The Agricultural Origins of Time Preference

Oded Galor and Ömer Özak

American Economic Review, 2016

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

– Aristotle

November 5, 2019

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  - What is the origin of the vast inequality in income per capita across countries and regions?

Main Hypothesis

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- Uncover geographical roots of human & cultural traits
  - Their impact on variations in human traits across the globe

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  - Contributed to regional variation in economic performance

Long-Term Orientation & Economic Prosperity

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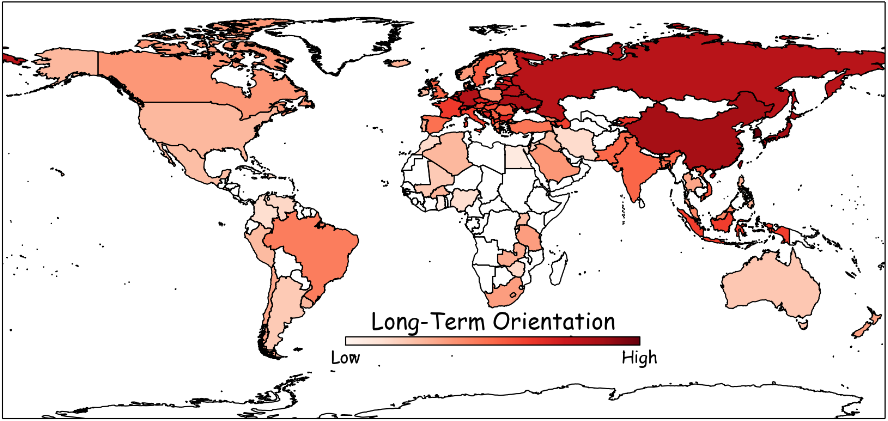
Cross Country Variation in Long-Term Orientation



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        - Economic behavior: education, saving, smoking & technological adoption

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    - $\rightarrow$ Transmitted enhanced LTO to their offspring

Structure of the presentation

The Model

- Overlapping generations economy

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where $R^1 > R^0 > 1$ Malthusian

Member i of generation t

- Preferences

$$u^{i,t} = \ln c_{i,t} + \beta_t^i[\gamma \ln n_{i,t+1} + (1-\gamma) \ln c_{i,t+1}]$$

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  - Rate of time preference $\equiv \rho_t^i > 0$

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Cost of raising a child $\equiv \tau > 0$

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- Indirect utility $\left(u^{i,t} = \ln c_{i,t} + \beta_t^i [\gamma \ln n_{i,t+1} + (1-\gamma) \ln c_{i,t+1}] \right)$

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

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

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

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$$\frac{\partial \hat{\beta}}{\partial R^1} < 0$$

Time Preference, Income and Fertility

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

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$\Rightarrow$

$$n^{\mathcal{I}} > n^E$$

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- Parents transmit their time preference to their children

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

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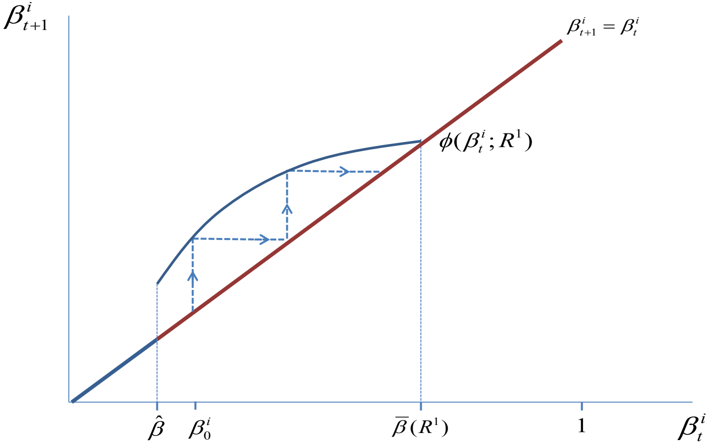
- Engagement in the investment mode enhances long-term orientation

The Evolution of Time Preference within a Dynasty



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- Evolution of population of each type in generation t

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  - Vanishes asymptotically

$$\lim_{t\to\infty} \theta_t^E = 0$$

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

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$$\lim_{t\to\infty} \theta_t^E = 0 \Rightarrow \lim_{t\to\infty} \bar{\beta}_t = \lim_{t\to\infty} \bar{\beta}_t^{\mathcal{I}}$$

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$$\lim_{t\to\infty} \theta_t^E = 0 \Rightarrow \lim_{t\to\infty} \bar{\beta}_t = \lim_{t\to\infty} \bar{\beta}_t^{\mathcal{I}} = \bar{\beta}(R^1)$$

Evolution of Time Preference

- Average time preference

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

$$\bar{\beta}_t^E \equiv \text{average time preference of endowment type}$$
$$\bar{\beta}_t^{\mathcal{I}} \equiv \text{average time preference of investment type}$$

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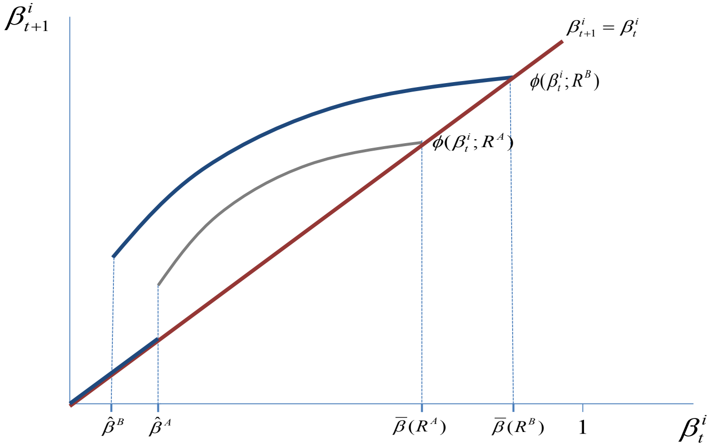
$$\lim_{t\to\infty} \theta_t^E = 0 \Rightarrow \lim_{t\to\infty} \bar{\beta}_t = \lim_{t\to\infty} \bar{\beta}_t^{\mathcal{I}} = \bar{\beta}(R^1)$$

