
PC2 Crop Change	0.15	-0.53***	0.10	1.00				
Land Suitability (Ancestors)	0.80***	0.21*	0.31**	0.02	1.00			
Population density in 1500 CE	0.29**	0.08	0.26**	-0.10	0.36***	1.00		
Urbanization rate in 1500 CE	-0.04	-0.14	-0.09	-0.23*	-0.17	0.44***	1.00	
Urbanization rate in 1800 CE	0.22*	-0.15	-0.12	-0.05	0.25*	0.18	0.36***	1.00

*** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

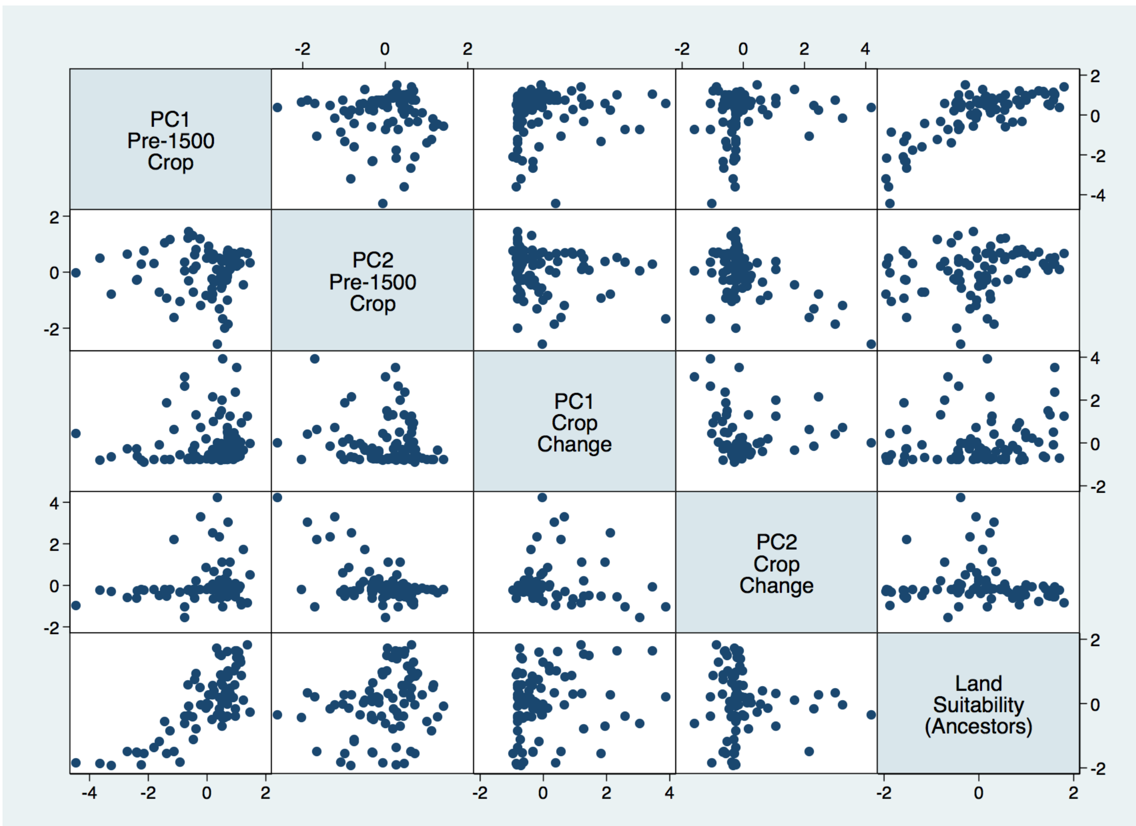


Figure B.6: Principal Components of Crop Yield and Growth Cycle, Their Changes, and Agricultural Suitability

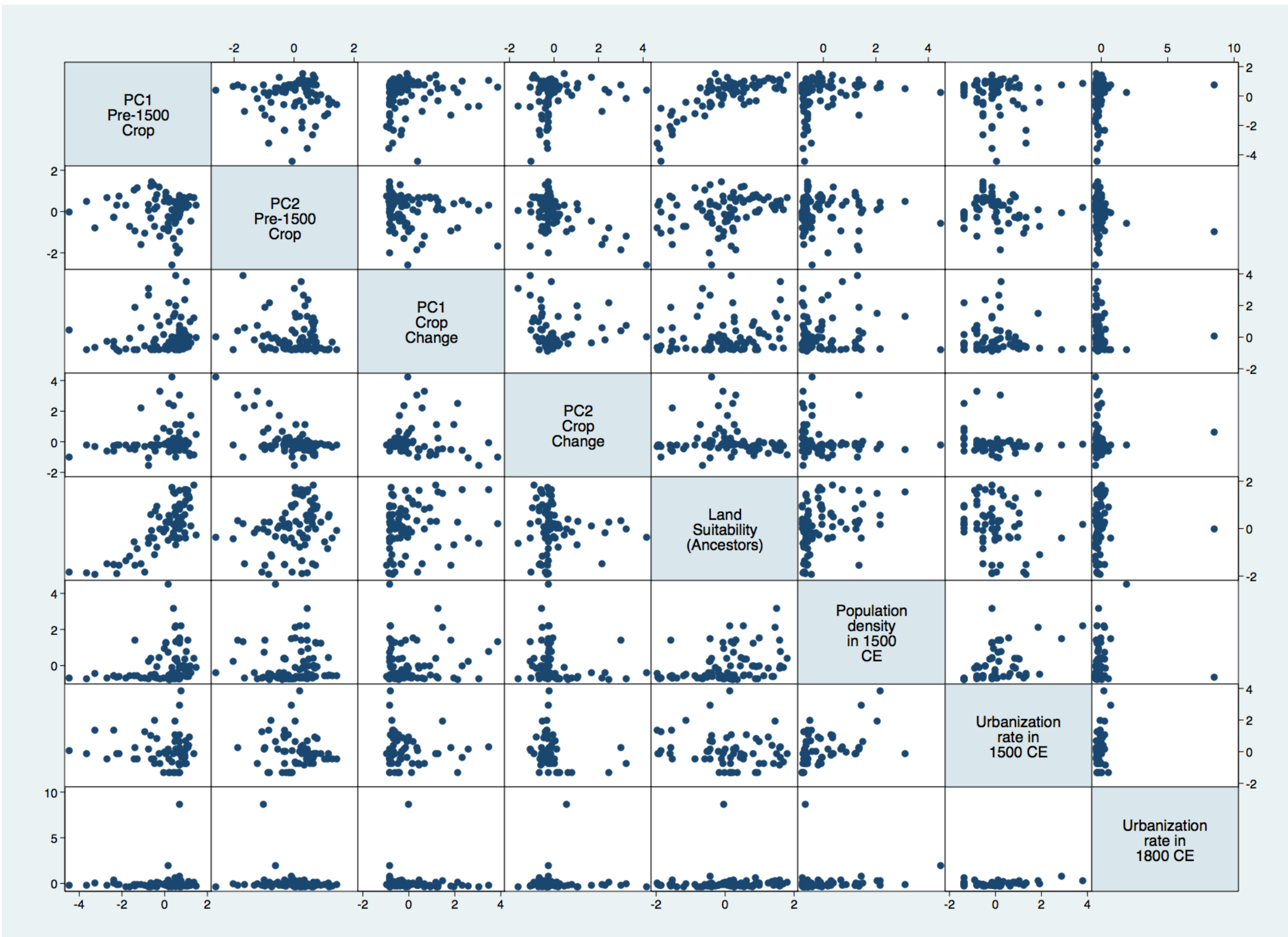


Figure B.7: Principal Components of Crop Yield and Growth Cycle, Their Changes, and Pre-Industrial Development

Table B.34 shows the relation between the principal components and Hofstede's measure of Long-Term Orientation (LTO). As expected, the coefficient on both second principal components are positive, and statistically and economically significant in all columns. In particular, column (1) shows the unconditional effect of the second principal component of ancestry adjusted pre-1500CE crop yield and growth cycle, PC2 pre-1500 crop, on LTO. The variation in PC2 pre-1500 crop explains 33% of the variation in LTO and the estimate implies that one standard deviation increase in this principal component increases LTO by 0.6 standard deviations. Column (2) shows that the first principal component of ancestry adjusted pre-1500CE crop yield and growth cycle, PC1 pre-1500 crop, does not have a statistically nor economically significant effect on LTO. Columns (3) and (4) additionally include the principal components for the changes, without affecting the results.

Column (5) controls jointly for all four principal components, while columns (6) controls for any time-invariant unobservables at the continent level. Once continental fixed effects are included, both PC2's and PC1 crop change become statistically significant at the 1% level. The estimates imply that a one standard deviation increase in PC2 pre-1500 crop increases LTO in 0.4 standard deviations, while one standard deviation increase in PC2 crop change increases LTO in 0.3 standard deviations, and one standard deviation increase in PC1 crop change increases LTO in 0.3 standard deviations.

Column (7) controls additionally for countries' geographical characteristics and column (8) for the ancestry adjusted timing of transition to the Neolithic without affecting the results. Again both PC2's remain statistically significant at the 1% level and generate economically significant results since a one standard deviation increase in PC2 pre-1500 crop increases LTO by 0.4 standard deviations and in PC2 crop change by 0.3 standard deviations. As shown in columns (9) and (10) the inclusion of agricultural suitability does not affect the results neither for the whole world sample, nor for the Old World sample.

Table B.34: Principal Components of Crop Yield and Growth Cycle, Their Changes and Time Preference

	Long-Term Orientation									
	Whole World									Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PC2 Pre-1500 Crop	17.38***		17.75***		18.53***	12.52***	13.37***	11.79***	10.90***	10.71***
	(2.69)		(2.70)		(3.10)	(2.35)	(3.27)	(3.22)	(3.21)	(3.34)
PC2 Crop Change			0.55		0.77	8.82***	8.74***	8.22***	7.93***	6.39**
			(2.66)		(2.88)	(2.20)	(2.46)	(2.34)	(2.35)	(2.75)
PC1 Pre-1500 Crop		1.25		1.10	0.74	0.75	3.08*	4.02**	2.72	3.11
		(2.05)		(2.05)	(1.57)	(1.57)	(1.69)	(1.89)	(2.80)	(2.85)
PC1 Crop Change				1.30	3.28	8.04***	7.22***	6.95***	6.29***	4.86
				(3.04)	(2.49)	(2.24)	(2.40)	(2.12)	(2.26)	(3.01)
Neolithic Transition Timing (Anc.)								-6.46**	-7.05**	-9.88**
								(3.02)	(3.17)	(4.06)
Land Suitability (Anc.)									2.34	4.28
									(3.20)	(3.50)
Continent FE	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Geographical Controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.33	-0.01	0.32	-0.02	0.33	0.62	0.66	0.68	0.68	0.63
Observations	85	85	85	85	85	85	85	85	85	70

The analysis of this section has provided additional support of the channel proposed in this paper. In particular, it has shown that the variation in pre-1500CE crop yield and growth cycle and their change, which is orthogonal to agricultural suitability determines a country's Long-Term Orientation. This complements additional finding in various other sections of the paper and the appendix, which have shown that controlling for various measures of agricultural suitability (mean, gini, range), the volatility of weather and its spatial correlation, as well as measures of pre-industrial development do not affect the results. Thus, as suggested by the theory, crop yield and growth cycle experienced by a country's ancestral populations determine its LTO, and not the general level of agricultural suitability and its effect on pre-industrial development.

B.6 Alternative Cultural Characteristics

Table B.35: Crop Yield, Growth Cycle, and Long-Term Orientation: Accounting for Other (Cultural) Traits

	Long-Term Orientation					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Anc., pre-1500)	10.78***	11.07***	14.56**	12.33*	13.72*	12.01*
	(3.27)	(3.66)	(6.97)	(7.29)	(7.29)	(7.02)
Crop Yield Ch. (Anc., post-1500)	9.03***	8.97***	7.45***	6.88**	7.11***	6.84***
	(2.16)	(2.23)	(2.47)	(2.63)	(2.53)	(2.50)
Crop Growth Cycle (Anc., pre-1500)	-8.32**	-8.41**	-7.70	-7.15	-7.99	-7.36
	(3.82)	(3.84)	(6.78)	(7.40)	(7.14)	(6.80)
Crop Growth Cycle Ch. (Anc., post-1500)	-0.77	-0.71	0.17	-0.61	-1.16	-0.59
	(1.60)	(1.84)	(3.11)	(3.11)	(3.20)	(3.03)
Trust		0.63				
		(3.10)				
Individualism			4.80			
			(3.96)			
Power Distance				-0.45		
				(3.90)		
Masculinity					3.95	
					(4.20)	
Uncertainty Avoidance						1.18
						(6.06)
Land Suitability (Anc.)	2.33	2.35	-2.71	-1.13	-3.67	-1.61
	(3.15)	(3.51)	(4.93)	(4.76)	(5.54)	(5.32)
Neolithic Transition Timing (Anc.)	-7.58**	-7.51**	-7.86	-8.03	-8.22	-7.53
	(3.04)	(3.14)	(5.32)	(5.34)	(5.07)	(5.91)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.67	0.59	0.58	0.59	0.58
Observations	85	83	60	60	60	60

Notes: This table establishes the robustness of the positive effect of crop yield on Long-Term Orientation results to the inclusion of various cultural traits. All columns account for continental fixed effects, geographical controls, and land suitability and timing of transition to agriculture experienced by the country's ancestral populations. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.7 Potential Crop Yield, Long-Term Orientation and Other Pre-Industrial Channels

This section presents further evidence that rejects the existence of alternative pre-industrial channels. This complements the findings of table 3. Table B.37 reproduces the analysis of table 3, but considers only the cells for which the crop in use changed post-1500CE. As can be seen the results are qualitatively unchanged. Potential crop yield and its change remain economically and statistically significant. Furthermore, none of the additional variables provides any additional explanatory power, while crop yield, growth rate, and their change retain their explanatory power.

Additionally, tables B.39-B.41 analyze the possible effect of other agricultural channels. In particular, it controls for average agricultural suitability (Ramankutty et al., 2002) and the use of the plow (Alesina et al., 2013). Reassuringly, in all columns potential crop yield and its change remain economically and statistically significant. Furthermore, neither one of the other agricultural measures provides any additional explanatory power, while crop yield, growth rate, and their change retain their explanatory power. This reinforces the results in the main body of the paper, that the alternative pre-industrial or agricultural channel do not explain the findings of this paper.

Additionally, table B.39 shows that the results are robust to a country's language's future time reference (FTR), which Chen (2013) shows correlates with individual's savings behavior. Reassuringly, inclusion of the level of strong FTR does not alter the results.

Tables B.42-B.43 analyze the effect of pre-industrial trade on the effect of potential crop yield on Long-Term Orientation. These tables address the potential concern that having trading possibilities might affect the mechanism highlighted in this paper. In particular, one might worry that if agents can trade amongst themselves, then the forces that allowed higher yields to cause higher levels of patience might be undermined and as such also the theoretical and empirical results. However, the theory is based on frictions to intertemporal trade, not to trade in general. Thus, the fact that agents can trade amongst themselves does not necessarily undermine the mechanism. Furthermore, intertemporal trade can affect the results only if patient individuals are not liquidity constrained and can thus lend resources to impatient ones. But the situation in the theory is precisely the opposite, as can be expected in reality also. As shown in tables B.42-B.43 the inclusion of additional controls for trade potential does not affect the empirical results. In particular, accounting for the effect of variation in agricultural suitability, the existence of a means of exchange, the levels of transportation technologies, or the pre-industrial distance to trade routes does not affect the qualitative results of the paper. After accounting for these measures of trade potential there exists a positive, statistically and economically significant effect of potential crop yield pre-1500 and its change post-1500 on Long-Term Orientation.

Finally, table B.44 analyzes the robustness of the results to the possibility of diversification by including scale and risk factors in the analysis. In particular, if larger countries could diversify the timing of planting and harvesting across space, the mechanism highlighted in this paper might be hindered from working. Reassuringly, inclusion of a country's area does not alter the results. Similarly, climatic risks can prevent people adopting the investment mode and thus prevent our mechanism from being operative. Reassuringly, inclusion of the average standard deviation across months of precipitation or temperature does not alter the results. Also, controlling for the spatial autocorrelation with climatic conditions in adjacent cells does not alter the results. After accounting for these measures of climatic risk and scale the positive, statistically and economically significant effect of potential crop yield pre-1500 and its change post-1500 on Long-Term Orientation remains.[37]

[37] Allowing for interactions between crop yield and diversification or risk factors did not alter the results.

Table B.36: Potential Crop Yield, Long-Term Orientation, and Pre-Industrial Development

	Long-Term Orientation						
	1500CE					1800CE	
	Population Density		Urbanization		Both	Urbanization	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	11.05***	11.52***	10.01***	11.08***	9.85***	11.54***	11.54***
	(2.53)	(2.33)	(3.68)	(3.68)	(3.63)	(3.18)	(3.22)
Crop Yield Change (post-1500)	10.76***	10.40***	8.77**	9.96***	6.54*	10.05***	10.22***
	(2.89)	(2.78)	(3.35)	(3.35)	(3.60)	(3.23)	(3.37)
Crop Growth Cycle (Ancestors, pre-1500)	-8.06*	-10.43***	-5.06	-7.30	-5.63	-8.60*	-8.75*
	(4.06)	(3.63)	(5.28)	(5.37)	(5.39)	(4.68)	(4.84)
Crop Growth Cycle Change (post-1500)	-0.46	-1.06	1.06	0.55	1.35	0.07	0.03
	(1.72)	(1.84)	(2.91)	(2.95)	(2.60)	(2.37)	(2.41)
Population density in 1500 CE		3.76**			5.84		
		(1.86)			(3.62)		
Urbanization rate in 1500 CE				1.90	-1.06		
				(2.24)	(2.67)		
Urbanization rate in 1800 CE							-0.57
							(1.22)
	Partial R^2						
Crop Yield (Ancestors, pre-1500)	0.23***	0.25***	0.11***	0.12***	0.11***	0.20***	0.20***
Crop Yield Change (post-1500)	0.16***	0.16***	0.08**	0.09***	0.04*	0.12***	0.12***
Crop Growth Cycle (Anc., pre-1500)	0.06*	0.09***	0.02	0.03	0.02	0.06*	0.06*
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population density in 1500 CE		0.05**			0.06		
Urbanization rate in 1500 CE				0.01	0.00		
Urbanization rate in 1800 CE							0.00
	Semi-Partial R^2						
Crop Yield (Ancestors, pre-1500)	0.08***	0.09***	0.04***	0.04***	0.03***	0.07***	0.07***
Crop Yield Change (post-1500)	0.05***	0.05***	0.03**	0.03***	0.01*	0.04***	0.04***
Crop Growth Cycle (Anc., pre-1500)	0.02*	0.03***	0.00	0.01	0.00	0.02*	0.02*
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population density in 1500 CE		0.01**			0.02		
Urbanization rate in 1500 CE				0.00	0.00		
Urbanization rate in 1800 CE							0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.65	0.67	0.60	0.60	0.63	0.63	0.62
Observations	87	87	65	65	64	79	79

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield and potential crop growth cycle on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's level of pre-industrial development as measured by its population density or urbanization rates in 1500 CE have economically smaller and not always statistically significant effects. In particular, columns (1)-(2) compare the effects of potential crop yields and population densities in 1500CE, while columns (3)-(4) use urbanization rates in 1500 CE instead. Column (5) controls for both urbanization rates and population densities in 1500CE. Finally, columns (6)-(7) compare the effects of crop yield pre-1500CE and its change and urbanization in 1800CE. In all columns crop yield and its change remain positive, statistically and economically significant, and have a higher explanatory power than any of the alternative channels. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, mean temperature, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.37: Potential Crop Yield, Long-Term Orientation, and Pre-Industrial Development, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation							
	Population Density		Urbanization				GDP pc	
	1500CE		1500CE		1800CE		1870CE	1913CE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (Anc., pre-1500)	6.63**	6.29**	5.45*	6.14*	6.88**	6.86**	10.72**	10.35**
	(2.64)	(2.57)	(3.16)	(3.46)	(2.78)	(2.82)	(3.97)	(3.91)
Crop Yield Change (post-1500)	5.90**	4.63	5.71*	5.61	5.63*	5.67*	10.22*	10.68**
	(2.80)	(3.02)	(3.32)	(3.35)	(3.32)	(3.36)	(5.03)	(5.03)
Crop Growth Cycle (Anc., pre-1500)	1.26	2.29	2.02	1.07	1.04	1.00	-4.32	-3.66
	(2.74)	(2.88)	(3.01)	(3.39)	(3.07)	(3.10)	(5.52)	(5.43)
Crop Growth Cycle Ch. (post-1500)	-5.26***	-4.91**	-6.92***	-7.03***	-5.50***	-5.54**	-4.34	-4.06
	(1.96)	(2.11)	(2.00)	(2.01)	(2.04)	(2.11)	(3.56)	(3.49)
Population density in 1500 CE		1.89						
		(2.23)						
Urbanization rate in 1500 CE				-1.56				
				(2.06)				
Urbanization rate in 1800 CE						-0.26		
						(1.21)		
GDPpc 1870							0.72	
							(4.75)	
GDPpc 1913								3.16
								(3.80)
	Partial R^2							
Crop Yield (Anc., pre-1500)	0.11**	0.10**	0.08*	0.08*	0.12**	0.12**	0.22**	0.22**
Crop Yield Change (post-1500)	0.07**	0.03	0.06*	0.06	0.05*	0.05*	0.16*	0.17**
Crop Growth Cycle (Anc., pre-1500)	0.00	0.01	0.01	0.00	0.00	0.00	0.02	0.02
Crop Growth Cycle Ch. (post-1500)	0.11***	0.09**	0.21***	0.21***	0.12***	0.12**	0.07	0.06
Population density in 1500 CE		0.01						
Urbanization rate in 1500 CE				0.01				
Urbanization rate in 1800 CE						0.00		
GDPpc 1870							0.00	
GDPpc 1913								0.02
	Semi-Partial R^2							
Crop Yield (Anc., pre-1500)	0.03**	0.03**	0.02*	0.02*	0.04**	0.04**	0.07**	0.07**
Crop Yield Change (post-1500)	0.02**	0.01	0.02*	0.02	0.02*	0.02*	0.05*	0.05**
Crop Growth Cycle (Anc., pre-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Crop Growth Cycle Ch. (post-1500)	0.03***	0.03**	0.07***	0.07***	0.04***	0.04**	0.02	0.02
Population density in 1500 CE		0.00						
Urbanization rate in 1500 CE				0.00				
Urbanization rate in 1800 CE						0.00		
GDPpc 1870							0.00	
GDPpc 1913								0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.68	0.67	0.66	0.66	0.65	0.59	0.60
Observations	87	87	65	65	79	79	50	50

