The Agricultural Origins of Time Preference*

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January 7, 2015

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

JEL Classification: O1, O4, Z1

*The authors wish to thank Alberto Alesina, Quamrul Ashraf, Francesco Cinerella, Marc Klemp, Anastasia Litina, Isaac Mbiti, Stelios Michalopoulos, Dan Millimet, Louis Putterman, Uwe Sunde, David Weil, Glenn Weyl, participants of the conferences on "Deep Rooted Factors in Comparative Economic Development", Brown, 2014; Summer School in Economic Growth, Capri, 2014; Demographic Change, "Long-Run Development", Venice, 2014; and "The Long Shadow of History", Munich, 2014; and seminar participants at Bar-Ilan, Haifa, St. Gallen, Southern Methodist, Tel-Aviv Universities, and Warwick for helpful discussions. Galor's research is supported by NSF grant SES-1338426.

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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 (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.[3]

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, long-term orientation had gradually increased, as the representation of traits for higher long-term orientation had gradually propagated in the population. In particular, the theory suggests that descendants of individuals who resided in geographical regions in which crop yield was historically higher are characterized by higher long-term orientation. Moreover, the theory further suggests that regions 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 in society, beyond the initial level determined by the caloric yield in the pre-1500 period.

Consistent with the predictions of the theory, the empirical analysis establishes that indeed higher potential crop yield experienced during the pre-industrial era increased the long-term orien-

[1] Following the pioneering exploration of the causes and effects of the ability to delay gratification and to exert self-control (Mischel and Ebbesen, 1970), this ability has been shown to be correlated with a wide variety of attributes, ranging from body mass to educational outcomes (Ayduk et al., 2000; Dohmen et al., 2010; Mischel et al., 1988, 1989; Shoda et al., 1990).

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

[3] Consistent with this predicted decline in time preference in the course of human history, Godoy et al. (2004) find that a forager society (i.e., Tsimane' Amerindians in the Bolivian Amazon) is less long-term oriented than Western Societies.

tation of individuals in the modern period. The analysis establishes this result in five layers: (i) a cross-country analysis of variations in time preference, 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; (ii) 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) 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) cross-regional analysis that accounts for the confounding effects of a large number of geographical controls, as well as country fixed-effects.

The empirical analysis exploits an exogenous source of variation in potential crop yield and potential crop growth cycle across the globe to establish a positive, statistically and economically significant effect of higher pre-industrial crop yields on various measures of long-term orientation at the country, region, and individual levels. This study constructs a novel measure of potential caloric yield across regions of the world using the Food and Agriculture Organization's global estimates of yield and growth cycle for 48 crops in grids with cells of size $5' \times 5'$ and the US Department of Agriculture's measure of food's caloric content. In particular, in order to capture the conditions that were prevalent during the pre-industrial era, while mitigating possible endogeneity concerns, this research constructs estimates of the 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 employed estimates of each crop yield are based on agro-climatic constraints that are largely orthogonal to human intervention. These restrictions remove potential concerns that the estimates of caloric yield reflect endogenous choices that could be potentially 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 potential 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 potential change in potential crop yield and growth cycle if and only if the potential yield of some newly introduce crop is larger than the potential yield of the originally dominating crop. Hence, by construction, the potential assignment of crops associated with this natural experiment is independent of any other attributes of the grid, and the estimated causal effect of the potential change in potential crop yield, conditional on pre-1500 crop yield and growth cycle, 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), this natural experiment reinforces the viewpoint that these geographical conditions had an effect on the evolution of time preference independent of the potential 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. The results are additionally robust to climatic variability and therefore the risk associated with agricultural investment, as well as pre-industrial trade, and economies of scale.

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 that is determined by potential crop yield. Moreover, the effect of crop yield on long-term orientation is not mediated by other cultural characteristics. In particular, 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.

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 in Europe. This analysis accounts for host country fixed-effects and, thus, overcomes 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. Furthermore, 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). 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.

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.

In all stages of the analysis, restricting attention to potential crops that were available for cultivation in pre-1500CE era, or to regions where crops used in the pre-1500 period were dominated by new crops in the post-1500 period, does not affect the qualitative results. Moreover, 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 crop yields 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.

This research constitutes the first attempt to decipher the bio-geographical origins of regional

variations in the rate of time preference across the globe. Moreover, it sheds additional light on the geographical and bio-cultural origins of comparative economic development (e.g., Ashraf and Galor, 2013; Diamond, 1997; Spolaore and Wacziarg, 2013), and the persistence of cultural characteristics (e.g., Belloc and Bowles, 2013; Bisin and Verdier, 2000; Fernández, 2012; Nunn and Wantchekon, 2011).

The remainder of the paper is organized as follows. Section 2 presents a basic model that predicts a positive relation between crop yield and long-term orientation. Section 3 presents the data and empirical strategy. Sections 4, 5, and 6 present the empirical findings. Section 7 concludes. Additional results and supporting material are presented in the appendix.

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 a larger reproductive success.[4] The evolution of time preference is based on four elements: selection, learning, reproductive success, and intergenerational transmission of time preference. First, individuals characterized by higher long-term orientation select agricultural practices that permit higher but delayed return. Second, the engagement of individuals with long-term orientation in profitable investment ventures mitigates the tendency to discount the future and reinforces their ability to delay gratification. Third, the superior economic outcome of individuals with long-term orientation increases their reproductive success. Finally, since time preference is transmitted intergenerationally, the adoption of crops with higher yields and their effect on resources and, thus, on reproductive success gradually increased the representation of high long-term orientation individuals in the population. Thus, societies characterized by greater return on 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' choices regarding their preferred mode of production 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.[5] Differences in reproductive success across households,

[4] See Ashraf and Galor (2011), Dalgaard and Strulik (2013) and Vollrath (2011).

[5] 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 behind the evolution of preferences.

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 production mode, in contrast, is associated with the planting and harvesting of crops. It requires an investment of I^0 in the first working period, leaving the individuals with 1 unit of output (generated by e.g., hunting, gathering, fishing, herding, or horticulture), but it provides a higher level of resources, R^1, in the second working period.

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[6]

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

where $\ln(R^1) > 2\ln(R^0)$.[7]

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. In particular, 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

In particular, Dohmen et al. (2012) establish empirically the presence of intergenerational transmission of cultural traits and the importance of socialization in this transmission process.

[6]This constant average productivity of labor reflects a Malthusian-Boserupian economy in which the adverse effect of an increase in population on the average productivity of labor is mitigated by the advancement in technology that is generated by the scale of the population. These characteristics are consistent with the positive growth of population in the world economy throughout human history.

[7]As will become apparent this assumption 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.

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

$$c_{i,t} \leq y_{i,t} = \begin{cases} R^0 & \text{under endowment mode} \\ \\ 1 & \text{under investment mode.} \end{cases} \tag{3}$$

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

$$\tau n_{i,t+1} + c_{i,t+1} \leq y_{i,t+1} = \begin{cases} R^0 & \text{under endowment mode} \\ \\ R^1 & \text{under investment mode.} \end{cases} \tag{4}$$

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 (2) subject to the budget constraint (4). 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

$$c_{i,t+1} = (1-\gamma) y_{i,t+1}, \qquad \text{and} \qquad n_{i,t+1} = \gamma y_{i,t+1}/\tau. \tag{5}$$

Given these optimal choices, the level of utility generated by member i of generation t is therefore,

$$v^{i,t} = \ln y_{i,t} + \beta_t^i [\ln y_{i,t+1} + \xi], \tag{6}$$

where $\xi \equiv \gamma \ln(\gamma/\tau) + (1-\gamma)\ln(1-\gamma)]$.

2.4 Choice of Production Mode

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.

As follows from (1) and (6), given the discount factor, β^i, the life time utility of a member i of

generation t, $v^{i,t}$, under each of the two modes of production is

$$v^{i,t} = \begin{cases} \ln R^0 + \beta_t^i[\ln R^0 + \xi] & \text{under endowment mode} \\ \\ \ln 1 + \beta_t^i[\ln R^1 + \xi] & \text{under investment mode.} \end{cases} \tag{7}$$

Hence, there exists an interior level of the discount factor, $\hat{\beta}(R^1)$, such that an individual who possesses this discount factor is indifferent between the endowment and the investment modes of production. In particular,

$$\ln R^0 + \hat{\beta}(R^1)[\ln R^0 + \xi] = \hat{\beta}(R^1)[\ln R^1 + \xi], \tag{8}$$

and therefore

$$\hat{\beta}(R^1) = \frac{\ln R^0}{\ln R^1 - \ln R^0} \in (0, 1). \tag{9}$$

The segmentation of the population between the investment and the endowment mode of production is determined by $\hat{\beta}(R^1)$. In particular, the production mode of a member i of generation t is

$$\text{Production mode} = \begin{cases} \text{endowment} & \text{if} \quad \beta_t^i \leq \hat{\beta}(R^1) \\ \\ \text{investment} & \text{if} \quad \beta_t^i > \hat{\beta}(R^1). \end{cases} \tag{10}$$

Thus, in an environment in which the investment mode generates a higher return, R^1, individuals with a higher rate of time preference would be engaged in this production mode. Also, the threshold level of the discount factor above which individuals are engaged in the investment mode is lower if the return on agricultural investment, R^1, is higher, i.e.,

$$\frac{\partial \hat{\beta}(R^1)}{\partial R^1} = \frac{-\ln R^0}{R^1[\ln R^1 - \ln R^0]^2} < 0. \tag{11}$$

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 $\hat{\beta}(R^1)$ of the discount factor. In particular,

$$(y_{i,t}, y_{i,t+1}) = \begin{cases} (R^0, R^0) & \text{if} \quad \beta_t^i \leq \hat{\beta}(R^1) \\ \\ (1, R^1) & \text{if} \quad \beta_t^i > \hat{\beta}(R^1). \end{cases} \tag{12}$$

Consequently, as follows from (5), the number of children of member i of generation t is deter-

mined by the threshold level of future discount factor, $\hat{\beta}(R^1)$, so that

$$n_{i,t+1} = \frac{\gamma y_{i,t+1}}{\tau} = \begin{cases} \frac{\gamma}{\tau} R^0 \equiv n^E & \text{if} \quad \beta_t^i \leq \hat{\beta}(R^1); \\ \\ \frac{\gamma}{\tau} R^1 \equiv n^I & \text{if} \quad \beta_t^i > \hat{\beta}(R^1). \end{cases} \tag{13}$$

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

$$n^I > n^E. \tag{14}$$

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. 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 tolerate delayed gratification and transmit to their offspring this acquired tolerance, $\phi(\beta_t^i; R^1)$ that is an increasing, strictly concave function of their inherited time preference, β_t^i.[8] Unlike the experience of individuals who are engaged in the endowment mode of production that has no positive reinforcement on their rate of time preference, the experience of individuals who are engaged in investment provides a positive reinforcement to their patience, enhancing their ability to delay gratification. The discount factor (i.e., long-term orientation) that they transmit to their offspring increases to $\phi(\beta_t^i, R^1)$, reflecting their inherited rate of time preference, β_t^i, as well as their acquired patience due to the reward on their investment in the last period of life, R^1.[9] The higher is the reward to their investment, the better is their experience with delayed gratification (as reflected by higher income and higher reproductive success), and the larger is the increase in their long-term orientation.

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

$$\beta_{t+1}^i = \begin{cases} \beta_t^i & \text{if} \quad \beta_t^i \leq \hat{\beta}(R^1) \\ \\ \phi(\beta_t^i; R^1) & \text{if} \quad \beta_t^i > \hat{\beta}(R^1), \end{cases} \tag{15}$$

[8] Allowing the offspring of the parents engaged in the endowment mode of production to adjust their behavior in response to their parents' and others' experiences would not alter the results. In fact, this extension would reinforce the mechanism highlighted in this paper.

[9] Bowles (1998) provides an overview of the evidence that preferences may change by individual's experiences. Bandura and Mischel (1965) show in an experimental setting that children become more long-term oriented when observing a long-term oriented adult. Additionally, Knowles and Postlewaite (2005), Anderson and Nevitte (2006), Webley and Nyhus (2006), Arrondel (2009), and Cronqvist and Siegel (2013) have shown that time preference is inherited (culturally and genetically) from parents.

where for $\beta_t^i \geq \hat{\beta}(R^1)$,

$$\begin{aligned} \beta_t^i \leq \phi(\beta_t^i; R^1) \leq 1; \qquad & \phi_R(\beta_t^i; R^1) > 0; \\ \phi_\beta(\beta_t^i; R^1) > 0; \qquad & \phi_{\beta\beta}(\beta_t^i; R^1) < 0. \end{aligned} \tag{16}$$

As depicted in Figure 1, given the evolution of the time preference among individuals who are engaged in the investment mode of production, there exist a unique level of time preference, $\bar{\beta}^I(R^1) > \hat{\beta}(R^1)$, such that

$$\bar{\beta}^I = \phi(\bar{\beta}^I; R^1). \tag{17}$$

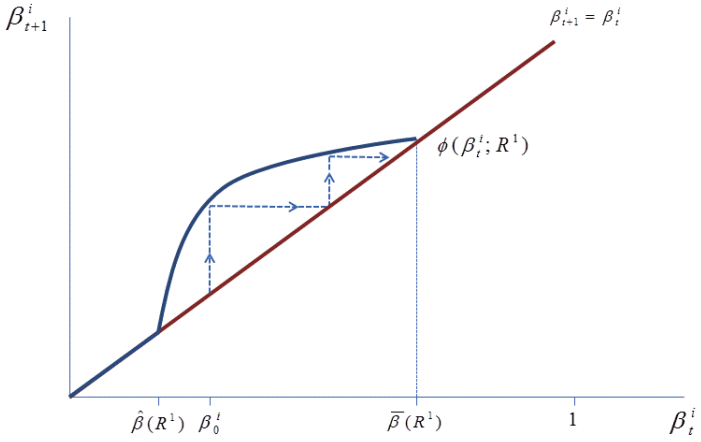


Figure 1: The Evolution of Time Preference within a Dynasty

Moreover, as depicted in Figure 1, as long as the steady-state equilibrium is locally stable (i.e., $\phi_\beta(\bar{\beta}^I; R^1) < 1$), every member i of generation t who is engaged in the investment mode of production converges to the same steady-state equilibrium, i.e., if $\beta_0^i > \hat{\beta}(R^1)$ then

$$\lim_{t \to \infty} \beta_t^i = \bar{\beta}^I(R^1). \tag{18}$$

The discount factor in the steady-state is higher if the investment mode generates a higher rate of return,[10] i.e.,

$$\frac{\partial \bar{\beta}^I(R^1)}{\partial R^1} = \frac{\phi_R(\beta_t^i; R^1)}{1 - \phi_\beta(\beta_t^i; R^1)} > 0. \tag{19}$$

2.6.2 Evolution of Time Preference Across Generations

Suppose that, as depicted in Figure 1, in period 0, individuals' discount factors in the economy, β_0^i, are distributed over the interval $[0, \tilde{\beta}]$, where $\tilde{\beta} \in (\hat{\beta}(R^1), \bar{\beta}^I(R^1))$.[11] Suppose further that the

[10] It is assumed here that $\beta^I(R^1) < 1$ for any feasible R^1.

