

# **Development Economics**

## **ECON 4915**

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# Outline

- **Gender and development economics:**
  - Overview WDR (2012).
  - The economics of gendercide (WDR 2012 and Qian 2008).
  - Cultural change (Jensen and Oster 2009)
  - (IF TIME) Gender equality and development generally (Duflo 2012)

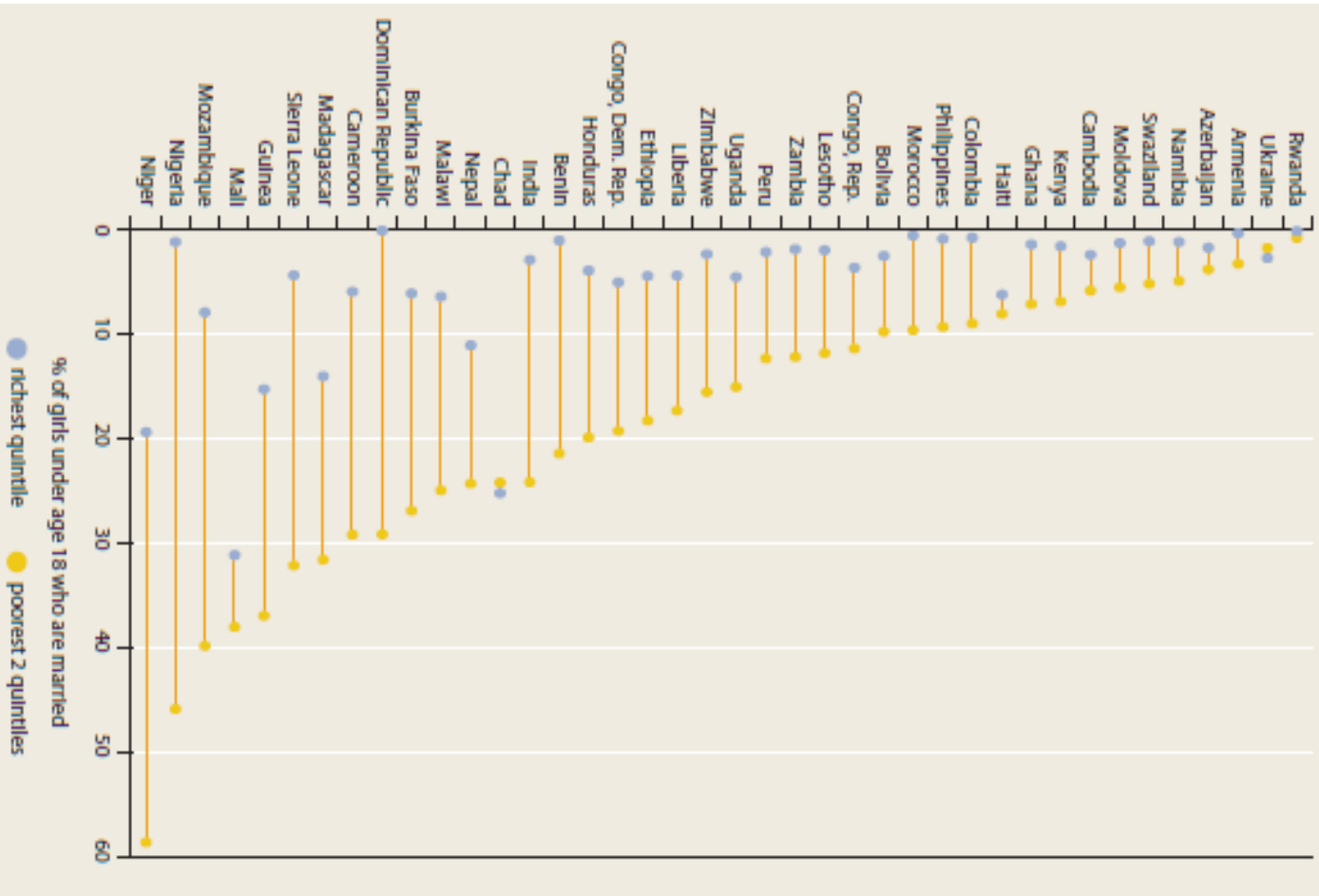
# Gender and development

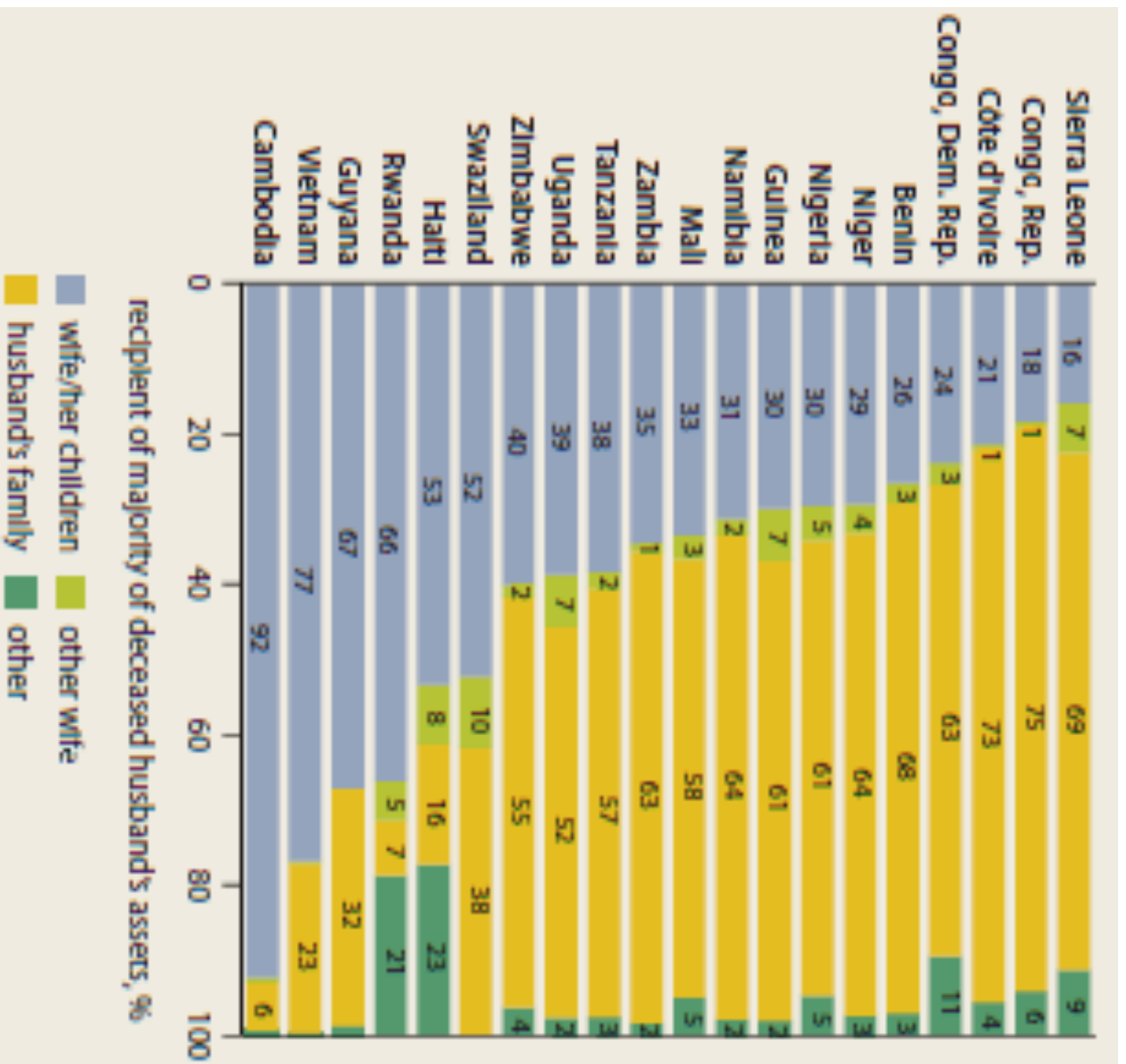
- An active research area in economics, partly due to the way the world looks like:
  - 6 million women a year go missing.
  - Labor market opportunities.
  - Political representation.

# Things we do not know yet

- Effects of legal rules on inheritance, marriage, and divorce.
- “Surprisingly little research” (Duflo 2012).
- Even though there is a lot of variation to be exploited and even though it is likely intimately related to women’s agency.