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield and potential crop growth cycle on its level of Long-Term Orientation, while controlling for continental fixed effects, other geographical characteristics, and pre-industrial development. A country's level of pre-industrial development is measured by its population density, urbanization rates, or GDP per capita. In particular, columns (1)-(2) compare the effects of potential crop yields and population densities in 1500CE, while columns (3)-(4) use urbanization rates in 1500 CE instead. Columns (5)-(6) compare the effects of crop yield pre-1500CE and its change and urbanization in 1800CE. Finally columns (7)-(8) compare the effect of crop yield and growth cycle to GDP per capita in 1870CE and 1913CE. In all columns crop yield and its change remain positive, statistically and economically significant, and have a higher explanatory power than any of the alternative channels. Geographical controls as in Table 2. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.38: Potential Crop Yield, Long-Term Orientation, and Pre-Industrial Development, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation						
	1500CE					1800CE	
	Population Density		Urbanization		Both	Urbanization	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	6.63**	6.29**	5.45*	6.14*	6.93**	6.88**	6.86**
	(2.64)	(2.57)	(3.16)	(3.46)	(3.23)	(2.78)	(2.82)
Crop Yield Change (post-1500)	5.90**	4.63	5.71*	5.61	4.86	5.63*	5.67*
	(2.80)	(3.02)	(3.32)	(3.35)	(4.15)	(3.32)	(3.36)
Crop Growth Cycle (Anc., pre-1500)	1.26	2.29	2.02	1.07	0.69	1.04	1.00
	(2.74)	(2.88)	(3.01)	(3.39)	(3.18)	(3.07)	(3.10)
Crop Growth Cycle Ch. (post-1500)	-5.26***	-4.91**	-6.92***	-7.03***	-5.93***	-5.50***	-5.54**
	(1.96)	(2.11)	(2.00)	(2.01)	(2.10)	(2.04)	(2.11)
Population density in 1500 CE		1.89			2.40		
		(2.23)			(3.95)		
Urbanization rate in 1500 CE				-1.56	-2.46		
				(2.06)	(2.86)		
Urbanization rate in 1800 CE							-0.26
							(1.21)
	Partial R^2						
Crop Yield (Ancestors, pre-1500)	0.11**	0.10**	0.08*	0.08*	0.11**	0.12**	0.12**
Crop Yield Change (post-1500)	0.07**	0.03	0.06*	0.06	0.03	0.05*	0.05*
Crop Growth Cycle (Anc., pre-1500)	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Crop Growth Cycle Ch. (post-1500)	0.11***	0.09**	0.21***	0.21***	0.16***	0.12***	0.12**
Population density in 1500 CE		0.01			0.01		
Urbanization rate in 1500 CE				0.01	0.02		
Urbanization rate in 1800 CE							0.00
	Semi-Partial R^2						
Crop Yield (Ancestors, pre-1500)	0.03**	0.03**	0.02*	0.02*	0.03**	0.04**	0.04**
Crop Yield Change (post-1500)	0.02**	0.01	0.02*	0.02	0.01	0.02*	0.02*
Crop Growth Cycle (Anc., pre-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crop Growth Cycle Ch. (post-1500)	0.03***	0.03**	0.07***	0.07***	0.04***	0.04***	0.04**
Population density in 1500 CE		0.00			0.00		
Urbanization rate in 1500 CE				0.00	0.00		
Urbanization rate in 1800 CE							0.00
Continental FE	Yes	Yes	Yes	Yes	Yes		
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes		
Adjusted-R^2	0.68	0.68	0.67	0.66	0.68	0.66	0.65
Observations	87	87	65	65	64	79	79

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield and potential crop growth cycle and their change on grids that experienced change in crop on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's level of pre-industrial development as measured by its population density or urbanization rates in 1500 CE have economically smaller and not always statistically significant effects. In particular, columns (1)-(2) compare the effects of potential crop yields and population densities in 1500CE, while columns (3)-(4) use urbanization rates in 1500 CE instead. Column (5) controls for both urbanization rates and population densities in 1500CE. Finally, columns (6)-(7) compare the effects of crop yield pre-1500CE and its change and urbanization in 1800CE. In all columns crop yield and its change remain positive, statistically and economically significant, and have a higher explanatory power than any of the alternative channels. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.39: Potential Crop Yield, Long-Term Orientation, Agriculture and Language

	Long-Term Orientation								
	Agricultural Suitability			Plow			Future Time Reference		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (Ancestors, pre-1500)	12.02***	11.46***	10.36***	12.85***	12.80***	12.72***	13.05***	14.10***	13.95***
	(2.69)	(2.91)	(3.32)	(2.65)	(2.67)	(2.70)	(2.75)	(2.77)	(2.80)
Crop Yield Change (post-1500)	10.70***	10.50***	10.03***	10.93***	10.93***	11.17***	10.30***	9.89***	10.13***
	(2.71)	(2.70)	(2.73)	(2.77)	(2.78)	(2.76)	(3.16)	(2.88)	(3.02)
Crop Growth Cycle (Ancestors, pre-1500)	-7.63*	-7.71*	-8.04*	-10.02**	-10.13**	-10.50***	-10.87**	-10.05**	-10.21**
	(3.85)	(3.94)	(4.09)	(3.94)	(3.92)	(3.94)	(4.14)	(3.80)	(3.97)
Crop Growth Cycle Change (post-1500)	-0.90	-0.96	-1.16	-1.30	-1.40	-1.63	-1.09	-0.86	-0.97
	(1.62)	(1.68)	(1.76)	(1.69)	(1.66)	(1.61)	(1.62)	(1.72)	(1.70)
Land Suitability		0.83							
		(2.07)							
Land Suitability (Ancestors)			2.34						
			(3.20)						
Plow					1.62				
					(3.17)				
Plow (Ancestors)						3.35			
						(3.92)			
Strong FTR								-3.68**	
								(1.68)	
Strong FTR (Ancestors)									-2.59
									(1.76)
	Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.23***	0.16***	0.11***	0.25***	0.25***	0.25***	0.28***	0.32***	0.31***
Crop Yield Change (post-1500)	0.17***	0.16***	0.14***	0.17***	0.17***	0.18***	0.15***	0.15***	0.15***
Crop Growth Cycle (Anc., pre-1500)	0.05*	0.06*	0.06*	0.10**	0.10**	0.10***	0.11**	0.10**	0.10**
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
Land Suitability		0.00							
Land Suitability (Anc.)			0.01						
Plow					0.00				
Plow (Ancestors)						0.01			
Strong FTR								0.08**	
Strong FTR (Anc.)									0.04
	Semi-Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.07***	0.05***	0.03***	0.08***	0.08***	0.08***	0.08***	0.09***	0.09***
Crop Yield Change (post-1500)	0.05***	0.05***	0.04***	0.05***	0.05***	0.05***	0.04***	0.03***	0.04***
Crop Growth Cycle (Anc., pre-1500)	0.01*	0.01*	0.02*	0.03**	0.03**	0.03***	0.03**	0.02**	0.02**
Crop Growth Cycle Ch. (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land Suitability		0.00							
Land Suitability (Anc.)			0.00						
Plow					0.00				
Plow (Ancestors)						0.00			
Strong FTR								0.02**	
Strong FTR (Anc.)									0.01
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.67	0.68	0.67	0.66	0.67	0.70	0.72	0.70
Observations	85	85	85	87	87	87	71	71	71

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield and potential crop growth cycle on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's level of agricultural suitability and suitability for the use of plows have economically smaller and not always statistically significant effects. In particular, columns (1)-(3) compare the effects of potential crop yields and agricultural suitability. Columns (4)-(6) compare the effects to the use of plow. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation and percentage of land in tropical, subtropical and temperate climates. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.40: Potential Crop Yield, Long-Term Orientation, and Agriculture, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation					
	Agricultural Suitability			Plow		
Crop Yield (Ancestors, pre-1500)	7.50***	7.60***	7.65**	6.63**	6.53**	6.37**
	(2.55)	(2.81)	(3.02)	(2.64)	(2.67)	(2.73)
Crop Yield Change (post-1500)	6.81***	6.87***	6.92***	5.90**	5.89**	5.69**
	(2.45)	(2.42)	(2.49)	(2.80)	(2.77)	(2.71)
Crop Growth Cycle (Ancestors, pre-1500)	1.12	1.18	1.20	1.26	0.93	0.98
	(2.74)	(2.78)	(2.79)	(2.74)	(2.82)	(2.80)
Crop Growth Cycle Change (post-1500)	-4.43**	-4.49**	-4.51**	-5.26***	-5.30***	-5.34***
	(1.89)	(1.88)	(1.93)	(1.96)	(1.99)	(2.00)
Land Suitability		-0.26				
		(1.80)				
Land Suitability (Ancestors)			-0.36			
			(2.90)			
Plow					2.57	
					(2.52)	
Plow (Ancestors)						3.42
						(2.89)
	Partial R^2					
Crop Yield (Ancestors, pre-1500)	0.15***	0.14***	0.12**	0.11**	0.11**	0.10**
Crop Yield Change (post-1500)	0.10***	0.09***	0.09***	0.07**	0.07**	0.06**
Crop Growth Cycle (Ancestors, pre-1500)	0.00	0.00	0.00	0.00	0.00	0.00
Crop Growth Cycle Change (post-1500)	0.09**	0.08**	0.08**	0.11***	0.11***	0.11***
Land Suitability		0.00				
Land Suitability (Ancestors)			0.00			
Plow					0.01	
Plow (Ancestors)						0.02
	Semi-Partial R^2					
Crop Yield (Ancestors, pre-1500)	0.04***	0.04***	0.03**	0.03**	0.03**	0.03**
Crop Yield Change (post-1500)	0.02***	0.02***	0.02***	0.02**	0.02**	0.02**
Crop Growth Cycle (Ancestors, pre-1500)	0.00	0.00	0.00	0.00	0.00	0.00
Crop Growth Cycle Change (post-1500)	0.02**	0.02**	0.02**	0.03***	0.03***	0.03***
Land Suitability		0.00				
Land Suitability (Ancestors)			0.00			
Plow					0.00	
Plow (Ancestors)						0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.71	0.71	0.71	0.68	0.68	0.68
Observations	85	85	85	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield and potential crop growth cycle and their change for grids that experienced change in crops on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's level of agricultural suitability and suitability for the use of plows have economically smaller and not always statistically significant effects. In particular, columns (1)-(3) compare the effects of potential crop yields and agricultural suitability. Columns (4)-(6) compare the effects to the use of plow. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.41: Potential Crop Yield, Long-Term Orientation, and Agriculture

	Long-Term Orientation					
	Agricultural Suitability			Plow		
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Ancestors, pre-1500)	10.31***	8.34**	9.15**	11.05***	10.86***	10.68***
	(2.51)	(3.41)	(3.72)	(2.53)	(2.61)	(2.61)
Crop Yield Change (post-1500)	10.41***	10.42***	10.47***	10.76***	10.75***	10.93***
	(2.69)	(2.80)	(2.76)	(2.89)	(2.90)	(2.90)
Crop Growth Cycle (Anc., pre-1500)	-5.73	-6.42	-6.39	-8.06*	-8.19**	-8.74**
	(3.80)	(3.92)	(4.08)	(4.06)	(4.09)	(4.15)
Crop Growth Cycle Change (post-1500)	-0.06	-0.14	-0.17	-0.46	-0.58	-0.88
	(1.59)	(1.69)	(1.69)	(1.72)	(1.72)	(1.69)
Land Suitability (Climate)		3.15				
		(3.24)				
Land Suitability (Climate, Anc.)			1.75			
			(3.92)			
Plow					1.76	
					(3.30)	
Plow (Anc.)						3.89
						(3.72)
	Partial R^2					
Crop Yield (Anc., pre-1500)	0.21***	0.09**	0.08**	0.23***	0.22***	0.21***
Crop Yield Change (post-1500)	0.16***	0.17***	0.17***	0.16***	0.16***	0.17***
Crop Growth Cycle (Anc., pre-1500)	0.03	0.04	0.03	0.06*	0.06**	0.07**
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00
Land Suitability		0.01				
Land Suitability (Anc.)			0.00			
Plow					0.00	
Plow (Anc.)						0.02
	Semi-Partial R^2					
Crop Yield (Anc., pre-1500)	0.07***	0.02**	0.02**	0.08***	0.08***	0.07***
Crop Yield Change (post-1500)	0.05***	0.05***	0.05***	0.05***	0.05***	0.06***
Crop Growth Cycle (Anc., pre-1500)	0.01	0.01	0.01	0.02*	0.02**	0.02**
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00
Land Suitability		0.00				
Land Suitability (Anc.)			0.00			
Plow					0.00	
Plow (Anc.)						0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.67	0.67	0.67	0.65	0.65	0.65
Observations	85	85	85	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield, crop growth cycle and their change post-1500CE on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's level of agricultural suitability and suitability for the use of plows have economically smaller and not always statistically significant effects. In particular, columns (1)-(3) compare the effects of potential crop yields and climatic agricultural suitability. Columns (4)-(6) compare the effects to the use of plow. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.42: Long-Term Orientation and Pre-Industrial Trade

	Long-Term Orientation								
	Suitability		Money			Transportation			Routes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (Ancestors, pre-1500)	9.00***	9.84***	11.48***	12.03***	11.27***	11.61***	12.37***	11.17***	11.73***
	(2.85)	(2.45)	(2.73)	(3.33)	(2.61)	(2.67)	(3.35)	(2.66)	(2.76)
Crop Yield Change (post-1500)	10.03***	10.84***	11.08***	11.48***	11.11***	10.98***	11.32***	11.13***	11.81***
	(2.97)	(2.72)	(3.16)	(3.42)	(3.09)	(3.16)	(3.17)	(3.14)	(3.42)
Crop Growth Cycle (Ancestors, pre-1500)	-5.35	-7.71*	-8.36*	-8.96*	-8.79**	-8.33*	-9.28**	-8.56*	-9.73**
	(4.23)	(4.29)	(4.28)	(4.66)	(4.38)	(4.30)	(4.61)	(4.42)	(4.51)
Crop Growth Cycle Change (post-1500)	-0.12	0.27	-0.07	-0.02	-0.10	0.02	0.10	-0.34	0.02
	(1.70)	(1.52)	(1.82)	(1.79)	(1.76)	(1.85)	(1.77)	(1.75)	(1.83)
Land Suitability (Gini)	-2.11								
	(2.02)								
Land Suitability (Range)		2.46							
		(1.65)							
Exchange Medium 1000BCE			0.05						
			(2.43)						
Exchange Medium 1CE				1.15					
				(3.12)					
Exchange Medium 1000CE					4.60				
					(4.32)				
Transportation Medium 1000BCE						0.84			
						(3.18)			
Transportation Medium 1CE							2.40		
							(4.36)		
Transportation Medium 1000CE								1.50	
								(4.39)	
Pre-Industrial Distance to Trade Route									0.16
									(5.98)
	Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.13***	0.20***	0.23***	0.22***	0.23***	0.24***	0.22***	0.22***	0.24***
Crop Yield Change (post-1500)	0.15***	0.17***	0.17***	0.17***	0.16***	0.17***	0.18***	0.16***	0.18***
Crop Growth Cycle (Ancestors, pre-1500)	0.03	0.05*	0.07*	0.07*	0.07**	0.07*	0.07**	0.07*	0.09**
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land Suitability (Gini)	0.01								
Land Suitability (Range)		0.02							
Exchange Medium 1000BCE			0.00						
Exchange Medium 1CE				0.00					
Exchange Medium 1000CE					0.01				
Transportation Medium 1000BCE						0.00			
Transportation Medium 1CE							0.01		
Transportation Medium 1000CE								0.00	
Pre-Industrial Distance to Trade Route									0.00
	Semi-Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.04***	0.06***	0.08***	0.08***	0.09***	0.09***	0.08***	0.08***	0.10***
Crop Yield Change (post-1500)	0.05***	0.05***	0.06***	0.06***	0.06***	0.06***	0.06***	0.06***	0.07***
Crop Growth Cycle (Ancestors, pre-1500)	0.01	0.01*	0.02*	0.02*	0.02**	0.02*	0.02**	0.02*	0.03**
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land Suitability (Gini)	0.00								
Land Suitability (Range)		0.01							
Exchange Medium 1000BCE			0.00						
Exchange Medium 1CE				0.00					
Exchange Medium 1000CE					0.00				
Transportation Medium 1000BCE						0.00			
Transportation Medium 1CE							0.00		
Transportation Medium 1000CE								0.00	
Pre-Industrial Distance to Trade Route									0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.66	0.67	0.63	0.64	0.63	0.63	0.64	0.62	0.61
Observations	84	84	81	81	81	81	81	81	71

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield, crop growth cycle and their change post-1500 on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's opportunities and technologies for trade, as captured by the Gini and range of agricultural suitability, existence of means of exchange, means of transportation, and distance to trade (Özak, 2012) routes have an economically smaller and not statistically significant effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.43: Long-Term Orientation and Pre-Industrial Trade, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation								
	Suitability		Money			Transportation			Routes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (Ancestors, pre-1500)	7.39***	7.38***	8.22**	7.56***	7.53***	7.81***	7.52***	7.54***	6.50**
	(2.70)	(2.69)	(3.20)	(2.74)	(2.77)	(2.94)	(2.81)	(2.77)	(2.85)
Crop Yield Change (post-1500)	6.72***	6.72***	6.04**	6.01**	5.63**	5.97**	6.08**	5.61**	7.12**
	(2.51)	(2.51)	(2.85)	(2.90)	(2.80)	(2.86)	(2.84)	(2.80)	(3.34)
Crop Growth Cycle (Ancestors, pre-1500)	1.05	1.17	0.90	0.77	1.97	1.17	1.03	1.63	0.12
	(2.77)	(2.76)	(2.90)	(3.23)	(3.03)	(2.93)	(3.25)	(3.04)	(3.20)
Crop Growth Cycle Change (post-1500)	-4.20**	-4.42**	-5.02**	-5.05**	-5.27**	-5.05**	-5.13**	-5.21**	-5.67**
	(2.06)	(1.94)	(2.16)	(2.13)	(2.10)	(2.15)	(2.11)	(2.11)	(2.17)
Land Suitability (Gini)	-0.50								
	(2.02)								
Land Suitability (Range)		0.37							
		(1.35)							
Exchange Medium 1000BCE			1.31						
			(2.51)						
Exchange Medium 1CE				-0.93					
				(2.73)					
Exchange Medium 1000CE					6.07				
					(4.08)				
Transportation Medium 1000BCE						0.88			
						(3.23)			
Transportation Medium 1CE							-0.71		
							(4.07)		
Transportation Medium 1000CE								3.09	
								(4.07)	
Pre-Industrial Distance to Trade Route									4.40
									(5.78)
	Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.14***	0.14***	0.14**	0.14***	0.14***	0.14***	0.14***	0.14***	0.11**
Crop Yield Change (post-1500)	0.09***	0.09***	0.07**	0.07**	0.06**	0.07**	0.07**	0.06**	0.09**
Crop Growth Cycle (Ancestors, pre-1500)	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Crop Growth Cycle Change (post-1500)	0.06**	0.08**	0.10**	0.10**	0.11**	0.10**	0.11**	0.11**	0.12**
Land Suitability (Gini)	0.00								
Land Suitability (Range)		0.00							
Exchange Medium 1000BCE			0.01						
Exchange Medium 1CE				0.00					
Exchange Medium 1000CE					0.02				
Transportation Medium 1000BCE						0.00			
Transportation Medium 1CE							0.00		
Transportation Medium 1000CE								0.01	
Pre-Industrial Distance to Trade Route									0.01
	Semi-Partial R^2								
Crop Yield (Ancestors, pre-1500)	0.04***	0.04***	0.04**	0.04***	0.04***	0.04***	0.04***	0.04***	0.04**
Crop Yield Change (post-1500)	0.02***	0.02***	0.02**	0.02**	0.02**	0.02**	0.02**	0.02**	0.03**
Crop Growth Cycle (Ancestors, pre-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crop Growth Cycle Change (post-1500)	0.02**	0.02**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.04**
Land Suitability (Gini)	0.00								
Land Suitability (Range)		0.00							
Exchange Medium 1000BCE			0.00						
Exchange Medium 1CE				0.00					
Exchange Medium 1000CE					0.01				
Transportation Medium 1000BCE						0.00			
Transportation Medium 1CE							0.00		
Transportation Medium 1000CE								0.00	
Pre-Industrial Distance to Trade Route									0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.70	0.70	0.67	0.66	0.66	0.66	0.66	0.66	0.63
Observations	84	84	81	81	81	81	81	81	71

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield, crop growth cycle and their change post-1500 in grids that experienced a change in crop on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's opportunities and technologies for trade, as captured by the Gini and range of agricultural suitability, existence of means of exchange, means of transportation, and distance to trade routes have an economically smaller and not statistically significant effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.44: Long-Term Orientation and Risk