[11] This initial condition assures that some individuals will be engaged in each mode of production. Moreover, it assures that for individuals who are engaged in the investment mode of production there are learning opportunities about the virtues of patience.

initial size of the population of generation 0 is $L_0 = 1$, i.e.,

$$L_0 = \int_0^{\tilde{\beta}} \nu(\beta_0^i) d\beta_0^i = 1, \tag{20}$$

where $\nu(\beta_0^i)$ is a continuous distribution function.

Given the threshold level of the discount factor, $\hat{\beta}(R^1)$, 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

$$L_0^E = \int_0^{\hat{\beta}(R^1)} \nu(\beta_0^i) d\beta_0^i \qquad \text{and} \qquad L_0^I = \int_{\hat{\beta}(R^1)}^{\tilde{\beta}} \nu(\beta_0^i) d\beta_0^i. \tag{21}$$

Since the critical level, $\hat{\beta}(R^1)$, is stationary over time, it follows from (15), that the distribution of β^i across individuals with a discount factor below $\hat{\beta}(R^1)$ is unchanged over time. Additionally, income and therefore the number of children of individuals who are engaged in the endowment mode of production and of those engaged in the investment mode is constant over time.

Thus, in generation t the size of the population of each group (i.e., the endowment type, E, and the investment type, I) is determined by its initial size and the number of children per adult. Specifically,

$$\begin{aligned} L_t^E &= (n^E)^t L_0^E = (\tfrac{\gamma}{\gamma} R^0)^t L_0^E, \\ L_t^I &= (n^I)^t L_0^I = (\tfrac{\gamma}{\gamma} R^1)^t L_0^I, \end{aligned} \tag{22}$$

where

$$L_t^E + L_t^I = L_t. \tag{23}$$

The average rate of time preference of generation t, $\bar{\beta}_t$, is therefore the weighted average of the average time preference of the endowment type, $\bar{\beta}_t^E$, and of the investment type, $\bar{\beta}_t^I$, in this generation.[12] The weights are determined by the relative size of two types of individuals in generation t.

Hence, the average rate of time preference in society in period t, $\bar{\beta}_t$, is

$$\bar{\beta}_t = \theta_t^E \bar{\beta}_t^E + (1 - \theta_t^E) \bar{\beta}_t^I, \tag{24}$$

where θ_t^E is the fraction of offsprings in generation t born to individuals who were engaged in the endowment mode of production in generation 0, i.e.,

$$\theta_t^E \equiv \frac{L_t^E}{L_t^E + L_t^I} = \frac{(R^0)^t}{(R^0)^t + (R^1)^t (L_0^I / L_0^E)} = \theta_t^E(R^1). \tag{25}$$

The fraction of the endowment type in generation t, θ_t^E, decreases as the return to agricultural

[12] Note that since there is no learning among the endowment type, $\bar{\beta}_t^E = \bar{\beta}_0^E$.

investment, R^1, increases, i.e.,

$$\partial\theta_t^E(R^1)/\partial R^1 < 0. \tag{26}$$

Moreover, for a given rate of return, R^1,the fraction of the endowment type declines asymptotically to zero, reflecting their lower reproductive success;

$$\lim_{t\to\infty} \theta_t^E(R^1) = 0. \tag{27}$$

2.7 Steady-State Equilibrium

As the economy approaches a steady-state equilibrium, the fraction of the endowment type in each generation declines asymptotically to zero. Hence, it follows from (18) and (24) that the steady-state level of average time preference in the economy, $\bar{\beta}$, is equal to steady-state level of time preference among individuals who are engaged in the investment mode of production, i.e.

$$\bar{\beta} = \bar{\beta}^I(R^1), \tag{28}$$

where as established in (19), $\partial\bar{\beta}(R^1)/\partial R^1 > 0$.[13]

Thus, while an increase in the rate of return to investment 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 engaged in the investment mode of production, and the increase in the relative share of individuals engaged in the investment mode of production, due to their higher resources and thus reproductive success, brings about an increase in the average discount factor, and thus increases the average long-term orientation in society as a whole in the steady-state.

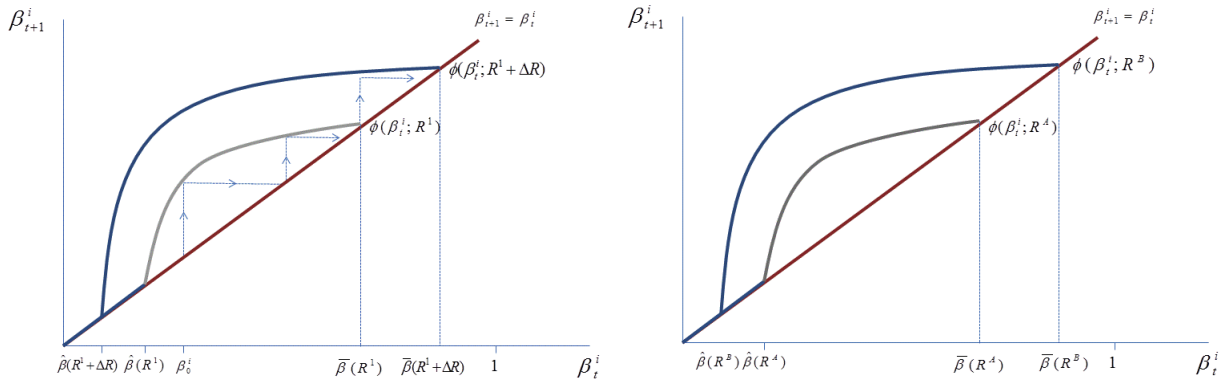
Furthermore, if after the economy reaches the steady-state equilibrium, $\bar{\beta}^I(R^1)$, new potential crops are introduced into the economy and the return on the investment mode of production increases from R^1 to $R^1+\Delta R$, then the economy's average long-term orientation will increase. This is depicted in Figure 2(a), where this increment increases the steady-state level to $\bar{\beta}^I(R^1+\Delta R)$ and the economy gradually transitions to this new steady state.

Moreover, consider two countries, A and B, that are identical in all respects except for the return to the investment mode of production. Suppose that $R^{1A} < R^{1B}$. Then, as depicted in Figure 2(b), the high return country, B, would have a higher long-term orientation in the steady-state, i.e., $\bar{\beta}(R^{1B}) > \bar{\beta}(R^{1A})$.

2.8 Testable Predictions

The model generates several testable predictions regarding the relationship between crop yield and the rate of time preference. First, the theory suggests that across economies identical in all respects

[13]Notice that the steady-state level of average time preference in the economy, $\bar{\beta}$ is independent of R^0. Thus, R^0 has no persistent effect on the average time preference of the economy in the long-run. Hence, it has no role in the empirical investigation of the deep determinants of contemporary time preference. Moreover, the results are robust to the inclusion of a range of investment modes.



(a) The Effect of the Introduction of New Potential Crops on the Long-Run Rate Steady-State of Time Preference

(b) Time Preference Across Countries $R^{1B} > R^{1A}$

Figure 2: Comparative Dynamics

except for their return on agricultural crops, the higher the crop yield, the higher the long-term orientation in the long-run. In particular, given the crop growth cycle, the higher the crop yield, the lower is the average rate of time preference and thus 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 the rewarding investment experience on the mitigating time preference. However, the increase in the duration of the investment could also operate towards the mitigation of the aversion of delayed consumption. Thus, the overall effect is ambiguous.

3 Data and Empirical Strategy

This section develops the empirical strategy and describes the data used to establish the persistent effect of the return to agricultural investment on contemporary variations in the rate of time preference across individuals, regions, and countries.

As hypothesized and established theoretically, the inherent rate of return to agricultural investment associated with crop yield, conditional on the crop growth cycle, might have had a persistent positive effect on the rate time preference. In particular, the theory predicts that the degree of long-term orientation had gradually increased in societies in which the ancestral population was exposed to a higher crop yield (conditional on the crop growth cycle), as the representation of

individuals with higher long-term orientation had gradually increased in the population.

In order to test the proposed hypothesis, this research constructs novel measures of historical potential crop yield and crop growth cycles across the globe and examines their persistent effect on a range of existing proxies for time preference, at the individual, regional, and national levels, accounting for continental as well country fixed effects. The dependent variables are introduced in each section where they are analyzed and further descriptions and summary statistics are available in appendix C.

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 the actual level of crop yield. In order to overcome this potential concern about reverse causality, this research exploits variations in potential (rather than actual) crop yields. Moreover, it focuses on potential 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. In order to overcome this concern, this research employs various strategies. The analysis accounts for a large set of possible 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). Moreover, it employs continental fixed effects in order to capture unobserved time-invariant heterogeneity at the continental level. In addition, it accounts for possible confounding individual characteristics (e.g., age, gender, education, religiosity, marital status, and income). Furthermore, the research 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. Finally, the research 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, culture), and permitting the identification of the effect of the portable, culturally-embodied, component of geography.[14]

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 effect of invariant geographical attributes on contemporary economic outcomes that may be correlated with the rate of time preference. In order to overcome this potential concern, this research exploits the potential yield in the

[14]Given the empirical strategy implemented in the analysis, measures of long-term orientation at the country, region, and individual level are required, including measures for second generation migrants. For this reason, the analysis employs three different measures of long-term orientation, which are introduced in the respective sections. Tables B.66 and B.67 show that all three measures are highly correlated, assuring that they are indeed capturing the same phenomenon.

pre-1500 period (i.e., prior to the expansion in the spectrum of potential crops during 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 permits to overcome potential concerns about omitted variables and sorting of high long-term orientation individuals into geographical regions characterized by higher agricultural return.[15] 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), this natural experiment reinforces the viewpoint that these geographical conditions had an effect on the evolution of time preference independent of the potential initial sorting. 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 some newly introduce crop is larger than the potential yield of the originally dominating crop. Hence, by construction, the assignment of crops associated with this natural experiment is independent of any other attributes of the grid. 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.

Finally, superior historical crop-yield could have affected positively past economic outcomes (e.g., population density and urbanization), and the persistent effect of these variables may have directly 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 potential effect of the persistence of past economic prosperity.

3.2 Independent Variables: Potential Crop Yield and Growth Cycle

The main independent variables in this research are two novel measures of potential crop yield (in calories) and potential crop growth cycle (in days) in the pre-industrial era. In particular, for each cell of size $5' \times 5'$ in the world, this research estimates the maximum caloric yield and the growth cycle attainable given the set of crops available before and after the Columbian Exchange.

These historical measures are constructed based on data from the Global Agro-Ecological Zones (GAEZ) project of the Food and Agriculture Organization (FAO).[16] 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).[17] For each crop, GAEZ provides estimates for crop yield based on

[15] It should be noted that the diffusion of diseases during the Columbian Exchange occurred across continents. Therefore the estimation based on variations within continents precludes the confounding effects of this potential transmission. Moreover, evidence suggests that very few diseases were spread from the New World into the Old World (Crosby, 1972). Furthermore, accounting for modern life-expectancy does not alter the qualitative nature of the results.

[16] The data can be obtained from `http://http://gaez.fao.org/`. Data accessed on August 14, 2013.

[17] The crops available are alfalfa, banana, barley, buckwheat, cabbage, cacao, carrot, cassava, chickpea, citrus,

three alternative levels of inputs – high, medium, and low - and two possible categories of 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.

In order to capture the conditions that were prevalent during the pre-industrial era, while mitigating potential endogeneity concerns, this research uses the estimates of potential crop yield and potential crop growth cycle, under low level of inputs and rain-fed agriculture – cultivation methods that characterized early stages of development. Moreover, the estimates of potential crop yield are based on agro-climatic constraints that are largely orthogonal to human intervention. Thus, 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 the rate of time preference.[18]

The FAO data set 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.[19]

In order to better capture the nutritional differences across crops, and thus to ensure comparability in the measure of crop yield, the yield of each crop in the GAEZ data (measured in tons, per hectare, per year) is converted into caloric return (measured in tens of millions of kilo calories, per hectare, per year). This conversion is based on the caloric content of crops, as provided by the United States Department of Agriculture Nutrient Database for Standard Reference.[20] Using these estimates, a comparable measure of crop yield (in tens of millions of kilo calories, per hectare, per year) is constructed for each crop. Based on these estimates, the analysis assigns to each cell the crop with the highest potential yield among the available crops pre- and post-1500CE. Thus, the research constructs three sets of grids, one with the yield and growth cycle for the crop that maximizes potential yield before the Columbian Exchange, another with the yield and growth cycle for the crop that maximizes potential yield after Columbian Exchange, and finally one that measures the changes in the yield and growth cycles of the dominating crop in each cell due to the Columbian Exchange.