FIGURE 4.3 Richer women marry later





world development report

2012

# GENDER EQUALITY AND DEVELOPMENT

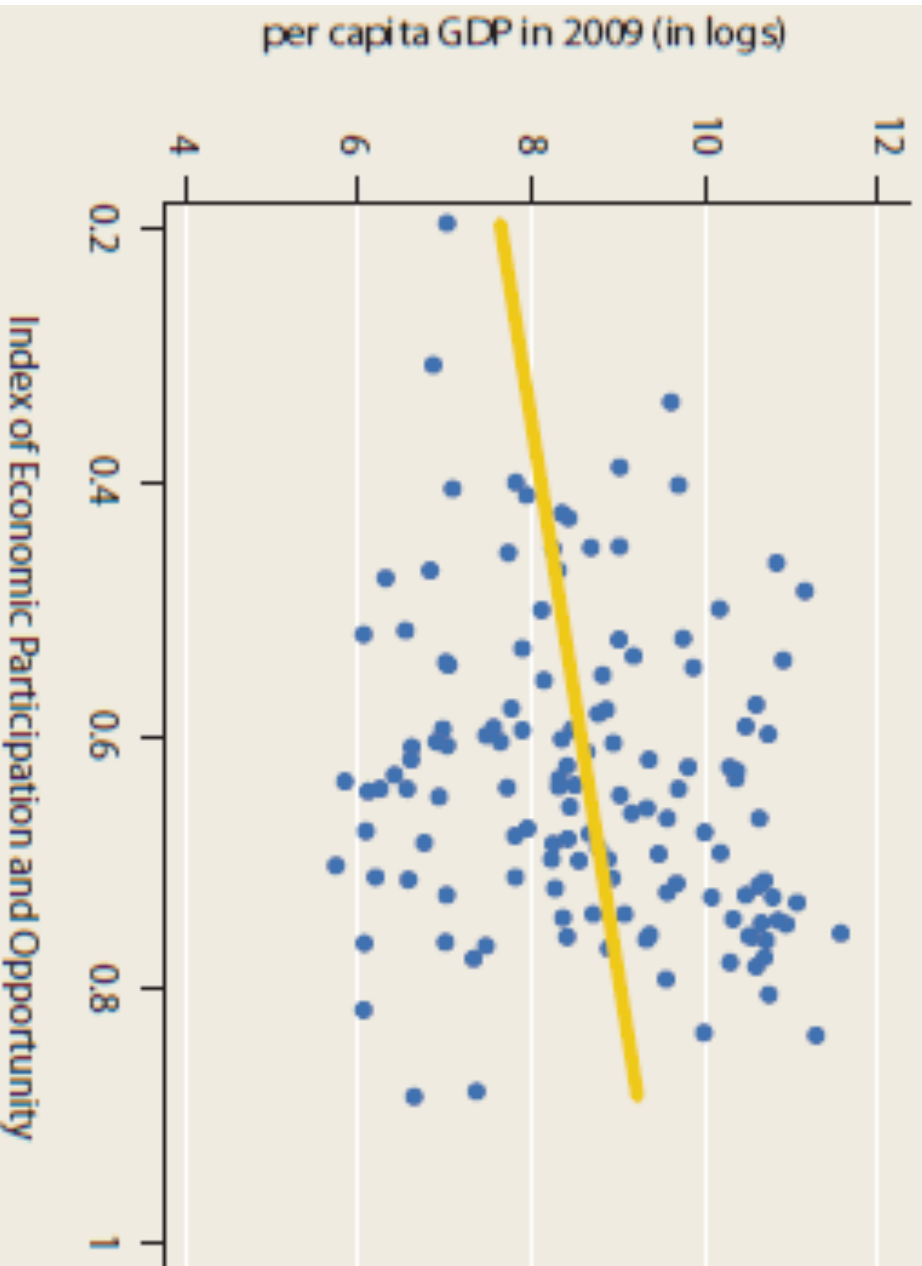


November 2011



THE WORLD BANK

**BOX FIGURE 0.1** *GDP per capita and gender equality are positively correlated*





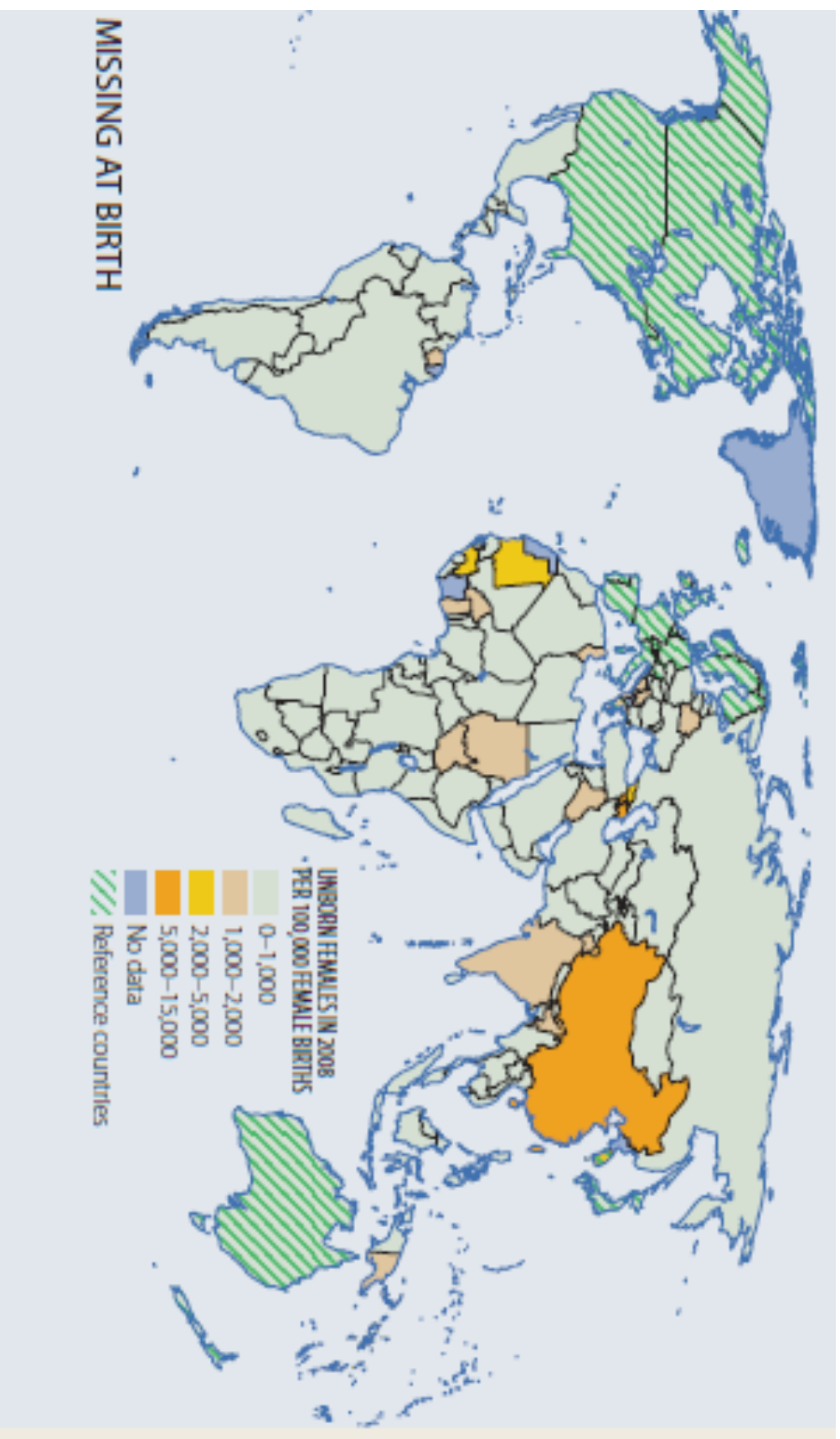
# Qian 2008

- **Research question: The effects of sex-specific earnings on gendercide.**
  - Interesting? Yes: Important topic (missing women, especially in China), also important topic in household/labor economics.
  - Original? Yes: previous empirical studies have faced severe identification problems.
  - Feasible? Yes: By exploiting two post-Mao reforms, DD, and IV.