	Long-Term Orientation									
	Scale		Risk							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (Ancestors, pre-1500)	10.62***	9.28***	10.88***	11.56***	10.19***	9.58***	11.06***	11.08***	10.98***	11.04***
	(2.62)	(2.49)	(2.68)	(2.70)	(2.97)	(2.81)	(2.58)	(2.62)	(2.58)	(2.64)
Crop Yield Change (post-1500)	10.23***	8.85***	10.75***	10.72***	10.23***	9.85***	10.77***	10.84***	10.74***	10.74***
	(2.95)	(2.93)	(2.92)	(2.88)	(3.00)	(2.93)	(2.92)	(3.14)	(2.92)	(3.12)
Crop Growth Cycle (Ancestors, pre-1500)	-7.45*	-3.79	-8.14*	-7.22*	-6.31	-4.59	-8.07*	-8.16*	-8.02*	-8.05*
	(4.30)	(4.10)	(4.18)	(4.32)	(4.83)	(4.71)	(4.09)	(4.33)	(4.11)	(4.33)
Crop Growth Cycle Change (post-1500)	-0.60	0.15	-0.47	-0.31	-0.12	0.19	-0.46	-0.48	-0.44	-0.45
	(1.68)	(1.65)	(1.73)	(1.75)	(1.87)	(1.82)	(1.75)	(1.78)	(1.74)	(1.77)
Total land area	3.04									
	(2.17)									
Total land area (Ancestry Adjusted)		7.31***								
		(2.08)								
Precipitation Volatility (mean)			0.69							
			(3.05)							
Precipitation Volatility (mean) (Ancestry Adjusted)				-2.26						
				(3.02)						
Temperature Volatility (mean)					4.37					
					(6.44)					
Temperature Volatility (mean) (Ancestry Adjusted)						6.70				
						(5.07)				
Precipitation Diversification (mean)							-0.22			
							(2.95)			
Precipitation Diversification (mean) (Ancestry Adjusted)								-0.28		
								(2.85)		
Temperature Diversification (mean)									0.78	
									(3.05)	
Temperature Diversification (mean) (Ancestry Adjusted)										0.05
										(2.97)
	Partial R^2									
Crop Yield (Ancestors, pre-1500)	0.21***	0.18***	0.21***	0.23***	0.18***	0.16***	0.22***	0.22***	0.22***	0.22***
Crop Yield Change (post-1500)	0.15***	0.13***	0.16***	0.16***	0.15***	0.14***	0.16***	0.16***	0.16***	0.16***
Crop Growth Cycle (Ancestors, pre-1500)	0.05*	0.01	0.06*	0.05*	0.03	0.02	0.06*	0.06*	0.06*	0.06*
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total land area	0.02									
Total land area (Ancestry Adjusted)		0.14***								
Precipitation Volatility (mean)			0.00							
Precipitation Volatility (mean) (Ancestry Adjusted)				0.01						
Temperature Volatility (mean)					0.01					
Temperature Volatility (mean) (Ancestry Adjusted)						0.03				
Precipitation Diversification (mean)							0.00			
Precipitation Diversification (mean) (Ancestry Adjusted)								0.00		
Temperature Diversification (mean)									0.00	
Temperature Diversification (mean) (Ancestry Adjusted)										0.00
	Semi-Partial R^2									
Crop Yield (Ancestors, pre-1500)	0.07***	0.05***	0.07***	0.08***	0.06***	0.05***	0.08***	0.08***	0.08***	0.08***
Crop Yield Change (post-1500)	0.05***	0.04***	0.05***	0.05***	0.05***	0.04***	0.05***	0.05***	0.05***	0.05***
Crop Growth Cycle (Ancestors, pre-1500)	0.02*	0.00	0.02*	0.01*	0.01	0.00	0.02*	0.02*	0.02*	0.02*
Crop Growth Cycle Change (post-1500)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total land area	0.01									
Total land area (Ancestry Adjusted)		0.04***								
Precipitation Volatility (mean)			0.00							
Precipitation Volatility (mean) (Ancestry Adjusted)				0.00						
Temperature Volatility (mean)					0.00					
Temperature Volatility (mean) (Ancestry Adjusted)						0.01				
Precipitation Diversification (mean)							0.00			
Precipitation Diversification (mean) (Ancestry Adjusted)								0.00		
Temperature Diversification (mean)									0.00	
Temperature Diversification (mean) (Ancestry Adjusted)										0.00
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.65	0.70	0.65	0.65	0.65	0.66	0.65	0.65	0.65	0.65
Observations	87	87	87	87	87	87	87	87	87	87

Notes: This table establishes the positive, statistically, and economically significant effect of a country's pre-1500 CE potential crop yield, crop growth cycle and their change post-1500 on its level of Long-Term Orientation, while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's size and climatic volatility, as captured by its area, the volatility of precipitation and temperatures, and the spatial correlation of precipitation and temperatures across cells have do not have a statistically nor economically significant effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.8 Long-Term Orientation and Age Structure of Population and Development

Tables B.45-B.47 analyze the robustness of the results in the main body of the paper with respect to the country's age dependency ratio, life-expectancy, and income. These variables can affect Long-Term Orientation if individuals level of patience is affected by their age or life expectancy. Furthermore, if countries are sufficiently developed, they might have institutions like social security, unemployment insurance, etc. which should affect its level of Long-Term Orientation. Reassuringly, the results in these tables show that the results of the main body of the paper are not affected by the inclusion of these variables. The effect of crop yield remains statistically and economically significant and one additional standard deviation in crop yield increases Long-Term Orientation between 0.5 and 1 standard deviations depending on the specification and measure used. Additionally, as can be seen the inclusion of these variables does not change the coefficient on crop yield in a statistically significant manner. Furthermore, the age dependency ratio has a negative, though not always statistically significant effect on Long-Term Orientation. Similarly, the life-expectancy at birth has a positive, though not always statistically significant effect on LTO. Similarly, income levels are positively correlated with LTO, although the result is not statistically significant.

Table B.45: Potential Crop Yield, Crop Growth Cycle, and Modern Development

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	11.67***	10.87***	13.23***	12.96***				
	(3.80)	(3.58)	(3.95)	(3.90)				
Crop Growth Cycle	-4.53	-4.73	-4.90	-4.61				
	(4.20)	(3.95)	(4.00)	(4.07)				
Crop Yield (Ancestors)					15.52***	14.42***	16.39***	16.31***
					(2.94)	(3.02)	(3.04)	(3.06)
Crop Growth Cycle (Ancestors)					-6.30*	-6.27*	-6.62*	-6.33*
					(3.54)	(3.41)	(3.50)	(3.49)
Age Dependency Ratio		-6.51**				-4.37		
		(2.95)				(2.84)		
Life Expectancy at Birth			7.24*				5.77	
			(4.32)				(3.80)	
Ln[GPD per capita]				3.67				3.04
				(3.00)				(2.57)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.62	0.64	0.63	0.62	0.68	0.69	0.68	0.68
Observations	87	87	87	87	87	87	87	87

Notes: This table shows the robustness of the main findings to the inclusion of a country's age dependency ratio, its life-expectancy at birth, and log-income per capita in 2005. It establishes the positive, statistically, and economically significant effect of a country's potential crop yield on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's age dependency ratio, life-expectancy, and log-income per capita in 2005 do not have a robust effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.46: Pre-1500CE Crop Yield, Crop Growth Cycle, Their Changes, and Modern Development

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	11.08***	10.19***	12.73***	12.09***				
	(3.72)	(3.60)	(3.78)	(3.84)				
Crop Yield Change (post-1500)	10.32***	9.70***	11.28***	10.78***				
	(2.85)	(2.77)	(2.57)	(2.81)				
Crop Growth Cycle (pre-1500)	-7.72*	-6.95	-8.28**	-7.49*				
	(4.36)	(4.45)	(4.13)	(4.34)				
Crop Growth Cycle Change (post-1500)	-0.69	-1.38	-0.73	-0.89				
	(1.81)	(1.59)	(1.69)	(1.69)				
Crop Yield (Ancestors, pre-1500)					12.83***	12.12***	13.59***	13.40***
					(2.50)	(2.71)	(2.58)	(2.64)
Crop Yield Change (Anc., post-1500)					9.91***	9.35***	10.35***	9.96***
					(2.12)	(2.24)	(1.88)	(2.08)
Crop Growth Cycle (Ancestors, pre-1500)					-9.19***	-8.65**	-9.51***	-8.96***
					(3.34)	(3.55)	(3.13)	(3.36)
Crop Growth Cycle Ch. (Anc., post-1500)					-0.37	-0.74	-0.48	-0.51
					(1.48)	(1.37)	(1.45)	(1.44)
Age Dependency Ratio		-5.83*				-3.18		
		(3.01)				(2.76)		
Life Expectancy at Birth			7.69*				5.82	
			(4.22)				(3.67)	
Ln[GPD per capita]				3.07				2.15
				(2.88)				(2.52)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.63	0.65	0.64	0.63	0.69	0.69	0.69	0.69
Observations	87	87	87	87	87	87	87	87

Notes: This table shows the robustness of the main findings to the inclusion of a country's age dependency ratio, its life-expectancy at birth, and log-income per capita in 2005. It establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and its change on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's age dependency ratio, life-expectancy, and log-income per capita in 2005 do not have a robust effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.47: Pre-1500CE Crop Yield, Crop Growth Cycle, and Modern Development, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	6.37**	5.54*	6.60**	6.24*				
	(3.18)	(3.19)	(3.26)	(3.25)				
Crop Yield Change (post-1500)	5.71**	5.67**	6.01**	5.88**				
	(2.66)	(2.45)	(2.37)	(2.54)				
Crop Growth Cycle (pre-1500)	-0.37	-0.52	0.60	0.45				
	(2.60)	(2.73)	(2.45)	(2.65)				
Crop Growth Cycle Change (post-1500)	-4.75**	-4.66*	-5.42**	-5.14**				
	(2.25)	(2.36)	(2.30)	(2.39)				
Crop Yield (Ancestors, pre-1500)					7.85**	7.21**	7.48**	7.63**
					(3.26)	(3.37)	(3.36)	(3.34)
Crop Yield Change (Anc., post-1500)					7.31***	6.93***	7.47***	7.31***
					(2.25)	(2.12)	(1.98)	(2.14)
Crop Growth Cycle (Anc., pre-1500)					-0.95	-1.27	0.52	-0.01
					(3.16)	(3.24)	(3.17)	(3.34)
Crop Growth Cycle Ch. (Anc., post-1500)					-3.44	-3.48	-4.06*	-3.80
					(2.27)	(2.37)	(2.27)	(2.33)
Age Dependency Ratio		-5.84**				-4.12		
		(2.88)				(2.62)		
Life Expectancy at Birth			7.14*				6.31	
			(4.19)				(3.90)	
Ln[GPD per capita]				2.42				2.35
				(3.08)				(2.71)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.65	0.66	0.65	0.64	0.69	0.69	0.69	0.68
Observations	87	87	87	87	87	87	87	87

Notes: This table shows the robustness of the main findings to the inclusion of a country's age dependency ratio, its life-expectancy at birth, and log-income per capita in 2005. It establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and its change (on grids that experienced a change in its potential crop) on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's age dependency ratio, life-expectancy, and log-income per capita in 2005 do not have a robust effect. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.48: Potential Crop Return, Growth Cycle and Time Preference (Robustness to Development)

	All World				Old Oworld
	(1)	(2)	(3)	(4)	(5)
Crop Yield (Ancestors, pre-1500)	6.31**	9.60***	9.41***	11.89***	12.54***
	(2.53)	(2.60)	(2.14)	(2.67)	(2.73)
Crop Yield Change (post-1500)			8.02***	11.20***	12.17***
			(2.13)	(2.77)	(3.13)
Crop Growth Cycle (Ancestors, pre-1500)				-7.95**	-9.53**
				(3.92)	(4.20)
Crop Growth Cycle Change (post-1500)				-0.85	-0.50
				(1.63)	(1.68)
Ln[GPD per capita]	1.00	2.70	3.40	3.21	3.50
	(2.73)	(2.67)	(2.33)	(2.23)	(2.20)
Continent FE	Yes	Yes	Yes	Yes	Yes
Geography	No	Yes	Yes	Yes	Yes
Neolithic	No	Yes	Yes	Yes	Yes
Adjusted-R^2	0.51	0.59	0.65	0.66	0.62
Observations	87	87	87	87	72

Notes: This table establishes the robustness of the main findings to the inclusion of a country's log-income per capita in 2005. It establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and its change on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.9 Long-Term Orientation and Income Inequality

This section shows that the results presented in the main body of the paper are robust to a country's level of inequality. In particular, one possible concern with the main results is that if preferences are non-homothetic, then levels of inequality might be correlated with Long-Term Orientation (LTO). Reassuringly, as shown in tables B.49-B.51 the main results do not change if one controls for various measures of inequality.

Table B.49: Crop Yield, Crop Growth Cycle, and Inequality

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	11.26***	11.06***	10.46**	10.90***				
	(3.92)	(3.97)	(4.30)	(3.95)				
Crop Growth Cycle	-4.59	-4.44	-4.19	-4.37				
	(4.25)	(4.29)	(4.48)	(4.27)				
Crop Yield (Ancestors)					15.59***	15.63***	15.38***	15.61***
					(3.13)	(3.10)	(3.43)	(3.14)
Crop Growth Cycle (Ancestors)					-6.13*	-6.15*	-6.03	-6.14*
					(3.56)	(3.56)	(3.69)	(3.52)
Net Inequality 2000		-1.25				0.19		
		(3.42)				(3.20)		
Market Inequality 2000			-1.41				-0.33	
			(2.08)				(2.01)	
Average Inequality (80-09)				-1.50				0.08
				(3.62)				(3.39)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.61	0.61	0.61	0.61	0.67	0.67	0.67	0.67
Observations	84	84	84	84	84	84	84	84

Notes: This table shows the robustness of the main findings to the inclusion of a country's level of inequality. It establishes the positive, statistically, and economically significant effect of a country's potential crop yield on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's level of inequality does not have a statistically or economically significant effect. Net and market Inequality are taken from version 5 of the Standardized World Income Inequality Database (Solt, 2009) and average inequality is the average the World Development indicators Gini index. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.50: Pre-1500CE Crop Yield, Crop Growth Cycle, Their Changes, and Inequality

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	10.67***	10.59***	10.02**	10.65***				
	(3.72)	(3.78)	(4.04)	(3.73)				
Crop Yield Change (post-1500)	10.05***	9.95***	9.57***	9.99***				
	(2.87)	(2.84)	(2.85)	(3.01)				
Crop Growth Cycle (pre-1500)	-8.54*	-8.45*	-8.19*	-8.52*				
	(4.40)	(4.47)	(4.63)	(4.47)				
Crop Growth Cycle Change (post-1500)	-0.39	-0.36	-0.23	-0.38				
	(1.76)	(1.76)	(1.79)	(1.73)				
Crop Yield (Ancestors, pre-1500)					12.51***	12.53***	12.33***	12.50***
					(2.70)	(2.69)	(2.98)	(2.68)
Crop Yield Change (Anc., post-1500)					9.83***	9.86***	9.69***	9.81***
					(2.20)	(2.22)	(2.23)	(2.33)
Crop Growth Cycle (Ancestors, pre-1500)					-9.42***	-9.44***	-9.32***	-9.41***
					(3.40)	(3.44)	(3.49)	(3.38)
Crop Growth Cycle Change (Anc., post-1500)					-0.19	-0.20	-0.13	-0.18
					(1.49)	(1.43)	(1.49)	(1.40)
Net Inequality 2000		-0.59				0.17		
		(3.21)				(3.02)		
Market Inequality 2000			-1.21				-0.36	
			(1.93)				(1.88)	
Average Inequality (80-09)				-0.13				-0.03
				(3.39)				(3.24)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.63	0.62	0.62	0.62	0.68	0.68	0.68	0.68
Observations	84	84	84	84	84	84	84	84

Notes: This table shows the robustness of the main findings to the inclusion of a country's level of inequality. It establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and its change on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's level of inequality does not have a statistically or economically significant effect. Net and market Inequality are taken from version 5 of the Standardized World Income Inequality Database (Solt, 2009) and average inequality is the average the World Development indicators Gini index. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.51: Pre-1500CE Crop Yield, Crop Growth Cycle, Their Change, and Inequality, for Grids that Experienced Change in Crop post-1500CE

	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	6.62**	6.49*	6.30*	6.62*				
	(3.29)	(3.37)	(3.46)	(3.34)				
Crop Yield Change (post-1500)	5.31*	5.08*	4.91*	4.52				
	(2.80)	(2.74)	(2.67)	(2.92)				
Crop Growth Cycle (pre-1500)	-0.22	-0.02	-0.25	0.01				
	(2.63)	(2.66)	(2.67)	(2.67)				
Crop Growth Cycle Change (post-1500)	-4.69**	-4.74**	-4.63**	-4.72**				
	(2.29)	(2.32)	(2.30)	(2.29)				
Crop Yield (Ancestors, pre-1500)					8.08**	8.00**	7.94**	8.10**
					(3.33)	(3.37)	(3.46)	(3.37)
Crop Yield Change (Ancestors, post-1500)					7.30***	7.16***	7.03***	6.90***
					(2.36)	(2.37)	(2.29)	(2.59)
Crop Growth Cycle (Ancestors, pre-1500)					-0.46	-0.34	-0.58	-0.41
					(3.24)	(3.27)	(3.27)	(3.24)
Crop Growth Cycle Change (Ancestors, post-1500)					-3.31	-3.35	-3.31	-3.33
					(2.33)	(2.35)	(2.35)	(2.33)
Net Inequality 2000		-1.38				-0.76		
		(3.06)				(2.89)		
Market Inequality 2000			-1.63				-0.93	
			(1.85)				(1.77)	
Average Inequality (80-09)				-1.76				-1.03
				(3.42)				(3.36)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.65	0.64	0.65	0.64	0.69	0.68	0.68	0.68
Observations	84	84	84	84	84	84	84	84

Notes: This table shows the robustness of the main findings to the inclusion of a country's level of inequality. It establishes the positive, statistically, and economically significant effect of a country's pre-1500CE potential crop yield and its change (on grids that experienced a change in its potential crop) on its level of Long-Term Orientation, while controlling for continental fixed effects, geographical characteristics, and the timing of transition to agriculture. Additionally, it shows that a country's level of inequality does not have a statistically or economically significant effect. Net and market Inequality are taken from version 5 of the Standardized World Income Inequality Database (Solt, 2009) and average inequality is the average the World Development indicators Gini index. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, mean precipitation, percentages of land in tropical, subtropical and temperate zones, landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.10 Long-Term Orientation and Population Density and Education

The model suggests that during the Malthusian era one should expect that individuals with higher Long-Term Orientation (at least temporarily) have higher fertility rates. Thus, regions with higher representation of individuals with higher Long-Term Orientation should be expected to have higher population density. Reassuringly, Table B.52 demonstrates that indeed higher crop yield is associated with higher population density in the year 1500. However, in the post-Malthusian era when reproductive success is no longer correlated with income, Long-Term Orientation should be expected to correlate with investment in the education of children rater than their number. Indeed, as established in table B.53 education is positively correlated with crop yield in the contemporary period.

Table B.52: Pre-1500CE Potential Crop Yield, Growth Cycle, Their Changes and Population Density in 1500CE

	All World				Old World	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (pre-1500)	0.50***	0.71***	0.56***	0.42***	0.75***	0.42***
	(0.12)	(0.12)	(0.11)	(0.14)	(0.10)	(0.14)
Crop Growth Cycle (pre-1500)				0.18*		0.22**
				(0.10)		(0.11)
Neolithic Transition Timing			0.60***	0.59***		0.58***
			(0.14)	(0.15)		(0.14)
Continent FE	No	Yes	Yes	Yes	Yes	Yes
Geography	No	No	Yes	Yes	No	Yes
Adjusted-R^2	0.10	0.47	0.59	0.60	0.40	0.54
Observations	145	145	145	145	124	124

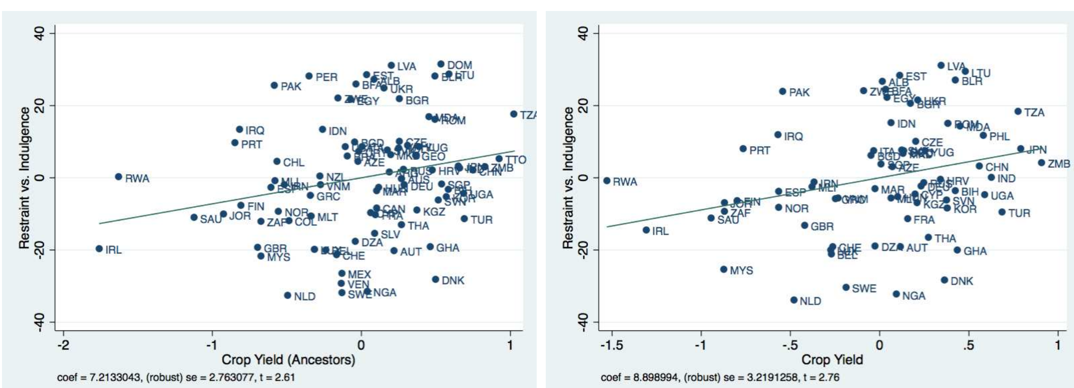
Table B.53: Long-Term Orientation and Education

	Years of Schooling						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Anc., pre-1500)	0.47**	0.89***	0.85***	0.85***	0.86***	0.91***	0.92***
	(0.21)	(0.23)	(0.22)	(0.22)	(0.22)	(0.24)	(0.28)
Crop Yield Ch. (post-1500)						0.12	0.14
						(0.28)	(0.34)
Crop Growth Cycle (Anc., pre-1500)							-0.02
							(0.30)
Crop Growth Cycle Ch. (post-1500)							0.07
							(0.17)
Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Continental FE	No	No	Yes	Yes	Yes	Yes	Yes
OPEC FE	No	No	Yes	Yes	Yes	Yes	Yes
Timing of Neolithic	No	No	No	No	Yes	Yes	Yes
Adjusted-R^2	0.03	0.53	0.59	0.59	0.59	0.59	0.58
Observations	130	130	130	130	130	130	130

B.11 Restraint vs Indulgence

Hofstede (1991) presents a second measure that could capture some elements of time preference. This measure, which he calls Restraint vs. Indulgence, "is characterized by a perception that one can act as one pleases, spend money, and indulge in leisurely and fun-related activities with friends or alone. All this predicts relatively high happiness. At the opposite pole we find a perception that one's actions are restrained by various social norms and prohibitions and a feeling that enjoyment of leisurely activities, spending, and other similar types of indulgence are somewhat wrong." (Hofstede et al., 2010, p.281) Although this seems to capture some elements of long-term orientation, it is also closely related to institutional and religious restraints on behavior, which are not related to the type of restraint caused by having higher levels of patience. For this reason, the analysis in this paper focuses on the Long-Term Orientation of Hofstede et al. (2010) instead of the Restraint vs. Indulgence (RIV) one. Still, as the analysis below shows, the main results would remain qualitatively unchanged with this other measure.

