

# Lecture 2

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Economic History

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# Outline of the course

1. Today: Introduction, fundamental causes of growth
  - 1.1 Introduction and the Malthusian Model
  - 1.2 **Luck, Geography and Culture**
  - 1.3 Institutions I
2. Tomorrow: fundamental (cont't), Innovations and crises
  - 2.1 Institutions II
  - 2.2 Technology
  - 2.3 Finance
3. Wednesday: Unleashing talent
  - 3.1 Geographical and social mobility
  - 3.2 Marriage, family and work

# 1: Geography

# Geography as destiny?

## The simplest version

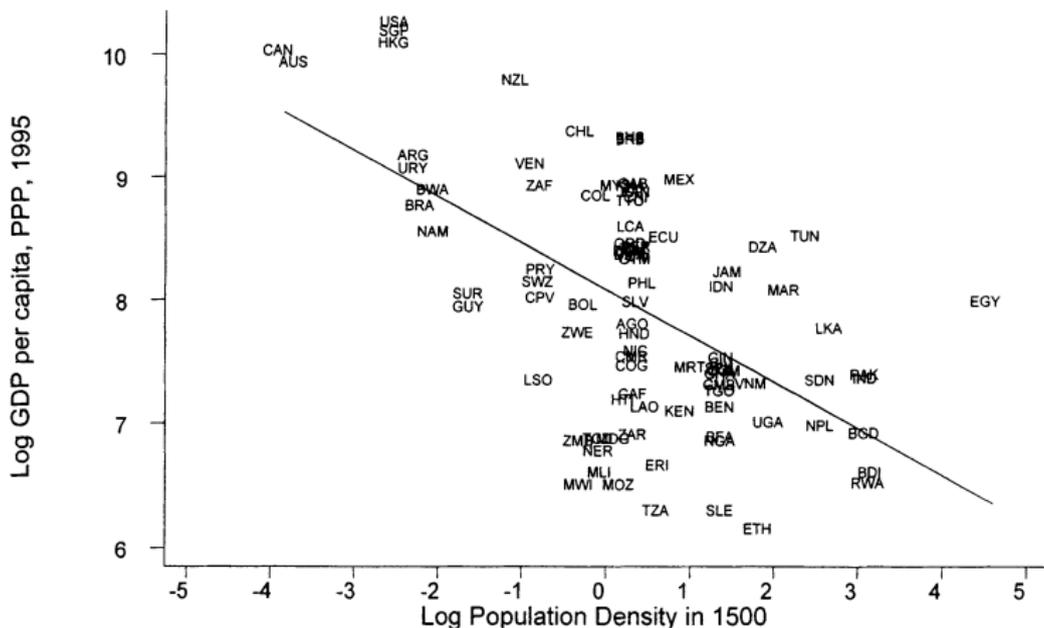
- time-invariant geographic variables (climate, topography, disease environment...) affect work effort and productivity, transportation costs etc.

## More nuanced versions exist

- Diamond (1997): Eurasia became powerful due to suitable environmental factors that were amplified by positive feedback loops. [see the National Geography TV version (!) in [YouTube](#).]

# Population density 1500 and GDP per capita 1995

Acemoglu, Johnson, Robinson (2002)



# Unique vs. multiple equilibria

## History and economic geography

- a good starting point to think about multiple equilibria
- instead of countries, we focus on locations within countries
- useful because culture and institutions vary less

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- if it is a prominent feature of the world, understanding history is much more important than in a unique equilibrium world
- it will also have very different implications for policy

Econ geography particularly interesting because “locational fundamentals” provide a powerful reason for unique equilibrium