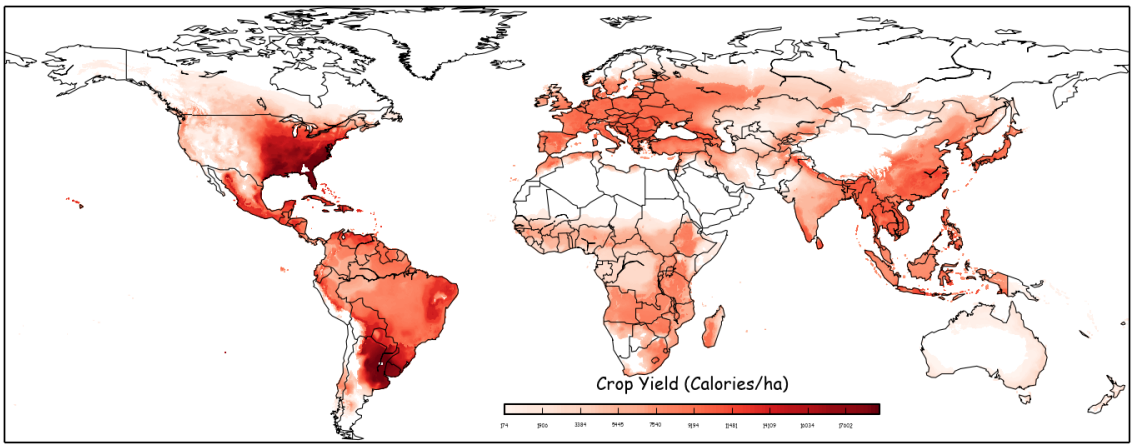
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coconut, coffee, cotton, cowpea, dry pea, flax, foxtail millet, greengram, groundnuts, indigo rice, maize, oat, oilpalm, olive, onion, palm heart, pearl millet, phaseolus bean, pigeon pea, rye, sorghum, soybean, sunflower, sweet potato, tea, tomato, wetland rice, wheat, spring wheat, winter wheat, white potato, yams, giant yams, subtropical sorghum, tropical highland sorghum, tropical lowland, sorghum, white yams.

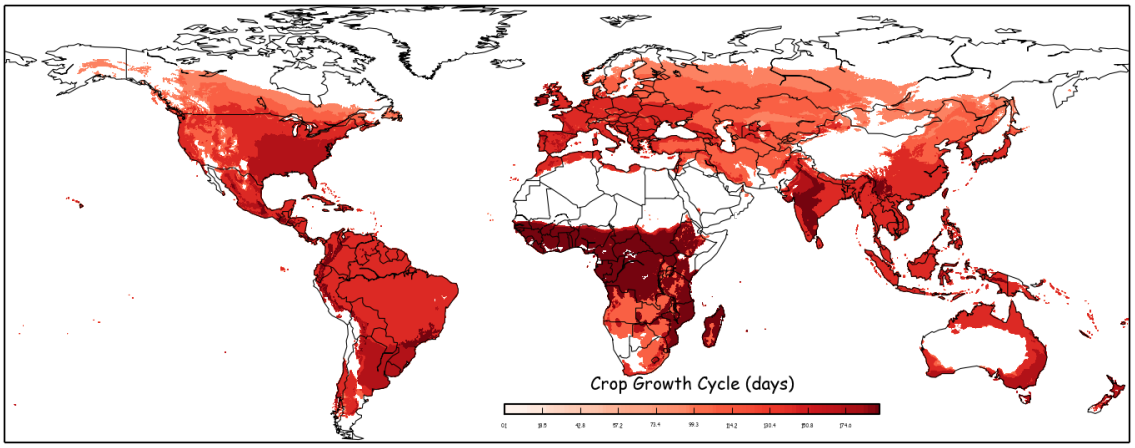
[18] The choice of rain-fed conditions is further justified by the fact that, although some societies had access to irrigation prior to the industrial revolution, GAEZ's data only provides estimates based on irrigation infrastructure available during the late twentieth century.

[19] In case of hibernating crops, the growth cycle captures the days elapsed from onset of post-dormancy period to full maturity.

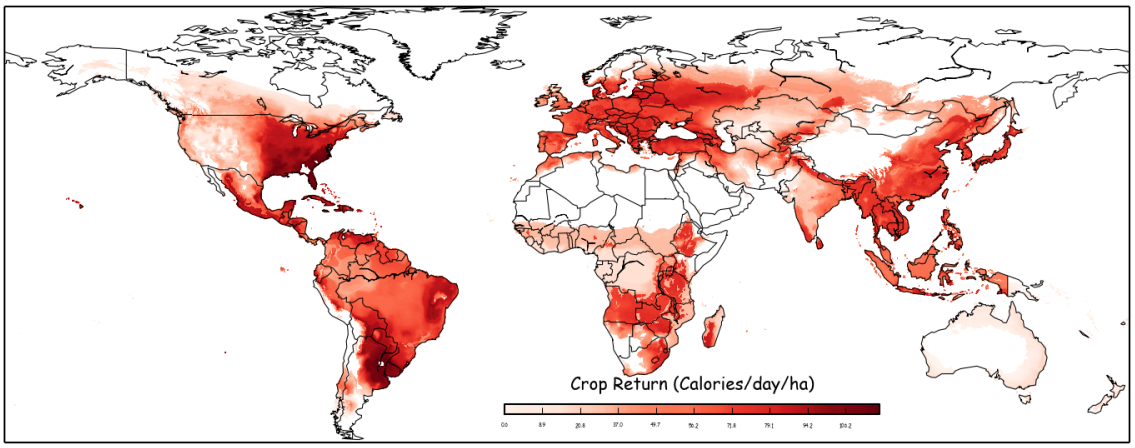
[20] This paper uses revision 25 accessed on October 29, 2013. Data can be accessed at `http://www.ars.usda.gov/Services/docs.htm?docid=23635`. Table A.1 shows the caloric content for each crop in the GAEZ data (measured in kilo calories per 100g).



(a) Potential Crop Yield ($5' \times 5'$ Grid)



(b) Potential Crop Growth Cycle ($5' \times 5'$ Grid)



(c) Potential Crop Return ($5' \times 5'$ Grid)

Figure 3: Potential Crop Yield, Growth Cycle, and Returns with pre-1500CE Crops

Using these grids, 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 regional level averages across cells where the maximum potential crop yield is positive.[21]

Figure 3 depicts the distribution of potential crop yield and growth cycle across global $5' \times 5'$ grids for crops available pre-1500CE.[22] Each cell in Figure 3(a) depicts the potential yield (measured in tens of 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 are marked by lighter ones. Similarly, Figure 3(b) shows in each cell the potential crop growth cycle for the crop with the highest potential yield in that cell. Longer growth cycles are marked by darker cells and shorter ones by lighter cells. Finally, Figure 3(c) shows the ratio of crop yield to growth cycle, which measures the yield per day. Higher yields per day of growth cycle are marked by darker cells and lower 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 (i.e., those with above 16,500 tens of millions kilo calories, per hectare, per year) 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.

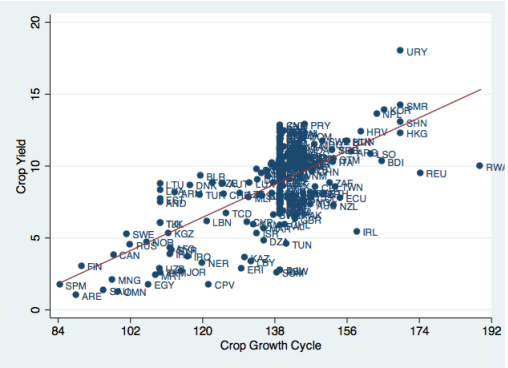
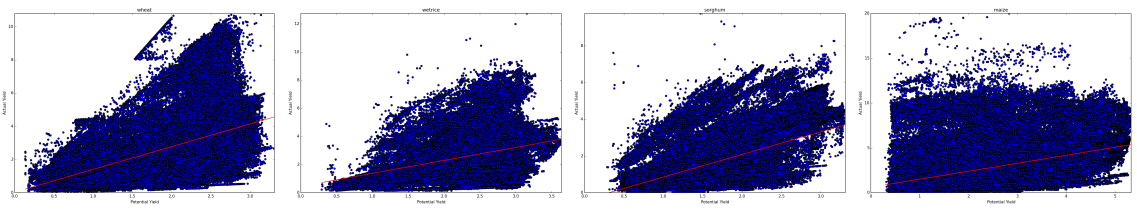


Figure 4: Potential Crop Yield and Potential Crop Growth Cycle

Figure 4 shows the correlation between the post-1500CE potential crop yield and growth cycles across countries. There is a strong positive correlation between these country level averages with a Pearson correlation coefficient of 0.78 ($p < 0.01$). This figure epitomizes that *"Trees that are slow to grow, bear the best fruit"* (Molière).

[21] The results of the empirical analysis are robust to the inclusion of cells with no potential yield as shown in table B.14 in the appendix.

[22] Table A.2 in the appendix shows the global distribution of crops pre-1500CE.



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

Figure 5: Correlation between Potential and Actual Crop Yields.

Importantly, potential crop yield is positively correlated with actual crop yield at the cell level (Figure 5) and thus potential crop yield serves as a proxy for actual crop yield without subjecting the analysis to the concern of reverse causality.[23,24]

Figure 6 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.[25]

3.3 Additional Controls

Crop yield is correlated with other geographical characteristics that may have affected the evolution of time 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.[26] Furthermore, unobserved continent-specific geographical and historical characteristics may have codetermined the global distributions of time preference. For this reason, the analysis accounts for these characteristics by the inclusion of a complete set of continental fixed effects.

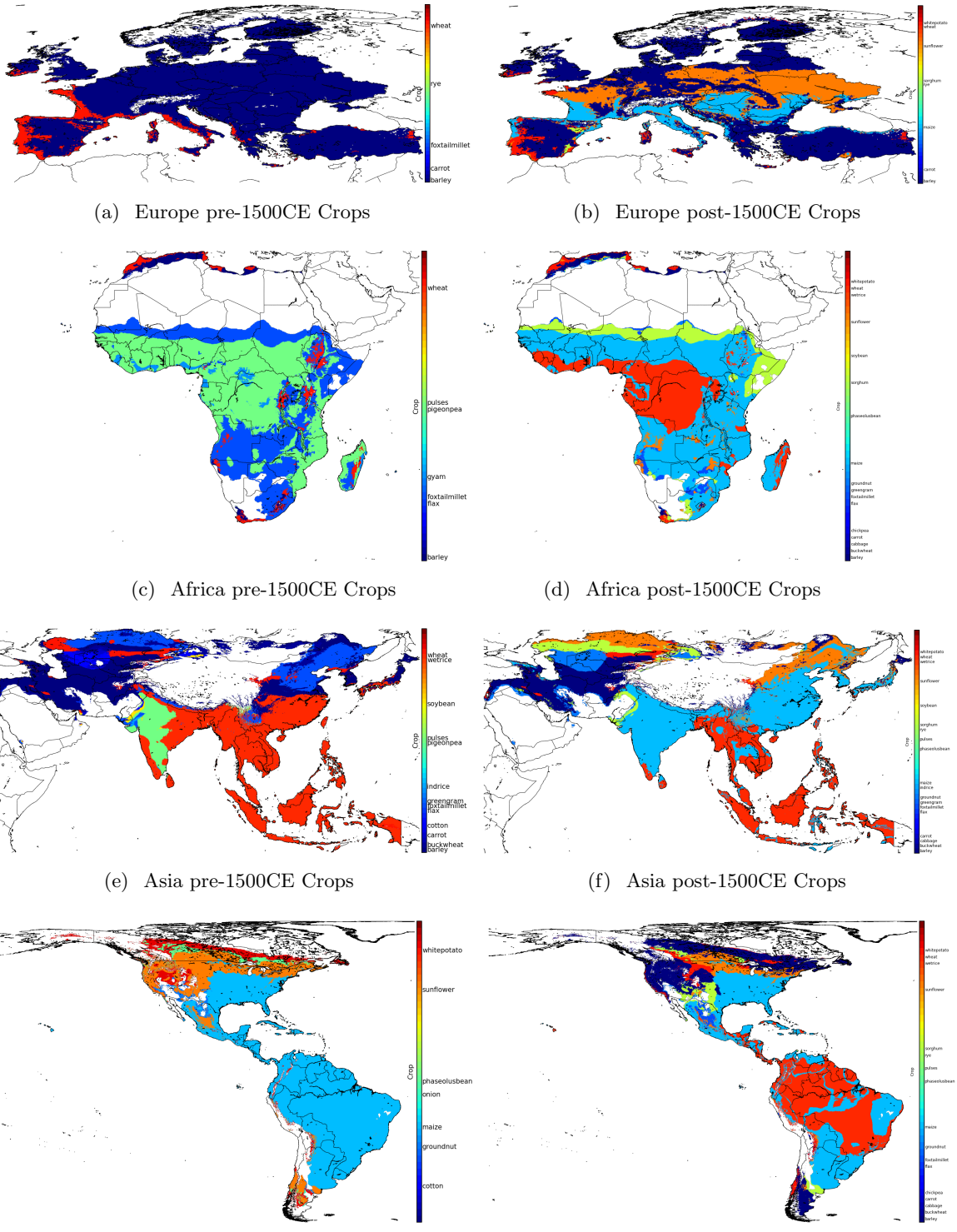
Furthermore, the empirical analysis considers the confounding effect of the advent of sedentary agriculture, as captured by the years elapsed since the onset of the Neolithic Revolution, on the evolution of the rate of time preference. The onset of agriculture generated various conflicting effects on the evolution of time preference. The rise of institutionalized statehood in the aftermath

[23]The analysis performed in this paper can be seen as the reduced form in an instrumental variables strategy, which would establish the effect of actual crop yield (instrumented by potential crop yield) on long-term orientation. GAEZ provides data on actual crop yields in the year 2000 for a small subset of crops. Given this data limitation, an explicit two-stage least-squares or instrumental variable analysis is not feasible since it requires data on actual crop yield and growth cycle in the pre-1500 period.

[24]Reassuringly, potential crop yield is also positively correlated with the level of dependence on agriculture, the intensity of agriculture, and the share of consumption generated by agriculture for ethnic groups in the Ethnographic Atlas (Murdock, 1967). Results available upon request.