The partial correlation between RIV and potential crop yield, after controlling for time invarying continental heterogeneity, is 0.32 ($p < 0.01$). Table B.54 replicates the analysis of table 1, which used Hofstede's Long-Term Orientation, using the Restraint vs. Indulgence measure. As can be seen there the results are fairly similar, although a little weaker in this case. This supports the interpretation that RIV is a noisy measure of Long-Term Orientation and captures additional elements unrelated to patience. Figure B.8 shows the partial correlation between both variables for the specifications in columns (6) and (8). The next section analyzes further the relation between crop yield, Long-Term Orientation and other societal cultural measures.



(a) Ancestry adjusted (b) Old World

Figure B.8: Restraint vs. Indulgence and Potential Crop Yield

B.12 Potential Crop Yield and Other Societal Preferences and Cultural Characteristics

This section establishes that the effect of potential crop yield on Long-Term Orientation does not capture a wider effect of potential crop yield on a wide range of other cultural characteristics. In particular, Uncertainty Avoidance (the level of tolerance and rigidness of society); Power distance (the level of hierarchy and inequality of power); Individualism (how individualistic as opposed to collectivistic a society is); and Masculinity (level of internal cooperation or competition) as constructed by Hofstede et al. (2010), and the level of generalized trust as reported by the World Values Survey.

Table B.54: Potential Crop Yield, Potential Crop Growth Cycle, and Restraints vs. Indulgence (Hofstede)

	Restraints vs. Indulgence							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	6.16***	7.95***	8.26***	7.66**			9.28***	8.90***
	(1.78)	(1.80)	(1.77)	(2.90)			(1.86)	(3.22)
Crop Growth Cycle				1.05				0.60
				(4.07)				(4.46)
Crop Yield (Ancestors)					7.38***	7.21**		
					(1.71)	(2.76)		
Crop Growth Cycle (Ancestors)						0.30		
						(4.22)		
Absolute latitude		0.83	1.40	1.67	3.00	3.06	0.97	1.12
		(3.16)	(3.19)	(3.13)	(3.40)	(3.30)	(3.60)	(3.49)
Mean elevation		0.37	-0.18	-0.39	-0.60	-0.64	-2.39	-2.46
		(2.96)	(3.13)	(3.18)	(3.12)	(3.16)	(2.87)	(2.90)
Terrain Roughness		-2.35	-2.55	-2.54	-2.53	-2.53	-2.49	-2.50
		(2.15)	(2.18)	(2.18)	(2.26)	(2.27)	(2.25)	(2.26)
Neolithic Transition Timing			2.89	2.72			3.79	3.69
			(3.38)	(3.29)			(3.39)	(3.34)
Neolithic Transition Timing (Ancestors)					2.58	2.54		
					(2.70)	(2.66)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.37	0.42	0.41	0.41	0.39	0.38	0.23	0.22
Observations	86	86	86	86	86	86	71	71

Notes: This table establishes the positive, statistically, and economically significant effect of a country's potential crop yield, measured in calories per hectare per year, on its level of restraint as opposed to indulgence measured, on a scale of 0 to 100, by Hofstede et al. (2010), while controlling for continental fixed effects and other geographical characteristics. Additionally, it shows that a country's potential crop growth cycle does not have a statistically significant effect on its restraint vs. indulgence measure. In particular, columns (1)-(3) show the effect of crop yield after controlling for the country's absolute latitude, mean elevation above sea level, terrain roughness, distance to a coast or river, of it being landlocked or an island, and the time since it transitioned to agriculture. Columns (4)-(6) show that the effect remains after controlling for potential crop growth cycle and the effects of migration. Columns (7)-(8) show that restraining the analysis to the Old World, where intercontinental migration played a smaller role, does not alter the results. Additional geographical controls include distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on a country's restraint vs. indulgence measure. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.55 shows the Pearson correlations between these cultural characteristics. As expected,[38] Long-Term Orientation is significantly statistically correlated with the measure of Restraint vs. Indulgence. On the other hand, it is not correlated with *any* of the other cultural characteristics measured by Hofstede et al. (2010), nor with levels of generalized trust.

Table B.56 shows the effect of crop yield on each of these measures after controlling for continental

[38] See previous subsection.

Table B.55: Long-Term Orientation and Other Societal Preferences

	Correlation Among Cultural Indices						
	(LTO)	(RVI)	(Trust)	(Ind)	(PDI)	(Coop)	(UAI)
Long-Term Orientation (LTO)	1.00						
Restraint vs. Indulgence (RIV)	0.53***	1.00					
Trust	0.19	-0.07	1.00				
Individualism (Ind)	0.12	-0.18	0.45***	1.00			
Power Distance (PDI)	0.05	0.34**	-0.50***	-0.66***	1.00		
Cooperation	0.01	-0.09	-0.21	0.05	0.16	1.00	
Uncertainty Avoidance (UAI)	-0.04	0.07	-0.50***	-0.23	0.27*	-0.00	1.00

Notes: This table shows the correlations between Long-Term Orientation and various measures of societal preferences and culture. In particular, it includes all other measures presented by Hofstede et al. (2010) and the conventional measure of interpersonal trust based on the World Values Survey. As can be seen, the only measure that correlates with Long-Term Orientation is Restraint vs. Individualism (RIV). This is expected, since RIV seems to capture some elements of the ability to delay gratification, although it is mostly correlated with institutional level constraints on behavior. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

fixed effects. As can be seen there, crop yield is only economically and statistically significant in columns (1) and (2), i.e. for Long-Term Orientation and Restraint vs. Indulgence. On the other hand, it is not economically nor statistically significant in the regression of any of the other cultural measures.

Tables B.57-B.59 show the relation between ancestry adjusted potential crop yield and its change for crops available pre-1500CE on the various cultural measures after controlling for continental fixed effects, geography, agricultural suitability and years since transition to agriculture. As can be seen there, the effect of crop yield is economically and statistically significant only on Long-Term Orientation.[39]

Finally, tables B.60 and B.61 show the relation between ancestry adjusted crop yields and their change for crops available pre-1500CE and Long-Term Orientation, after controlling for the effect of geography, agricultural suitability, years since the transition to agriculture, and continental fixed effects. Additionally it shows the effect of including each of the other cultural measures. As can be seen there, the effect of crop yield is not affected by the inclusion of this large set of geographical controls, nor of the cultural measures. Furthermore, except for Restraint vs. Indulgence, none of the other cultural measures has an effect on Long-Term Orientation that is statistically significantly different from zero.

These results suggest that crop yield's effect on a country's culture is mainly on its level of time preference. Furthermore, and reassuringly, there does not seem to exist a significant correlation among the time preference measures and other measures of culture at the country level, which might have biased the results.

[39] In some specifications crop yield or agricultural suitability are negatively correlated with levels of trust and cooperation. This result supports similar findings by Litina (2013).

Table B.56: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Cultural Indices						
	Long-Term Orientation	Restraint vs Indulgence	Trust	Individua-lism	Power Distance	Coopera-tion	Uncertainty Avoidance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield	9.67***	6.76**	-4.24	-1.32	4.04	-2.16	4.37
	(2.86)	(2.82)	(2.98)	(3.33)	(4.29)	(3.65)	(5.02)
Crop Growth Cycle	-3.78	-1.81	-2.65	-1.52	2.35	10.07***	2.87
	(2.29)	(3.14)	(2.86)	(3.10)	(3.81)	(3.10)	(5.27)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.55	0.37	0.32	0.53	0.14	0.10	0.16
Observations	87	85	85	62	62	62	62

Notes: This table analyzes the relation between various societal preferences and cultural indices and potential crop yield and growth cycle. All columns account for continental fixed effects. It establishes that potential crop yield has a positive, statistically, and economically significant effect only on measures of a country's level of time preference, i.e. Long-Term Orientation and Restraint vs Indulgence. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.57: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Cultural Indices						
	Long-Term Orientation	Restraint vs Indulgence	Trust	Individualism	Power Distance	Cooperation	Uncertainty Avoidance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	7.29**	1.99	-10.60***	-8.90*	7.71*	-0.62	5.83
	(2.89)	(3.51)	(2.97)	(4.47)	(4.46)	(5.02)	(4.10)
Crop Growth Cycle (Ancestors, pre-1500)	-1.10	-1.95	-1.38	2.45	-1.47	3.13	4.33
	(3.01)	(3.44)	(2.68)	(3.42)	(3.69)	(4.11)	(3.95)
Land Suitability	3.03	6.51*	0.02	3.48	6.81*	7.47*	3.33
	(2.70)	(3.28)	(3.33)	(3.41)	(3.43)	(3.84)	(2.72)
Neolithic Transition Timing (Ancestors)	-7.92**	-1.30	-1.00	0.73	-0.44	3.89	-7.51*
	(3.75)	(4.60)	(3.97)	(3.62)	(4.11)	(5.28)	(3.79)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.62	0.38	0.46	0.66	0.41	0.43	0.61
Observations	85	83	83	60	60	60	60

Notes: This table analyzes the relation between various societal preferences and cultural indices and pre-1500CE potential crop yield and growth cycle experienced by a country's ancestral populations. All columns account for continental fixed effects, geographical controls, land suitability, and the ancestry adjusted timing of transition to agriculture. It establishes that potential crop yield has a positive, statistically, and economically significant effect only on a country's level of Long-Term Orientation. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.58: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Cultural Indices						
	Long-Term Orientation	Restraint vs Indulgence	Trust	Individualism	Power Distance	Cooperation	Uncertainty Avoidance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	11.02***	4.61	-11.23***	-7.70	8.80*	-1.80	5.94
	(2.63)	(3.20)	(3.36)	(5.09)	(5.00)	(5.79)	(4.99)
Crop Yield Change (Anc., post-1500)	9.39***	7.49***	-1.77	-1.98	3.66*	0.42	0.55
	(2.11)	(2.69)	(3.15)	(2.66)	(2.07)	(2.33)	(2.39)
Crop Growth Cycle (Ancestors, pre-1500)	-5.75**	-5.03	-0.43	2.27	-2.82	3.63	4.15
	(2.66)	(3.41)	(3.43)	(3.81)	(4.14)	(4.44)	(4.35)
Crop Growth Cycle Change (Anc., post-1500)	-0.58	1.61	1.07	-3.73	-1.05	2.99	-0.04
	(1.55)	(2.27)	(1.98)	(3.41)	(2.87)	(2.63)	(3.16)
Land Suitability	0.92	4.39	0.05	3.99	6.70**	7.13*	3.30
	(2.14)	(3.10)	(3.48)	(3.29)	(3.21)	(3.78)	(2.77)
Neolithic Transition Timing (Ancestors)	-7.18**	-0.63	-0.98	0.87	-0.78	3.89	-7.56*
	(2.97)	(4.49)	(4.03)	(3.39)	(4.09)	(5.54)	(3.89)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.42	0.44	0.67	0.40	0.41	0.59
Observations	85	83	83	60	60	60	60

Notes: This table analyzes the relation between various societal preferences and cultural indices and pre-1500CE potential crop yield and growth cycle and their change post-1500CE experienced by a country's ancestral populations. All columns account for continental fixed effects, geographical controls, land suitability, and the ancestry adjusted timing of transition to agriculture. It establishes that potential crop yield has a positive, statistically, and economically significant effect only on a country's level of Long-Term Orientation. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.59: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Cultural Indices						
	Long-Term Orientation	Restraint vs Indulgence	Trust	Individua-lism	Power Distance	Coopera-tion	Uncertainty Avoidance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	10.03***	6.58	-7.11*	-10.88	6.69	-7.60	3.03
	(3.05)	(3.99)	(3.72)	(6.59)	(5.92)	(5.98)	(5.55)
Crop Yield Change (Anc., post-1500)	9.03***	7.91**	-0.53	-3.05	2.50	-1.51	-0.39
	(2.16)	(3.10)	(3.48)	(2.62)	(2.18)	(2.23)	(2.21)
Crop Growth Cycle (Ancestors, pre-1500)	-5.98**	-4.59	0.35	2.20	-2.50	3.50	4.06
	(2.75)	(3.57)	(3.47)	(3.82)	(4.11)	(4.15)	(4.33)
Crop Growth Cycle Change (Anc., post-1500)	-0.77	2.02	1.96	-3.72	-0.89	3.00	-0.05
	(1.60)	(2.42)	(2.09)	(3.18)	(2.90)	(2.51)	(3.24)
Land Suitability (Ancestors)	2.33	0.91	-6.17	6.94	7.75*	12.54***	6.08
	(3.15)	(4.86)	(5.10)	(4.99)	(4.22)	(3.91)	(3.98)
Neolithic Transition Timing (Ancestors)	-7.58**	-0.19	0.56	-0.60	-2.13	1.22	-8.88**
	(3.04)	(4.62)	(4.09)	(3.32)	(4.40)	(5.85)	(3.77)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.41	0.46	0.68	0.39	0.46	0.60
Observations	85	83	83	60	60	60	60

Notes: This table analyzes the relation between various societal preferences and cultural indices and pre-1500CE potential crop yield and growth cycle and their change post-1500CE experienced by a country's ancestral populations. All columns account for continental fixed effects, geographical controls, and the land suitability and the timing of transition to agriculture experienced by the country's ancestral populations. It establishes that potential crop yield has a positive, statistically, and economically significant effect only on a country's level of Long-Term Orientation. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.60: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Long-Term Orientation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	7.29**	6.76**	7.84**	11.75**	10.33**	10.74**	10.21**
	(2.89)	(2.89)	(3.51)	(5.19)	(5.07)	(4.68)	(4.92)
Crop Growth Cycle (Ancestors, pre-1500)	-1.10	-0.62	-1.90	-2.92	-2.55	-3.26	-2.91
	(3.01)	(3.06)	(3.16)	(5.14)	(5.20)	(5.19)	(4.96)
Restraint vs. Indulgence		4.44**					
		(2.05)					
Trust			-0.09				
			(3.12)				
Individualism				3.01			
				(4.22)			
Power Distance					0.77		
					(3.55)		
Cooperation						4.39	
						(3.57)	
Uncertainty Avoidance							1.59
							(5.58)
Land Suitability	3.03	1.73	2.74	-2.81	-2.62	-3.93	-2.60
	(2.70)	(2.80)	(2.72)	(3.55)	(3.72)	(3.87)	(3.81)
Neolithic Transition Timing (Ancestors)	-7.92**	-7.71**	-7.51*	-7.50	-7.39	-8.22	-6.88
	(3.75)	(3.67)	(3.82)	(5.40)	(5.50)	(5.14)	(5.53)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.62	0.63	0.61	0.56	0.56	0.58	0.56
Observations	85	83	83	60	60	60	60

Notes: This table establishes the positive, statistically and economically significant effect of pre-1500CE potential crop yield and growth cycle experienced by a country's ancestral populations on its level of Long-Term Orientation. All columns account for continental fixed effects, geographical controls, and the land suitability and timing of transition to agriculture experienced by the country's ancestral populations. It establishes that the inclusion of other societal preferences and cultural indices does not affect the estimated coefficient on potential crop yield. Furthermore, other cultural values do not have a statistically significant effect different from zero. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.61: Crop Yield, Crop Growth Cycle, and Other Societal Preferences

	Long-Term Orientation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	10.03***	9.38***	10.30***	13.54**	11.47*	12.76*	11.17*
	(3.05)	(3.21)	(3.41)	(6.49)	(6.78)	(6.78)	(6.53)
Crop Yield Change (Anc., post-1500)	9.03***	8.55***	8.97***	7.45***	6.88**	7.11***	6.84***
	(2.16)	(2.53)	(2.23)	(2.47)	(2.63)	(2.53)	(2.50)
Crop Growth Cycle (Ancestors, pre-1500)	-5.98**	-5.71*	-6.05**	-5.53	-5.14	-5.75	-5.29
	(2.75)	(3.08)	(2.76)	(4.88)	(5.32)	(5.14)	(4.89)
Crop Growth Cycle Change (Anc., post-1500)	-0.77	-0.88	-0.71	0.17	-0.61	-1.16	-0.59
	(1.60)	(1.71)	(1.84)	(3.11)	(3.11)	(3.20)	(3.03)
Restraint vs. Indulgence		2.18					
		(2.22)					
Trust			0.63				
			(3.10)				
Individualism				4.80			
				(3.96)			
Power Distance					-0.45		
					(3.90)		
Cooperation						3.95	
						(4.20)	
Uncertainty Avoidance							1.18
							(6.06)
Land Suitability (Ancestors)	2.33	2.30	2.35	-2.71	-1.13	-3.67	-1.61
	(3.15)	(3.30)	(3.51)	(4.93)	(4.76)	(5.54)	(5.32)
Neolithic Transition Timing (Ancestors)	-7.58**	-7.49**	-7.51**	-7.86	-8.03	-8.22	-7.53
	(3.04)	(3.05)	(3.14)	(5.32)	(5.34)	(5.07)	(5.91)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.68	0.68	0.67	0.59	0.58	0.59	0.58
Observations	85	83	83	60	60	60	60

Notes: This table establishes the positive, statistically and economically significant effect of pre-1500CE potential crop yield, growth cycle and their change post-1500CE experienced by a country's ancestral populations on its level of Long-Term Orientation. All columns account for continental fixed effects, geographical controls, and the land suitability and timing of transition to agriculture experienced by the country's ancestral populations. It establishes that the inclusion of other societal preferences and cultural indices does not affect the estimated coefficient on potential crop yield. Furthermore, other cultural values do not have a statistically significant effect different from zero. Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, landlocked and island dummies, precipitation, and shares of land in tropical, subtropical and in temperate climate zones. Heteroskedasticity robust standard error estimates are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.13 Potential Crop Yield, Growth Cycle and Mode of Production

Table B.62: Pre-1500CE Crop Yield, Growth Cycle, and Ethnic Subsistence (Ethnographic Atlas)

	Subsistence Dependence on								
	Agriculture					Gathering	Hunting	Fishing	Animal Husbandry
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (pre-1500)	0.34***	0.31***	0.35***	0.26***	0.23***	-0.12*	0.01	-0.09**	-0.16*
	(0.10)	(0.07)	(0.06)	(0.06)	(0.05)	(0.07)	(0.05)	(0.04)	(0.09)
Crop Yield Ch. (post-1500)			0.13***	0.09**	0.07**	-0.01	-0.06	0.05	-0.08
			(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.05)	(0.08)
Crop Cycle (pre-1500)					0.01	0.03	-0.00	-0.09*	0.04
					(0.04)	(0.05)	(0.04)	(0.05)	(0.03)
Crop Growth Cycle Ch. (post-1500)					-0.06	-0.01	-0.06**	-0.00	0.15*
					(0.06)	(0.03)	(0.02)	(0.03)	(0.08)
Continental FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.12	0.44	0.45	0.49	0.49	0.44	0.47	0.44	0.50
Observations	1181	1181	1181	1181	1181	1181	1181	1181	1181

Notes: This table establishes the positive correlation between the agricultural subsistence mode and pre-1500 potential crop yield and its change. Additionally, it establishes the negative or zero correlation between potential yield, its change and other modes of subsistence. Standardized coefficients. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.63: Pre-1500CE Crop Yield, Growth Cycle, and Intensity of Agriculture (Ethnographic Atlas)

	Intensive Agriculture				
	(1)	(2)	(3)	(4)	(5)
Crop Yield (pre-1500)	0.46***	0.33***	0.32***	0.32***	0.29***
	(0.10)	(0.08)	(0.07)	(0.07)	(0.08)
Crop Yield Ch. (post-1500)			-0.02	-0.02	-0.04
			(0.06)	(0.04)	(0.03)
Crop Cycle (pre-1500)					0.00
					(0.05)
Crop Growth Cycle Ch. (post-1500)					-0.06**
					(0.03)
Continental FE	No	Yes	Yes	Yes	Yes
Geographical Controls	No	No	No	Yes	Yes
Adjusted-R^2	0.21	0.47	0.47	0.51	0.51
Observations	1141	1141	1141	1141	1141

Notes: Standardized coefficients. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.64: Pre-1500CE Crop Yield, Growth Cycle, and Subsistence on Agriculture vs Others (Ethnographic Atlas)

	Agriculture Contributes Most to Subsistence				
	(1)	(2)	(3)	(4)	(5)
Crop Yield (pre-1500)	0.32***	0.30***	0.35***	0.26***	0.21***
	(0.10)	(0.09)	(0.08)	(0.08)	(0.06)
Crop Yield Ch. (post-1500)			0.16***	0.12**	0.10**
			(0.05)	(0.05)	(0.04)
Crop Cycle (pre-1500)					0.03
					(0.05)
Crop Growth Cycle Ch. (post-1500)					-0.07
					(0.06)
Continental FE	No	Yes	Yes	Yes	Yes
Geographical Controls	No	No	No	Yes	Yes
Adjusted-R^2	0.10	0.35	0.36	0.39	0.40
Observations	1181	1181	1181	1181	1181

Notes: Standardized coefficients. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.14 Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants

This section presents additional supporting tables for the analysis of Long-Term Orientation in second-generation migrants. In particular, it analyzes the effect of crop yield and growth cycle pre- and post1500CE, their changes on Long-Term Orientation (LTO) using both ordinary least squares (OLS) and ordered probit regressions, and constraining the sample to individuals both of whose parents are foreign.