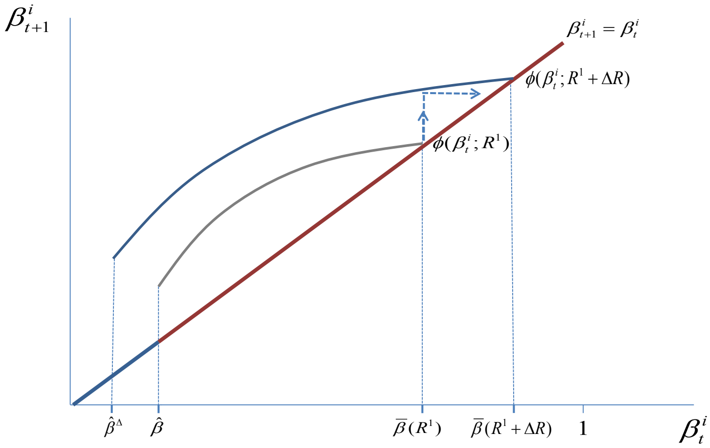
  - Increases in return to investment

$$\frac{\partial \bar{\beta}(R^1)}{\partial R^1} > 0$$

Cross-Country Differences in Return to Investment



Effect of an Increase in Return to Investment



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Data

- FAO/GAEZ project

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  - Major crops

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  - Major crops
  - Over global $5' \times 5'$ grid ($10km \times 10km$)

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Caloric Suitability Index (CSI)

- Potential Crop Yield

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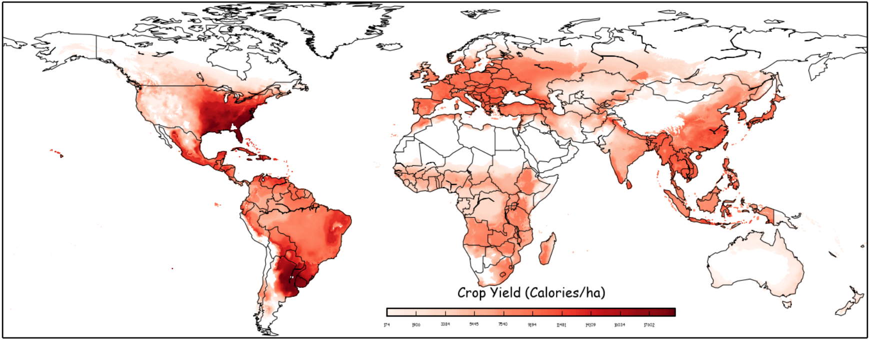
  - Cell: Calories per hectare per year of the most productive crop
- Potential Crop Growth Cycles
  - Cell: average of days elapsed from planting to harvesting for the most productive crop