[25]Figure B.3 in the appendix shows the cells that changed crop for each continent. Figure B.2 shows for the whole world the set of dominating crops and the cells where the dominating crop changed after the Columbian Exchange. Additionally, Figure B.1 shows that selecting the highest yielding or highest return crop generates essentially the same crop selection.

[26]The appendix shows the summary statistics and descriptions of all variables used in the analysis.



(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 6: Potential Crop by Region and Period.

of the transition to agriculture was associated with the taxation of crop yield. However, the effect of the Neolithic Revolution on technological advancements and public investment in agricultural infrastructure may have countered this adverse effect on the net crop yield. Thus, for a given crop yield, an earlier onset of the agricultural revolution could be associated with either a lower or higher rate of time preference.

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 the time preference via this channel.

4 Potential 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 a country level measure of long-term orientation. In particular, it examines the effect of crop yield on the rate of time preference, where the dependent variable is the cultural dimension identified by Hofstede (1991) as Long-Term Orientation.[27]

Hofstede (1991) is a major source of cultural dimensions and values, which have been widely used in cross-cultural studies, management, and economics, among others. In the latest version of these cultural dimensions dataset, Hofstede et al. (2010) define Long-Term Orientation as the cultural value that "stands for the fostering of virtues oriented toward future rewards, in particular, perseverance and thrift" (Hofstede et al., 2010, p.239-251). Hofstede and his collaborators have shown that this measure is positively correlated with the importance ascribed to receiving profits in the future, marginal savings rates, investment in real estate, math and science scores, etc. (Hofstede et al., 2010, p.245, 266). 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 growth.[28]

The Long-Term Orientation (LTO) measure varies between 0 (short-term orientation) and 100 (long-term orientation). Table 1 shows preliminary supporting evidence at the continental level in the Old World (where intercontinental migration and population replacement were less prevalent) of the positive relation between Long-Term Orientation and the pre-1500CE crop yield and daily crop return measures. The table establishes that Europe and Asia have higher crop yields and shorter growth cycles in comparison to North and Subsaharan Africa. Moreover, Europe has the highest caloric return per day and the largest LTO, followed by Asia, North and Subsaharan Africa.

[27] The most current version of the data is available at `http://www.geerthofstede.nl/dimension-data-matrix`.

[28] See Figure B.8 in the appendix.

Furthermore, for the sample of countries in the Old World, the correlation between potential crop yield and Long-Term Orientation is 0.6 ($p < 0.01$), and the partial correlation between LTO and potential crop yield and growth cycle is 0.7 ($p < 0.01$) and -0.5 ($p < 0.01$) respectively.

Table 1: Pre-1500CE Crop Yield, Growth Cycle, and Long-Term Orientation - Old World

	Top Crop				All Crops			LTO
Continent	Crop	Yield	Cycle	Return	Yield	Cycle	Return	
Europe	Barley	8371	125	68	6117	112	52	66
Asia	Rice	8709	139	63	5973	127	46	64
North Africa	Wheat	5958	140	43	4646	133	34	13
SSA	Pea	4495	190	23	4180	189	22	20

Notes: Yield measured in tens of millions of kilo calories per hectare per year, cycle in days, and return in tens of millions of kilo calories per hectare per day.

In order to explore the relation between both variables more systematically variations of the following empirical specification are estimated via ordinary least squares (OLS):

$$LTO_i = \beta_0 + \beta_1 \text{crop yield}_i + \beta_2 \text{crop growth cycle}_i + \sum_j \gamma_{0j} X_{ij} + \gamma_1 \text{YST}_i + \sum_c \gamma_c \delta_c + \epsilon_i, \quad (29)$$

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} are additional geographical characteristics of country i, YST_i are the number of years since country i transitioned to agriculture, δ_c are a complete set of continental fixed effects, and ϵ_i is the error term. The theory proposed in this paper implies that $\beta_1 > 0$. In order to increase comparability across specifications and variables, all independent variables have been normalized by subtracting their mean and dividing them by their standard deviation, and the sample is chosen to include all countries for which all information was available across specifications.

The results of OLS regressions using the post-1500CE potential crop yield and growth cycle measures based on the full set of available crops in the contemporary era are shown in Table 2. Column (1) shows the relationship between crop yield and Long-Term Orientation, accounting for continental fixed effects and therefore for any unobserved time-invariant omitted variable at the continental level. The estimated coefficient is statistically significant at the 1% and implies an economically significant effect of crop yield. In particular, an increase of one standard deviation in crop yield (approximately 2758 tens of millions of kilo calories per hectare per year) increases Long-Term Orientation by 0.3 standard deviations, i.e. 7.4 percentage points. Thus, crop yield has a positive effect on Long-Term Orientation as suggested by the theory.

Column (2) controls for other confounding geographical characteristics of the country. In particular, a country's absolute latitude, mean elevation above sea level, its terrain roughness, its mean distance to the sea or a navigable river, and dummies for being landlocked or an island. The

statistical and economic significance of crop yield remains, and the point estimate is higher by 2.4 units. This implies that after controlling for the effects of geography and unobserved continental heterogeneity, one additional standard deviation 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. Furthermore, most geographical characteristics of a country have an effect on Long-Term Orientation that is not statistically different from zero at traditional significance levels.

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. The onset of agriculture could have generated various conflicting effects on the evolution of time preference. In particular, 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). In contrast, the effect of the Neolithic Revolution on technological advancements (Ashraf and Galor, 2011; Diamond, 1997) and public investment in agricultural infrastructure 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. Reassuringly, the coefficient on crop yield remains statistically significant at the 1% level and implies that an additional standard deviation 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%. Thus, one additional standard deviation in the number of years since the transition to the Neolithic (approximately 2348 years) lowers Long-Term Orientation by 6.5 percentage points.

Column (4) adds crop growth cycle to the set of controls. As suggested by the theory the coefficient on crop yield remains positive and statistically significant at the 1%, while crop growth cycle's coefficient is negative, though not statistically different from zero. The estimated coefficient on crop yield implies that a one standard deviation increase on crop yield increases Long-Term Orientation by 9.5 percentage points. The point estimates in columns (1)-(4) are not statistically different and imply an economically significant effect of crop yield on Long-Term Orientation.

The proposed hypothesis suggests that the evolution of time preference reflected the exposure of the ancestral population of individuals today to higher crop yield. Hence, the migration of individuals in the post-1500 period would be expected to generate a mismatch between the crop yield in the country of residence and the crop yield to which the ancestral population of individuals was exposed. To analyze the effect that migration and population replacement might have had, columns (5) and (6) repeat the analysis of columns (3) and (4), but ancestry adjust the crop yield, the crop growth cycle, and the timing of transition to agriculture measures using the population migration matrix constructed by Putterman and Weil (2010). For example, for each country the adjusted crop yield is given by the weighted average of crop yield in the countries from which the ancestors of the current population migrated from, where the weights are given by the share of population

Table 2: Crop Yield, Crop Growth Cycle, and Long-Term Orientation (Hofstede)

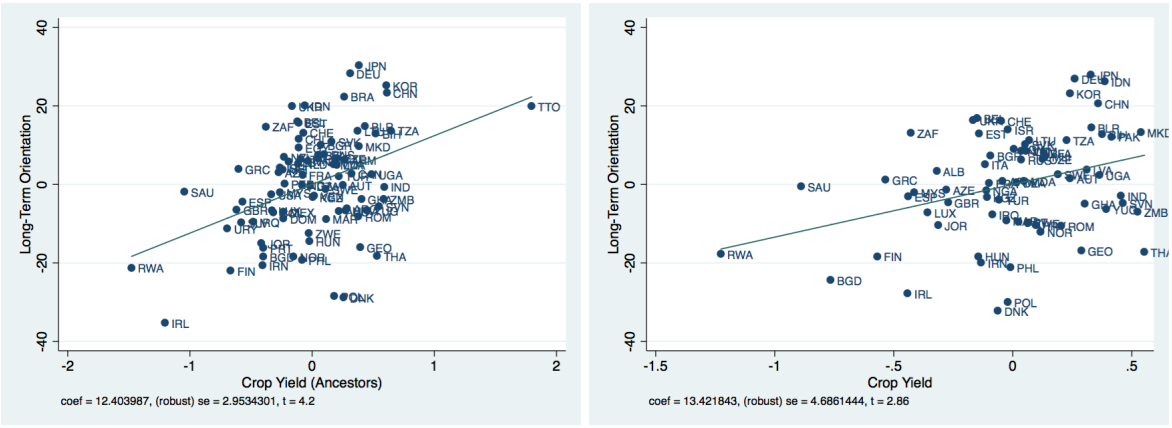
	Long-Term Orientation							
	Whole World						Old World	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield	7.43***	9.84***	9.06***	9.46***			13.26***	15.23***
	(2.48)	(2.88)	(2.62)	(3.41)			(2.55)	(3.58)
Crop Growth Cycle				-0.70				-3.18
				(3.96)				(4.03)
Crop Yield (Ancestors)					11.58***	13.31***		
					(2.15)	(2.94)		
Crop Growth Cycle (Ancestors)						-3.15		
						(3.52)		
Absolute latitude		2.85	1.88	1.68	4.72	3.99	4.76	3.87
		(4.05)	(3.85)	(4.33)	(3.29)	(3.63)	(4.15)	(4.71)
Mean elevation		4.98*	5.97**	6.09**	5.56**	5.96**	4.58	4.87
		(2.87)	(2.96)	(3.03)	(2.48)	(2.46)	(2.99)	(3.03)
Terrain Roughness		-6.24**	-5.72**	-5.72**	-6.74***	-6.72***	-6.40**	-6.29**
		(2.51)	(2.75)	(2.75)	(2.53)	(2.49)	(2.83)	(2.82)
Neolithic Transition Timing			-6.46**	-6.31**			-4.75*	-4.08
			(2.87)	(3.06)			(2.60)	(2.66)
Neolithic Transition Timing (Anc.)					-4.77**	-4.31*		
					(2.24)	(2.30)		
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	0.66	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 post-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 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.

coming from each ancestor country. This correction should mitigate the measurement error created by cross country migrations and population replacements that have occurred in the past 500 years. Additionally, by construction, the share of the ancestry adjusted measure determined by non-native ancestors captures the effect of crop yield that is not determined by the country's geographical characteristics, but is culturally embodied.

As can be seen in the table, the results after ancestry adjustment are similar to the previous ones, although the point estimates are larger, suggesting the presence of measurement error in the

previous estimates. In particular, the result shown in column (6) implies that after controlling for continental fixed effects, other geographical characteristics, the ancestry adjusted timing of transition to the Neolithic, and the ancestry adjusted crop growth cycle, an additional standard deviation in the crop yield experienced by the ancestors of current countries increased current levels of Long-Term Orientation by 0.53 standard deviations, i.e. 13.3 percentage points. Figure 7(a) shows the partial correlation plot for the specification in column (6).



(a) Ancestry Adjusted (b) Old World

Figure 7: Long-Term Orientation and Potential Crop Yield

Additionally, columns (7) and (8) show the results for the sample of countries in the Old World, where intercontinental migration and population replacement were less prevalent. Reassuringly, the estimated effect of crop yield on Long-Term Orientation is even larger in these cases, with each additional standard deviation in crop yield increasing Long-Term Orientation by 13.3 and 15.2 percentage points in columns (7) and (8) respectively, which are equivalent to 0.52 and 0.60 standard deviations respectively. Figure 7(b) shows the partial correlation between crop yield and Long-Term Orientation for the specification in column (8).

These results mitigate concerns that the positive effect of crop yield on Long-Term Orientation is generated by measurement error, or simply captures a country's geographical characteristics, and suggest that as proposed by the theory, the effect of crop yield is culturally embodied. Thus, descendants of migrants who originated in countries that have higher crop yields also have higher Long-Term Orientation.

4.2 Natural Experiment: The Columbian Exchange

As discussed in section 3.1, the natural experiment generated by the Columbian Exchange allows one to overcome potential concerns about the historical nature of the effect of crop yield on long-term orientation, the sorting of high long-term oriented individuals into high yield regions, and omitted variables at the country level. 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 some newly introduce crop is larger than the potential yield of the originally dominating crop. Hence, by construction, the assignment of crops associated with this natural experiment is independent of any other attributes of the grid. Indeed, as established in Appendix B.2), except for crop yield and growth cycle, other geographical characteristics of a country do not explain the changes in crop yield or growth cycle. Thus, this natural experiment permits the analysis to overcome potential concerns about omitted variables as well as sorting and past vs present effects.

Table 3: Natural Experiment: Pre-1500CE Potential Crop Yield, Growth Cycle, and Long-Term Orientation (Hofstede)

	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***			12.23***	15.21***
	(2.40)	(2.09)	(2.29)	(3.13)			(2.84)	(3.51)
Crop Yield Change (post-1500)		7.88**	8.77***	9.83***			7.95***	10.53***
		(3.08)	(2.69)	(3.11)			(2.56)	(3.30)
Crop Growth Cycle (pre-1500)				-3.77				-7.65
				(4.17)				(4.80)
Crop Growth Cycle Change (post-1500)				0.16				0.31
				(1.90)				(1.73)
Crop Yield (Ancestors, pre-1500)					8.62***	10.56***		
					(2.01)	(2.35)		
Crop Yield Change (Anc., post-1500)					8.03***	9.86***		
					(2.03)	(2.28)		
Crop Growth Cycle (Ancestors, pre-1500)						-7.31**		
						(3.59)		
Crop Growth Cycle Change (Anc., post-1500)						0.77		
						(1.60)		
Neolithic Transition Timing			-7.05**	-6.15**			-5.06*	-3.46
			(2.90)	(2.96)			(2.73)	(2.77)
Neolithic Transition Timing (Ancestors)					-5.23**	-4.27*		
					(2.25)	(2.23)		
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	0.66	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 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 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 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, 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 3 shows the effect of pre-Columbian crop yields and growth cycles and of the change in yields and cycles caused by the introduction of new crops on Long-Term Orientation. Column (1) shows that conditional on the effect of continent-specific unobserved heterogeneity, an additional standard deviation in the crop yield of crops available pre-1500CE resulted in a 5.7 percentage points increase in Long-Term Orientation in the twentieth century. Column (2) shows that the introduction of new crops, which allowed the attainment of higher yields, also increased Long-Term Orientation. In particular, the effect of a one standard deviation increase in pre-1500 crop yield is to increase Long-Term Orientation by 6 percentage points, while the change in crop yield increases it by 7.9 percentage points. Column (3) additionally controls for the confounding effects of a country's other geographical characteristics and its timing of transition to agriculture, which causes both point estimates to increase.