# Unique vs. multiple equilibria

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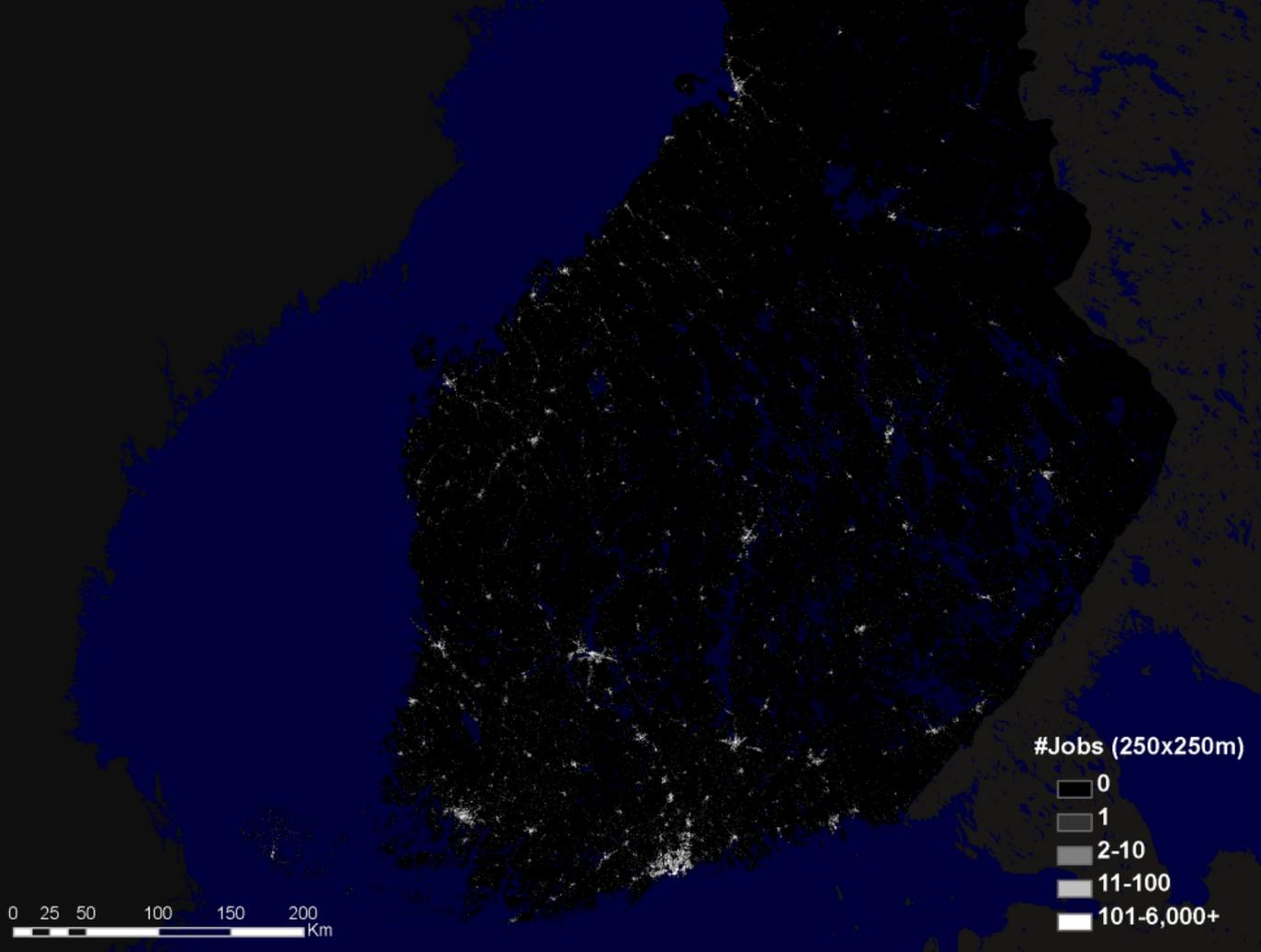
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Next slide: an example of the pattern to be explained (spatial distribution of jobs in Finland in 2010 using  $250 \times 250$ m grid)



50% of jobs in 0.03% of the land area  
98% of non-water cells empty  
largest cluster: 25% of jobs, 0.4% of land  
tiny clusters even in the countryside  
clusters tend to be located by sea or large lake