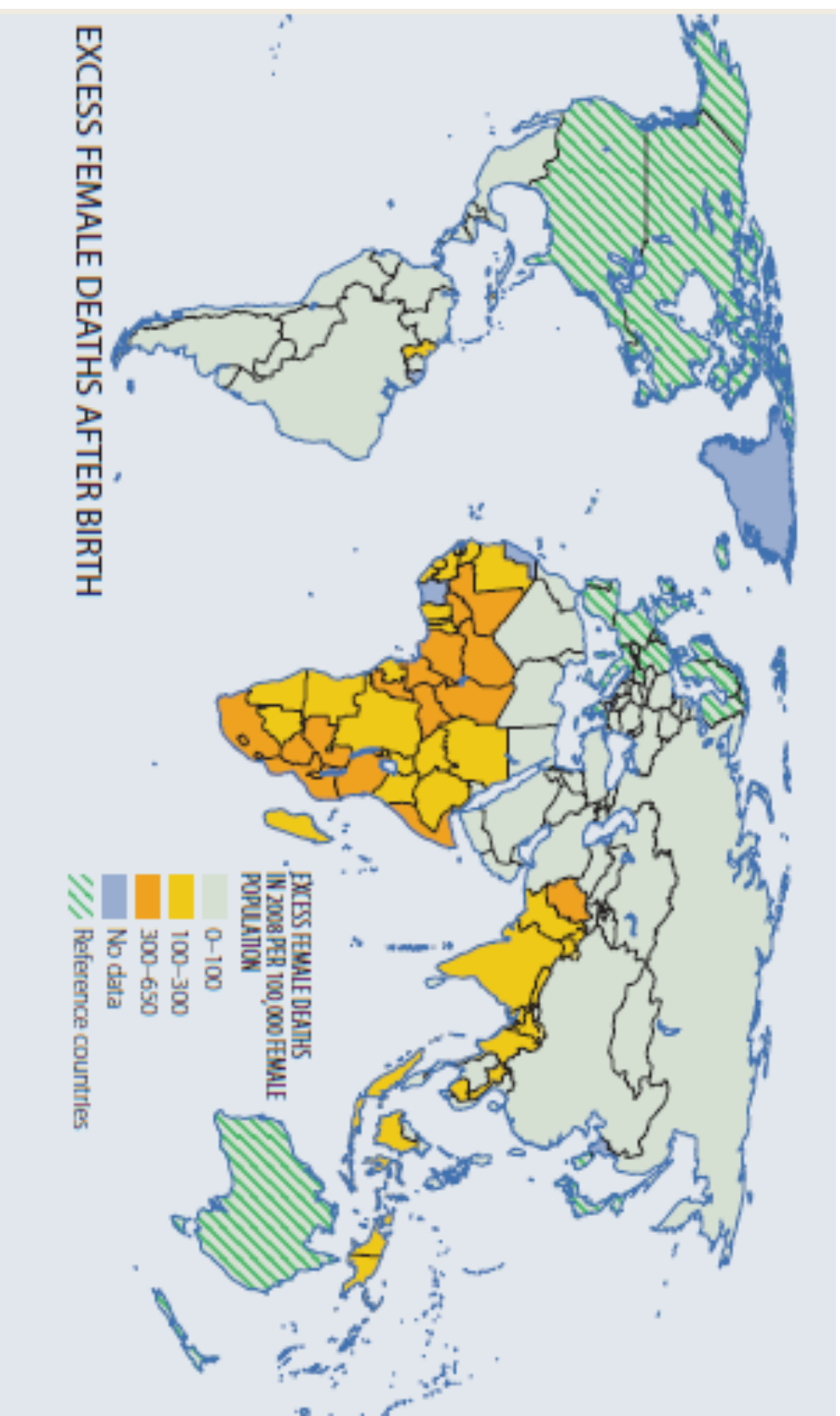
# A detour on missing women

- Women who “should be alive” but are not.
- $MW = (\text{Current population} * \text{share of females in reference category}) - \text{Current number of women.}$
- Globally, 6 million women a year become missing.
- 1/5 is never born, 1/10 dies in early childhood, 1/5 in the reproductive years, and 2/5 at older ages.