Column (4) additionally controls for the effect of growth cycle for crops available pre-1500 and its change caused by the Columbian Exchange. Reassuringly, the effect of pre-1500CE crop yield and its change are higher than before and thus remain statistically and economically significant. Columns (5) and (6) repeat the analysis by adjusting for the ancestry of current populations, while columns (7) and (8) constrain the sample to the countries in the Old World. These corrections, which lower measurement errors caused by intercontinental migration and population replacement, raise the coefficient on both pre-1500CE yield and its change. In particular, column (8) implies that an increase in one standard deviation in pre-1500CE crop yield increased Long-Term Orientation by 15.2 percentage points, while an increase in one standard deviation in the change in yield caused by the introduction of new crops increased Long-Term Orientation by 10.5 percentage points.

The results in table 3 are reassuring, since they show that both the crop yield before 1500 and its change post-1500 have a positive effect on Long-Term Orientation as posited by the theory. Moreover, the results are not driven by selection on observables nor unobservables and imply that there is a causal effect of crop yield on LTO.[29] Furthermore, 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.[30]

A possible concern with the previous results is that superior historical crop-yield could have affected positively past economic outcomes (e.g., population density, urbanization, or GDP per capita), which persisted over time and may have directly affected the observed rate of time preference. Moreover, the effect of changes in crops might be associated with changes in productivity and therefore in population density and urbanization (Nunn and Qian, 2011). Hence, 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 potential effect of the persistence of past economic prosperity.

Table 4 shows that controlling for historical levels of population density, urbanization, and

[29]These analyses are relegated to the appendix in order to economize space. See appendix B.2, and tables B.10 and B.13 in particular.

[30]Section B.2 in the appendix constrains the analysis to include only the crop data for cells in each country where the crop used before and after 1500 changed. Reassuringly, the results remain qualitatively unchanged.

Table 4: Potential Crop Yield, Long-Term Orientation, and 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-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 3. 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.

GDP per capita does not alter the results. The coefficients on crop yield, growth cycle and their change is statistically and economically significant in all columns and their size is similar to the ones previously found. Furthermore, the values of their partial and semi-partial R^2 show that their explanatory power is significantly larger than any of the other variables included in the analysis.[31]

These results provide support to the theory presented in this paper against an alternative one where higher agricultural productivity fostered urbanization rates, population densities and development in the past, which themselves generated higher levels of Long-Term Orientation, without any direct effect of crop yield. Moreover, the results are not simply capturing the positive effect of agricultural productivity on LTO. First, as shown in the appendix, the changes in yields and growth cycles are orthogonal to conventional measures of agricultural suitability. Furthermore, using principal component analysis the research shows that the variations in crop yield and growth cycle and their changes, which are orthogonal to agricultural productivity, are the ones generating the variation in LTO.[32] Moreover, the results do not capture a general effect of crop yield and growth cycles on a country's culture. In particular, LTO is not correlated with other cultural values. Additionally, crop yield, growth cycles, and their changes only correlate with LTO and as Table 5 shows, inclusion of additional cultural values in the analysis does not alter the results.[33]

Finally, the results are robust to a large set of alternative theories and confounding factors. E.g. effective crop yields might be affected by climatic risks, spatial diversification, or trade. Thus, the extent of pre-industrial trade and land might allow individuals to smooth consumption without requiring them to delay gratification. Also, other pre-industrial factors like the structure of language (Chen, 2013), or the availability of the plough (Alesina et al., 2013) might be correlated with both LTO and crop yields and growth cycles. Similarly, if agricultural investment is risky, the actual return to agricultural investment will be lower. Additionally, income inequality, the age structure, and the life-expectancy of the population might affect LTO. Reassuringly, accounting for these and other factors does not alter the results (see appendix).[34]

[31] As established in Table B.26, the qualitative results are unchanged, if the analysis uses only grids that experienced a change in the crop used post-1500CE.

[32] See also appendix B.2 and B.5.

[33] See also Table B.41 and appendix B.10.

[34] Appendix B shows the analysis for these and other channels. It establishes the robustness of the results to other agricultural, cultural, and trade channels, including the existence of pre-industrial media of exchange or transportation technologies, the location of pre-industrial trade routes, land area, and climatic risk factors, the availability of the plough, a country's languages future time reference, etc., as well as to spatial autocorrelation, selection on unobservables, religious composition, among others. It additionally presents a pairwise analysis that allows the use of country fixed effects. In particular, it analyzes the effect of pairwise absolute differences in crop yield, growth cycle and their changes on absolute differences in long-term orientation. The results of that analysis provide additional support for the theory of the paper.

Table 5: 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 Ch. (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 ancestors 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 ancestors. 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.

5 Potential Crop Yield and Long-Term Orientation (Second-Generation Migrant Analysis)

This section analyses the effect of crop yield and crop growth cycle on the Long-Term Orientation of second-generation migrants as reported in the European Social Survey.[35,36] The analysis of second-

[35]The Long-Term Orientation measure 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?" taken from the "Timing of Life" module in the third wave of the European Social Survey, and is again measured between 0 (short term-orientation) and 100 (Long-Term Orientation). The original answers were normalized to ensure comparability with the analysis of the previous section.

[36]Other researchers have used the General Social Survey (GSS) to study second-generation migrants. Regretfully, the GSS does not ask a question that captures long-term orientation, and thus, cannot be used in this analysis.

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.

The sample of second-generation migrants is composed by all respondents who were born in the country where the interview was conducted, and whose parents were not born in that country. This measure of long-term orientation and the respondent's completed number of years of schooling and total household income in wave 3 of the survey are strongly positively correlated, suggesting it captures elements of time preference.[37]

The following empirical specification is estimated via ordinary least squares (OLS),

$$\begin{aligned} LTO_{ic} =& \beta_0 + \beta_1 \text{crop yield}_{ip} + \beta_2 \text{crop growth cycle}_{ip} \\ &+ \sum_j \gamma_{0j} X_{ipj} + \gamma_1 \text{YST}_{ip} + \sum_j \gamma_{2j} Y_{ij} + \sum_c \gamma_c \delta_c + \epsilon_i, \end{aligned} \tag{30}$$

where LTO_{ic} is the Long-Term Orientation measure of second-generation migrant i in country c, crop yield$_{ip}$ and crop growth cycle$_{ip}$ are the measures in the country of origin of parent p of individual i, X_{ipj} are other geographical characteristics 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} are characteristics of individual i (sex, age, education, marital status, health status, religiosity),[38] δ_c is a complete set of host country of agent i fixed effects, and ϵ_i is the error term. The theory proposed in this paper implies that the estimates of the coefficient on crop yield should satisfy $\beta_1 > 0$. As before, all independent variables have been normalized by subtracting their mean and dividing them by their standard deviation, and the sample is chosen to include all individuals for whom all information was available across specifications.

The OLS estimates from this analysis are presented in Table 6. All columns control for an individual's sex and age and its squared, 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.[39] 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

[37] See Tables B.49 and B.50 in the appendix.

[38] Inclusion of individuals' incomes in the regression does not alter the results, but reduces the sample size by almost 50%.

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

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. Again, this should correct for any mismeasurement caused by migration and population replacement that occurred during the last 500 years. Reassuringly, the 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 ancestors 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 minimizes any measurement error generated by migration and population replacement. Reassuringly, the coefficient on crop yield remains statistically significant

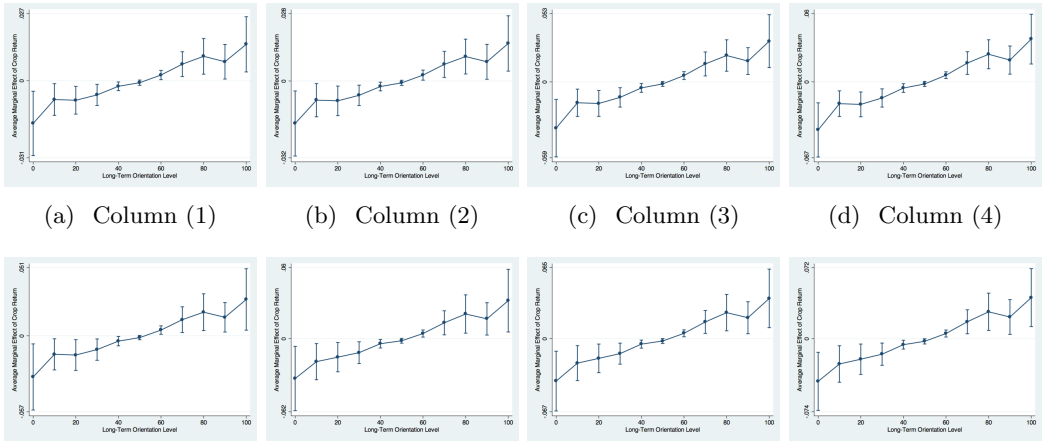
Table 6: Potential Crop Yield, Potential Crop Growth Cycle, and Long-Term Orientation in Second-Generation Migrants

	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.

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 6 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



(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 8: Average Marginal Effects of Potential Crop Yield on Long-Term Orientation of Second-Generation Migrants

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 Table B.51). Although this is reassuring, the interpretation of the coefficients is not straightforward. In order to better understand the implied relation, figure 8 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 6. 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 $r + 1$.

Finally, using the pre-1500CE crop yield, growth cycle and their change, as in section 4, does not alter the results.[40] 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 ancestors 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

[40] Tables B.52 and B.53 in the appendix show the effect of crop yield pre-1500 and its post-1500 change on Long-Term Orientation.

by the theory, the effect of crop yield is the culturally embodied and rooted in the historical experience 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.54).

6 Potential Crop Yield and Long-Term Orientation (Individual-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) on the share of individuals in a region who are long-term oriented.[41] Given that the dependent variable in the individual 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 general empirical specification is

$$\begin{aligned} LTO_{ircw} =& \beta_0 + \beta_1^{1500}\text{crop yield}_{rc} + \beta_1^{ch}\text{crop yield change}_{rc} \\ &+ \beta_2^{1500}\text{crop growth cycle}_{rc} + \beta_2^{ch}\text{crop growth cycle change}_{rc} \\ &+ \sum_j \gamma_{0j} X_{rc} + \gamma_1 \text{YST}_{rc} + \sum_j \gamma_{2j} Y_{ircwj} + \sum_{cw} \gamma_{cw}\delta_{cw} + \epsilon_{ircw}, \end{aligned} \tag{31}$$

where $LTO_{ircw} \in \{0, 1\}$ denotes the Long-Term Orientation of individual i of region r in country c during wave w of the WVS; crop yield$_{rc}$ and crop growth cycle$_{rc}$ are the pre-1500 measures in region r of country c; change crop yield$_{rc}$ and change crop growth cycle$_{rc}$ are the change in the measures in region r of country c caused by the Columbian Exchange; X_{rc} are other geographical characteristics of region r in country c; YST$_{rc}$ are the years since the region r in country c transitioned to agriculture; Y_{ircwj} are characteristics of individual i (sex, age, education, income) in region r of country c during wave w; δ_{cw} is a complete set of continent or country, and wave fixed effects; and ϵ_{ircw} is the error term. The theory proposed in this paper implies that the estimate of the coefficient on crop yield and its change should satisfy $\beta_1^{1500} > 0$ and $\beta_1^{ch} > 0$. As before, all independent variables have been normalized by subtracting their mean and dividing them by their standard deviation, and the sample is chosen to include all individuals for which all information was available across specifications. Additionally, heteroskedasticity robust standard errors clustered by wave-region and individual characteristics are employed.

The results of estimating equation (31) using OLS at the country level are shown in Table 7. In particular, every variable for region r in country c is given the country level value of the variable. Thus, no country-subregional level differences are exploited in the identification of the effect. All

[41] The measure of Long-Term Orientation is 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.

columns include fixed effects for the WVS wave in which the interview was conducted and for each continent.

Column (1) shows that after controlling for wave and continental fixed effects, increasing the country's crop yield by one standard deviation increases the probability of having Long-Term Orientation by 2.5 percentage points. Column (2) shows that controlling for a country's absolute latitude, mean elevation above sea level, terrain roughness, distance to the sea or navigable river, and it being landlocked or an island does not alter the result. Even more, it increases the estimate of the effect of crop yield so that one standard deviation increase in crop yield increases the probability of having Long-Term Orientation to 4.0 percentage points. Column (3) shows that accounting additionally for a country's years since transition to agriculture does not alter the results.

Column (4) accounts additionally for the individual's gender, age, income, and education levels. Reassuringly, the result is robust to controlling for individual characteristics. Thus, after controlling for wave and continental fixed effects, country's geographical characteristics, and individual's characteristics, increasing crop yield by one standard deviation increases the probability of having Long-Term Orientation by 3.2 percentage points.

Column (5) analyzes the effect of the change in crop yield generated by the Columbian Exchange. Reassuringly, the coefficient on pre-1500CE crop yield remains unchanged so that an increase of one standard deviation increases Long-Term Orientation by 3.2 percentage points. Additionally, a one standard deviation in the change in crop yield generated by the introduction of new crops increases Long-Term Orientation by 5.3 percentage points.