# Multiple equilibria in spatial structure: an example

Krugman (1991): *Geography and Trade*

Imagine a country with two locations: East and West

Agriculture divided 50/50 between East and West

Manufacturing: can be produced in East, West or both

- production only in East/West → transportation costs
- production in both → fixed setup cost
- monopolistic competition (each firm produces own variety)

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A numerical example

- fixed-cost of opening a plant: 4
- transportation cost per unit: 1
- total demand for a variety: 10
- 60% of labor force farmers
  - ▶ splitted manufacturing: local demands 5 and 5
  - ▶ concentrated manufacturing: local demands 7 and 3

# Multiple equilibria in spatial structure: an example

Krugman (1991): Geography and Trade

Distribution of manufacturing employment	Cost for a typical firm		
	East	Both	West
East only	7	8	11
50/50 split	9	8	9
West only	11	8	7

There are three equilibria. Suppose that all other manufacturing firms are already in the East (first row). If one firm now locates to East, it will pay the fixed costs 4 once and transportation cost of 3. If it locates in both, it will pay the fixed costs twice and no transportation costs,  $2 \times 4 = 8$ . If it locates to west, it will pay  $4 + 7 = 11$ . So, everyone locates in the East because everyone else locates in the East. The case for everyone locating in the West is symmetrical (last row). But if manufacturing is initially splitted 50/50, the cost minimizing strategy for everyone is to have two plants. Homework: what happens when transportation costs change? Are the equilibria stable?

# “Transformation costs” can take many forms

Marshall (1890): *The Principles of Economics*

“When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another. The mysteries of the trade become no mysteries; but are as it were in the air [...] if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas. And presently subsidiary trades grow up in the neighbourhood, supplying it with implements and materials, organizing its traffic [...] Employers are apt to resort to any place where they are likely to find a good choice of workers with the special skill which they require; while men seeking employment naturally go to places where there are many employers who need such skill as theirs”

# “Transformation costs” can take many forms

Marshall (1890) as summarized by Ed Glaeser

Proximity decreases the cost of moving

- ideas
- goods
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These gains are often referred to as agglomeration economies

- population density increases productivity

# Implications of multiple equilibria

Currently rich and poor areas were not destined to be so

- “historical accidents” matter

Geography may work through favorable initial conditions

- e.g. most great cities located by a river

One-off shocks may have long-term effects

- wars, natural disasters, “Big Push” development policies...

## 2: Culture

# How to define culture?

Guiso, Sapienza, Zingales (2006)

Customary **beliefs and values** that

- ethnic, religious, and social groups
- transmit fairly unchanged from generation to generation

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Culture may result from society-wide optimization

- but it is not continually altered in step with the circumstances

Social interactions with friends, colleagues etc.

- can be seen as the fast-moving component of culture
- we focus on the slow-moving part

# Culture as priors and preferences

Guiso, Sapienza, Zingales (2006)

## Priors

- many decisions are made without previous experience (choice of education, occupation, savings for retirement...)
- these choices must be based on prior beliefs ... but where do these priors come from?

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## Preferences

- culture may affect values through the socialization process
- socialization process may be affected by parents' priors



An Example: Early technology and long-term gender roles  
Alesina, Giuliano, Nunn (2013)

# The Boserup (1970) hypothesis

## Two types of cultivation

- shifting cultivation is labor intensive and uses handheld tools
- plough cultivation requires significant strength, bursts of power

In plough agriculture societies men worked in the fields, while women specialized in activities within the home

- this division of labor then generated the belief that the natural place for women is within the home
- cultural beliefs persisted and still affect women's entrepreneurship, and participation in market employment, politics



# How to test the hypothesis? A roadmap

Alesina, Giuliano, Nunn (2013)

ALG combine pre-industrial ethnographic and contemporary data and show that traditional plough use is

- positively correlated with attitudes reflecting gender inequality
- negatively correlated with female labor force participation, female firm ownership, and female participation in politics