The OLS estimates from this analysis are presented in Table B.65. All columns control for an individual's sex and age and its square, and include host country fixed effects. Columns (1)-(5) use the values of crop yield, crop growth cycle, all additional geographical controls, and the timing of transition to agriculture of the individual's mother's country of origin.[40] Columns (6)-(8) use only the sample of individuals whose parents come from the same country. Heteroskedasticity robust standard errors are clustered at the parent's country of origin and shown in parenthesis.

Column (1) shows that after controlling for an individual's sex and age, and any time-invariant unobservable host country factors, an additional standard deviation crop yield in the individual's mother's country of origin, increases the individual's Long-Term Orientation by 3.1 percentage points. Column (2) shows that controlling for an individual's level of education, marital and health status, and religiosity, does not alter the results. The coefficient on crop yield remains statistically significant at the 1% level and increasing crop yield by one standard deviation increases Long-Term Orientation by 3.3 percentage points.

Column (3) additionally controls for other geographical characteristics of the country of origin of the mother and for its years since the transition to the Neolithic. The geographical controls included are the country's absolute latitude, mean elevation above sea level, its terrain roughness, its mean distance to the sea or navigable river, and dummies for being landlocked or an island. The coefficient on crop yield doubles in size and remains statistically significant at the 1% level. As in the analysis of the previous section, crop yield has the largest effect on Long-Term Orientation among all geographical controls. In particular, increasing crop yield by one standard deviation in the country of origin of the mother increases an individual's Long-Term Orientation by 6.1 percentage points.

Column (4) includes crop growth cycle in the specification of column (3). The effect of crop growth cycle is again negative, but not statistically different from zero. On the other hand, crop yield remains statistically significant at the 1% level and its point estimate increases by 1 unit. Thus, after controlling for individual's characteristics, host country fixed effects, other geographical characteristics of the mother's country of origin and its crop growth cycle, an increase in one standard deviation in crop yield generates an increase of 7.2 percentage points on an individuals Long-Term Orientation. Column (5) repeats the analysis of column (4), but uses the mother's ancestry adjusted crop return, crop growth cycle, and years since transition to agriculture. As can be seen there, the results remain qualitatively unchanged, and the coefficient on crop yield increases to 8 and is statistically significant at the 1% level.

In order to avoid the difference between fathers and mothers, columns (6)-(8) focus on individuals whose parents came from the same country of origin. Column (6) repeats the analysis of columns (4) using only this restricted sample. The coefficient on crop yield is 6 and is close to being significant at the 1% level. On the other hand, none of the other geographical controls, the timing of transition to the Neolithic, nor crop growth cycle are statistically significant.

Column (7) adjusts crop yield, crop growth cycle, and the timing of the transition to the Neolithic for the ancestry of the current inhabitants of the parents country of origin. Thus, accounting for migration and population replacement that occurred during the last 500 years. Reassuringly, the

[40] Using the father's country of origin generates similar results.

Table B.65: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants

	Long-Term Orientation (OLS)							
	Country of Origin							
	Mother					Parents		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	3.12***	3.27***	6.07***	7.16***		5.97**		8.22***
	(1.17)	(1.23)	(2.10)	(2.23)		(2.65)		(3.05)
Crop Growth Cycle				-3.26		-2.05		-2.23
				(2.12)		(2.21)		(2.56)
Crop Yield (Ancestors)					7.95***		7.12**	
					(2.24)		(2.72)	
Crop Growth Cycle (Ancestors)					-3.50		-2.39	
					(2.20)		(2.38)	
Neolithic Transition Timing			-1.66	-1.23		0.09		-1.74
			(1.66)	(1.57)		(1.69)		(1.78)
Neolithic Transition Timing (Ancestors)					-1.76		-0.67	
					(1.63)		(1.77)	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sex & Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Ind. Chars.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	Yes
R^2	0.06	0.10	0.12	0.12	0.12	0.15	0.15	0.15
Observations	705	705	705	705	705	566	566	557

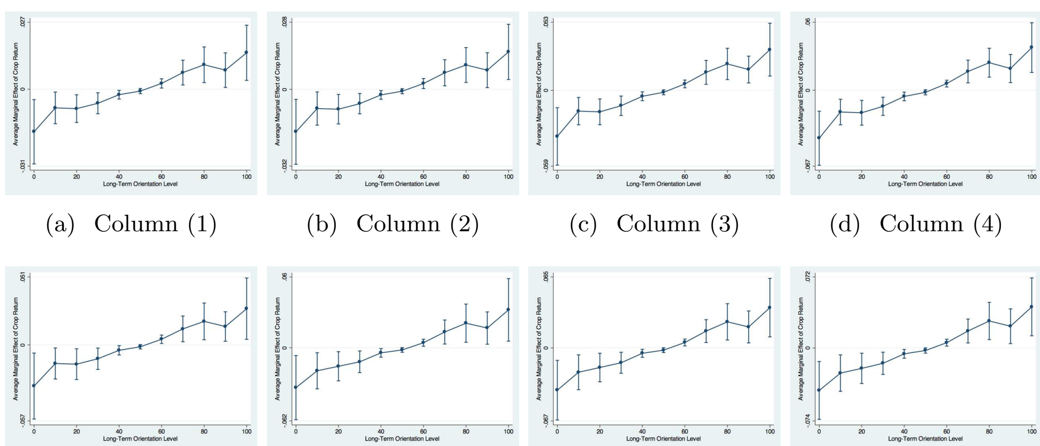
Notes: This table establishes that the potential crop yield in the country of origin of first generation migrants in Europe has a positive, statistically, and economically significant effect on the Long-Term Orientation of their foreign born children. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question "Do you generally plan for your future or do you just take each day as it comes?".The data is taken from the third wave of the European Social Survey (2006). The analysis is restricted to second-generation migrants, i.e. individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. All columns include fixed effects for the country where the interview was conducted, and individual characteristics (sex, age, education, marital status, health status, religiosity). Geographical controls include absolute latitude, mean elevation, terrain roughness, distance to coast or river, and landlocked and island dummies. In columns (1)-(4) the potential crop yield, potential crop growth cycle, and geographical characteristics of the country of origin of the mother are used as controls. Column (5) uses the data of the father's country of origin, while columns (6)-(7) restricts the sample to individuals whose parents come from the same country of origin. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

results remain qualitatively unchanged. None of the geographical characteristics of parents' country of origin nor its ancestry adjusted timing of the transition to the Neolithic have an effect that is statistically different from zero. On the other hand, the crop yield of the ancestral populations of the parents' country of origin has a statistically and economically significant effect. The results imply that increasing the ancestry adjusted crop yield of an individual's parents' country of origin increases their Long-Term Orientation by 7.1 percentage points.

Finally, column (8) restricts the sample to the individuals whose parents came from the same country in the Old World. This lowers concerns generated by migration and population replacement since 1500. Reassuringly, the coefficient on crop yield remains statistically significant at the 5% level and implies that an increase of one standard deviation in the crop yield in the country of origin of an individual's parents increases her Long-Term Orientation by 8.2 percentage points. On the other hand, as before the effect of all other geographical characteristics, the timing of the Neolithic, and crop growth cycle remains not statistically different from zero.

The Long-Term Orientation measure is constructed based on a survey question where individuals answered on a scale from 0 to 100 in intervals of 10. The OLS estimates presented in table B.65 assume that the distance between those intervals is meaningful and that the length of all intervals represents the same difference in Long-Term Orientation. This cardinality assumption might not always be adequate, as the scale might only capture the qualitative order of preferences. In this case it is better to use ordered probit to estimate the relation.

Ordered probit estimates the probability of observing each level of Long-Term Orientation given the values of the independent variables. The estimated parameters have the same sign and significance pattern found with OLS (see appendix B.14). Although this is reassuring, the interpretation of the coefficients is not straightforward. In order to better understand the implied relation, figure B.9 presents the average marginal effects of crop yield for each level of the Long-Term Orientation under order probit estimation for the same specifications as in table B.65. Each figure measures Long-Term Orientation on the horizontal axis and the average marginal effect of crop yield with its 95% confidence interval on the vertical axis. As can be seen there, the average marginal effect of crop yield is negative for low values of Long-Term Orientation and increases monotonically until it becomes positive for high values of Long-Term Orientation. This implies that increasing crop yield decreases the probability of observing low values of Long-Term Orientation and increases the probability of observing high values of Long-Term Orientation. Thus, as crop yield increases, the probability distribution of Long-Term Orientation shifts rightwards. This is equivalent to saying that the probability distribution of Long-Term Orientation with crop yield r is first order stochastically dominated by the probability distribution of Long-Term Orientation with crop yield $r + 1$.



(a) Column (1) (b) Column (2) (c) Column (3) (d) Column (4)

(e) Column (5) (f) Column (6) (g) Column (7) (h) Column (8)

Figure B.9: Average Marginal Effects of Potential Crop Yield on Long-Term Orientation of Second-Generation Migrants

Finally, using the pre-1500CE crop yield, growth cycle and their change, as in section 4, does not alter the results.[41] The coefficient on crop yield pre-1500 remains highly statistically and economically significant. In particular, a one standard deviation increase in the pre-1500 crop yield experienced by ancestral populations of the mother's country of origin increases a second-generation migrant's Long-Term Orientation by about 7.3 percentage points. This highlights the fact that as suggested by the theory, the effect of crop yield is the culturally embodied and rooted in the historical experience

[41] Tables B.69 and B.70 in the appendix show the effect of crop yield pre-1500 and its post-1500 change on Long-Term Orientation.

during the pre-1500CE period that matters for Long-Term Orientation. Additionally, the results are robust to the use of survey design weights, or weighing the regression to ensure that each country of origin is equally represented, increases the coefficients on crop yield, increasing the economic significance of the result (see table B.71).

Table B.66: Long-Term Orientation and Education

	Years of Schooling							
	Second-Generation Migrants				All Individuals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long-Term Orientation	0.35***	0.37***	0.36**	0.32**	0.79***	0.88***	0.70***	0.63***
	(0.13)	(0.14)	(0.14)	(0.13)	(0.05)	(0.05)	(0.05)	(0.04)
Country FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Sex & Age	No	No	Yes	Yes	No	No	Yes	Yes
Pray & Health	No	No	No	Yes	No	No	No	Yes
Adjusted-R^2	0.01	0.10	0.10	0.11	0.04	0.15	0.19	0.21
R^2	0.01	0.13	0.13	0.16	0.04	0.15	0.20	0.21
Observations	705	705	705	705	42016	42016	42016	42016

Notes: This table establishes the positive correlation between Long-Term Orientation and individual education levels for respondents in the third wave of the European Social Survey. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question "Do you generally plan for your future or do you just take each day as it comes?". The data is taken from the third wave of the European Social Survey (2006). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.67: Long-Term Orientation and Income

	Total Household Income							
	Second-Generation Migrants				All Individuals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long-Term Orientation	0.33**	0.22*	0.22**	0.23**	0.35***	0.45***	0.36***	0.32***
	(0.14)	(0.12)	(0.10)	(0.11)	(0.08)	(0.04)	(0.04)	(0.04)
Country FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Sex & Age	No	No	Yes	Yes	No	No	Yes	Yes
Pray & Health	No	No	No	Yes	No	No	No	Yes
Adjusted-R^2	0.01	0.40	0.40	0.41	0.01	0.50	0.52	0.53
R^2	0.01	0.43	0.43	0.47	0.01	0.50	0.52	0.53
Observations	383	383	383	383	29323	29323	29323	29323

Notes: This table establishes the positive correlation between Long-Term Orientation and individual income levels for respondents in the third wave of the European Social Survey. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question "Do you generally plan for your future or do you just take each day as it comes?". The data is taken from the third wave of the European Social Survey (2006). All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.68: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation

	Long-Term Orientation (Ordered Probit)							
	Country of Origin							
	Mother					Parents		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.11***	0.11***	0.23***	0.27***		0.23***		0.31***
	(0.04)	(0.04)	(0.07)	(0.07)		(0.09)		(0.11)
Crop Growth Cycle				-0.13*		-0.09		-0.10
				(0.07)		(0.07)		(0.09)
Crop Yield (Ancestors)					0.30***		0.27***	
					(0.08)		(0.09)	
Crop Growth Cycle (Ancestors)					-0.14*		-0.10	
					(0.07)		(0.08)	
Absolute Latitude			0.14***	0.11**	0.12**	0.15**	0.16**	0.16**
			(0.05)	(0.06)	(0.06)	(0.07)	(0.07)	(0.08)
Mean Elevation			-0.00	-0.02	-0.02	0.01	0.01	0.04
			(0.05)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
Terrain Roughness			0.15**	0.16***	0.17***	0.10**	0.11**	0.13***
			(0.06)	(0.06)	(0.06)	(0.04)	(0.04)	(0.04)
Neolithic Transition Timing			-0.08	-0.06		-0.02		-0.08
			(0.06)	(0.05)		(0.05)		(0.06)
Neolithic Transition Timing (Ancestors)					-0.08		-0.04	
					(0.05)		(0.06)	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sex & Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Ind. Chars.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	Yes
Pseudo-R^2	0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Observations	705	705	705	705	705	566	566	557

Notes: This table establishes that the potential crop yield in the country of origin of first generation migrants in Europe has a positive, statistically, and economically significant effect on the Long-Term Orientation of their foreign born children. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question "Do you generally plan for your future or do you just take each day as it comes?".The data is taken from the third wave of the European Social Survey (2006). The analysis is restricted to second-generation migrants, i.e. individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. All columns include fixed effects for the country where the interview was conducted, and individual characteristics (sex, age, education, marital status, health status, religiosity). Additional geographical controls include distance to coast or river, and landlocked and island dummies. In columns (1)-(4) the potential crop yield, potential crop growth cycle, and geographical characteristics of the country of origin of the mother are used as controls. Column (5) uses the data of the father's country of origin, while columns (6)-(7) restricts the sample to individuals whose parents come from the same country of origin. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.69: Pre-1500 Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants

	Long-Term Orientation (OLS)								
	Country of Origin								
	Mother						Parents		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (pre-1500)	2.96**	3.40**	6.45***	6.50***	6.65***		5.08**		7.62**
	(1.18)	(1.32)	(2.17)	(2.16)	(2.15)		(2.48)		(2.92)
Crop Yield Change (post-1500)				0.44	1.37		1.98		2.29
				(1.20)	(1.40)		(1.63)		(1.65)
Crop Growth Cycle (pre-1500)					-1.60		-2.65		-2.36
					(2.58)		(2.37)		(2.53)
Crop Growth Cycle Change (post-1500)					-1.27		-0.07		-0.24
					(0.92)		(1.19)		(1.29)
Crop Yield (Ancestors, pre-1500)						8.10***		6.54**	
						(2.03)		(2.55)	
Crop Yield Change (Anc., post-1500)						1.00		1.87	
						(1.45)		(1.66)	
Crop Growth Cycle (Ancestors, pre-1500)						-2.42		-3.16	
						(2.53)		(2.67)	
Crop Growth Cycle Ch. (Anc., post-1500)						-1.03		0.13	
						(0.92)		(1.17)	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sex & Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Ind. Chars.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	No	Yes
R^2	0.06	0.11	0.12	0.12	0.12	0.12	0.15	0.15	0.15
Observations	705	705	705	705	705	705	566	566	557

Notes: This table establishes that the potential crop yield in the country of origin of first generation migrants in Europe has a positive, statistically, and economically significant effect on the Long-Term Orientation of their foreign born children. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question “Do you generally plan for your future or do you just take each day as it comes?”. The data is taken from the third wave of the European Social Survey (2006). The analysis is restricted to second-generation migrants, i.e. individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. All columns include fixed effects for the country where the interview was conducted, and individual characteristics (sex, age, education, marital status, health status, religiosity). Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, and landlocked and island dummies. In columns (1)-(4) the potential crop yield, potential crop growth cycle, and geographical characteristics of the country of origin of the mother are used as controls. Column (5) uses the data of the father’s country of origin, while columns (6)-(7) restricts the sample to individuals whose parents come from the same country of origin. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.70: Pre-1500 Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants, for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation (OLS)								
	Country of Origin								
	Mother						Parents		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crop Yield (pre-1500)	3.71***	3.81***	6.16***	6.09***	6.44***		4.97**		4.85*
	(1.19)	(1.30)	(1.59)	(1.63)	(1.67)		(2.42)		(2.46)
Crop Yield Change (post-1500)				0.42	-0.25		0.39		0.94
				(1.58)	(1.52)		(1.45)		(1.47)
Crop Growth Cycle (pre-1500)					0.14		-0.07		0.79
					(1.88)		(2.28)		(2.30)
Crop Growth Cycle Change (post-1500)					1.18		2.06		1.01
					(1.62)		(1.63)		(1.37)
Crop Yield (Ancestors, pre-1500)						6.49***		4.50**	
						(1.70)		(2.23)	
Crop Yield Change (Ancestors, post-1500)						-0.86		0.41	
						(1.49)		(1.47)	
Crop Growth Cycle (Ancestors, pre-1500)						0.28		0.22	
						(1.86)		(2.30)	
Crop Growth Cycle Ch. (Anc., post-1500)						1.88		2.24	
						(1.59)		(1.62)	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sex & Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Ind. Chars.	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	No	Yes
R^2	0.06	0.11	0.12	0.12	0.12	0.12	0.15	0.15	0.15
Observations	705	705	705	705	705	705	566	566	557

Notes: This table establishes that the potential crop yield in the country of origin of first generation migrants in Europe has a positive, statistically, and economically significant effect on the Long-Term Orientation of their foreign born children. Long-term orientation is measured on a scale of 0 to 100 by the answer to the question "Do you generally plan for your future or do you just take each day as it comes?".The data is taken from the third wave of the European Social Survey (2006). The analysis is restricted to second-generation migrants, i.e. individuals who were born in the country where the interview was done, but whose parents were born overseas and migrated to that country. All columns include fixed effects for the country where the interview was conducted, and individual characteristics (sex, age, education, marital status, health status, religiosity). Geographical controls include absolute latitude, mean elevation above sea level, terrain roughness, distance to coast or river, and landlocked and island dummies. In columns (1)-(4) the potential crop yield, potential crop growth cycle, and geographical characteristics of the country of origin of the mother are used as controls. Column (5) uses the data of the father's country of origin, while columns (6)-(7) restricts the sample to individuals whose parents come from the same country of origin. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the country of origin level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.71: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants

	Long-Term Orientation (weighted OLS)											
	All crops				All cells				Changing cells/crops			
	(Survey)	(N_c)	(N)	(N_m)	(Survey)	(N_c)	(N)	(N_m)	(Survey)	(N_c)	(N)	(N_m)
Crop Yield (Ancestors)	7.10***	15.24***	12.16***	9.29***								
	(2.48)	(3.25)	(2.83)	(3.42)								
Crop Growth Cycle (Anc.)	-4.72*	1.46	0.05	4.58								
	(2.43)	(3.78)	(3.25)	(4.43)								
Crop Yield (Anc., pre-1500)					7.03***	15.24***	12.29***	11.88***				
					(2.39)	(2.54)	(2.21)	(2.86)				
Crop Yield Change (post-1500)					0.87	0.50	0.33	-1.75				
					(1.55)	(2.61)	(2.20)	(1.94)				
Crop Growth Cycle (Anc., pre-1500)					-3.28	2.98	1.61	4.23				
					(2.77)	(4.25)	(3.90)	(4.93)				
Crop Growth Cycle Ch. (post-1500)					-1.70*	1.11	-0.04	1.34				
					(0.98)	(1.69)	(1.41)	(1.39)				
Crop Yield (Anc., pre-1500)									6.38***	9.39***	8.18***	8.25***
									(1.97)	(2.68)	(2.25)	(2.24)
Crop Yield Change (post-1500)									-1.46	0.92	0.38	-0.73
									(1.66)	(2.74)	(2.43)	(2.27)
Crop Growth Cycle (Anc., pre-1500)									-0.96	1.26	1.32	-0.45
									(2.27)	(2.49)	(2.31)	(2.45)
Crop Growth Cycle Ch. (post-1500)									2.49	0.78	-0.70	-2.60
									(1.59)	(1.97)	(1.95)	(1.95)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sex & Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education & Marital Status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pray & Health	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.05	0.20	0.23	0.27	0.05	0.21	0.24	0.28	0.05	0.17	0.22	0.27
R^2	0.13	0.26	0.29	0.32	0.13	0.27	0.30	0.34	0.13	0.24	0.28	0.33
Observations	705	705	705	705	705	705	705	705	705	705	705	705

Notes: This table shows that the results of Tables B.65-B.70 are robust to the weighting scheme applied in the analysis. (Survey) uses the weights provided by the survey (variable dweight in the ESS), (N_c) uses weights that ensure the same sample size of countries of origin within each interview country, (N) uses weighs that additionally ensure the same sample size for each country of origin in each country of interview, (N_m) uses weighs that ensure the same sample size for each country of origin. The positive, statistically, and economically significant effect of potential crop yield on an individual's Long-Term Orientation is robust and increasingly so as one weighs appropriately. All columns include continental fixed effects, geographical controls, and the ancestry adjusted timing of the Neolithic. Crop yield, crop growth cycle, and all other geographical controls refer to the country of origin of the mother. Geographical controls include absolute latitude, mean elevation above sea-level, mean terrain roughness, distance to coast or river, and landlocked and island dummies. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.72: Pre-1500CE Crop Yield, Growth Cycle, Their Changes and Saving in Second-Generation Migrants

	Saving						
	Full Sample				Hofstede		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop Yield (Ancestors, pre-1500)	0.06**	0.06**	0.09**	0.12**	0.14**	0.04	
	(0.03)	(0.03)	(0.04)	(0.05)	(0.06)	(0.05)	
Crop Yield Change (post-1500)		0.01	0.05*	0.07**	0.08**	0.05	
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	
Crop Growth Cycle (Ancestors, pre-1500)				-0.08	-0.10	-0.02	
				(0.07)	(0.07)	(0.07)	
Crop Growth Cycle Change (post-1500)				-0.02	-0.03	-0.02	
				(0.03)	(0.04)	(0.03)	
Long-Term Orientation						0.15***	0.14***
						(0.03)	(0.04)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	No	No	Yes	Yes	Yes	Yes	No
Adjusted-R^2	0.14	0.14	0.15	0.15	0.15	0.15	0.15
Observations	2559	2559	2559	2559	2436	2436	2436

Notes: Standardized coefficients. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.73: Pre-1500CE Crop Yield, Growth Cycle, and Smoking Behavior in Second-Generation Migrants (Both Parents Foreign)

	Smoking					
	Habit					Ever
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Ancestors, pre-1500)	-0.02**	-0.02**	-0.02*	-0.04**	-0.05***	-0.14***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
Crop Yield Change (post-1500)			-0.02**	-0.01	-0.01	-0.03
			(0.01)	(0.01)	(0.03)	(0.03)
Crop Growth Cycle (Ancestors, pre-1500)					0.02	0.10***
					(0.02)	(0.03)
Crop Growth Cycle Change (post-1500)					-0.00	0.05*
					(0.03)	(0.03)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	No	No	Yes	Yes	Yes
Adjusted-R^2	0.05	0.07	0.07	0.07	0.07	0.15
Observations	817	817	817	817	817	496

Notes: Heteroskedasticity robust standard error estimates clustered at the country of origin of parents level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.15 Potential Crop Yield, Crop Growth Cycle, and Long-Term Orientation in the World Values Survey

This section presents additional results for the individual level analysis based on the World Values Survey. Table B.74 shows the average marginal effects of the probit estimation for the same specifications as the ones presented in table 8. Tables B.75 and B.76 show the average marginal effects and the changes in probability from a 1 standard deviation change in the dependent variables when the independent variables are not standardized. Reassuringly, the results are basically identical to the ones found using the standardized version of the variables. Additionally, table B.77 shows the results of using only the data of cells where the crop used before and after 1500CE changed. As can be seen, the results remain basically unchanged. Also, table B.78 shows that the weighting scheme used does not alter the results.