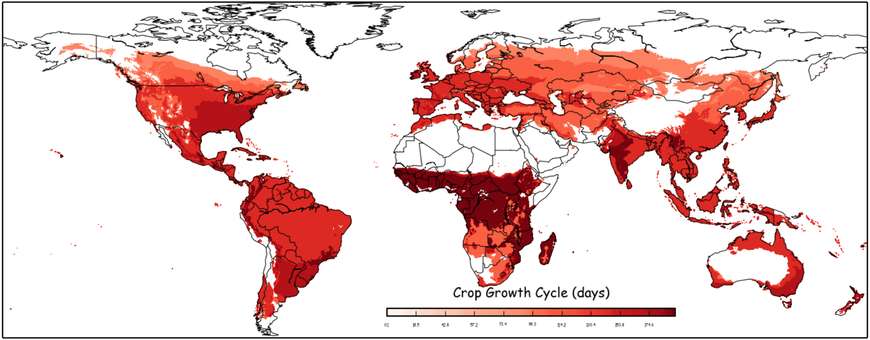
Potential Crop Yield pre-1500CE

Post-1500CE



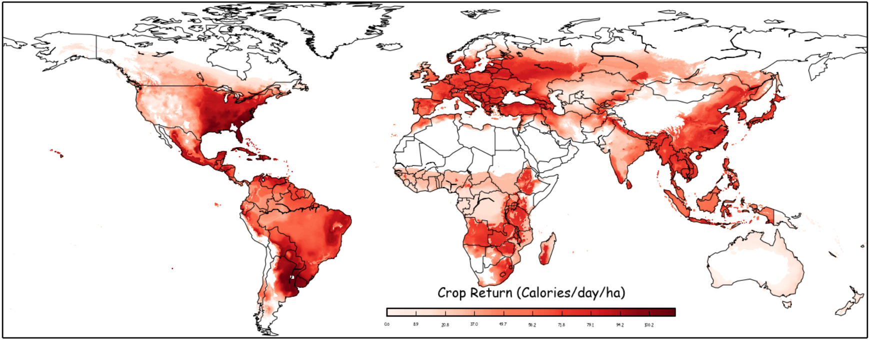
Potential Crop Growth Cycle pre-1500CE

Post-1500CE

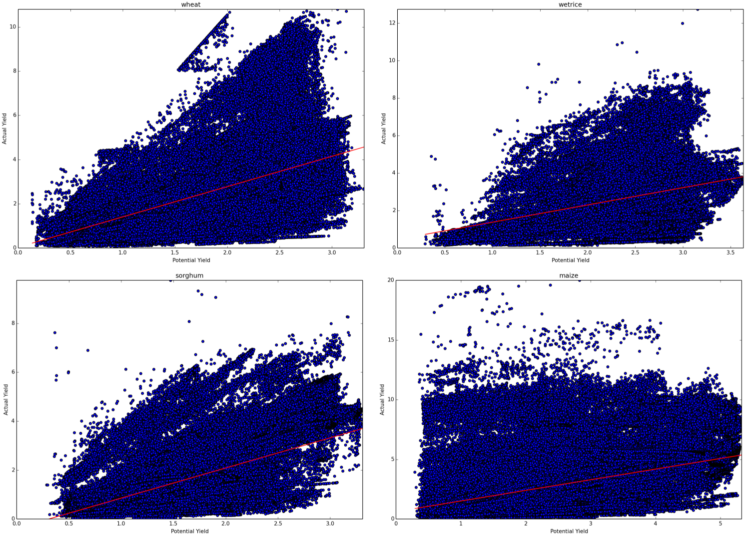


Potential Crop Return pre-1500CE

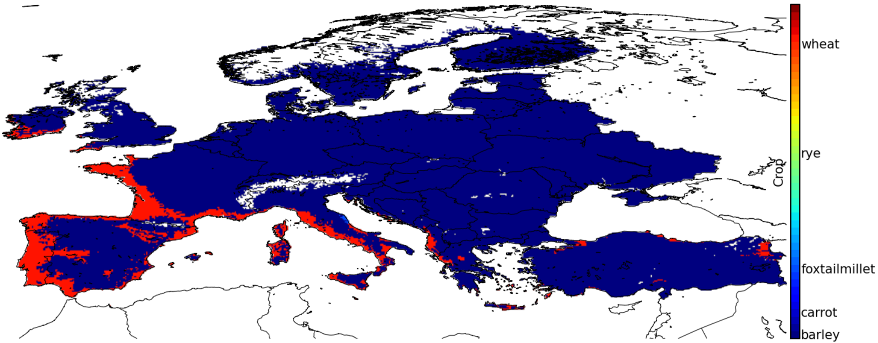
Post-1500CE



Potential vs Actual Yield

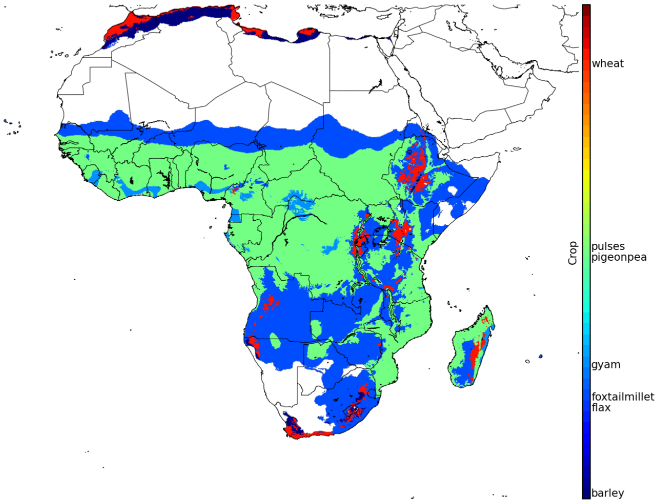


Most Productive Crops pre-1500CE



Other Rule

Most Productive Crops pre-1500CE



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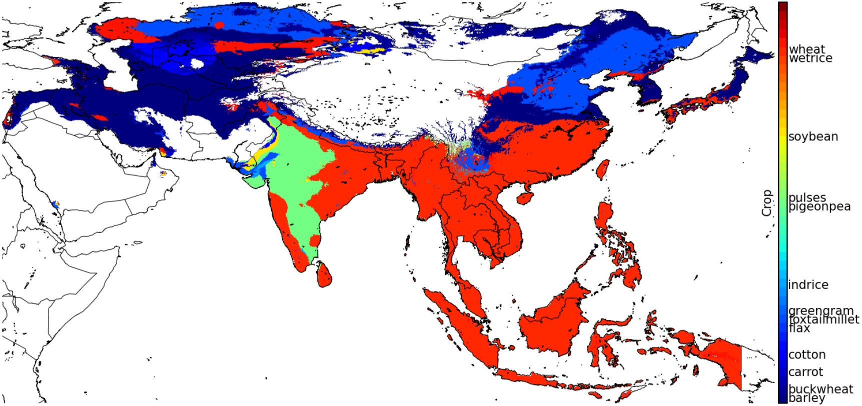

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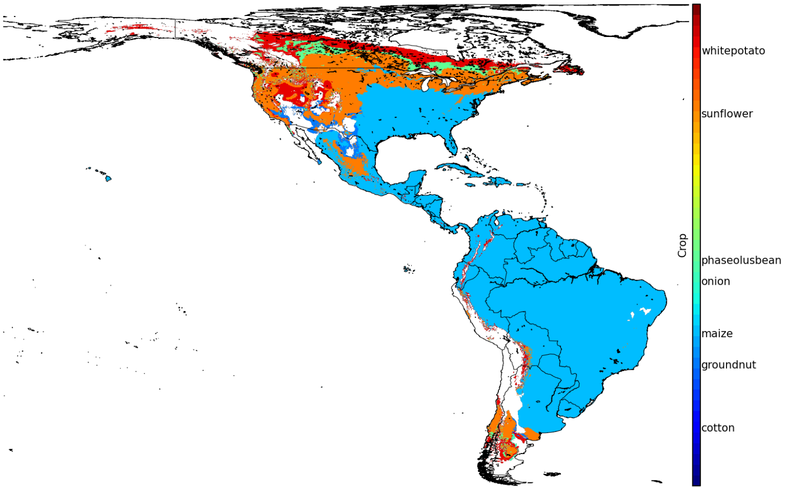

Other Rule

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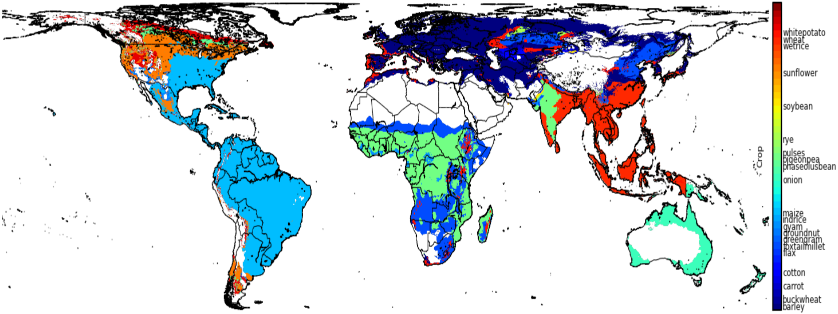
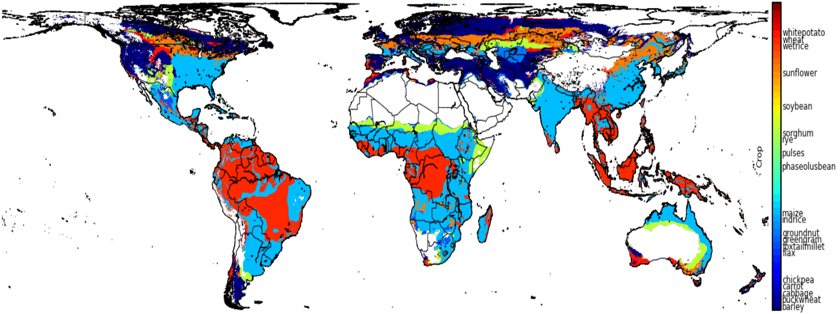


Most Productive Crops post-1500CE



LTO, Crop Yield, Growth Cycle and Return - Old World

	Top Crop				All Crops			LTO
Region	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
SSA	Pea	4495	190	23	4180	189	22	20