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Mechanism: cultural beliefs vs. institutions

- ALG hold institutions constant by examining children of immigrants living in the US and Europe
- and show that immigrants from cultures that historically used the plough have: (a) less equal gender norms, (b) lower female labor force participation

# Conceptual framework

Alesina, Giuliano, Nunn (2013)

Boyd and Richerson (1985)

- may be optimal to use heuristics if information is costly
- the distribution of cultural beliefs evolves through a natural-selection-like process

Gender inequality relatively beneficial in plough agriculture societies (in comparison to hoe-agriculture societies)

Why could beliefs on gender roles persist?

- inherent “stickyness” of cultural beliefs
- reinforced by policies, laws, and institutions
- complementarity with industrial structure: gender roles → specialization in brawn-intensive industries → gender roles...

AGN want to differentiate between these mechanisms

# Step 1: Plough and historical gender roles

Alesina, Giuliano, Nunn (2013)

The proposed causal chain

- plough agriculture → lower female participation in agriculture historically → low female participation today

First need to establish that the first link exists

# Data: Ethnographic Atlas

Alesina, Giuliano, Nunn (2013)

Covers 1,265 ethnic groups

- published by anthropologist G. P. Murdock between 1962–1980 in the journal *Ethnology*
- based either on early written history or accounts from the earliest (European) observers of these cultures

Information on

- plough use and participation in agriculture (males only, males more, equal, females more, females only)
- large domesticated animals, economic development, political complexity, historical location of the group

Standard Cross-Cultural Sample

- 186 societies chosen to be representative of Ethnographic Atlas
- includes more detailed information

# Plough and historical gender roles: Results

Alesina, Giuliano, Nunn (2013)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Traditional participation of females relative to males in the following tasks:						
	Overall agriculture	Land clearance	Soil preparation	Planting	Crop tending	Harvesting	
Mean of dep. var.	3.04	2.83	1.45	2.15	2.86	3.16	3.23
Traditional plough agriculture	-0.883*** (0.225)	-1.136*** (0.240)	-0.434** (0.197)	-1.182*** (0.320)	-1.290*** (0.306)	-1.188*** (0.351)	-0.954*** (0.271)
Ethnographic controls	yes	yes	yes	yes	yes	yes	yes
Observations	660	124	129	124	131	122	131
Adjusted R-squared	0.13	0.19	0.14	0.10	0.09	0.13	0.16
R-squared	0.14	0.23	0.18	0.14	0.13	0.18	0.20

Col 1: The use of the plough is associated with less female participation in agriculture. The point estimate of 0.88 is large given that it has mean 3, standard deviation 1. Col 2: replicate col 1 with SCCS data. Cols 3–7: plough use is associated with less female participation in all agricultural tasks, with the largest declines in soil preparation, planting, and crop tending.

# Plough and historical gender roles: Results

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent variable: Traditional participation of females relative to males in the following tasks:								
	Caring for small animals	Caring for large animals	Milking	Cooking	Fuel gathering	Water fetching	Burden carrying	Handicrafts	Trading
Mean of dep. var.	3.53	1.73	3.25	4.65	3.90	4.64	3.47	2.78	2.47
Traditional plough use	0.14 (0.517)	0.064 (0.254)	0.63 (0.697)	-0.019 (0.108)	-0.638 (0.403)	-0.052 (0.205)	-0.962** (0.378)	-0.157 (0.274)	-0.155 (0.542)
Ethnographic controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	88	95	48	173	159	154	135	74	59
Adjusted R-squared	-0.02	-0.02	0.03	0.01	-0.001	0.01	0.12	0.07	-0.01
R-squared	0.05	0.04	0.14	0.04	0.04	0.04	0.16	0.15	0.10

Plough use is not significantly correlated with female participation in other activities (except for burden carrying). **Consistent with women working less outside the home** in societies that traditionally used the plough.