# Missing girls at birth

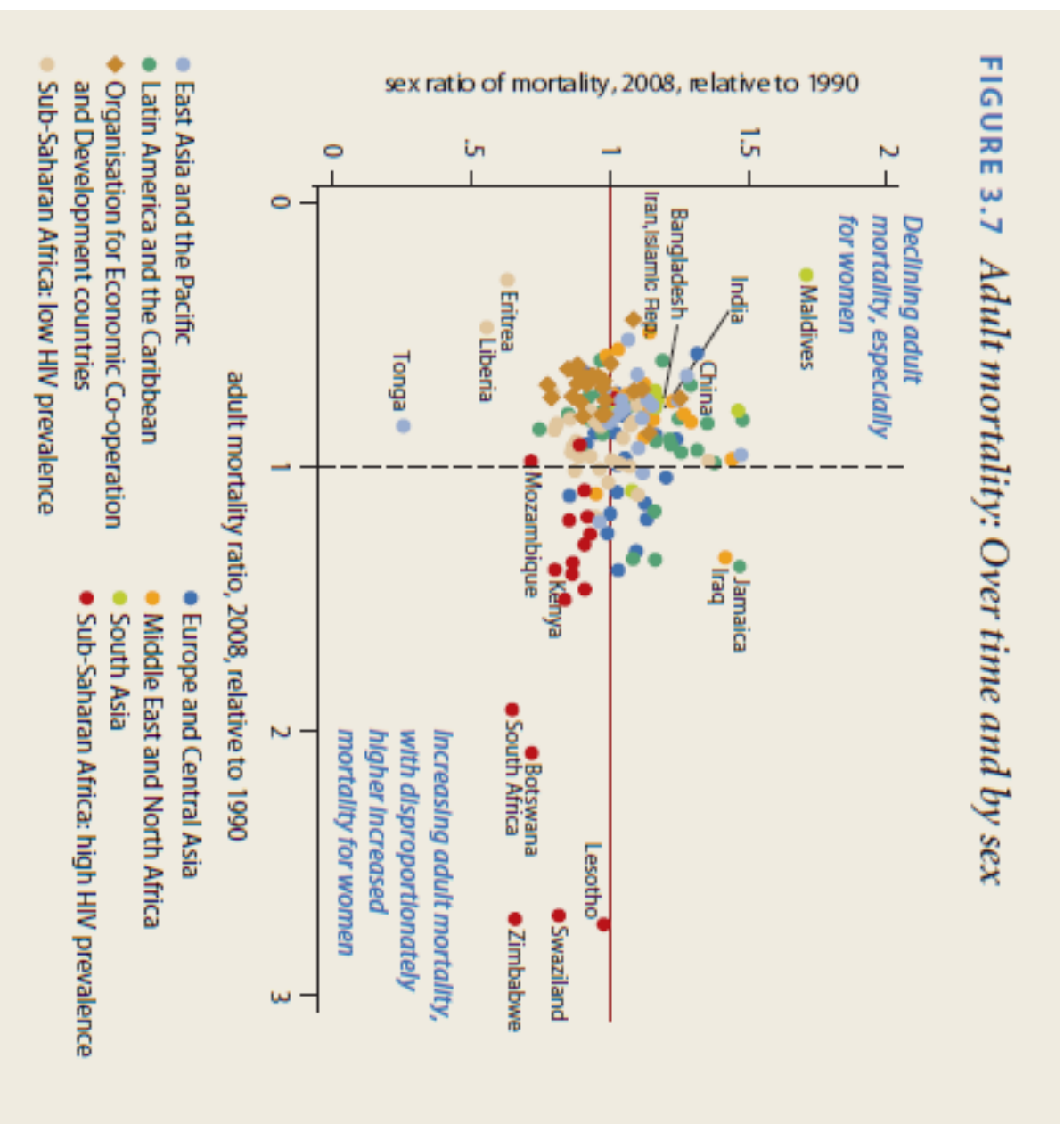


# After birth



# Sex ratio of deaths and changes over time

FIGURE 3.7 Adult mortality: Over time and by sex



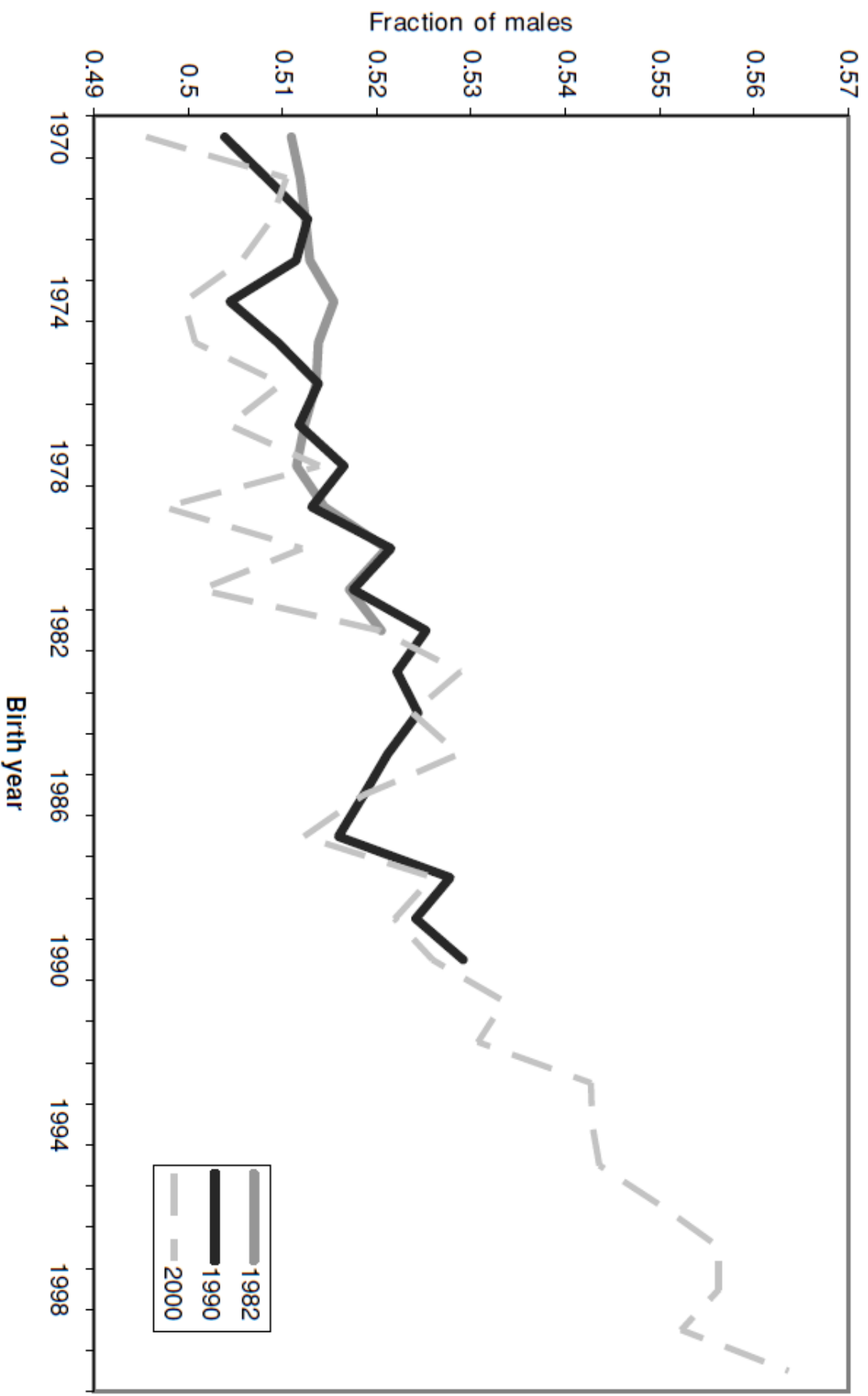


FIGURE I  
Sex Ratios by Birth Year in Rural China

# The empirical problem

- In linking female share of income with gendercide there is a fundamental identification problem:
- Areas with higher female income may have higher income precisely because women's status is higher for other reasons.

# The story (1)

- Women have a comparative advantage in producing tea.
- Men have a comparative advantage in producing orchard fruits.
- Only looking at tea areas vs non tea areas is not enough either: regions that *choose* to plant tea may be regions with weaker boy preference.



## The story (2)

- Reforms increased the price dramatically.
- Areas suitable for tea production receive a shock in female incomes.
- More girls survive.

# Empirical strategy

- “... compare sex imbalance for cohorts born before and after the reforms (**1<sup>st</sup> diff**), between countries that plant and do not plant sex-specific crops (**2<sup>nd</sup> diff**), where the value of those crops increased because of the reform.”

= Difference in differences (DD).

## Recap difference in differences (DD)

- Requires that data is available both before and after treatment.
- Basic idea: Control for pre-period differences in outcomes between T and C.