Country-Level Analysis

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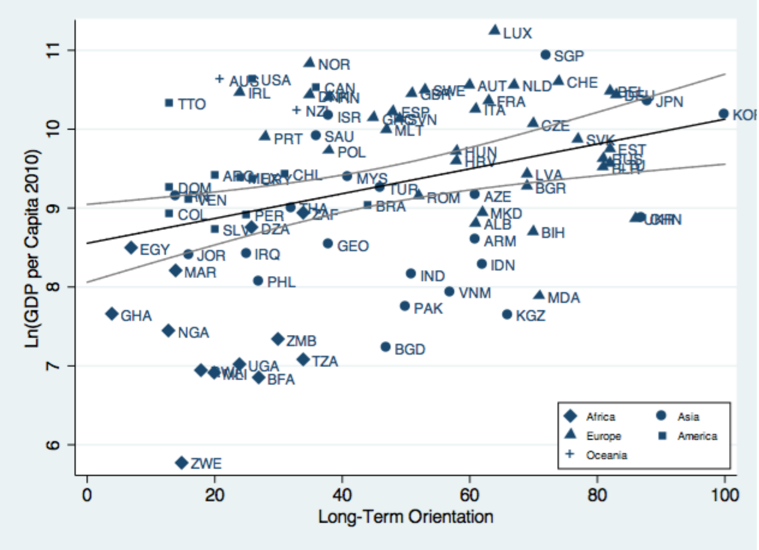
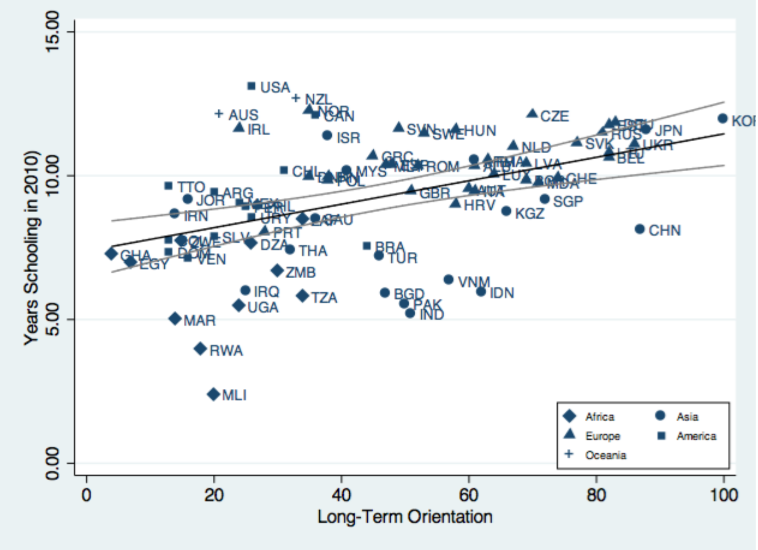
  - 0 (Short-Term) to 100 (Long-Term)

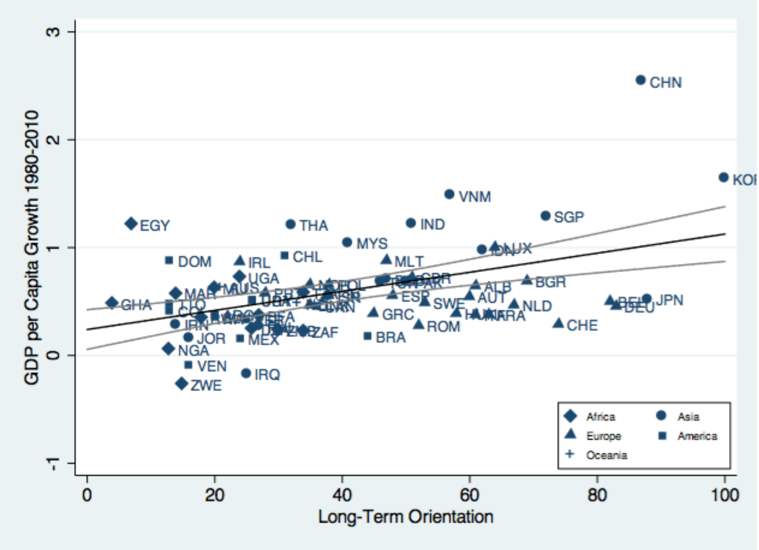
Long-Term Orientation & Income per Capita



Long-Term Orientation & Education



Long-Term Orientation & Growth



Crop Yield and Long-Term Orientation

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

Identification Strategy: Reverse causality

- Potential Concern: Reverse causality

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  - Exploit variation in potential (rather than actual) return to agricultural investment

Identification Strategy: Omitted Variables

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$$\begin{tikzcd} & \text{Long-Term Orientation} \\ \text{Geography} \arrow[ur, Rightarrow] \arrow[dr, Rightarrow] & \\ & \text{Potential Crop Yield \& Growth Cycle} \end{tikzcd}$$

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$$\begin{tikzcd} & \text{Long-Term Orientation} \\ \begin{array}{c}\text{Institutions} \\ \text{Culture}\end{array} \arrow[ur, Rightarrow] & \\ & \begin{array}{c}\text{Potential Crop Yield} \\ \text{\& Growth Cycle}\end{array} \arrow[ul, Rightarrow] \end{tikzcd}$$

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  - Exploit natural experiment - the Columbian Exchange

Initial Empirical Specification

$$\begin{aligned} LTO_i = &\beta_0 + \beta_1 \text{crop yield}_i + \beta_2 \text{crop growth cycle}_i \\ &+ \sum_j \gamma_{0j} X_{ij} + \gamma_1 \text{YST}_i + \delta_c \Delta_i + \epsilon_i, \end{aligned}$$

- $LTO_i \equiv$ Long-Term Orientation measure
- $X_{ij} \equiv$ Geographical controls
- $YST_i \equiv$ Years since transition to agriculture
- $\Delta_i \equiv$ Continental FEs

Crop Yield and Long-Term Orientation

	Long-Term Orientation							
	Whole World						Old World	
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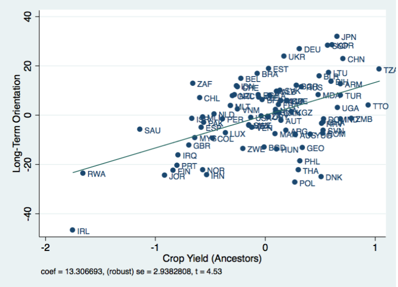
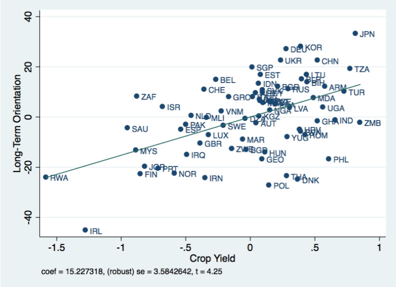
Observations	87	87	87	87	87	87	72	72

Partial Correlation: Crop Yield and LTO



(a) Ancestry Adjusted



(b) Old World

Identifying the Mechanism: Natural Experiment

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- Potential Concern: Selection

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  - High long-term orientation individuals settled in regions which reward LTO

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Identifying the Mechanism: Natural Experiment

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  - Genetic: High LTO individuals had an evolutionary advantage and their representation in the population increases over time

Identifying the Mechanism: Natural Experiment

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- Genetic vs Cultural Evolution:
  - Genetic: High LTO individuals had an evolutionary advantage and their representation in the population increases over time
  - Cultural: Higher reward to LTO increases the benefits from learning how to delay gratification and the representation of LTO increases over time

Identification of Mechanisms - Natural Experiment

Historical vs Contemporary Effect

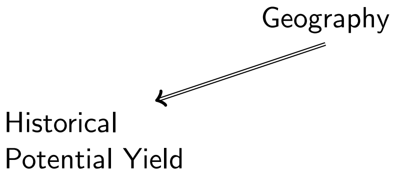
Identification of Mechanisms - Natural Experiment