## Step 2: Plough use and current outcomes

Alesina, Giuliano, Nunn (2013)

Practical problem: how to link the historical ethnicity-level data to current location level data?

Ethnologue: Languages of the World

- current geographic distribution of 7,612 different languages
- includes polygons (borders), with each polygon indicating the location of a specific language as of 2003

Manually matched to

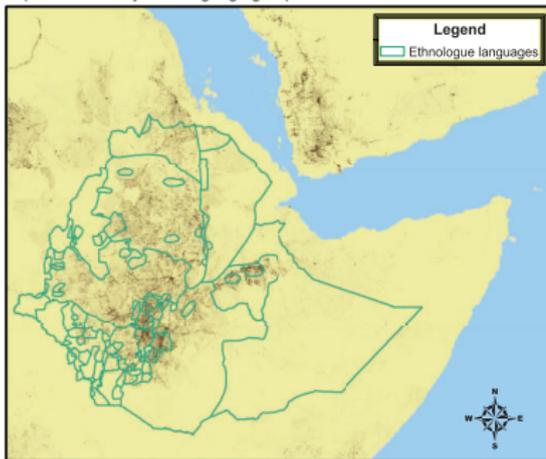
- the ethnic groups in Ethnographic Atlas
- Landscan estimates of population in 2000 in 1x1km grid cells

... and aggregated to modern boundaries

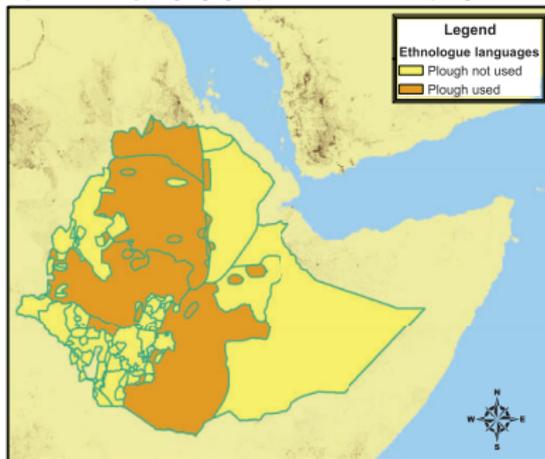
# GIS Magic

Alesina, Giuliano, Nunn (2013)

(a) Population density and language groups



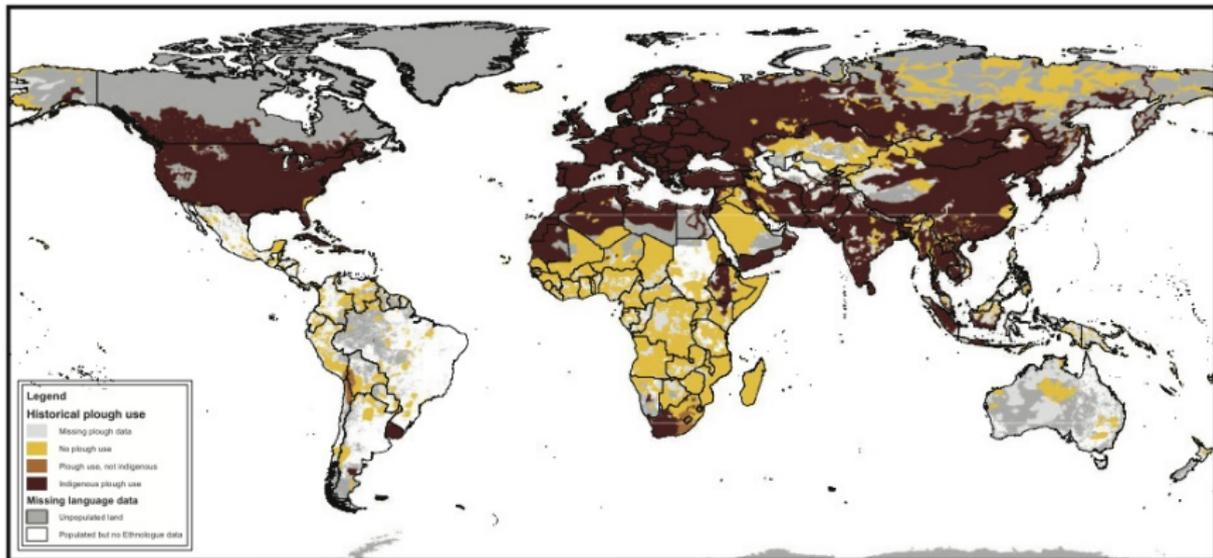
(b) Population density, language groups, and their traditional plough use