Given that the same set of variables was not available at the regional and country levels, the same set of variables could not be employed in the regional analysis of section 6. For this reason, tables B.82 and B.83 replicate the analysis of tables B.80 and B.81 using the same set of controls used in the regional analysis in tables B.84 and B.85. As can be seen the results in both sets of tables is similar and are not driven by the particular choice of controls.

It is important to highlight some issues present in the regional analysis due to missing data and the possibility of measurement error. First, not all regions in all countries can be identified with the data in the WVS. This implies that within country variation might be small for some countries, so that the inclusion of country fixed effects might not leave any unexplained variation. Second, for the identified regions, not all variables can be constructed for that level of aggregation. In particular, there is no regional measure of the years since a region transitioned to agriculture. Third, given that the population migration matrix of Putterman and Weil (2010) is constructed at the country level, ancestry adjusting the regional measures of crop yield and crop growth cycle cannot be done at the regional level or can be done only imperfectly.[42] Fourth, besides overseas migration, one cannot account for internal migration within a country. Thus, individuals born in a different region, who migrated to the region of interview will be erroneously assigned the measure for the region of interview. Appendix B.16 shows that the measurement error generated by internal migration biases the estimated coefficient towards zero and increases its standard error even at low internal migration rates. Fifth, there are large variations in the size of regions within and across countries. Since crop yields and growth cycles do not vary across too small areas, within country variation might again be small. These issues suggest that once country fixed effects are included in the analysis, the coefficient might be downward biased and its statistical significance might be small. Reassuringly, as established in Appendix B.15 (Table B.84), regional potential crop yield has a positive statistically and economically significant effect on individual-level LTO, even after accounting for country fixed effects.

Taking these caveats into account, table B.84 replicates the analysis using regional level data. In particular, columns (1)-(4) control for wave and continental time invariant unobservable characteristics, region's geographical characteristics, and individual characteristics. The results imply that increasing regional crop yield by one standard deviation increases the probability of having Long-Term Orientation by around 4 percentage points.[43] Column (5) additionally controls for crop growth cycles in the specification of column (4). The results remain qualitatively unchanged with

[42]Namely, it would have to be assumed that all immigrants from overseas are allocated to all regions in a country uniformly. Furthermore, all emigrants from a specific country would need to be assumed to come uniformly from the regions in that country. Thus, the ancestry adjusted measures in regions within a country would differ only by the fraction of the population that is native and the difference in the regions' measures.

[43]This is similar to the results presented in tables B.80 and B.82 where country level measures of the same variables are used.

Table B.74: Pre-1500 Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (Probit)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.025***	0.040***	0.036***	0.032***	0.032***	0.031***		0.066***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Yield Change (post-1500)					0.051***	0.053***		0.054***
					(0.002)	(0.002)		(0.003)
Crop Growth Cycle (pre-1500)						-0.008***		-0.018***
						(0.003)		(0.003)
Crop Growth Cycle Change (post-1500)						0.025***		0.026***
						(0.002)		(0.002)
Crop Yield (Ancestors, pre-1500)							0.042***	
							(0.002)	
Crop Yield Change (Anc., post-1500)							0.040***	
							(0.002)	
Crop Growth Cycle (Ancestors, pre-1500)							-0.005*	
							(0.003)	
Crop Growth Cycle Change (Anc., post-1500)							0.018***	
							(0.002)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	Yes	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.02	0.02	0.02	0.04	0.04	0.04	0.05	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

the coefficient on crop yield remaining statistically significant at the 1% level.

Column (6) shows that after controlling for time invariant country specific unobservable factors, wave fixed effects, regional geographical characteristics, and individual characteristics the effect of crop yield and crop growth cycle remain statistically significant. In particular, the coefficient on crop growth cycle becomes negative and statistically significant at the 1% level, while the coefficient on crop yield remains positive and statistically significant at the 5% level. Still, the size of the coefficient on crop yield falls by about 80%, which was expected given the various sources of measurement error highlighted above. The estimated coefficient implies that an additional standard deviation in the region's crop yield would increase the probability of having Long-Term Orientation by 0.7 percentage points. This small effect can be considered a lower bound generated by measurement error. If the changes in the size of the coefficient caused by ancestry adjustments and the Monte Carlo simulation in appendix B.16 are any guide, one can expect the true effect to be many times larger.

Column (7) repeats the analysis of column (5), but constrains the sample to include only regions in the Old World in order to account for intercontinental migration and population replacement. Doing so increases the size of the coefficient on crop yield by almost 100%, while the coefficient on crop growth cycle becomes zero. Thus, increasing a region's crop yield by one standard deviation increases the probability of having Long-Term Orientation by 5.9 percentage points.

Column (8) presents the results of the same exercise as column (6) constrained to the Old World. The results show that the point estimates for both crop yield and crop growth cycle increase. This might again be driven by the fact that by constraining the set, some the measurement error is lowered. Still, the coefficient on crop yield in columns (7) is about 7 times the size of the one in column (8), which suggests that most of the measurement error is still present, or that there is not enough within country variation to identify the effect. In effect, since internal migration has been experienced by countries all over the world, it is not surprising to find that the estimated coefficient and the fall in its size is similar for the Old World and full samples.[44]

[44] These results are robust to the estimation method or to using the pre-1500CE crop yield and growth cycles and their changes. See appendix tables B.85-B.87 in Appendix B.

Table B.75: Pre-1500 Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (Probit)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.010***	0.016***	0.014***	0.013***	0.013***	0.012***		0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)
Crop Yield Change (post-1500)					0.034***	0.035***		0.035***
					(0.001)	(0.002)		(0.002)
Crop Growth Cycle (pre-1500)						-0.000***		-0.001***
						(0.000)		(0.000)
Crop Growth Cycle Change (post-1500)						0.002***		0.003***
						(0.000)		(0.000)
Crop Yield (Anc., pre-1500)							0.022***	
							(0.001)	
Crop Yield Change (Anc., post-1500)							0.030***	
							(0.002)	
Crop Growth Cycle (Anc., pre-1500)							-0.000*	
							(0.000)	
Crop Growth Cycle Ch. (Anc., post-1500)							0.002***	
							(0.000)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	No	No	No	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.04
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.76: Pre-1500 Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (Probit) Change in Probability from a +/-1 SD Change							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.025***	0.040***	0.036***	0.032***	0.032***	0.032***		0.059***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Yield Change (post-1500)					0.052***	0.053***		0.054***
					(0.002)	(0.002)		(0.003)
Crop Growth Cycle (pre-1500)						-0.008***		-0.017***
						(0.003)		(0.003)
Crop Growth Cycle Change (post-1500)						0.025***		0.028***
						(0.002)		(0.002)
Crop Yield (Anc., pre-1500)							0.043***	
							(0.002)	
Crop Yield Change (Anc., post-1500)							0.040***	
							(0.002)	
Crop Growth Cycle (Anc., pre-1500)							-0.005*	
							(0.003)	
Crop Growth Cycle Ch. (Anc., post-1500)							0.018***	
							(0.002)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	No	No	No	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.04
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.77: Pre-1500 Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Country Analysis), for Grids that Experienced Change in Crop post-1500

	Long-Term Orientation (OLS)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.039***	0.053***	0.052***	0.049***	0.041***	0.034***		0.034***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)		(0.002)
Crop Yield Change (post-1500)					0.034***	0.032***		0.036***
					(0.002)	(0.002)		(0.002)
Crop Growth Cycle (pre-1500)						0.013***		0.013***
						(0.002)		(0.003)
Crop Growth Cycle Change (post-1500)						-0.008***		-0.011***
						(0.001)		(0.001)
Crop Yield (Ancestors, pre-1500)							0.029***	
							(0.002)	
Crop Yield Change (Anc., post-1500)							0.028***	
							(0.002)	
Crop Growth Cycle (Ancestors, pre-1500)							0.014***	
							(0.002)	
Crop Growth Cycle Change (Anc., post-1500)							-0.012***	
							(0.001)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.78: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (Weighted)

	Long-Term Orientation (Weighted OLS)											
	All crops				All cells				Changing cells/crops			
	(No)	(Survey)	(Same N)	(Pop)	(No)	(Survey)	(Same N)	(Pop)	(No)	(Survey)	(Same N)	(Pop)
Crop Yield (Ancestors)	0.048***	0.047***	0.056***	0.015**								
	(0.003)	(0.003)	(0.003)	(0.006)								
Crop Growth Cycle (Ancestors)	0.017***	0.018***	0.010***	0.046***								
	(0.003)	(0.003)	(0.003)	(0.006)								
Crop Yield (Anc., pre-1500)					0.046***	0.044***	0.048***	0.021***				
					(0.002)	(0.002)	(0.002)	(0.004)				
Crop Growth Cycle (Anc., pre-1500)					-0.012***	-0.010***	-0.019***	0.006				
					(0.003)	(0.003)	(0.003)	(0.005)				
Crop Yield Ch. (post-1500)					0.052***	0.051***	0.062***	0.038***				
					(0.003)	(0.003)	(0.003)	(0.004)				
Crop Growth Cycle Ch. (post-1500)					0.021***	0.020***	0.014***	0.033***				
					(0.002)	(0.002)	(0.002)	(0.003)				
Crop Yield (Anc., pre-1500)									0.033***	0.032***	0.028***	0.033***
									(0.002)	(0.002)	(0.002)	(0.004)
Crop Growth Cycle (Anc., pre-1500)									0.010***	0.016***	0.014***	-0.000
									(0.002)	(0.002)	(0.002)	(0.003)
Crop Yield Ch. (post-1500)									0.032***	0.031***	0.041***	0.026***
									(0.002)	(0.002)	(0.002)	(0.003)
Crop Growth Cycle Ch. (post-1500)									-0.006***	-0.005***	-0.007***	0.007***
									(0.001)	(0.001)	(0.001)	(0.003)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical Controls & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.04	0.05	0.05	0.07	0.05	0.05	0.05	0.07	0.04	0.05	0.05	0.07
Adjusted-R^2	0.04	0.05	0.05	0.07	0.05	0.05	0.05	0.07	0.04	0.05	0.05	0.07
Observations	217953	217953	217953	217953	217953	217953	217953	217953	217953	217953	217953	217953

Notes: This table shows that the results of Tables B.80-B.77 are robust to the weighting scheme applied in the analysis. (No) refers to unweighted OLS, (Survey) uses the weights provided by the survey (variable s017 in the WVS), (Same N) uses weights that ensure same sample size across countries (variable s018 in WVS), (Pop) weighs by population ($s018 * Population/1000$). The positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation is robust. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted, continental fixed effect, geographical controls, and the ancestry adjusted timing of the Neolithic. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Geographical controls include absolute latitude, mean elevation above sea-level, mean terrain roughness, distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.79: Pre-1500 Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation									
	Whole World									Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crop Yield (pre-1500)	0.03***	0.04***	0.04***	0.03***	0.03***	0.03***		-0.03***	-0.04***	0.07***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.01)	(0.00)
	[16.29]	[22.76]	[20.66]	[18.99]	[19.95]	[13.20]		[-5.81]	[-6.99]	[21.80]
Crop Yield Change (post-1500)					0.05***	0.05***		0.05***	0.03***	0.05***
					(0.00)	(0.00)		(0.00)	(0.01)	(0.00)
					[29.80]	[22.34]		[20.32]	[3.84]	[20.32]
Crop Growth Cycle (pre-1500)						-0.01**		0.03***	0.05***	-0.02***
						(0.00)		(0.01)	(0.01)	(0.00)
						[-2.38]		[4.85]	[6.34]	[-5.27]
Crop Growth Cycle Change (post-1500)						0.03***		0.02***	0.05***	0.03***
						(0.00)		(0.00)	(0.01)	(0.00)
						[13.86]		[11.56]	[7.42]	[14.05]
Crop Yield (Anc., pre-1500)							0.04***	0.07***	0.08***	
							(0.00)	(0.00)	(0.01)	
							[17.98]	[15.04]	[14.97]	
Crop Yield Change (Anc., post-1500)							0.04***		0.02***	
							(0.00)		(0.01)	
							[18.33]		[2.92]	
Crop Growth Cycle (Anc., pre-1500)							-0.01*	-0.04***	-0.06***	
							(0.00)	(0.01)	(0.01)	
							[-1.75]	[-6.01]	[-7.33]	
Crop Growth Cycle Ch. (Anc., post-1500)							0.02***		-0.03***	
							(0.00)		(0.01)	
							[10.06]		[-4.46]	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.02	0.02	0.02	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Adjusted-R^2	0.02	0.02	0.02	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(9) show the results for the whole world sample, while column (10) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust and clustered standard error estimates are reported in parentheses; t-statistics in square brackets; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.80: Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (OLS)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.041***	0.055***	0.051***	0.048***	0.027***		0.055***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)		(0.003)
Crop Growth Cycle						0.030***		0.024***
						(0.003)		(0.003)
Crop Yield (Ancestors)							0.048***	
							(0.003)	
Crop Growth Cycle (Ancestors)							0.017***	
							(0.003)	
Absolute latitude			-0.014***	-0.021***	-0.024***	-0.013***	-0.004*	0.003
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean elevation			0.003	0.012***	0.008***	0.002	0.007***	0.002
			(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)
Terrain Roughness			-0.021***	-0.021***	-0.016***	-0.017***	-0.024***	-0.028***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Neolithic Transition Timing				-0.032***	-0.039***	-0.041***		-0.029***
				(0.002)	(0.002)	(0.002)		(0.002)
Neolithic Transition Timing (Ancestors)							-0.035***	
							(0.002)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	No	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.01	0.02	0.03	0.03	0.04	0.04	0.04	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.81: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (Probit)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.041***	0.054***	0.051***	0.048***	0.027***		0.055***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)		(0.003)
Crop Growth Cycle						0.029***		0.024***
						(0.003)		(0.003)
Crop Yield (Ancestors)							0.047***	
							(0.003)	
Crop Growth Cycle (Ancestors)							0.016***	
							(0.003)	
Absolute Latitude			-0.014***	-0.021***	-0.023***	-0.013***	-0.004*	0.003
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean Elevation			0.003	0.012***	0.008***	0.002	0.007***	0.002
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Terrain Roughness			-0.020***	-0.021***	-0.016***	-0.017***	-0.024***	-0.027***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Neolithic Transition Timing				-0.031***	-0.038***	-0.040***		-0.029***
				(0.002)	(0.002)	(0.002)		(0.002)
Neolithic Transition Timing (Ancestors)							-0.035***	
							(0.002)	
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	No	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Pseudo-R^2	0.00	0.02	0.02	0.02	0.03	0.03	0.03	0.04
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Individual Characteristics include age, sex, education, and income. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.82: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (OLS)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.041***	0.035***	0.035***	0.032***	0.020***		0.046***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Growth Cycle						0.019***		0.023***
						(0.003)		(0.003)
Crop Yield (Ancestors)							0.041***	
							(0.002)	
Crop Growth Cycle (Ancestors)							0.011***	
							(0.003)	
Absolute Latitude			-0.004*	-0.004*	-0.005*	0.003	0.010***	0.015***
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean Elevation			0.013***	0.013***	0.008***	0.003	0.001	-0.007***
			(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Terrain Roughness			-0.020***	-0.020***	-0.016***	-0.016***	-0.017***	-0.021***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	No	No	No	No	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Adjusted-R^2	0.01	0.02	0.03	0.03	0.04	0.04	0.04	0.05
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and suitable area. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.83: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Country Analysis)

	Long-Term Orientation (Probit)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.041***	0.035***	0.035***	0.032***	0.020***		0.046***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Growth Cycle						0.019***		0.022***
						(0.003)		(0.003)
Crop Yield (Ancestors)							0.041***	
							(0.002)	
Crop Growth Cycle (Ancestors)							0.011***	
							(0.003)	
Absolute Latitude			-0.004*	-0.004*	-0.004*	0.004	0.010***	0.014***
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Mean Elevation			0.012***	0.012***	0.007***	0.003	0.001	-0.007***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Terrain Roughness			-0.019***	-0.019***	-0.015***	-0.015***	-0.016***	-0.020***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Chars	No	No	No	No	Yes	Yes	Yes	Yes
Old World Subsample	No	No	No	No	No	No	No	Yes
Pseudo-R^2	0.00	0.02	0.02	0.02	0.03	0.03	0.03	0.04
Observations	217953	217953	217953	217953	217953	217953	217953	176489

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the country where the interview was conducted. Additional geographical controls include distance to coast or river, and landlocked and island dummies. Columns (1)-(7) show the results for the whole world sample, while column (8) shows the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.84: Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Regional Analysis)

	Long-Term Orientation (OLS)							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.040***	0.041***	0.039***	0.036***	0.007**	0.060***	0.008**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)
Crop Growth Cycle					0.006**	-0.008**	0.001	-0.007
					(0.003)	(0.004)	(0.003)	(0.004)
Absolute Latitude			0.007***	0.006**	0.008***	0.031***	0.013***	0.036***
			(0.002)	(0.002)	(0.003)	(0.006)	(0.003)	(0.008)
Mean Elevation			-0.013***	-0.012***	-0.012***	0.003	-0.002	0.011***
			(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Terrain Roughness			0.011***	0.012***	0.010***	-0.009***	-0.020***	-0.017***
			(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	No	Yes	No
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	Yes	No	Yes
Old World Subsample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.01	0.02	0.03	0.04	0.04	0.08	0.05	0.08
Observations	185659	185659	185659	185659	185659	185659	151299	151299

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation across regions, accounting of country fixed effects. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the region where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Individual Characteristics include age, sex, education, and income. Columns (1)-(6) show the results for the whole world sample, while columns (7)-(8) show the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.85: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Regional Analysis)

	Long-Term Orientation (Probit)							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	0.036***	0.039***	0.041***	0.038***	0.035***	0.007**	0.059***	0.008**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)
Crop Growth Cycle					0.007**	-0.011***	0.000	-0.010**
					(0.003)	(0.004)	(0.003)	(0.004)
Absolute Latitude			0.007***	0.006**	0.008***	0.028***	0.012***	0.034***
			(0.002)	(0.002)	(0.003)	(0.006)	(0.003)	(0.008)
Mean Elevation			-0.013***	-0.012***	-0.011***	0.002	-0.001	0.009**
			(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Terrain Roughness			0.010***	0.010***	0.009***	-0.009***	-0.020***	-0.015***
			(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
			(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	No	Yes	Yes	Yes	Yes	No	Yes	No
Additional Geographical Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Characteristics	No	No	No	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	Yes	No	Yes
Old World Subsample	No	No	No	No	No	No	Yes	Yes
Pseudo-R^2	0.00	0.02	0.02	0.03	0.03	0.06	0.04	0.07
Observations	217953	217953	185659	185659	185659	185659	151299	151299

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation across regions, accounting of country fixed effects. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the region where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Individual Characteristics include age, sex, education, and income. Columns (1)-(6) show the results for the whole world sample, while columns (7)-(8) show the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.86: Potential Crop Yield, Growth Cycle, and Long-Term Orientation (WVS Regional Analysis)

	Long-Term Orientation (OLS)							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.023***	0.024***	0.023***	0.025***	0.028***	0.005*	0.055***	0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)
Crop Yield Change (post-1500)				0.043***	0.046***	0.006**	0.042***	0.007**
				(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Crop Growth Cycle (pre-1500)					-0.011***	-0.009**	-0.012***	-0.008
					(0.003)	(0.004)	(0.003)	(0.005)
Crop Growth Cycle Change (post-1500)					0.002	-0.007***	0.002	-0.007***
					(0.002)	(0.002)	(0.002)	(0.003)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Individual Chars	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	Yes	No	Yes
Old World Subsample	No	No	No	No	No	No	Yes	Yes
Adjusted-R^2	0.02	0.02	0.04	0.04	0.04	0.08	0.05	0.08
Observations	185659	185659	185659	185659	185659	185659	151299	151299