Historical vs Contemporary Effect

Geography

Identification of Mechanisms - Natural Experiment

Historical vs Contemporary Effect



Identification of Mechanisms - Natural Experiment

Historical vs Contemporary Effect

$$
\begin{tikzcd}
 & \text{Geography} \arrow[dl, Rightarrow] \arrow[dr, Rightarrow] & \\
\begin{array}{l}\text{Historical}\\ \text{Potential Yield}\end{array} & & \begin{array}{l}\text{Contemporary}\\ \text{Potential Yield}\end{array}
\end{tikzcd}
$$

Identification of Mechanisms - Natural Experiment

Historical vs Contemporary Effect

$$
\begin{tikzcd}
& \text{Geography} \arrow[dl, Rightarrow] \arrow[dr, Rightarrow] & \\
\text{Historical Potential Yield} & & \text{Contemporary Potential Yield} \arrow[dl, Rightarrow] \\
& \text{Long-Term Orientation} &
\end{tikzcd}
$$

Identification Strategy - Natural Experiment

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Identification Strategy - Natural Experiment

- Exploit the natural experiment associated with the Columbian Exchange
  - Changes in the spectrum of potential crops in the post-1500 period Crops
  - Random assignment of potentially superseding crops to existing individuals across regions (conditional on initial crop returns) Random

Empirical Specification

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

- $LTO_i \equiv$ Long-Term Orientation measure
- $X_{ij} \equiv$ Geographical controls
- $YST_i \equiv$ Years since transition to agriculture
- $\Delta_i \equiv$ Continental FEs

Pre-1500CE Crop Yield and LTO $\Delta > 0$ Natives

	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)		
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical & Neolithic	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

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)

  $\rightarrow$ Population density

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)
  - $\rightarrow$ Population density
  - $\rightarrow$ Urbanization

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)
  - $\rightarrow$ Population density
  - $\rightarrow$ Urbanization
- Persistence of pre-industrial development

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)
  - $\rightarrow$ Population density
  - $\rightarrow$ Urbanization
- Persistence of pre-industrial development
  - $\rightarrow$ Income, education, etc.

Excluding the Persistence of Development Channel

- Agricultural productivity (crop yield)
  - $\rightarrow$ Population density
  - $\rightarrow$ Urbanization
- Persistence of pre-industrial development
  - $\rightarrow$ Income, education, etc.
  - $\rightarrow$ Long-term orientation

Excluding the Pre-Industrial Development Channel

	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)
	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

Excluding Other Channels

Excluding Other Channels

- Average Suitability PCA

Excluding Other Channels

- Average Suitability PCA
- Plow

Excluding Other Channels

- Average Suitability PCA
- Plow
- Future Time Reference (FTR)

Excluding Other Channels

- Average Suitability PCA
- Plow
- Future Time Reference (FTR)

  $\rightarrow$ Long-Term Orientation

Excluding Other Channels

	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)
	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 (Ancestors, pre-1500)	0.01*	0.01*	0.02*	0.03**	0.03**	0.03***	0.03**	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
Land Suitability		0.00							
Land Suitability (Ancestors)			0.00						
Plow					0.00				
Plow (Ancestors)						0.00			
Strong FTR								0.02**	
Strong FTR (Ancestors)									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

Excluding Other Cultural Channels

Excluding Other Cultural Channels

Long-Term Orientation is correlated with other cultural traits.

Excluding Other Cultural Channels

Long-Term Orientation is correlated with other cultural traits.

Potential concern:

Excluding Other Cultural Channels

Long-Term Orientation is correlated with other cultural traits.

Potential concern:

$\rightarrow$ Potential yield determines other cultural traits

Excluding Other Cultural Channels

Long-Term Orientation is correlated with other cultural traits.

Potential concern:

$\rightarrow$ Potential yield determines other cultural traits

$\rightarrow$ Other cultural traits determine LTO

Excluding Other Cultural Channels Corr

	Cultural Indices						
	Long-Term Orientation	Restraint vs Indulgence	Trust	Indivi-dualism	Power Distance	Coope-ration	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

Excluding Other Cultural Channels

	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

Robustness

- Including Cells with Zero Caloric Output Table Zeroes

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade
- Population Age Structure

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade
- Population Age Structure
- Life-Expectancy Table Age

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade
- Population Age Structure
- Life-Expectancy Table Age
- Current Income

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade
- Population Age Structure
- Life-Expectancy Table Age
- Current Income
- Climatic Variability Table Climatic

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
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- Spatial Autocorrelation (Cliff and Ord, 1973; Conley, 1999)

Robustness

- Including Cells with Zero Caloric Output Table Zeroes
- Daily Return Table Daily
- Trade Table Trade
- Population Age Structure
- Life-Expectancy Table Age
- Current Income
- Climatic Variability Table Climatic
- Spatial Autocorrelation (Cliff and Ord, 1973; Conley, 1999)
- Omitted Variable Bias (Altonji, Elder, and Taber, 2005; Bellows and Miguel, 2009; Oster, 2014) Table AET Table AET Changes

Crop Yield, LTO and Technological Adoption

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

Crop Yield, LTO and Education

	Years of Schooling in 2005					
	(1)	(2)	(3)	(4)	(5)	(6)
Crop Yield (Ancestors, pre-1500)	0.93***	0.90***	0.90***	0.90***	0.84***	0.88***
	(0.24)	(0.30)	(0.24)	(0.29)	(0.23)	(0.28)
Crop Growth Cycle (Ancestors, pre-1500)	-0.08	-0.05	-0.04	-0.04	0.03	0.03
	(0.20)	(0.23)	(0.19)	(0.23)	(0.24)	(0.32)
Crop Yield Change (post-1500)		-0.05		0.02		0.09
		(0.27)		(0.26)		(0.34)
Crop Growth Cycle Change (post-1500)		0.00		0.02		0.08
		(0.16)		(0.16)		(0.17)
Geographical Controls	Yes	Yes	Yes	Yes	Yes	Yes
Timing of Neolithic	No	No	Yes	Yes	Yes	Yes
Continental FE	No	No	No	No	Yes	Yes
Adjusted-R^2	0.52	0.51	0.53	0.52	0.59	0.58
Observations	129	129	129	129	129	129

Second Generation Migrants Analysis

Data

Analysis of 2^{nd} generation migrants:

Second Generation Migrants Analysis Data

Analysis of 2^{nd} generation migrants:

- Accounts for host country FEs (geography, institutions, culture)

Second Generation Migrants Analysis

Data

Analysis of 2^{nd} generation migrants:

- Accounts for host country FEs (geography, institutions, culture)
- Accounts for individual characteristics (e.g., age, gender, education, etc.)