- Crucial assumption. Absent the treatment, the outcomes would have followed the same trend.
- Main practical issue: Omitted variable... you must argue your case strongly!

# Problems

- The main problem is that something else may have happened at the same time.
- Or that the *trends* are different.
- More periods is better.

## Three effects of the reforms are exploited

- 1) The reform increased the value of adult female labor in tea-producing regions.
- 2) The reform increased the value of adult male labor in orchard-producing regions.
- 3) The reform increased total household income in regions with other cash crops which favor neither male nor female labor.

# Data

- **Censuses from 1990 and 1997.**  
Used to get historical fertility and to see which regions plant tea.
- **ArcGIS data on hilliness.**  
Increasingly popular to use GIS data in economics.

# Main equation of interest

$$(2) \quad \text{sex}_{ic} = (\text{tea}_i \times \text{post}_c) \beta + (\text{orchard}_i \times \text{post}_c) \delta + (\text{cashcrop}_i \times \text{post}_c) \rho \\ + \text{Han}_{ic} \zeta + \alpha + \psi_i + \gamma_c + \varepsilon_{ic}.$$

# Basic results

	Fraction of males		
	(1)	(2)	(3)
	OLS	OLS	OLS
Tea × post	-0.012 (0.007)	-0.013 (0.006)	-0.012 (0.005)
Orchard × post	0.005 (0.002)		
Cashcrop × post	-0.002 (0.002)		
Linear trend	No	No	Yes
Observations	28,349	37,756	37,756