The inclusion of pre-1500CE crop growth cycle and its change as controls, column (6), lowers the effect of pre-1500CE crop yield on the probability of having Long-Term Orientation to 3.1 percentage points per additional standard deviation in return and increases the effect of the change in yield generated by the Columbian Exchange to 5.4 percentage points. At the same time, the estimated effect of pre-1500CE crop growth cycle is negative, while the effect of its change post-1500 is positive, both statistically and economically significant. In particular, it implies that a one standard deviation increase in pre-1500Ce crop growth cycle decreases the probability of having Long-Term Orientation by 0.7 percentage points, while its change increases LTO by 2.5 percentage points. As explained before, the counterintuitive positive effect of crop growth cycle on individual's long-term orientation could be generated by the positive correlation between potential yields and growth cycles or by the mitigating effect of growth cycles on long-term orientation.

Clearly, the migration and population replacements that occurred in the last 500 years cause measurement error. Columns (7) and (8) deal with this possibility by using ancestry adjustments for crop yield, crop growth cycle, and years since transition, column (7); and constraining the sample to include only individuals interviewed in the countries in the Old World, column (8). The results show a higher effect of pre-1500 crop yield, namely every additional standard deviation in crop yield increases the probability of having Long-Term Orientation by 4.3 and 6.6 percentage points respectively in columns (7) and (8). Additionally, a one standard deviation increase in its change post-1500 increases LTO by 4.1 and 5.5 percentage points respectively. At the same time,

Table 7: Pre-1500 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 (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 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.

pre-1500 crop growth cycle now lowers LTO by 0.5 percentage points and by 1.8 percentage points respectively. Post-1500 change in crop growth cycle on the other hand increases LTO by 1.8 and 2.6 percentage points respectively. These results as well as the ones based on second-generation migrants suggest that the effect of crop yield is culturally-embodied and that the crop yield faced by individuals ancestors plays a crucial role in the determination of an individuals preferences.[42,43]

The rest of this section analyzes Long-Term Orientation at the sub-regional level. It is important to highlight some issues present in this 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.[44] 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.14 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, the size of regions varies a lot 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.

Taking these caveats into account, table 8 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.[45] Column (5) additionally controls for crop growth cycles in the specification of column (4). The results remain qualitatively unchanged with 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,

[42]Clearly, this type of measurement error biases the coefficient on crop yield downwards and lowers its size by almost 50%. See also appendix B.14.

[43]Estimating a probit model does not alter the results (Table B.55). In particular, an increase of one standard deviation in the crop yield faced by their ancestors increases the probability of an individual having Long-Term Orientation by 4.8 percentage points. Similarly, the results are not affected by the inclusion of only cells that changed crops post-1500CE or the weighting scheme used.

[44]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.

[45]This is similar to the results presented in tables B.58 and B.60 where country level measures of the same variables are used.

Table 8: 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 kms. 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.

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.14 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 decrease the measurement error caused by 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.[46]

In addition to the previous analysis of the effect of crop yield on individual's preferences, this section also analyzes its effect on the regional level of Long-Term Orientation. In particular, using the answers for each individual, a regional level of Long-Term Orientation is created, by assigning to each region the share of respondents that have Long-Term Orientation. This overcomes possible concerns that the previous results are driven by omitted individual characteristics or idiosyncratic shocks.

The results of this analysis are shown in Table 9. Column (1) shows that after controlling for continental fixed effects, increasing a regions crop yield by one standard deviation increases its share of population with Long-Term Orientation by 4.9 percentage points. Additionally controlling for the effect of a region's other geographical characteristics, column (2), does not alter the results, and the coefficient on crop yield remains statistically significant at the 1% level. Column (3) adds a region's crop growth cycle as a control. Doing so increases the estimated effect of crop

[46]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.62-B.64 in Appendix B.

Table 9: 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	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. 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 kms. 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.

yield implying that a one standard deviation increase in a region's crop yield increases its share of population with Long-Term Orientation by 5.3 percentage points. Additionally, the coefficient on crop growth cycle is negative, but not statistically different from zero. Similarly, no other regional geographical characteristic has an effect on a region's Long-Term Orientation that is statistically different from zero.

Column (4) corrects the crop yield and crop growth cycle measures for intercontinental migration and population replacements. As explained above, this is done by assuming that all immigrants into a country are uniformly distributed across regions in the receiving country, and come uniformly from the regions of the country of origin. As before, this ancestry adjustment increases the absolute size of both coefficients, although the coefficient on crop growth cycle remains not statistically different from zero. The ancestry adjusted effect of crop yield implies that an increase of one standard deviation in the crop yield experienced by the ancestors of the population of a region increases its share of population that has Long-Term Orientation by 7.7 percentage points.

Columns (5) and (6) repeat the analysis of columns (3) and (4), but weigh regions importance in the regression according to their area. Thus, larger regions are given more weight in the regression than smaller ones. This helps to take into account that larger regions are easier to identify and thus their crop measures might be more accurate. Also, since migration out of a larger region is more difficult than from smaller ones, it might lower the measurement error caused by internal migration. As can be seen there, by assigning more importance to regions with larger areas, the size of the coefficient on crop yield doubles in size and the coefficient on crop growth cycle increases almost five-fold. In particular, the results in column (6) imply that an additional standard deviation in crop yield increases a region's share of population with Long-Term Orientation by 13.3 percentage points, while an additional standard deviation in crop growth cycle decreases it by 5 percentage points. Interestingly, the effect of all other geographical characteristics remains statistically insignificant at traditional significance levels.

Columns (7) and (8) control for time invariant country level unobservable heterogeneity in the specifications of columns (5) and (6). As before, the coefficients fall by more then 50% on both crop yield and crop growth cycle. Still, the effect of both variables remains statistically and economically significant, with the share of population with Long-Term Orientation in column (8) changing by 4.3 and -2.7 percentage points for each additional standard deviation in crop yield and crop growth cycle respectively.

Columns (9) and (10) repeat the analysis of columns (7) and (8), but weigh regions according to the share of their area within the country. As can be seen there, the results are qualitatively unchanged by this different weighting scheme. Finally, columns (11) and (12) show the results for both weighting schemes when the sample is constrained to countries in the Old World. Again, the effect of both crop yield and crop growth cycle have the expected signs, are statistically significant at the 5% level, and also economically significant with effects similar to the ones found previously.[47]

[47]Similar results are obtained using the pre-1500CE crop yield and growth cycle and their changes, as shown in table B.65.

7 Concluding Remarks

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 agro-climatic characteristics in the pre-industrial era 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 empirical analysis establishes that indeed higher potential crop yields in the pre-industrial era increased the long-term orientation of individuals in the modern period. The analysis establishes this result in five layers: (i) a cross-country analysis of variations in time preference 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; (ii) within-country analysis across second-generation migrants that accounts for the host country fixed effects, the sending country's geographical characteristics 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) 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) cross-regional analysis that accounts for the confounding effects of a large number of geographical controls, as well as country fixed-effects.

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 100g.

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

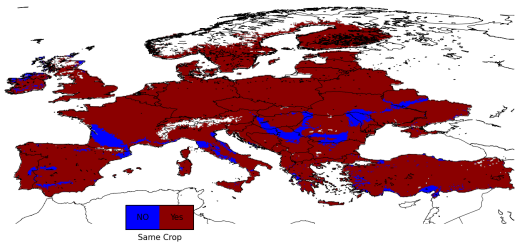
Notes: Taken from various sources, including Crosby (1972) and Diamond (1997).

B Additional Results

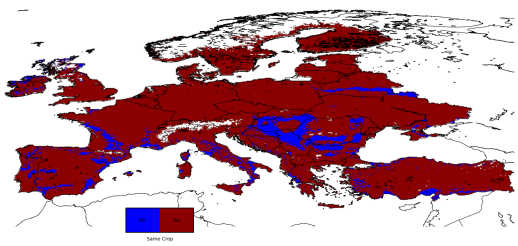
This section presents additional results that were omitted in the main body of the paper. Some of them are referenced there and are presented here in order to avoid unnecessary repetition and due to space limitations.

B.1 Crop Return and Long-Term Orientation

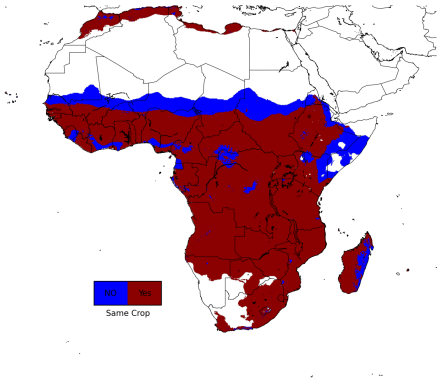
The analysis of section 4 used crop yield as the main independent variable. This captured the insight from the model and directly identified the effect of yield on preferences. But individuals' preferences might have instead reacted to the crop return per day, where the return is given by the ratio of crop yield to crop growth cycle. Figure B.1 shows the cells where the same potential crop generates the highest total yield or highest return. Additionally, table B.3 presents the results of using crop return as the main independent variable. As can be seen, the results are very similar and tell the same story, namely higher yield, which conditional on the growth cycle are reflected in higher returns, generate a higher Long-Term Orientation.



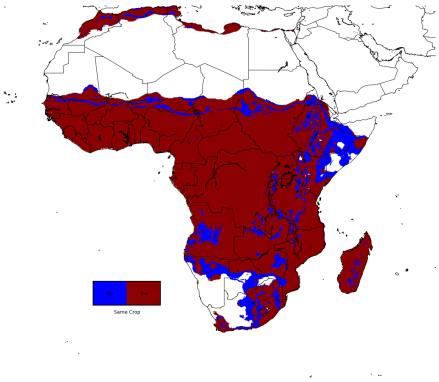
(a) Europe pre-1500CE Crops



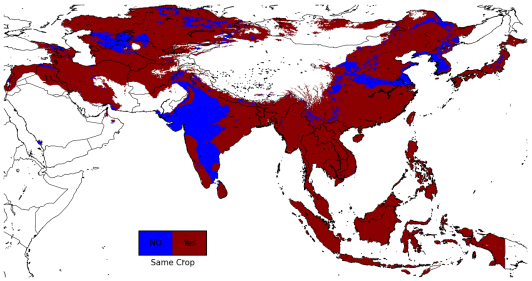
(b) Europe post-1500CE Crops



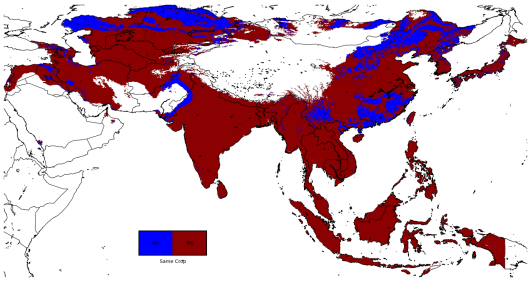
(c) Africa pre-1500CE Crops



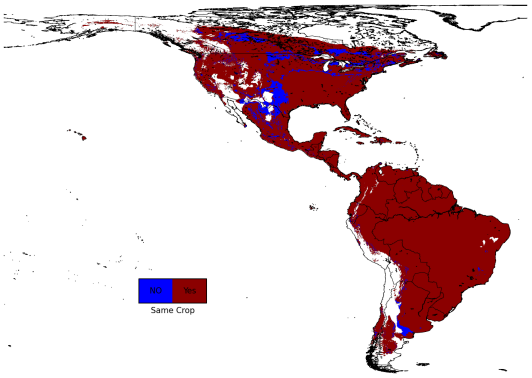
(d) Africa post-1500CE Crops



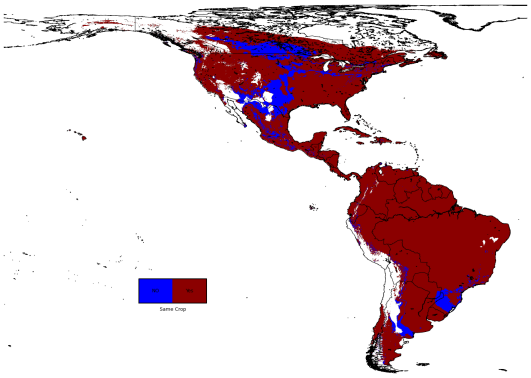
(e) Asia pre-1500CE Crops



(f) Asia post-1500CE Crops



(g) America pre-1500CE Crops



(h) America post-1500CE Crops

Figure B.1: 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.

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.[48] Figure B.3 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.

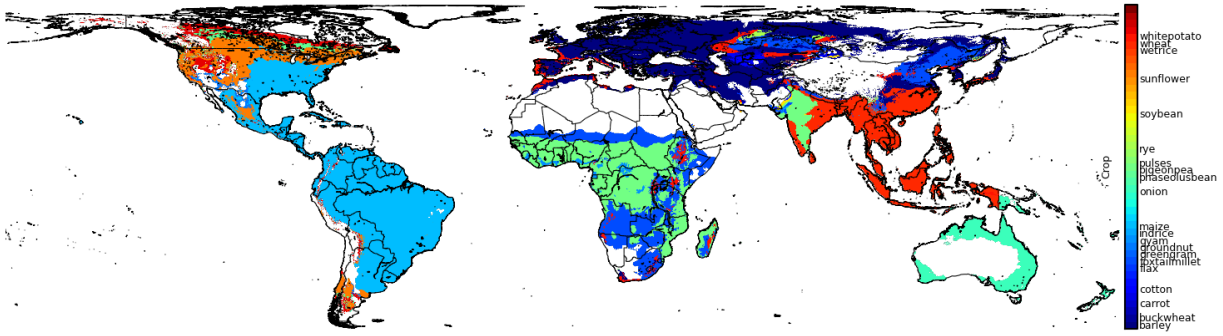
Notice that by construction, the change in potential crops, their yields and growth cycles generated by the Columbian Exchange is orthogonal to the characteristics of the individuals inhabiting any region in the world. Still, it is not immediate that these changes are not correlated with other characteristics 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.4-B.9 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.15 in the next section shows that using this subsample does not alter the results.