Second Generation Migrants Analysis

Data

Analysis of 2^{nd} generation migrants:

- Accounts for host country FEs
  (geography, institutions, culture)
- Accounts for individual characteristics
  (e.g., age, gender, education, etc.)
- Focus on portable component of the effect of crop yield

Correlations: 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

Income

Empirical Specification

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

- $LTO_{ic} \equiv$ Long-Term Orientation of individual i in country c
- $X_{ipj} \equiv$ Geographical controls in parent's country of origin
- $YST_{ip} \equiv$ Years since transition to agriculture in parent's country of origin
- $Y_{ij} \equiv$ Individual controls (age, sex, education, marital status, health status, religiosity)
- $\Delta_i \equiv$ Host country fixed effects

Crop Yield and Long-Term Orientation in Second Generation Migrants

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

Crop Yield and Saving in Second Generation Migrants

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

Crop Yield and Smoking in Second Generation Migrants

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

Individual-Level Analysis (WVS) Data

Individual-level analysis:

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- Accounts for individual characteristics (e.g., age, gender, education, etc.)

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Individual-level analysis:

- Accounts for individual characteristics
  (e.g., age, gender, education, etc.)
- Country FE
  (geography, institutions, culture)

Empirical Specification

$$LTO_{ircw} = \beta_0 + \beta_1 \text{crop yield}_{rc} + \beta_2 \text{crop growth cycle}_{rc} + \sum_j \gamma_{0j} X_{rc} + \gamma_1 \text{YST}_{rc} + \sum_j \gamma_{2j} Y_{ircwj} + \delta_{cw} \Delta_{cw} + \epsilon_{ircw}$$

- $LTO_{ircw} \equiv$ Long-Term Orientation of individual i in region r of country c in wave w
- $X_{rc} \equiv$ Geographical controls in region r of country c
- $YST_{rc} \equiv$ Years since transition to agriculture in region r of country c
- $Y_{ircwj} \equiv$ Individual controls (age, sex, education, income)
- $\Delta_{cw} \equiv$ Continent/Country and Wave fixed effects

Crop Yield and Long-Term Orientation (WVS)

	Long-Term Orientation (OLS)							
	Whole World							Old World
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crop Yield (pre-1500)	0.025***	0.040***	0.036***	0.032***	0.032***	0.031***		0.066***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
Crop Yield Change (post-1500)					0.053***	0.054***		0.055***
					(0.002)	(0.002)		(0.003)
Crop Growth Cycle (pre-1500)						-0.007**		-0.018***
						(0.003)		(0.003)
Crop Growth Cycle Change (post-1500)						0.025***		0.026***
						(0.002)		(0.002)
Crop Yield (Ancestors, pre-1500)							0.043***	
							(0.002)	
Crop Yield Change (Anc., post-1500)							0.041***	
							(0.002)	
Crop Growth Cycle (Ancestors, pre-1500)							-0.005*	
							(0.003)	
Crop Growth Cycle Change (Anc., post-1500)							0.018***	
							(0.002)	
Wave & 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
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

Robustness

Results are robust to:

Robustness

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- Estimation method Probit

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- Weighted Observations Table

Robustness

Results are robust to:

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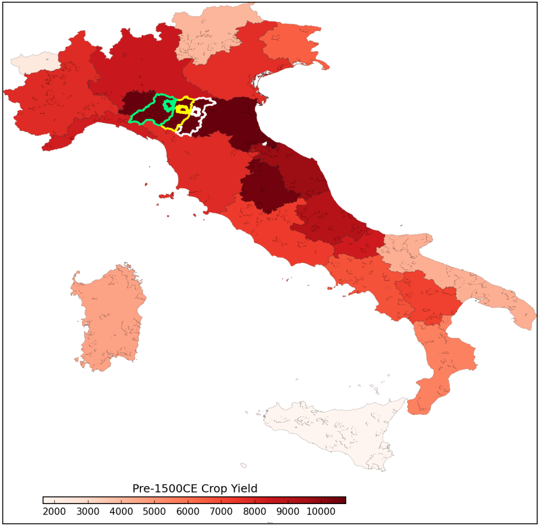
- Cells that experienced change in crop post-1500 Table
- Weighted Observations Table
- Country Fixed Effects Table

Regional Analysis

	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 (Anc.)				-0.012		-0.050***		-0.027***		-0.037***		
				(0.013)		(0.018)		(0.009)		(0.009)		
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
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	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

Crop Yield and the Adoption of Lengthy Production Processes: Aceto Balsamico and Parmigiano Reggiano



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  - $\Rightarrow$ Technological Adoption

The Agricultural Origins of Time Preference

Oded Galor and Ömer Özak

American Economic Review, 2016

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

– Aristotle

November 5, 2019

Malthusian Framework: Endowment Sector

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- Production function

$$Y_t^E = A_t(L_t^E)^{(1-\alpha)}X^{\alpha}, \quad \alpha \in (0,1)$$

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$$A_t \equiv A(L_t^E) = R^0(L_t^E)^\alpha$$

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$$A_t \equiv A(L_t^E) = R^0(L_t^E)^{\alpha}$$

- Per capita output

$$\frac{Y_t^E}{L_t^E} = \frac{R^0(L_t^E)^{\alpha}(L_t^E)^{(1-\alpha)}X^{\alpha}}{L_t^E} = R^0X^{\alpha}$$

Back

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- Per capita output

$$\frac{Y_t^{\mathcal{I}}}{L_t^{\mathcal{I}}} = \frac{R^1(L_t^{\mathcal{I}})^{\alpha}(L_t^{\mathcal{I}})^{(1-\alpha)}X^{\alpha}}{L_t^{\mathcal{I}}} = R^1X^{\alpha}$$

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Potential Crop Yield post-1500CE