Left: land inhabited by different ethnic groups (each polygon represents the approximate borders of a group from Ethnologue), and population of each cell within the country (darker shade indicates greater population). Right: matching language groups to Ethnographic Atlas ethnic groups to determine whether the ancestors of each language group engaged in plough agriculture. Combine this with information on modern boundaries to construct district- and country-level averages of ancestral plough use. This provides an estimate of the fraction of the population currently living in a district (or country) with ancestors that traditionally engaged in plough agriculture.

# Plough Use among Ethnic/Language Groups

Alesina, Giuliano, Nunn (2013)



Potential concerns: (i) Little variation within Europe and within sub-Saharan Africa → use within-country variation, report cross-country estimates omitting Europe, Africa. (ii) most of the variation appears to be at the macro level (though micro-level variation hard to see at this scale) → within-country variation. (iii) missing information → assess whether the missing data are systematically biasing the estimates

# Country-level estimates

Alesina, Giuliano, Nunn (2013)

COUNTRY-LEVEL OLS ESTIMATES WITH HISTORICAL CONTROLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable:							
	Female labor force participation in 2000		Share of firms with female ownership, 2003–2010		Share of political positions held by women in 2000		Average effect size (AES)	
Mean of dep. var.	51.03		34.77		12.11		2.31	
Traditional plough use	-14.895*** (3.318)	-15.962*** (3.881)	-16.243*** (3.854)	-17.806*** (4.475)	-2.522 (1.967)	-2.303 (2.353)	-0.736*** (0.084)	-0.920*** (0.100)

COUNTRY-LEVEL OLS ESTIMATES WITH HISTORICAL AND CONTEMPORARY CONTROLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable:							
	Female labor force participation in 2000		Share of firms with female ownership, 2003–2010		Share of political positions held by women in 2000		Average effect size (AES)	
Mean of dep. var.	51.35		35.17		11.83		2.31	
Traditional plough use	-12.401*** (2.964)	-12.930*** (3.537)	-15.241*** (4.060)	-16.587*** (4.960)	-4.821*** (1.782)	-5.129** (2.061)	-0.743*** (0.080)	-0.845*** (0.091)

In countries with a tradition of plough use, women are less likely to participate in the labor market, are less likely to own firms, and are less likely to participate in national politics. Data from World Bank's World Development Indicators, World Bank Enterprise Surveys and UN Women's Indicators and Statistics Database. The first estimate for each outcome is the baseline, the second one controls for continent fixed effects (i.e. uses only within-continent variation in traditional plough use).

# Individual-level estimates within countries

Alesina, Giuliano, Nunn (2013)

INDIVIDUAL-LEVEL OLS ESTIMATES USING WVS DATA

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable:					
	Female labor force participation, 1995–2007		When jobs are scarce, 1995–2007		Men better political leaders, 1995–2007	
Mean of dep. var.	0.55	0.55	0.46	0.47	2.62	2.64
Traditional plough use	-0.177*** (0.035)	-0.002 (0.031)	0.193*** (0.033)	0.100* (0.059)	0.224*** (0.069)	0.304*** (0.117)
Individual & district controls	yes	yes	yes	yes	yes	yes
Contemporary country controls	yes	n/a	yes	n/a	yes	n/a
Fixed effects	continent	country	continent	country	continent	country
Number of countries	73	78	74	79	50	55
Number of districts	672	698	674	700	453	479
Observations	43,801	47,587	80,303	87,528	64,215	72,152
Adjusted R-squared	0.17	0.27	0.21	0.28	0.19	0.26
R-squared	0.17	0.27	0.21	0.28	0.19	0.26

**Traditional plough use has a negative relationship between and current female labor force participation, and a positive relationship with attitudes reflecting gender inequality.** Data from the World Value Survey. Controlling for historical ethnographic variables and respondents age, age squared, marital status fixed effects, educational attainment fixed effects, and gender (for the attitude regressions only).