These results suggests that it is unlikely that other omitted regional characteristics are biasing the results. In fact, table B.10 follows Altonji et al. (2005), Bellows and Miguel (2009), and Oster

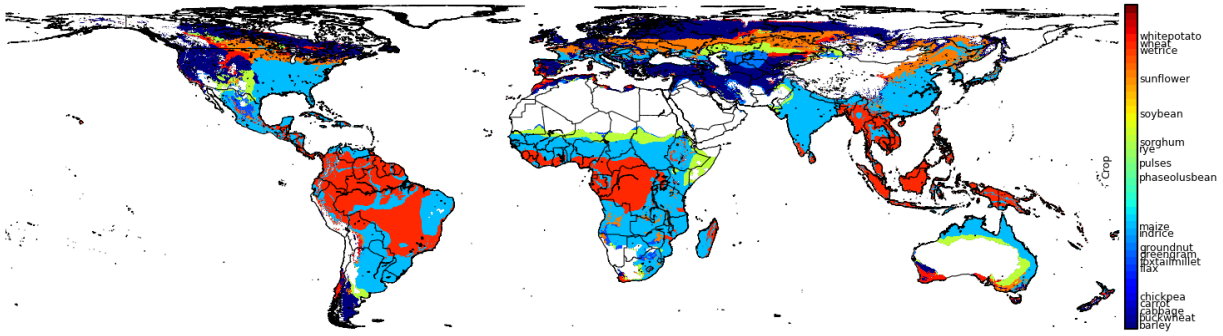
[48] In fact, as Crosby (1972) shows, many of the crops were quickly transplanted between the Old and New Worlds.

(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.

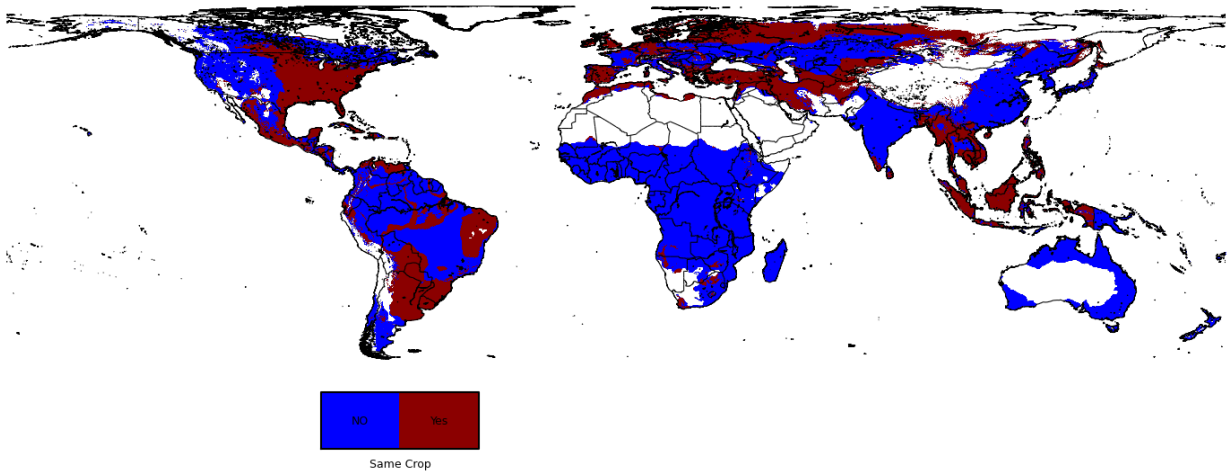
Thus, the natural experiment overcomes any possible concerns generated by the selection of high long-term orientation individuals into regions that generated higher yields. Additionally, it suggests that neither selection on observables nor unobservables drive the results of the paper, overcoming any 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

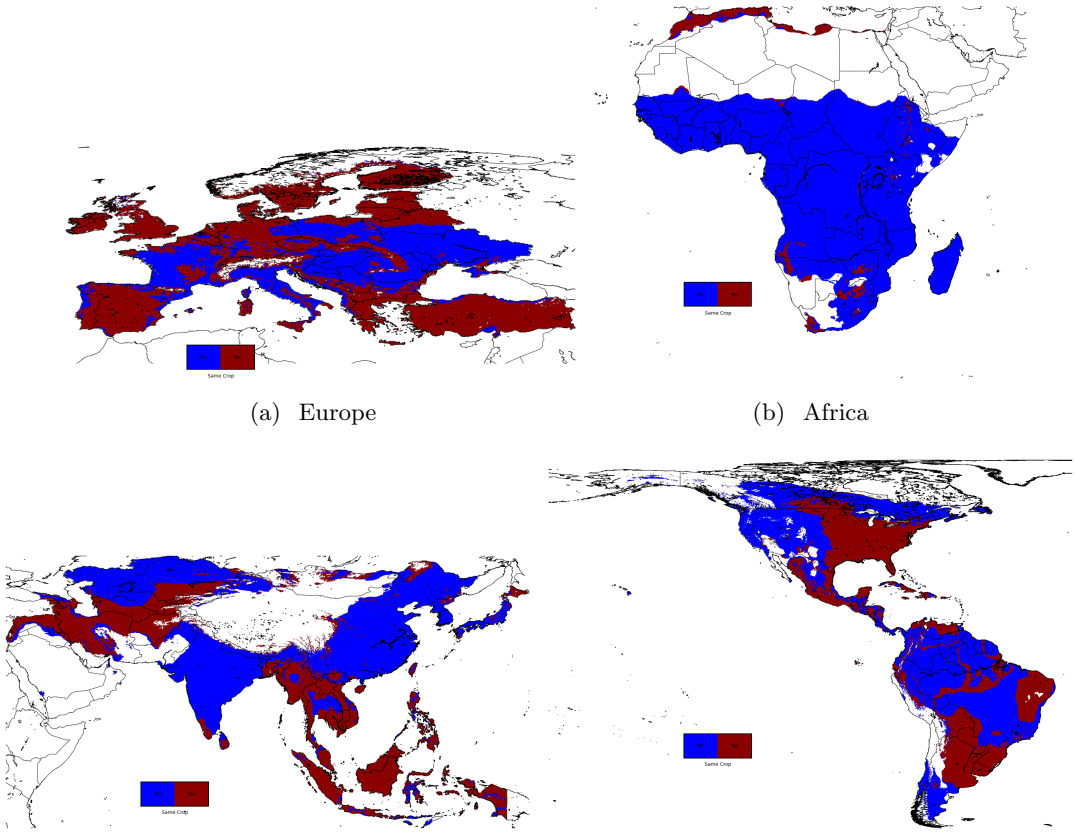


(b) World post-1500CE Crops



(c) Same Crop pre- and post1500CE

Figure B.2: Potential Crop pre- and post-1500CE.



(a) Europe (b) Africa

(c) Asia (d) America

Figure B.3: Change in Potential Crop after Columbian Exchange.

Table B.4: 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.5: 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.6: 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.7: 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.8: 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.9: 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.10: 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 3 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.11 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.11 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.11 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.11: 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.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.12 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, 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. 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.13 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.14 replicates the analysis of table 2, 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.15 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 re-

Table B.12: 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 parenthesis 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.13: 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 parenthesis 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.14: 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 2 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.

sults 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.15: 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 2-B.11.

Table B.16: 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.17: 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.18: 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 LTO. 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.19 shows the correlation between the agricultural suitability experienced by countries' ancestors 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.19: 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 LTO. Similarly, only *conditional* on crop yield does growth cycle decrease LTO. Thus, it is this dual relation that ought to drive the empirical relation between LTO 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.20 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 LTO 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.20: 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.21 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.21: 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.22 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 ancestors 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.4 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.23 and figure B.5 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.22: 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.24 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,

Table B.23: 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.

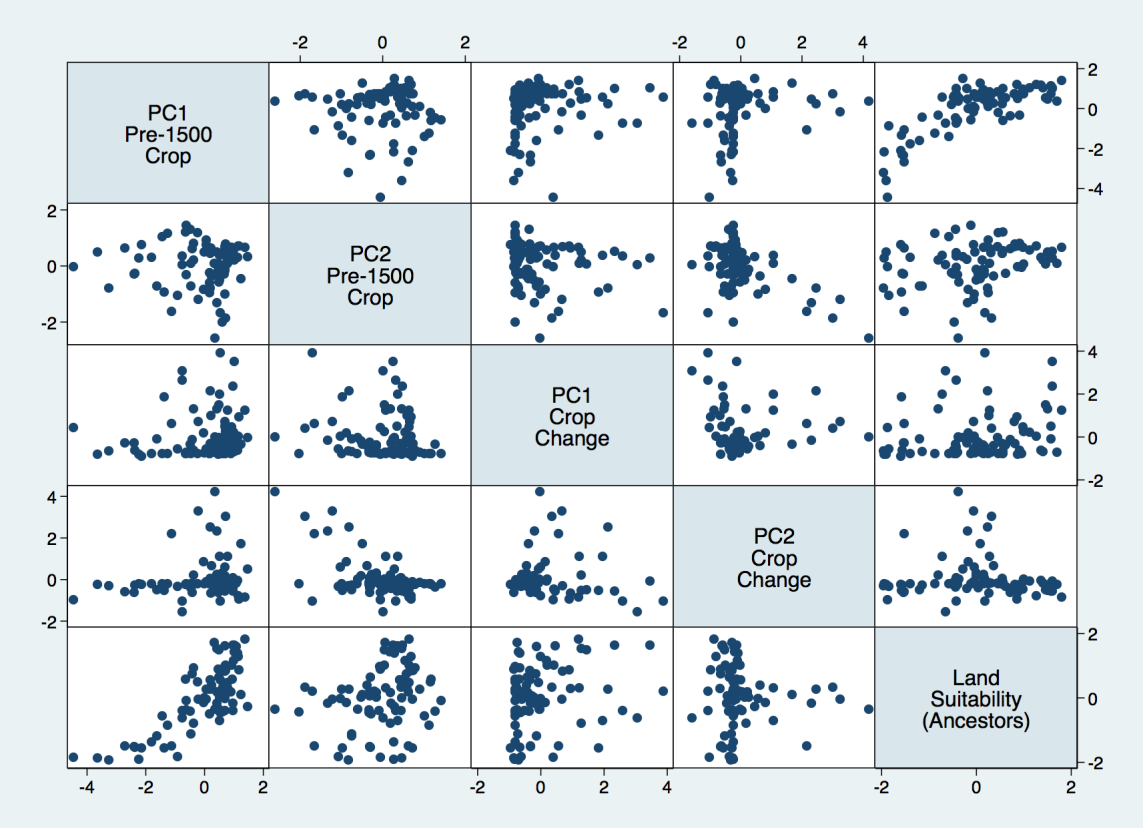


Figure B.4: Principal Components of Crop Yield and Growth Cycle, Their Changes, and Agricultural Suitability

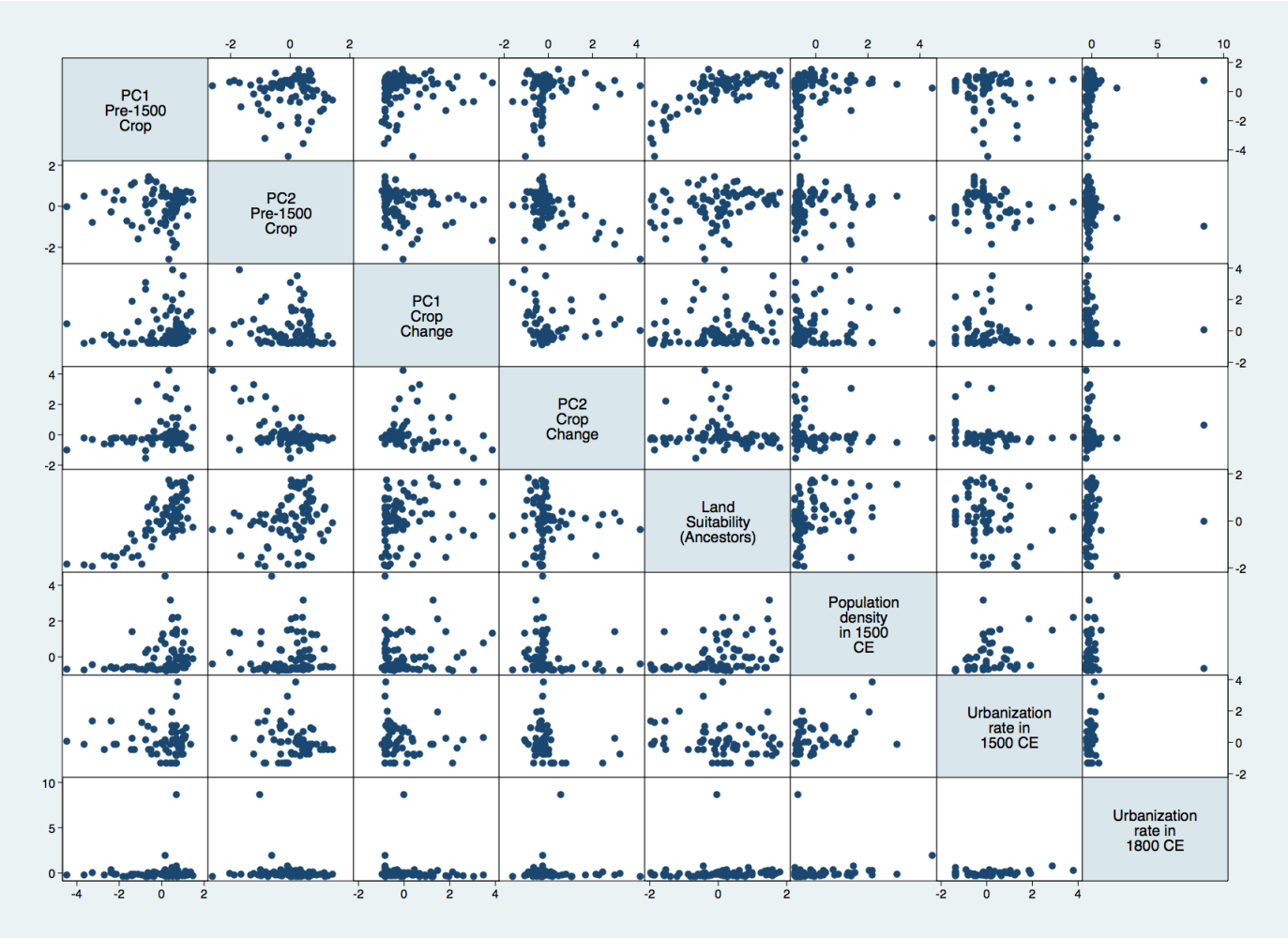


Figure B.5: Principal Components of Crop Yield and Growth Cycle, Their Changes, and Pre-Industrial Development

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.24: 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 ancestors determine its LTO, and not the general level of agricultural suitability and its effect on pre-industrial development.