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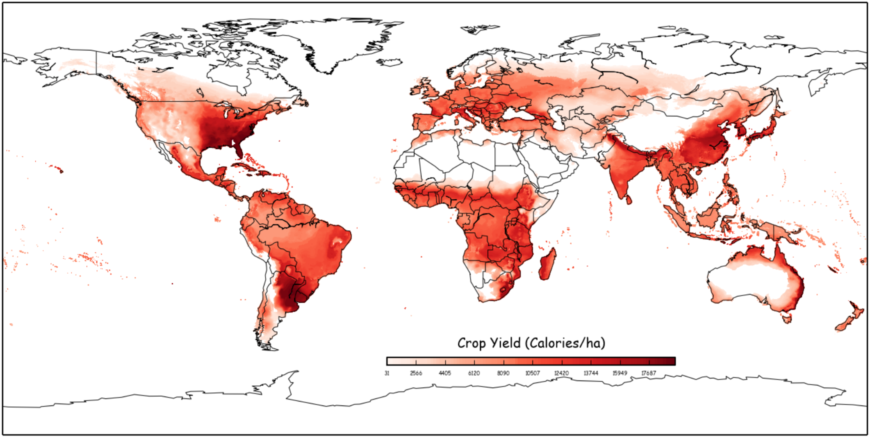
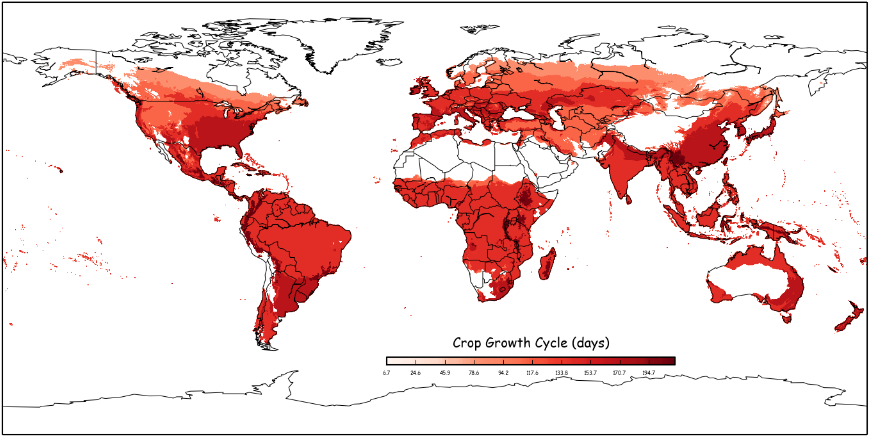


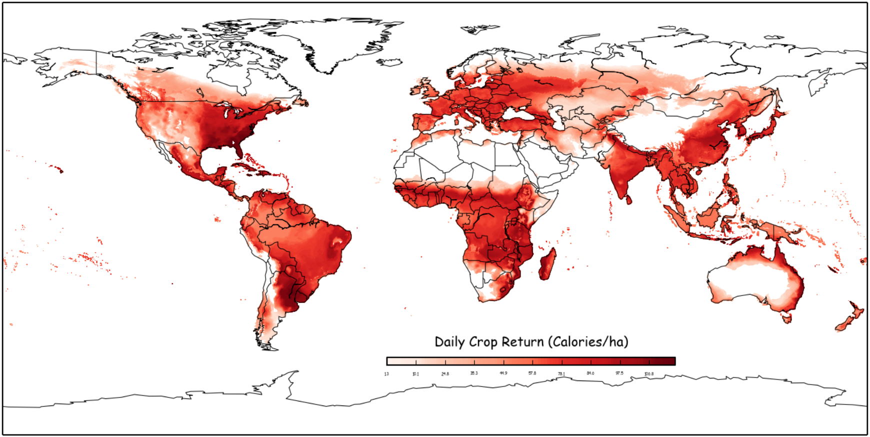
Potential Crop Growth Cycle post-1500CE

Pre-1500CE

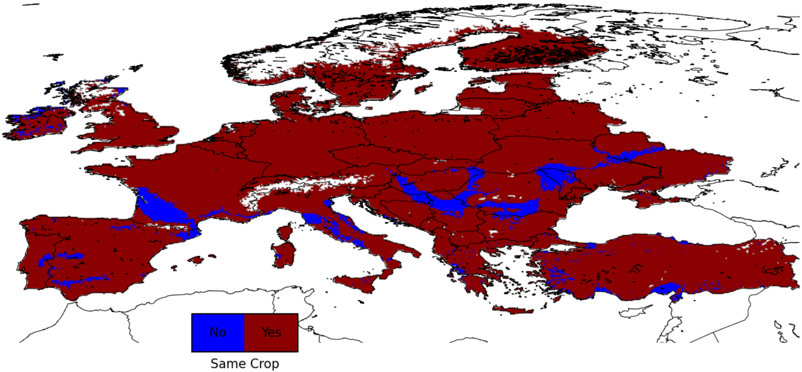


Potential Crop Return post-1500CE

Pre-1500CE



Total vs. Daily Yield



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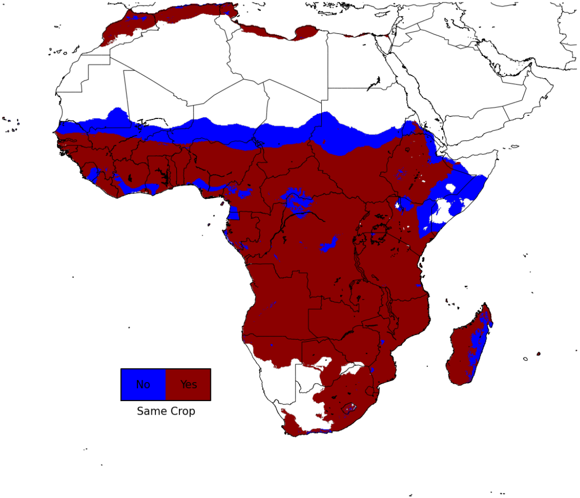
Total vs. Daily Yield



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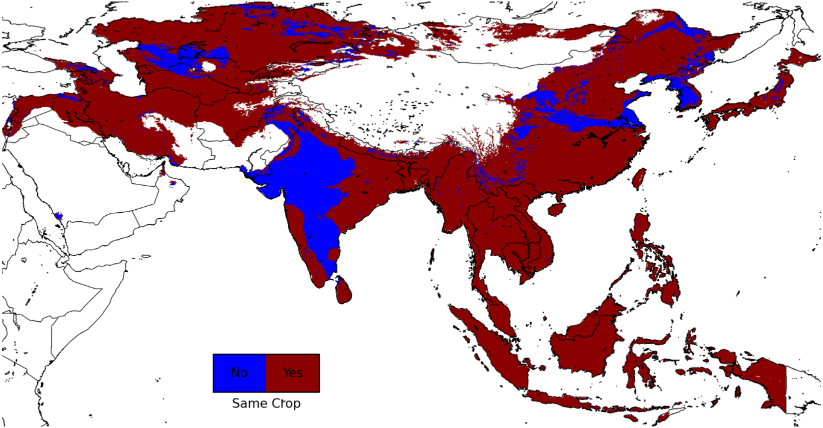
Total vs. Daily Yield