# Individual-level estimates within countries

Alesina, Giuliano, Nunn (2013)

INDIVIDUAL-LEVEL OLS ESTIMATES USING IPUMS-INTERNATIONAL DATA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent variable: Female labor force participation indicator								
	Bolivia 2001	Chile, 2002	Cambodia, 2008	Malaysia, 70, 80, 91, 00	Mongolia, 1989, 2000	Nepal, 2001	Philippines, 1990	Uganda, 1991, 2002	All countries
Mean of dep. var.	0.44	0.40	0.78	0.40	0.38	0.54	0.39	0.56	0.49
Traditional plough use	-0.035*** (0.002)	-0.073*** (0.003)	-0.064** (0.027)	-0.080*** (0.016)	-0.006 (0.013)	-0.100** (0.043)	0.035 (0.023)	-0.079*** (0.020)	-0.040** (0.019)
Individual & ethnicity controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
District fixed effects	9	26	24	15	23	14	77	4	192
Ethnic groups	6	5	11	21	10	16	21	60	150
Observations	173,804	505,114	432,481	319,580	125,349	710,662	1,266,363	1,003,321	4,536,674
Adjusted R-squared	0.07	0.17	0.19	0.10	0.50	0.19	0.13	0.09	0.15
R-squared	0.07	0.17	0.19	0.10	0.50	0.19	0.13	0.09	0.15

**Overall there is a negative and statistically significant relationship between female participation in the labor force and a tradition of ancestral plough use.**

Data from IPUMS International Census data for all countries that report respondents' ethnicity and that have within-country variation in traditional plough use.

# Causality

Alesina, Giuliano, Nunn (2013)

## Robustness

- results hold across countries, across districts within countries, and across ethnicities within districts and survive controlling for an exhaustive set of observable characteristics

## Additional evidence using FAO's GAEZ data

- reports suitability of the location for cultivating a variety of different crops for every 56x56km grid cell in the world in 2002

Idea: compare plough-positive vs. plough-negative locations

- i.e. places better suited for cultivating wheat, barley, rye vs. sorghum, foxtail millet, pearl millet

Key assumption: the two sets of cereals are otherwise similar

# Crop suitabilities and current gender roles

Alesina, Giuliano, Nunn (2013)

	Female labor force participation in 2000		Share of firms with female ownership, 2005–2011		Share of political positions held by women in 2000		Average effect size (AES)	
Mean of dep. var.	51.10		35.04		11.86		2.31	
Panel B. Reduced-form estimates								
Plough-positive environment	-10.644*** (3.816)	-11.299*** (4.285)	-13.164** (5.610)	-12.692** (6.214)	-5.800** (2.534)	-6.840** (2.790)	-0.639*** (0.214)	-0.774*** (0.288)

**Ethnic groups coming from an ancestral environment that was better able to cultivate plough-positive crops have less-equal gender roles today.** “Plough-positive environment” is the average fraction of ancestral land that was suitable for growing barley, rye, and wheat divided by the fraction that was suitable for any crops. Controlling for: ancestral suitability for agriculture, fraction of ancestral land that was tropical or subtropical, ancestral domestication of large animals, ancestral settlement patterns, and ancestral political complexity.