B.6 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 4. Table B.26 reproduces the analysis of table 4, 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.28-B.30 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.28 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.31-B.32 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.31-B.32 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.33 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.[49]

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

Table B.25: 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.26: 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 3. 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: 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.28: 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.29: 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.30: 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.31: 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.32: 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.33: 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.7 Long-Term Orientation and Age Structure of Population

Tables B.34-B.36 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.34: 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.35: 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.36: 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.

B.8 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.37-B.39 the main results do not change if one controls for various measures of inequality.

Table B.37: 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.38: 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.39: Pre-1500CE Crop Yield, Crop Growth Cycle, Their Change, and Inequality, for Grids that Experienced Change in Crop post-1500CE

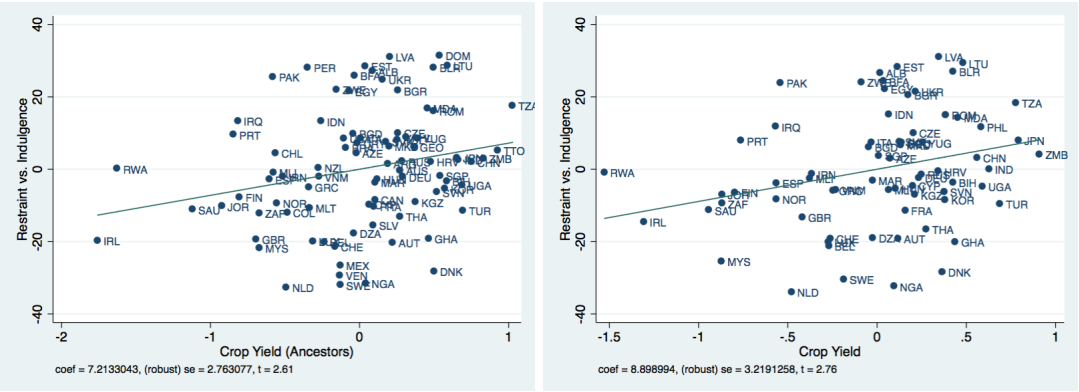
	Long-Term Orientation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	6.62**	6.49*	6.30*	6.62*				
	(3.29)	(3.37)	(3.46)	(3.34)				
Crop Yield Change (post-1500)	5.31*	5.08*	4.91*	4.52				
	(2.80)	(2.74)	(2.67)	(2.92)				
Crop Growth Cycle (pre-1500)	-0.22	-0.02	-0.25	0.01				
	(2.63)	(2.66)	(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.9 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.40 replicates the analysis of table 2, 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.6 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.6: Restraint vs. Indulgence and Potential Crop Yield

Table B.40: 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.

B.10 Potential Crop Yield and Other Societal Preferences and Cultural Characteristics

This section analyzes the relation between potential crop yield, Long-Term Orientation and other cultural characteristics of countries. Hofstede et al. (2010) present various additional measures of

societal preferences. In particular, they measure Uncertainty Avoidance, which measures the level of tolerance and rigidness of society; Power distance, which measures the level of hierarchy and inequality of power; Individualism, which measures how individualistic as opposed to collectivistic a society is; and Masculinity, which measures a society's level of internal cooperation or competition. In order to complement this set of country-level cultural characteristics, this analysis also considers the level of generalized trust.

Table B.41: 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.

Table B.41 shows the Pearson correlations between these cultural characteristics. As expected,[50] 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.42 shows the effect of crop yield on each of these measures after controlling for continental 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.43-B.45 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.[51]

Finally, tables B.46 and B.47 show the relation between ancestry adjusted crop yields and their

[50] See previous subsection.

[51] 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.42: 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.

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.

Table B.43: 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)	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 ancestors. 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.44: 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)	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 ancestors. 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.45: 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 ancestors. All columns account for continental fixed effects, geographical controls, and the land suitability and the timing of transition to agriculture experienced by the ancestors of the country. 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.46: 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 ancestors 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 ancestors. 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.47: 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 ancestors 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 ancestors. 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.11 Pairwise Differences in Long-Term Orientation

This section analyzes the relation between crop yield and Long-Term Orientation based on pairwise differences. The predicted monotonic relation between LTO and crop yield implies also a monotonic relation between pairwise absolute differences in LTO and absolute differences in crop yield. Additionally, the model predicts that pairs of countries for which the absolute difference in changes in crop yield is larger should have smaller absolute difference in LTO. Using pairwise differences allows the use of country fixed effects and two-way clustering at the country level, providing additional evidence that alleviates possible concerns about unobserved country level effects driving the results. The analysis additionally controls for other pairwise differences and a set of pairwise fixed effects that control for the number of islands, landlocked countries and continents where the countries in are located.

The results shown in Table B.48 provide additional support for the theory put forward in this paper. There exists a strong increasing relation between absolute differences in LTO and absolute differences in crop yield. In all columns absolute differences in ancestry adjusted pre-1500CE crop yield have a monotonically increasing relation with absolute differences in LTO. Furthermore, the relation between absolute differences ub changes in crop yield and absolute differences in LTO is negative and statistically significant. These results provide additional support for the theory proposed in this paper.

Table B.48: Long Term Orientation

	Long Term Orientation (Pairwise Differences)					
	(1)	(2)	(3)	(4)	(5)	(6)
Abs. Diff. Crop Yield (pre-1500, Anc.)	0.14**	0.14**	0.12**	0.12**	0.12*	0.12*
Abs. Diff. Crop Growth Cycle (pre-1500, Anc.)					0.01	0.02
Abs. Diff. Crop Yield Change (Anc., post-1500)						-0.13***
Abs. Diff. Crop Growth Cycle Change (Anc., post-1500)						0.06
Abs. Diff. Neolithic Transition Timing (Ancestors)				0.04	0.04	0.04
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Continental FE	No	Yes	Yes	Yes	Yes	Yes
Geography	No	No	Yes	Yes	Yes	Yes
Adjusted-R^2	0.28	0.28	0.39	0.39	0.39	0.40
Observations	3741	3741	3741	3741	3741	3741

Notes: This table establishes the positive, statistically and economically significant effect of absolute differences in pre-1500CE potential crop yield, growth cycle and their changes post-1500CE experienced by a country's ancestors on absolute differences in the level of Long-Term Orientation for pairs of countries. All columns account for country fixed effects, and additionally control for pairwise differences in geographical characteristics, and of the timing of transition to agriculture. Coefficients are standardized betas. Heteroskedasticity robust two-way clustered 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.12 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.

Table B.49: 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.50: 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.51: 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.52: 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.53: 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.54: 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 6-B.53 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.

B.13 Potential Crop Yield, Potential 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.55 shows the average marginal effects of the probit estimation for the same specifications as the ones presented in table 7. Additionally, table B.56 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.57 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.60 and B.61 replicate the analysis of tables B.58 and B.59 using the same set of controls used in the regional analysis in tables 8 and B.62. As can be seen the results in both sets of tables is similar and are not driven by the particular choice of controls.

Table B.55: 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.

Table B.56: 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.57: 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.58-B.56 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.58: 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.59: 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.60: 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 kms. 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.61: 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.62: 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 kms. 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.63: 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 kms. 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.64: 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 kms. 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.65: 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 kms. 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.14 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.7(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.[52] As can be seen there, the OLS estimate for the data without migration is correctly estimated to be $\hat{\beta}_1 = 1$

[52] Similar results were obtained for other parametrizations.

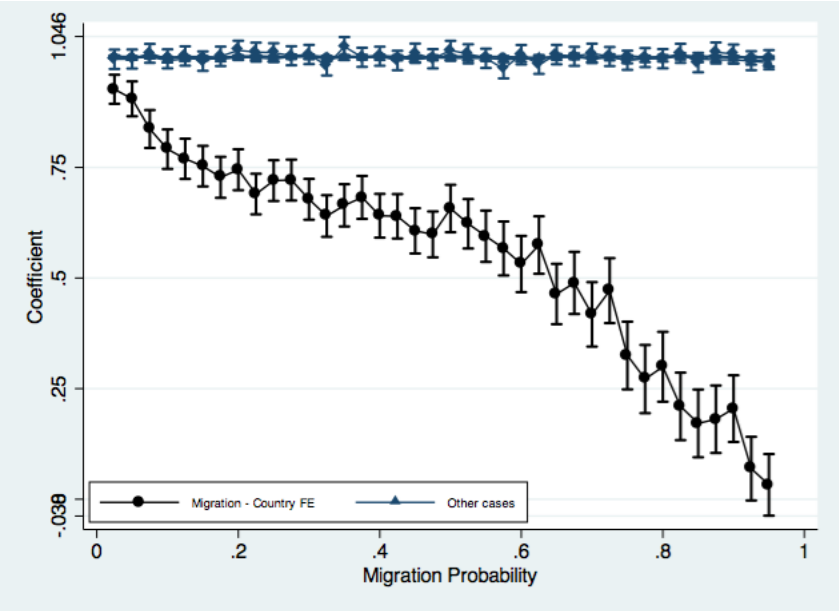
both for the specification with and without country fixed effects. On the other hand, for the data with migration, the specification without country fixed effects correctly estimates $\hat{\beta}_1 = 1$, but with country fixed effects there exists a bias that increases with the probability of migration. 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 averages is

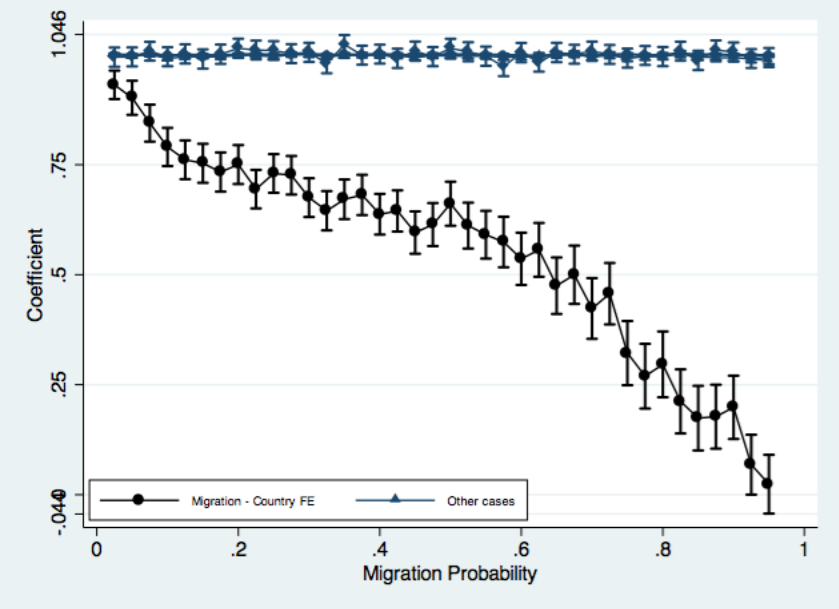
$$\bar{y}_{rc} = \bar{x}_{rc} + \epsilon_{rc},$$

with $\bar{x}_{rc} = rc$. Figure B.7(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

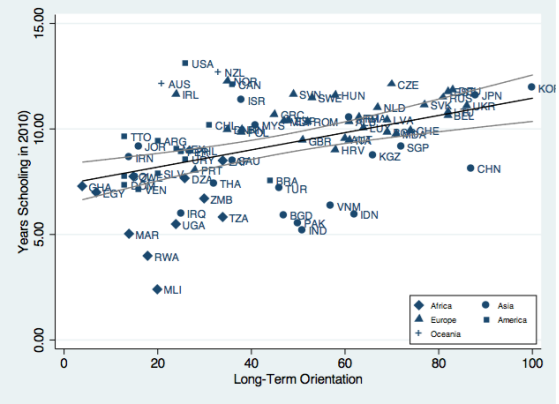
Figure B.7: Migration Rates and Measurement Error

B.15 Long-Term Orientation Measures

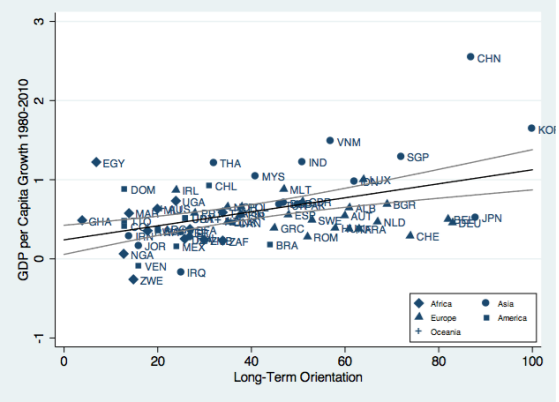
This section shows the correlations between the different measures at the country level. For the ESS and WVS the country-level measure is the average of the individual responses in the data. As tables B.66 and B.67 show, the three measures are highly correlated, which suggests they are indeed measuring the same phenomenon. Additionally, table B.68 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.



(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.8: Hofstede's Long-Term Orientation and Development

Table B.66: 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.67: 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.68: 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

C Variable Definitions and Sources

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`.

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`.

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.

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 ancestor of country 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).[53]

[53]Hofstede et al. (2010, p.61) defines it as "Power distance can therefore be defined as the extent to which the less

- **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).[54]

- **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).[55]

- **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).[56]

- **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.69: 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
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

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."

[54]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."

[55]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.

[56]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.69: Summary Statistics (continued)

	Mean	Std.	Min	Max	N
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

Table C.69: Summary Statistics (continued)

	Mean	Std.	Min	Max	N
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
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

Table C.69: Summary Statistics (continued)

	Mean	Std.	Min	Max	N
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.70: 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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