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation across regions, accounting of country fixed effects. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the region where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Individual Characteristics include age, sex, education, and income. Columns (1)-(6) show the results for the whole world sample, while columns (7)-(8) show the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.87: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation (WVS Regional Analysis)

	Long-Term Orientation (Probit)							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.023***	0.025***	0.023***	0.025***	0.028***	0.005*	0.054***	0.006
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Crop Yield Change (post-1500)				0.042***	0.046***	0.005*	0.042***	0.006*
				(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Crop Growth Cycle (pre-1500)					-0.012***	-0.009**	-0.012***	-0.009*
					(0.003)	(0.004)	(0.004)	(0.005)
Crop Growth Cycle Change (post-1500)					0.001	-0.007***	0.002	-0.007**
					(0.002)	(0.002)	(0.002)	(0.003)
Absolute Latitude		0.006**	0.005*	0.004	-0.002	0.028***	0.004	0.034***
		(0.003)	(0.002)	(0.002)	(0.003)	(0.006)	(0.003)	(0.008)
Mean Elevation		-0.021***	-0.019***	-0.006**	-0.006**	0.002	-0.000	0.009**
		(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Terrain Roughness		0.013***	0.013***	0.001	0.002	-0.009***	-0.021***	-0.016***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Individual Chars	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	Yes	No	Yes
Old World Subsample	No	No	No	No	No	No	Yes	Yes
R^2								
Pseudo-R^2	0.01	0.02	0.03	0.03	0.03	0.06	0.04	0.07
Observations	185659	185659	185659	185659	185659	185659	151299	151299

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the probability an individual has Long-Term Orientation across regions, accounting of country fixed effects. Shown are the average marginal effects of probit regressions. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. All columns include fixed effects for the wave the interview was conducted. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the region where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Individual Characteristics include age, sex, education, and income. Columns (1)-(6) show the results for the whole world sample, while columns (7)-(8) show the results for the Old World sample. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.88: Potential Crop Yield, Growth Cycle, and Long-Term Orientation in WVS Regions

	Share of Individuals in WVS Region with Long-Term Orientation											
	Whole World										Old World	
	Unweighted				Weighted: Area				Weighted: Area Share		Area	Share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Crop Yield (pre-1500)	0.033***	0.032***	0.040***		0.074***		0.019		0.017**		0.027	0.019*
	(0.010)	(0.010)	(0.014)		(0.027)		(0.013)		(0.008)		(0.019)	(0.010)
Crop Yield Change (post-1500)	0.055***	0.049***	0.054***		0.079***		0.001		0.012**		0.001	0.012**
	(0.013)	(0.014)	(0.016)		(0.028)		(0.010)		(0.005)		(0.010)	(0.005)
Crop Growth Cycle (pre-1500)			-0.012		-0.038*		-0.014		-0.026***		-0.018*	-0.027***
			(0.013)		(0.020)		(0.008)		(0.005)		(0.009)	(0.006)
Crop Growth Cycle Change (post-1500)			-0.004		-0.031***		-0.026***		-0.028***		-0.026***	-0.027***
			(0.008)		(0.007)		(0.007)		(0.002)		(0.008)	(0.002)
Crop Yield (Anc., pre-1500)				0.056***		0.109***		0.022		0.019**		
				(0.017)		(0.036)		(0.018)		(0.009)		
Crop Yield Change (Anc., post-1500)				0.043***		0.060***		-0.000		0.011**		
				(0.013)		(0.017)		(0.010)		(0.005)		
Crop Growth Cycle (Anc., pre-1500)				-0.014		-0.045**		-0.015*		-0.025***		
				(0.013)		(0.019)		(0.008)		(0.005)		
Crop Growth Cycle Change (Anc., post-1500)				-0.001		-0.029***		-0.026***		-0.028***		
				(0.008)		(0.010)		(0.008)		(0.002)		
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Country FE	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Additional Geographical Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old World Sample	No	No	No	No	No	No	No	No	No	No	Yes	Yes
Weighted by Region Area	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No
Weighted by Region's Share of Area	No	No	No	No	No	No	No	No	Yes	Yes	No	Yes
Adjusted-R^2	0.24	0.26	0.26	0.29	0.29	0.37	0.72	0.72	0.86	0.86	0.72	0.86
Observations	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1143	1143

Notes: This table establishes the positive, statistically, and economically significant effect of potential crop yield on the share of individual's with Long-Term Orientation across regions, accounting of country fixed effects. Individuals have Long-Term Orientation if they consider thrift as an especially important child quality in the World Values Survey. Potential crop yield, potential crop growth cycle, and all other geographical controls refer to the region where the interview was conducted. Additional geographical controls include percentage of land within 100 km of sea, landlocked dummy, and area suitable for agriculture. Columns (1)-(4) show the results without weights; columns (5)-(8) use the region's area as weight; columns (9)-(10) use the region's area as a share of the country's area as weight; and columns (11)-(12) repeat the analysis for the Old World Sample.. All independent variables have been normalized by subtracting their mean and dividing by their standard deviation. Thus, all coefficients can be compared and show the effect of a one standard deviation in the independent variable on Long-Term Orientation. Heteroskedasticity robust clustered standard error estimates are reported in parentheses; clustering at the region of interview and individual characteristics level; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

B.16 The Effect of Migration on the Estimation: A Monte Carlo Study

The cross country analysis in this paper has tried to correct the measurement error caused by large intercontinental and cross country migrations by using the population matrix developed by Putterman and Weil (2010) or by using the Old World subsample. Since such a matrix does not exist for migration that occurred within regions in the same country and between countries, the regional analysis performed for the World Values Survey is prone to have measurement error caused by within country interregional migration. In order to assess the size of the bias generated by internal migration, this section creates artificial data on individuals in regions within countries and studies the effect of migration on the OLS estimates.

In particular, the outcome for individual i in region r in country c is generated by

$$y_{irc} = x_{irc} + \epsilon_{irc},$$

where ϵ_{irc} is normally distributed with mean zero and variance equal to 1, and $x_{irc} = r \cdot c$, i.e. each individual's outcome is equal to the region within a country in which she resides plus some idiosyncratic shock. Countries and regions within each country are generated in such a way that both within and across countries the true data generating process has a slope equal to 1 and a constant equal to zero.

The original data represents the migration corrected data, i.e. where migration did not occur or one correctly identifies the migrants and assigns them the correct value. In order to analyze the measurement error generated by internal migration, it is assumed that each individual has a probability $\lambda \in (0,1)$ of migrating to another region within her own country. No cross country migrations are allowed. If she gets a migration shock, she chooses a region within the same country at random. Thus, with probability $\lambda(N_{r_c}-1)/N_{r_c}$ she will move to another region and with probability $(1-\lambda)+\lambda/N_{r_c}$ she remains in the same region she was born, where N_{r_c} is the number of regions in her country. The migration based data represent the data one would observe if (i) no cross country migration had occurred or if the data had been corrected for cross country migration; and (ii) if within country migration cannot be corrected.

For each constructed set of data, with and without internal migration, the following two relations were estimated

$$y_{irc} = \beta_0 + \beta_1 x_{irc} + e_{irc} \qquad\qquad y_{irc} = \beta_0 + \beta_1 x_{irc} + \sum_c \delta_c \gamma_c + e_{irc}$$

where γ_c is a complete set of country fixed effects and β_1 is the coefficient of interest. By construction, the real values are $\beta_0 = 0$ and $\beta_1 = 1$. Figure B.10(a) shows the estimated coefficient $\hat{\beta}_1$ for various levels of the probability of migration when there are 100 countries, each with 10 regions and 10 individuals per region, and each specification is replicated 5000 times.[45] As can be seen there, the OLS estimate for the data without migration is correctly estimated to be $\hat{\beta}_1 = 1$ both for the specification with and without country fixed effects. On the other hand, for the data with migration, the specification without country fixed effects correctly estimates $\hat{\beta}_1 = 1$, but with country fixed effects there exists a bias that increases with the probability of migration. This shows that not correcting for migration destroys the informational content of x_{irc} and can create a large bias in the estimated coefficient.

As a second exercise the individual data is aggregated at the regional level both before and after migration. Again the data generating process implies that the correct relation between the regional

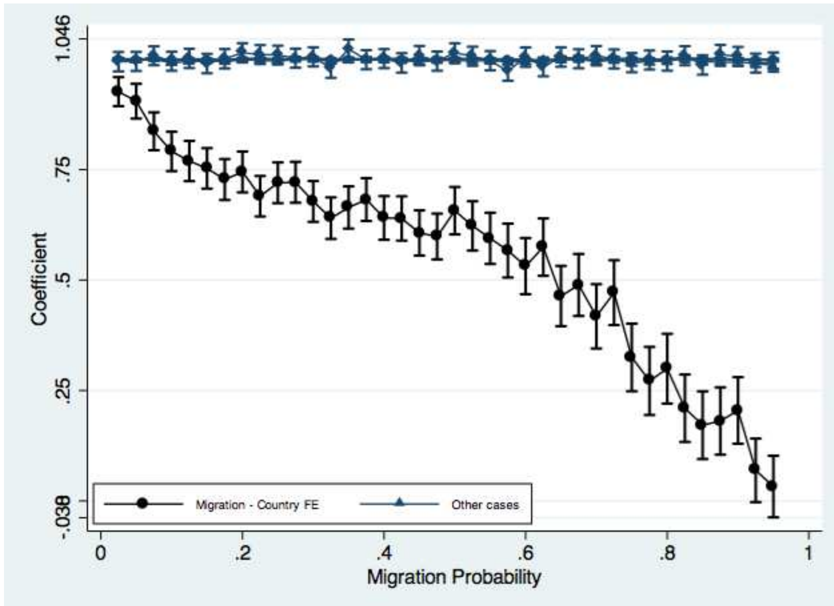
[45] Similar results were obtained for other parametrizations.

averages is

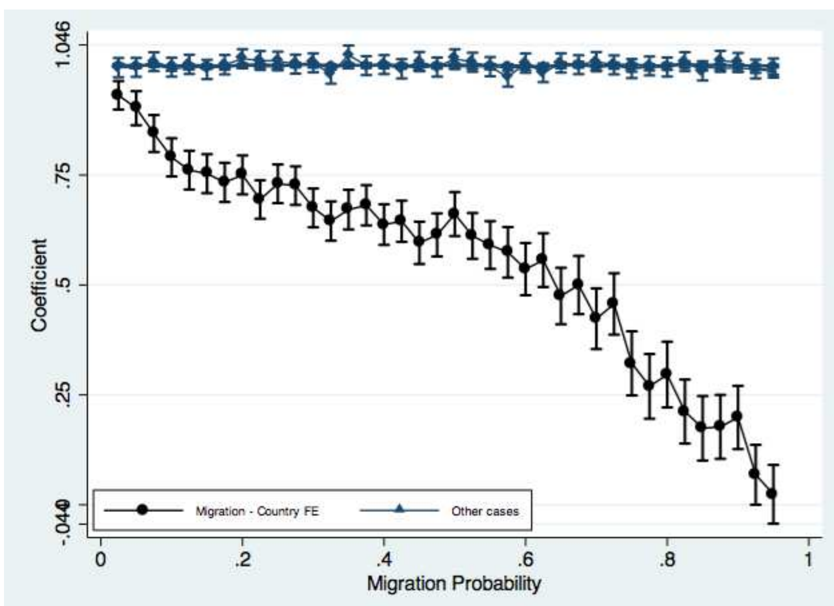
$$\bar{y}_{rc} = \bar{x}_{rc} + \epsilon_{rc},$$

with $\bar{x}_{rc} = rc$. Figure B.10(b) shows the estimated coefficient $\hat{\beta}_1$ for the same specifications as before. As can be seen there the results are similar to the individual level regressions. In particular, the regressions on the data without migration or with migration without country fixed effects correctly estimate $\hat{\beta}_1 = 1$, while there exists a bias increasing in the rate of migration in the estimation of the data with migration and country fixed effects.

The results show that with a migration rate of 60% the estimated coefficient falls by about 1/2, i.e. $\beta/\hat{\beta} = 2$. Furthermore, while relation between $\beta/\hat{\beta}$ is convex for $\lambda < 1/2$, the relation becomes concave for $\lambda > 1/2$. These results suggest that as most countries have experienced large increases in urbanization rates and within country mobility is easier than cross country mobility, one should expect measurement error due to within country migration to be larger than due to cross country migration.



(a) Individuals



(b) Regions

Figure B.10: Migration Rates and Measurement Error

B.17 Additional Predictions (Robustness)

Table B.89: Pre-1500CE Crop Yield, Growth Cycle, and Technological Adoption (SCCS)

	Major Technological Changes Industrialization, Factories, etc.					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (pre-1500)	0.13*	0.20**	0.21**	0.25**	0.53***	0.55***
	(0.08)	(0.09)	(0.10)	(0.12)	(0.17)	(0.18)
Crop Yield Ch. (post-1500)			0.04	0.06	0.17*	0.17*
			(0.08)	(0.08)	(0.09)	(0.10)
Crop Cycle (pre-1500)				-0.11	-0.21	-0.20
				(0.10)	(0.14)	(0.15)
Crop Growth Cycle Ch. (post-1500)				-0.10	-0.18	-0.17
				(0.09)	(0.12)	(0.13)
Geographical Controls	No	Yes	Yes	Yes	Yes	Yes
Language Family FE	No	No	No	No	Yes	Yes
Continental FE	No	No	No	No	No	Yes
Adjusted-R^2	0.01	0.02	0.02	0.01	0.13	0.09
Observations	133	133	133	133	133	133

Notes: Major technological changes include industrialization, factories, mining, large machinery. Standardized coefficients. Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Figure B.11 plots the NUTS 2 level regions in Italy and uses colors in order to identify the pre-1500CE crop yield in each region. Darker tones denote higher yields. Additionally, the map plots in white the boundaries of the Modena province (larger region) and the location of the Modena commune (smaller region), in yellow the boundaries of the Reggio Emilia province (larger region) and the location of the Reggio Emilia commune (smaller region), and in green the location of the Parma province (larger region) and the Parma commune (smaller region), which are the regions that produce Parmiggiano-Reggiano and also aceto balsamico. Moreover, the region of Emilia-Romagna, in which all three are located, has the highest pre-1500CE crop yield among Italian regions.

B.18 Long-Term Orientation Measures

This section shows the correlations between the different measures at the country level. For the ESS and WVS the country-level measure is the average of the individual responses in the data. As tables B.92 and B.93 show, the three measures are highly correlated, which suggests they are indeed measuring the same phenomenon. Additionally, table B.94 shows that the results of the country-level analysis shown in main body of the paper do not change qualitatively if one uses the WVS-based measure in the country-level analysis.

Table B.90: Pre-1500CE Crop Yield, Growth Cycle, and Technological Change (SCCS)

	Sum of Technological Changes (Poisson Regression)					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (pre-1500)	0.20***	0.25***	0.26***	0.38***	0.43***	0.29**
	(0.08)	(0.09)	(0.09)	(0.12)	(0.13)	(0.13)
Crop Yield Ch. (post-1500)			0.04	0.07	0.09	0.23
			(0.10)	(0.09)	(0.10)	(0.14)
Crop Cycle (pre-1500)				-0.28**	-0.39**	-0.42**
				(0.13)	(0.16)	(0.17)
Crop Growth Cycle Ch. (post-1500)				-0.11	-0.09	-0.09
				(0.10)	(0.12)	(0.11)
Geographical Controls	No	Yes	Yes	Yes	Yes	Yes
Language Family FE	No	No	No	No	Yes	Yes
Continental FE	No	No	No	No	No	Yes
Pseudo-R^2	0.02	0.05	0.05	0.06	0.11	0.13
Observations	86	86	86	86	86	86

Notes: Technological changes include introduction of foreign goods (weapons, etc.), minor technological changes (wheels, carts, plough, changes in house construction) and major technological changes (industrialization, factories, mining, large machinery). Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.91: Pre-1500CE Crop Yield, Growth Cycle, and Technological Change (SCCS)

	Sum of Technological Changes (Poisson Regression)					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (pre-1500)	0.11**	0.14**	0.15**	0.18**	0.30**	0.16
	(0.05)	(0.06)	(0.06)	(0.09)	(0.13)	(0.12)
Crop Yield Ch. (post-1500)			0.01	0.03	0.11	0.22**
			(0.08)	(0.08)	(0.08)	(0.10)
Crop Cycle (pre-1500)				-0.11	-0.29**	-0.33**
				(0.10)	(0.14)	(0.14)
Crop Growth Cycle Ch. (post-1500)				-0.11	-0.12	-0.08
				(0.07)	(0.10)	(0.09)
Geographical Controls	No	Yes	Yes	Yes	Yes	Yes
Language Family FE	No	No	No	No	Yes	Yes
Continental FE	No	No	No	No	No	Yes
Pseudo-R^2	0.01	0.03	0.03	0.03	0.13	0.15
Observations	133	133	133	133	133	133

Notes: Technological changes include introduction of foreign goods (weapons, etc.), minor technological changes (wheels, carts, plough, changes in house construction) and major technological changes (industrialization, factories, mining, large machinery). Heteroskedasticity robust standard error estimates clustered at the language family level are reported in parentheses; *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.92: Correlation of Long-Term Orientation Measures

	Long-Term Orientation Measures	
	Hofstede	WVS
Hofstede	1.00	
WVS	0.58***	1.00
Observations	87	

Notes: This table shows the strong positive correlation between the country level measure of Long-Term Orientation (LTO) from Hofstede and the country level average of the LTO measure from the WVS for the sample in section 4. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.93: Correlation of Long-Term Orientation Measures

	Long-Term Orientation Measures		
	ESS	Hofstede	WVS
ESS	1.00		
Hofstede	0.37*	1.00	
WVS	0.44**	0.59***	1.00
Observations	22		

Notes: This table shows the strong positive correlation between the country level measure of Long-Term Orientation (LTO) from Hofstede and the country level average of the LTO measure from the WVS and from the ESS for the sample in section 5. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level, all for two-sided hypothesis tests.

Table B.94: Crop Yield and Growth Cycle, Their Changes and Long-Term Orientation (Alternative LTO Measure)

	Whole World				Old World			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	9.09**				14.25***			
	(4.02)				(4.37)			
Crop Growth Cycle	-2.57				-3.71			
	(4.40)				(4.28)			
Crop Yield (Ancestors)		11.61***				12.54***		
		(3.81)				(4.12)		
Crop Growth Cycle (Ancestors)		-3.58				-3.78		
		(4.21)				(4.30)		
Crop Yield (Ancestors, pre-1500)			8.17**				9.55***	
			(3.45)				(3.57)	
Crop Yield Change (Anc., post-1500)			9.34***				9.20**	
			(3.22)				(4.02)	
Crop Growth Cycle (Anc., pre-1500)			-5.03				-5.36	
			(4.31)				(4.73)	
Crop Growth Cycle Change (Anc., post-1500)			-1.03				-0.92	
			(2.42)				(2.41)	
Crop Yield (Ancestors, pre-1500)				7.12**				8.44**
				(3.17)				(3.48)
Crop Yield Change (Anc., post-1500)				6.37*				6.94*
				(3.25)				(3.68)
Crop Growth Cycle (Anc., pre-1500)				-2.67				-3.28
				(3.49)				(3.82)
Crop Growth Cycle Ch. (Anc., post-1500)				1.16				1.65
				(2.64)				(2.70)
Continental FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geography & Neolithic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.24	0.28	0.27	0.26	0.23	0.22	0.20	0.20
Observations	91	91	91	91	74	74	74	74

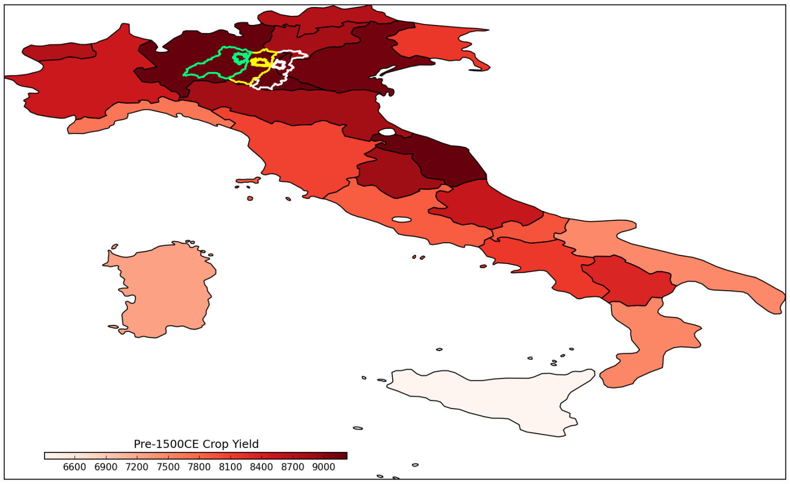
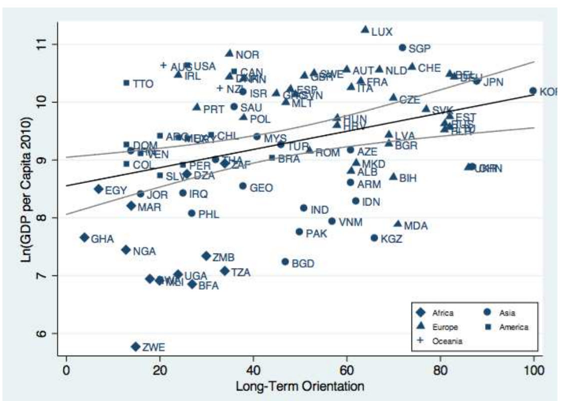
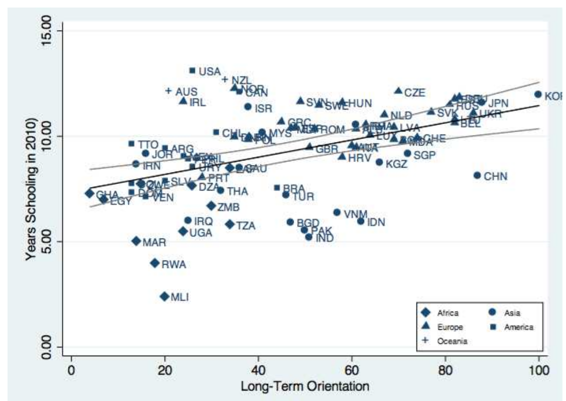


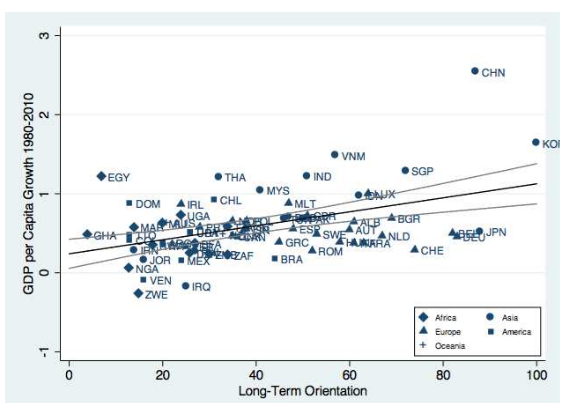
Figure B.11: Crop Yield and the Adoption of Lengthy Production Processes: Aceto Balsamico and Parmiggiano Reggiano



(a) GDP per capita in 2010 and LTO



(b) Schooling in 2010 and LTO



(c) GDP per capita growth between 1980 and 2010 and LTO

Figure B.12: Hofstede's Long-Term Orientation and Development

C Variable Definitions, Sources and Summary Statistics

C.1 Outcome Variable: Measures of Long-Term Orientation

- **Long-Term Orientation (Country-level analysis)**: Taken from Hofstede et al. (2010) available at `http://www.geerthofstede.nl/dimension-data-matrix`. Accessed on February 17, 2014. Scale between 0 (short term-orientation) and 100 (Long-Term Orientation)

- **Long-Term Orientation (Second-generation analysis)**: Based on the answer to the question "Do you generally plan for your future or do you just take each day as it comes?" taken from the "Timing of Life" module in the third wave of the European Social Survey. Scale between 0 (short term-orientation) and 100 (Long-Term Orientation)

- **Long-Term Orientation (Individual-level analysis)**: Based on the following question taken from the integrated file for waves 1-5 of the WVS: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?" An individual is considered to have Long-Term Orientation if she answered "Thrift, saving money and things" as an especially important quality children should learn at home. Coded 1 if individual has LTO, and 0 otherwise.