## Step 3: Mechanisms

Alesina, Giuliano, Nunn (2013)

The plough may cause less female participation because it affects institutions (and thus costs/benefits)

In order to isolate the causal impact of **cultural beliefs and values**, AGN turn to the children of immigrants

- diverse histories of ancestral plough use
- but face the same external environment

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Caveats

- immigrants are not a random sample of the full population
- informal institutions may be recreated in the host country

# Female labor force participation in the U.S.

Alesina, Giuliano, Nunn (2013)

	All women			Married women					
	Woman's ancestry			Woman's ancestry			Husband's ancestry		
	Father's country	Mother's country	Parents same country	Father's country	Mother's country	Parents same country	Father's country	Mother's country	Parents same country
Mean of dep. var.	0.63	0.63	0.60	0.68	0.69	0.69	0.70	0.71	0.70
Traditional plough use	-0.044*** (0.015)	-0.043** (0.018)	-0.062*** (0.020)	-0.094** (0.046)	-0.118*** (0.043)	-0.136** (0.054)	-0.065*** (0.024)	-0.045** (0.022)	-0.058** (0.024)
Observations	57,138	55,341	32,776	10,206	9,508	6,835	35,393	35,158	23,124
Adjusted R-squared	0.23	0.23	0.25	0.10	0.10	0.11	0.08	0.08	0.08
R-squared	0.23	0.23	0.26	0.11	0.11	0.12	0.09	0.08	0.09

There is a **negative relationship between a tradition of plough use in the parents' home country and participation in the labor force**. A tradition of plough use among the husband's ancestors is also associated the wife's participation in the labor market. Comparison to cross-country regressions suggests that the transmission of internal norms, as identified in the children-of-immigrant regressions, may account for roughly 35–50 percent of the total effect (but you should interpret this calculation with quite a bit of caution). Data from the U.S. Current Population Survey.

# Gender attitudes in Europe

Alesina, Giuliano, Nunn (2013)

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variables: "When jobs are scarce..." survey response, 2004–2011					
	Father's country		Mother's country		Same country	
	1–5 scale	Indicator	1–5 scale	Indicator	1–5 scale	Indicator
Mean of dep. var.	2.54	0.32	2.53	0.32	2.62	0.35
Traditional plough use	0.219** (0.091)	0.073** (0.034)	0.214** (0.086)	0.070** (0.033)	0.298*** (0.096)	0.094** (0.038)
Observations	15,545	13,024	15,260	12,788	10,535	8,780
Adjusted R-squared	0.18	0.16	0.17	0.16	0.17	0.16
R-squared	0.18	0.17	0.17	0.16	0.17	0.17

There is a **positive relationship between traditional plough use and beliefs about gender inequality**. The estimated impact of traditional plough use is stronger when both parents come from the same country. Comparison to WVS results suggests that between 36 and 49 percent of the total impact may be explained by cultural persistence (but, again, one must interpret these findings with appropriate caution). Data from the European Social Survey.

# Women and the plough: Summary

Alesina, Giuliano, Nunn (2013)

The Boserup hypothesis

- agricultural technology shaped gender norms
- these norms have been transmitted over centuries

AGN present evidence that

- *current* gender norms predicted by ancestors use of the plough
- part of this effect works through beliefs and values

Clearly, other forces are at play, too

- associations much smaller among second-generation immigrants than in the source countries (though this could be also due to selection into migration)
- in our last lecture, we will discuss the equally remarkable *change* in gender roles during the 20th century

## Papers for the essays

Voigtlander, Voth (2012): Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany. *QJE* 127(3): 1339–1392.

- Plague-era pogroms reliably predict violence against Jews in the 1920s, votes for the Nazi Party, deportations after 1933, attacks on synagogues, and letters to *Der Stürmer*. Persistence was lower in cities with high levels of trade or immigration

Nunn, Wantchekon (2011): The Slave Trade and the Origins of Mistrust in Africa, *AER* 101 (7): 3221–3252

- Individuals whose ancestors were heavily raided during the slave trade are less trusting today. Most of the impact is through factors that are internal to the individual, such as cultural norms, beliefs, and values.