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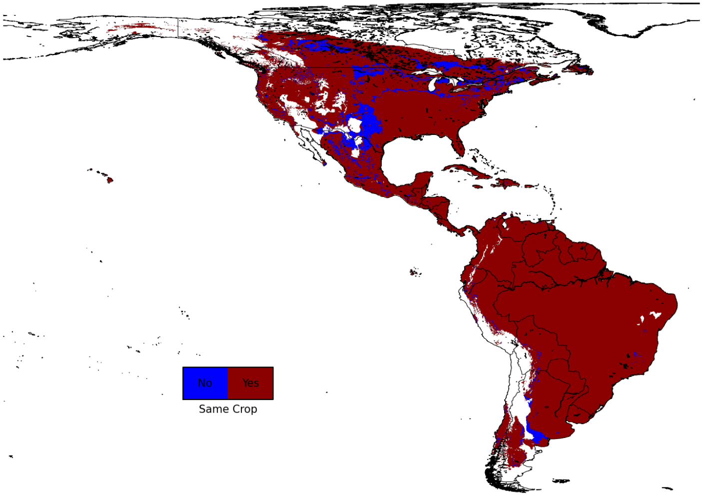
Total vs. Daily Yield



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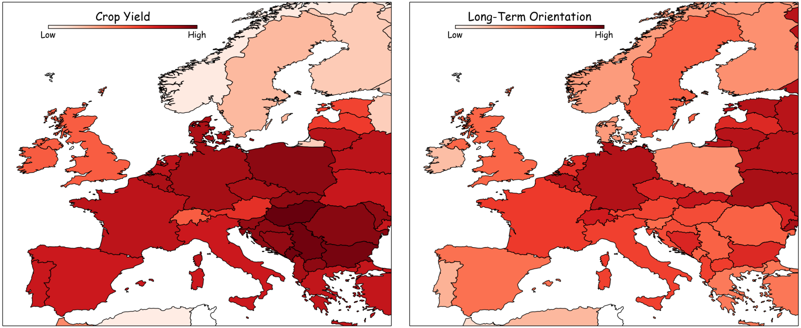
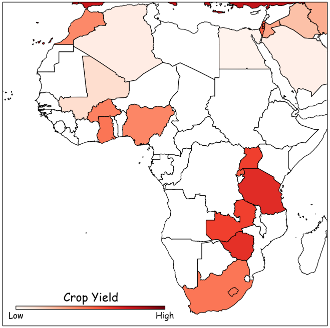
Potential Crop Yield (Ancestry Adjusted) and LTO



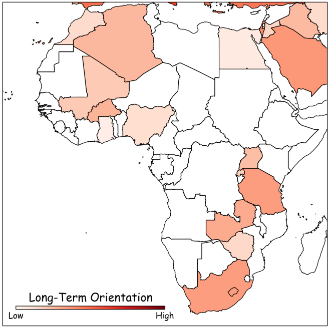
(a) Potential Crop Yield (b) Long-Term Orientation

Potential Crop Yield (Ancestry Adjusted) and LTO

Unadjusted



(a) Potential Crop Yield



(b) Long-Term Orientation

Continental Distribution of crops (and their variants) pre-1500CE

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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

Changes in Crop Yield and Growth Cycle and their Correlates (Anc.)

Back

	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

Potential Crop Yield, Growth Cycle, Agricultural Suitability and LTO

Back

	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		

	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		

Potential Crop Yield, Growth Cycle, Agricultural Suitability and LTO Back

	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

Pre-1500CE Crop Yield and LTO

Grids that Experienced Change in Crop post-1500

Back

	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

Pre-1500CE Crop Yield and LTO

Natural Experiment in Countries with High Share of Natives

Back

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

Excluding Other Cultural Channels: Correlations

Back

	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

Potential Crop Yield, Growth Cycle, and LTO (Including Grids Not-Suitable for Production)

Back

	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

Potential Daily Crop Return, Crop Growth Cycle, and LTO

Back

	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

Excluding Trade Channel

Back

	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)
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

Potential Crop Yield and Development

Back

	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
Geographical Characteristics & 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

Crop Yield, Climatic Risk, and LTO Back

	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
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

Crop Yield and LTO

Back

	Long-Term Orientation					
	(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

Changes in Crop Yield & Growth Cycle and LTO (Selection on Unobserv.)

Back

	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

European Social Survey

Back

Data:

- Third Wave European Social Survey
    - Academically driven cross-national survey that has been conducted every two years across Europe since 2001
    - Survey measures the attitudes, beliefs and behavior patterns of diverse populations in 25 nations
- “Do you generally plan for your future or do you just take each day as it comes?”

Correlations: 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

Education

Crop Yield, Crop Growth Cycle, and LTO in Second Generation Migrants

Graphs

	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)	
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 & Neolithic	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

Pre-1500 Crop Yield and LTO in Second Generation Migrants

Back

	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 & Neolitic	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

Pre-1500 Crop Yield and LTO in 2nd Gen. Migrants, Grids that Changed Crop post-1500

Back

	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

Crop Yield and Long-Term Orientation in Second Generation Migrants Back

	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)
Yield (Ancestors)	7.10***	15.24***	12.16***	9.29***								
	(2.48)	(3.25)	(2.83)	(3.42)								
Growth Cycle (Anc.)	-4.72*	1.46	0.05	4.58								
	(2.43)	(3.78)	(3.25)	(4.43)								
Yield (Anc., pre)					7.03***	15.24***	12.29***	11.88***				
					(2.39)	(2.54)	(2.21)	(2.86)				
Yield Change (post)					0.87	0.50	0.33	-1.75				
					(1.55)	(2.61)	(2.20)	(1.94)				
Growth Cycle (Anc., pre)					-3.28	2.98	1.61	4.23				
					(2.77)	(4.25)	(3.90)	(4.93)				
Growth Cycle Ch. (post)					-1.70*	1.11	-0.04	1.34				
					(0.98)	(1.69)	(1.41)	(1.39)				
Yield (Anc., pre)									6.38***	9.39***	8.18***	8.25***
									(1.97)	(2.68)	(2.25)	(2.24)
Yield Change (post)									-1.46	0.92	0.38	-0.73
									(1.66)	(2.74)	(2.43)	(2.27)
Growth Cycle (Anc., pre)									-0.96	1.26	1.32	-0.45
									(2.27)	(2.49)	(2.31)	(2.45)
Growth Cycle Ch. (post)									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
All Controls	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

World Values Survey Back

Data:

- All waves of WVS
    - cross-national survey conducted every 4-5 years
    - 96 countries
    - widely used in social research
- Long-Term Orientation measure based preference for thrift in children

Question

Back

"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?"

Question Back

"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?"

Individual has LTO if mentioned "thrift, saving money and things"

Crop Yield and LTO (WVS) Back

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

Pre-1500 Crop Yield and LTO (WVS) Back

	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	Yes	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

Pre-1500 Crop Yield and LTO (WVS), Grids that Experienced Change in Crop post-1500

Back

	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

Crop Yield and Long-Term Orientation (Weighted) Back

	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

Crop Yield and Long-Term Orientation (WVS Regional Analysis) Back

	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 & 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
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