- **Restraint vs. Indulgence**: This is a renormalization of the Indulgence vs. Restraint variable of Hofstede et al. (2010). Scale between 0 (short term-orientation) and 100 (Long-Term Orientation). This variable by construction captures certain aspects of LTO.

- **Thrift**: Share of population in country/region that have LTO according to the WVS question above.

C.2 Crop Yield and Growth Cycle

The Global Agro-Ecological Zones (GAEZ) project of the Food and Agriculture Organization (FAO) presents data on the following 48 crops: alfalfa, banana, barley, buckwheat, cabbage, cacao, carrot, cassava, chickpea, citrus, coconut, coffee, cotton, cowpea, dry pea, flax, foxtail millet, greengram, groundnuts, indigo rice, maize, oat, oilpalm, olive, onion, palm heart, pearl millet, phaseolus bean, pigeon pea, rye, sorghum, soybean, sunflower, sweet potato, tea, tomato, wetland rice, wheat, spring wheat, winter wheat, white potato, yams, giant yams, subtropical sorghum, tropical highland sorghum, tropical lowland, sorghum, white yams. For each crop GAEZ provides a grid with cells of size $5' \times 5'$ (i.e., approximately 100 km^2). The analysis uses the following two measures:

- **Crop yield (tons)**: agro-climatic yield under low input settings in tons per hectare per year, taken from FAO's GAEZ project available at `gaez.fao.org`.

- **Crop growth cycle (days)**: growth cycle in days under low input settings and agro-climatic conditions, taken from FAO's GAEZ project available at `gaez.fao.org`.[46]

The analysis converts the yield in tons for each crop into yield in calories, by multiplying the caloric content in each ton of the crop by the crop yield in tons. Table A.1 shows the caloric content for 100mg of each crop. The source is

- **Caloric content of crops**: United States Department of Agriculture Nutrient Database for Standard Reference. This paper uses revision 25 accessed on October 29, 2013. Data can be accessed at `http://www.ars.usda.gov/Services/docs.htm?docid=23635`.

[46]Growth cycle for hibernating crops are the days elapsed from onset of post-dormancy period to full maturity.

Given the constructed grids of caloric yield per crop, the analysis selects for each $5' \times 5'$ cell the crop that maximizes caloric content across all crops (i.e. 48 grids) or the crops available in the cell's region before the Columbian Exchange as shown in table A.2. So, the main independent variables are

- **(Modern, post-1500CE) Crop Yield**: Maximum caloric yield produced across all 48 crops for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.
- **(Modern, post-1500CE) Crop Growth Cycle**: Growth cycle of the crop that maximizes caloric yield across all 48 crops for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.
- **(Pre-1500CE) Crop Yield**: Maximum caloric yield produced across crops available pre-1500CE for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.
- **(Pre-1500CE) Crop Growth Cycle**: Growth cycle of the crop that maximizes caloric yield across crops available pre-1500CE for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.
- **(Post-1500CE) Crop Yield Change**: Change in maximum caloric yield produced by expansion in crops post-1500CE for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.
- **(Post-1500CE) Crop Growth Cycle Change**: Change in growth cycle produced by expansion in crops post-1500CE for a $5' \times 5'$ cell under agro-climatic conditions and low inputs.

More information and data is available at the Caloric Suitability Index Site (`http://ozak.github.io/Caloric-Suitability-Index/`).

C.3 Additional Controls

- **Absolute latitude**: The absolute value of the latitude of a country's approximate geodesic centroid, as reported by the CIA's World Factbook.
- **Mean Elevation**: The mean elevation of a country in km above sea level, calculated using geospatial elevation data reported by the G-ECON project (Nordhaus et al., 2006) at a 1-degree resolution. The interested reader is referred to the G-ECON project web site for additional details.
- **Terrain roughness**: The degree of terrain roughness of a country, calculated using geospatial surface undulation data reported by the G-ECON project (Nordhaus et al., 2006) at a 1-degree resolution. The interested reader is referred to the G-ECON project web site for additional details.
- **Mean distance to nearest waterway**: The distance, in thousands of km, from a GIS grid cell to the nearest ice-free coastline or sea-navigable river, averaged across the grid cells of a country. This variable was originally constructed by Gallup et al. (1999) and is part of Harvard University's CID Research Datasets on General Measures of Geography.
- **Percentage of population living in tropical, subtropical and temperate zones**: The percentage of a country's population in 1995 that resided in areas classified as tropical by the Köppen-Geiger climate classification system. This variable was originally constructed by Gallup et al. (1999) and is part of Harvard University's CID Research Datasets on General Measures of Geography.

- **Land Suitability**: Average probability within a region that a particular grid cell will be cultivated as computed by Ramankutty et al. (2002).
- **Land Suitability (Range)**: Range of probabilities within a region that a particular grid cell will be cultivated as computed by Ramankutty et al. (2002).
- **Land Suitability (Gini**: Gini of probabilities within a region that a particular grid cell will be cultivated as computed by Ramankutty et al. (2002).
- **Land Suitability (Std.)**: Standard deviation of probabilities within a region that a particular grid cell will be cultivated as computed by Ramankutty et al. (2002).
- **Island nation dummy**: An indicator for whether or not a country shares a land border with any other country, as reported by the CIA's World Factbook online.
- **Landlocked dummy**: An indicator for whether or not a country is landlocked, as reported by the CIA's World Factbook online.
- **Neolithic Transition Timing**: The number of thousand years elapsed (as of the year 2000) since the majority of the population residing within a country's modern national borders began practicing sedentary agriculture as the primary mode of subsistence (Putterman, 2008). See the Agricultural Transition Data Set website `http://www.econ.brown.edu/fac/louis_putterman/agricultural%20data%20page.htm` for additional details on primary data sources and methodological assumptions.
- **Total land area**: The total land area of a country, in millions of square kilometers, as reported for the year 2000 by the World Bank's World Development Indicators online.
- **Population Density in 1500CE**: Population density (in persons per square km) in 1500CE as reported by McEvedy and Jones (1978), divided by total land area, as reported by the World Bank's World Development Indicators.
- **Urbanization Rate in 1500CE and 1800CE**: Share of population living in cities as reported in Acemoglu et al. (2005).
- **GDP per capita in 1870CE, 1913CE**: Income per capita as reported by Maddison (2003). The data is available at `http://www.ggdc.net/maddison/Historical_Statistics/horizontal-file_02-2010.xls`.
- **Years of Schooling**: Average number of years of schooling in 2005 as measured by Barro and Lee (2013).
- **Major religion shares**: Share of major religion in each country as reported in La Porta et al. (1999).
- **Legal Origins**: Dummy variables for origin of legal system as identified in La Porta et al. (1999).
- **Historical Plough Use**: Share of country's ancestral populations that had experience with the plough as reported in Alesina et al. (2013).
- **Strong Future Time Reference**: Share of individuals in country that speak a language with strong future time reference as reported in Chen (2013). A language has a strong future time reference if the future tense is grammatically different from the present tense and it is obligatory to make the distinction. See Chen (2013) for additional details.

- **Exchange Medium in 1000BCE, 1CE and 1000CE**: Level of sophistication of medium of exchange as reported in Comin et al. (2010).

- **Transportation Medium in 1000BCE, 1CE and 1000CE**: Level of sophistication of medium of exchange as reported in Comin et al. (2010).

- **Pre-Industrial Distance to Trade Route**: Number of weeks of travel from a country's capital to the closest trade route as reported in Özak (2012).

- **Volatility (temperature and precipitation)**: Volatility of temperature and precipitation constructed using v3.2 of the Climatic Research Unit (CRU) database following the method of Durante (2010).

- **Diversification (temperature and precipitation)**: Spatial Correlation of temperature and precipitation shocks constructed using v3.2 of the Climatic Research Unit (CRU) database following the method of Durante (2010).

- **Age Dependency Ratio in 2005**: Ratio of dependents–people younger than 15 or older than 64–to the working-age population–those ages 15-64 for the year 2005 from the World Bank's World Development Indicators.

- **Life Expectancy at Birth**: Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Data for the year 2005 from the World Bank's World Development Indicators.

- **GDP per capita**: GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 U.S. dollars for the year 2005 from the World Bank's World Development Indicators and for 2005 from Penn World Table v8 Alan Heston and Aten (2011).

- **Average Inequality 1980-2009**: Average Gini for the period 1980-2009 from the World Bank's World Development Indicators. Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution.

- **Net and Market inequality 2000**: Net and market Inequality are taken from version 5 of the Standardized World Income Inequality Database (Solt, 2009). Net inequality measures inequality after taxes and market inequality before taxes.

- **Savings**: Gross domestic saving rate in 2005 from the World Bank's World Development Indicators.

- **OPEC**: Dummy variable that shows if a country belongs to the OPEC, as reported by the CIA's World Factbook.

- **Institutions**: Democracy index from Polity IV project.

- **Trust**: Share of population that have generalized trust. Based on the following question taken from the integrated file for waves 1-5 of the WVS: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". An individual has trust if she answered "Most people can be trusted".

- **Power Distance**: Dimension of national culture identified by Hofstede (2001), which measures the degree to which there exists a preference for hierarchical power structures or inequality in economic, political or other societal dimensions. Scale between 0 (Horizontal) to 100 (Vertical).[47]

- **Individualism**: Dimension of national culture identified by Hofstede (2001), which measures the degree to which a society is individualistic as opposed to collectivistic. Scale between 0 (Collectivistic) to 100 (Individualistic).[48]

- **Cooperation**: Dimension of national culture identified by Hofstede (2001), which measures the degree to which a society is cooperative. Scale between 0 (Non-cooperative) to 100 (Cooperative).[49]

- **Uncertainty Avoidance**: Dimension of national culture identified by Hofstede (2001), which measures the degree to which a society is tolerant of the ambiguous and the unpredictable. Scale between 0 (Intolerant) to 100 (Tolerant).[50]

- **Ancestry Adjusment**: Original data is adjusted by ancestry using the method and data from Putterman and Weil (2010).

- **Regional Data**: For regions within a country, data is computed using GIS software to compute the area of each region's polygon in the corresponding shape file of the Seamless Digital Chart of the World. Whenever possible, the same primary data sources as the ones used in the sources for the country level data is used. E.g. regional agricultural suitability is constructed using the data from Ramankutty et al. (2002).

- **Individual level controls**: Age, Gender, Education level, Health condition, Religiosity, Income for each individual in the ESS and WVS data sets.

Table C.95: Summary Statistics (Country-level Sample)

	Mean	Std.	Min	Max	N
Long-Term Orientation (Hofstede)	45.61	(23.36)	4.00	100.00	87
Long-Term Orientation (WVS)	57.51	(21.70)	13.04	100.00	87
Crop Yield	8.57	(2.73)	1.33	17.99	87
Crop Growth Cycle	135.81	(17.13)	89.91	189.29	87

[47] Hofstede et al. (2010, p.61) defines it as "Power distance can therefore be defined as the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally. Institutions are the basic elements of society, such as the family, the school, and the community; organizations are the places where people work."

[48] Hofstede et al. (2010, p.92) defines it as follows: "Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty."

[49] Hofstede et al. (2010, p.140) defines this dimension as Masculinity vs Femeninity, since he found gender based differences in the answers to the questions that defined this value.

[50] According to Hofstede et al. (2010, p.191) "Uncertainty avoidance can therefore be defined as the extent to which the members of a culture feel threatened by ambiguous or unknown situations."

Table C.95: Summary Statistics (continued)

	Mean	Std.	Min	Max	N
Crop Yield (Anc.)	8.42	(2.26)	1.83	13.90	87
Crop Growth Cycle (Anc.)	135.87	(15.58)	89.91	188.31	87
Crop Yield (pre-1500)	7.45	(2.68)	0.87	17.99	87
Crop Growth Cycle (pre-1500)	132.22	(16.33)	82.90	169.50	87
Crop Yield (Anc., pre-1500)	7.35	(1.92)	1.25	10.12	87
Crop Growth Cycle (Anc., pre-1500)	131.43	(14.33)	86.74	161.41	87
Crop Yield Change (post-1500)	1.13	(1.54)	-0.47	6.16	87
Crop Growth Cycle Ch. (post-1500)	3.59	(8.94)	-23.00	34.79	87
Crop Yield Change (Anc., post-1500)	1.07	(1.29)	-0.12	5.69	87
Crop Growth Cycle Ch. (Anc., post-1500)	4.43	(8.34)	-23.00	34.17	87
Crop Yield (pre-1500)	6.11	(3.57)	0.00	10.69	87
Crop Growth Cycle (pre-1500)	98.04	(55.81)	0.00	169.50	87
Crop Yield (pre-1500)	6.11	(3.57)	0.00	10.69	87
Crop Growth Cycle (Anc., pre-1500)	99.26	(48.88)	0.00	159.23	87
Crop Yield Change (post-1500)	1.70	(1.61)	0.00	6.49	87
Crop Growth Cycle Ch. (post-1500)	29.89	(18.94)	0.00	90.00	87
Crop Yield Change (Anc., post-1500)	1.69	(1.38)	0.01	5.69	87
Crop Growth Cycle Ch. (Anc., post-1500)	30.15	(17.14)	0.15	84.50	87
Absolute Latitude	34.27	(17.19)	1.00	64.00	87
Mean Elevation	0.52	(0.44)	0.02	2.43	87
Terrain Roughness	0.19	(0.13)	0.02	0.60	87
Distance to Coast or River	282.25	(408.02)	7.95	2385.58	87
Landlocked	0.18	(0.39)	0.00	1.00	87
Island	0.13	(0.33)	0.00	1.00	87
Pct. Land in Tropics and Subtropics	0.23	(0.38)	0.00	1.00	87
Pct. Land in Tropics	0.19	(0.35)	0.00	1.00	87
Pct. Land in Temperate Zone	0.48	(0.45)	0.00	1.00	87
Precipitation	81.20	(51.63)	2.91	233.93	87
Temperature	14.67	(8.39)	-7.93	28.64	87
Total land area	1.12	(2.63)	0.00	16.38	87
Total land area (Ancestry Adjusted)	1.14	(2.18)	0.02	15.74	87
Temperature Volatility (mean)	13.16	(5.46)	3.70	27.38	87
Temperature Volatility (mean) (Anc.)	13.55	(5.03)	3.85	27.11	87
Precipitation Volatility (mean)	368.58	(194.28)	27.90	943.01	87
Precipitation Volatility (mean) (Anc.)	352.51	(161.17)	34.91	943.01	87
Temperature Diversification (mean)	0.85	(0.20)	0.00	1.00	87
Temperature Diversification (mean) (Anc.)	0.86	(0.16)	0.03	1.00	87
Precipitation Diversification (mean)	0.80	(0.19)	0.00	0.98	87
Precipitation Diversification (mean) (Anc.)	0.80	(0.15)	0.03	0.97	87
Neolithic Transition Timing	5422.99	(2356.96)	400.00	10500.00	87
Neolithic Transition Timing (Anc.)	5996.87	(1886.92)	1480.00	10400.00	87
Land Suitability	0.42	(0.24)	0.00	0.96	85
Land Suitability (Anc.)	0.43	(0.21)	0.02	0.81	85
Land Suitability (Gini)	0.37	(0.23)	0.03	0.87	84
Land Suitability (Range)	0.78	(0.23)	0.03	1.00	84
Land Suitability	0.70	(0.31)	0.01	1.00	85

Table C.95: Summary Statistics (continued)

	Mean	Std.	Min	Max	N
Land Suitability (Anc.)	0.71	(0.27)	0.02	1.00	85
Population density in 1500 CE	9.32	(11.85)	0.02	62.50	87
Urbanization rate in 1500 CE	7.36	(5.43)	0.00	28.00	65
Urbanization rate in 1800 CE	0.15	(0.39)	0.00	3.50	84
GDPpc 1870	1234.60	(803.84)	337.00	3273.00	53
GDPpc 1913	2168.44	(1584.27)	485.00	7093.00	52
Years of Schooling (2005)	8.82	(2.37)	1.71	12.91	80
Savings (2005)	21.76	(14.52)	-17.91	56.98	86
Plow	0.71	(0.43)	0.00	1.00	87
Plow (Ancestors)	0.78	(0.34)	0.00	1.00	87
Strong FTR	0.81	(0.37)	0.00	1.00	71
Strong FTR (Ancestors)	0.77	(0.35)	0.00	1.00	71
British legal origin dummy	0.25	(0.44)	0.00	1.00	87
French legal origin dummy	0.36	(0.48)	0.00	1.00	87
Socialist legal origin dummy	0.29	(0.46)	0.00	1.00	87
German legal origin dummy	0.06	(0.23)	0.00	1.00	87
Scandinavian legal origin dummy	0.05	(0.21)	0.00	1.00	87
Share of Roman Catholics in the population	33.22	(37.47)	0.00	97.30	87
Share of Muslims in the population	18.98	(32.84)	0.00	99.40	87
Share of Protestants in the population	11.74	(21.85)	0.00	97.80	87
Share of other religions in the population	36.07	(33.87)	0.00	100.00	87
Exchange Medium 1000BCE	0.24	(0.37)	0.00	1.00	81
Exchange Medium 1CE	0.53	(0.42)	0.00	1.00	81
Exchange Medium 1000CE	0.75	(0.41)	0.00	1.00	81
Transportation Medium 1000BCE	0.48	(0.39)	0.00	1.00	81
Transportation Medium 1CE	0.63	(0.37)	0.00	1.00	81
Transportation Medium 1000CE	0.75	(0.40)	0.00	1.00	81
Pre-Industrial Distance to Trade Route	0.41	(1.17)	0.00	8.82	71
Age Dependency Ratio	55.04	(14.26)	39.02	108.10	87
Life Expectancy at Birth	71.40	(9.30)	41.47	81.93	87
Ln[GPD per capita]	9.08	(1.20)	5.78	11.20	87

Table C.96: List of countries included in different analyses

Sample	Countries
Country-level Analysis	Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Burkina Faso, Belarus, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordan, Republic of Korea, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malaysia, Mali, Malta, Mexico, Moldova, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, United Republic of Tanzania, Thailand, Trinidad, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe
Second-Generation Migrant Analysis	Country of Interview
	Austria, Belgium, Bulgaria, Switzerland, Cyprus, Germany, Denmark, Estonia, Spain, Finland, France, United Kingdom, Hungary, Ireland, Netherlands, Norway, Poland, Portugal, Russian Federation, Sweden, Slovenia, Slovakia, Ukraine
	Country of Origin Mother
	Angola, Albania, Argentina, Armenia, Austria, Azerbaijan, Belgium, Bangladesh, Bosnia, Belarus, Canada, Switzerland, Chile, China, Colombia, Czech Republic, Germany, Algeria, Egypt, Spain, Estonia, Finland, France, United Kingdom, Georgia, Ghana, Guinea, Guinea Bissau, Greece, Croatia, Hungary, India, Indonesia, Ireland, Italy, Jamaica, Kazakhstan, Kenya, Kyrgyzstan, Cambodia, Laos, Lebanon, Sri Lanka, Luxembourg, Latvia, Morocco, Madagascar, Macedonia, Mozambique, Malaysia, Nigeria, Netherlands, Norway, Pakistan, Poland, Portugal, Puerto Rico, Russian Federation, Slovakia, Sweden, Syria, Tunisia, Turkey, Uganda, Ukraine, Uzbekistan, Vietnam
Individual-Level and Regional Analyses	Countries
	Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium,Bosnia and Herzegovina, Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Colombia, Cyprus, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordan, Korea, South, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malaysia, Mali, Malta, Mexico, Moldova, Morocco, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Thailand, Trinidad and Tobago, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe

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