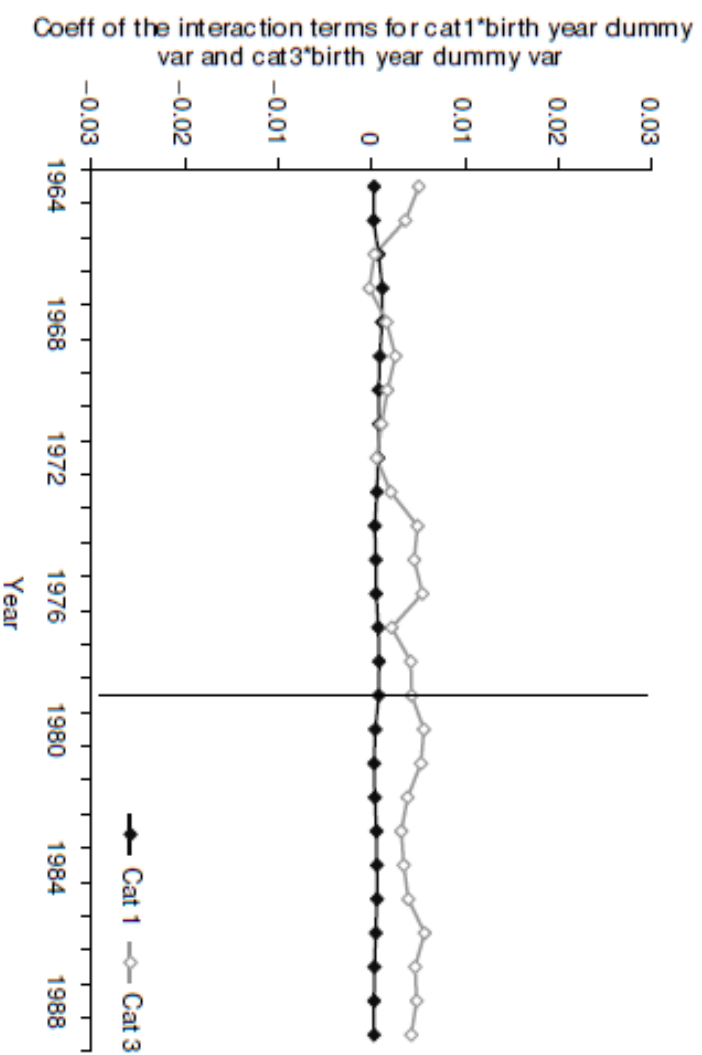
Control for varying cohort trends between countries



# Main worries in DD

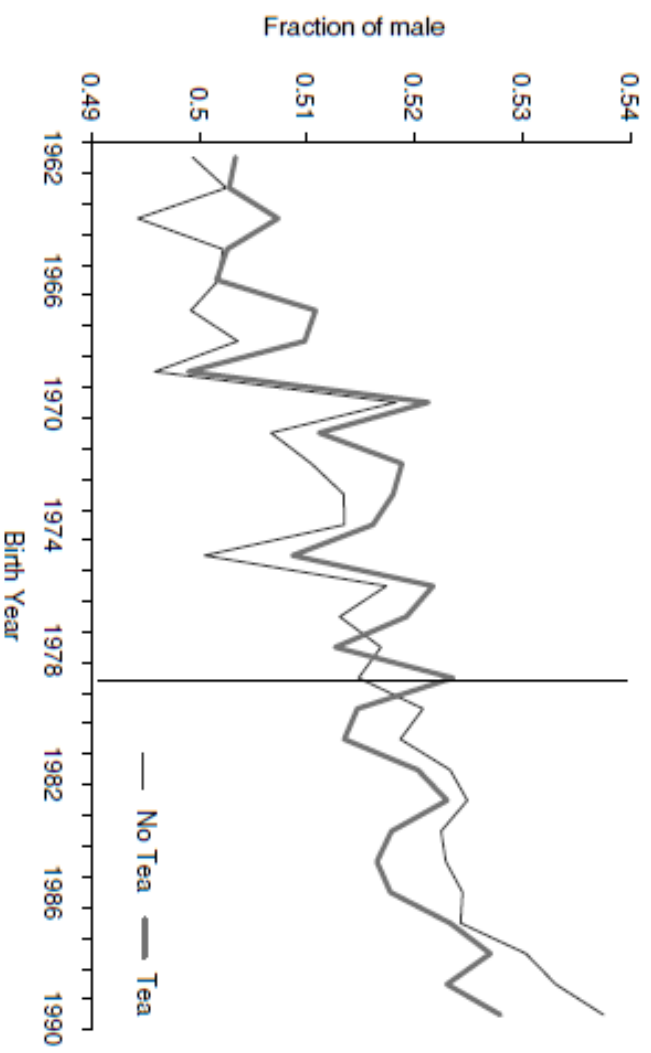
- The effects may be driven by changes in the control crops. (**Testable**)
- There may have been different pre-trends in sex ratios. (**Testable**)
- Increased price may change the reason people pick tea so that the prereform cohort is not a valid counterfactual. (**Use IV**)
- In, general, we may confound the effects of the reform with effects of other things that happened. (**Non-testable**)

# Changes in effects of control crops



Stable and close to zero.

# Pre-and post trends



# Timing of the effects

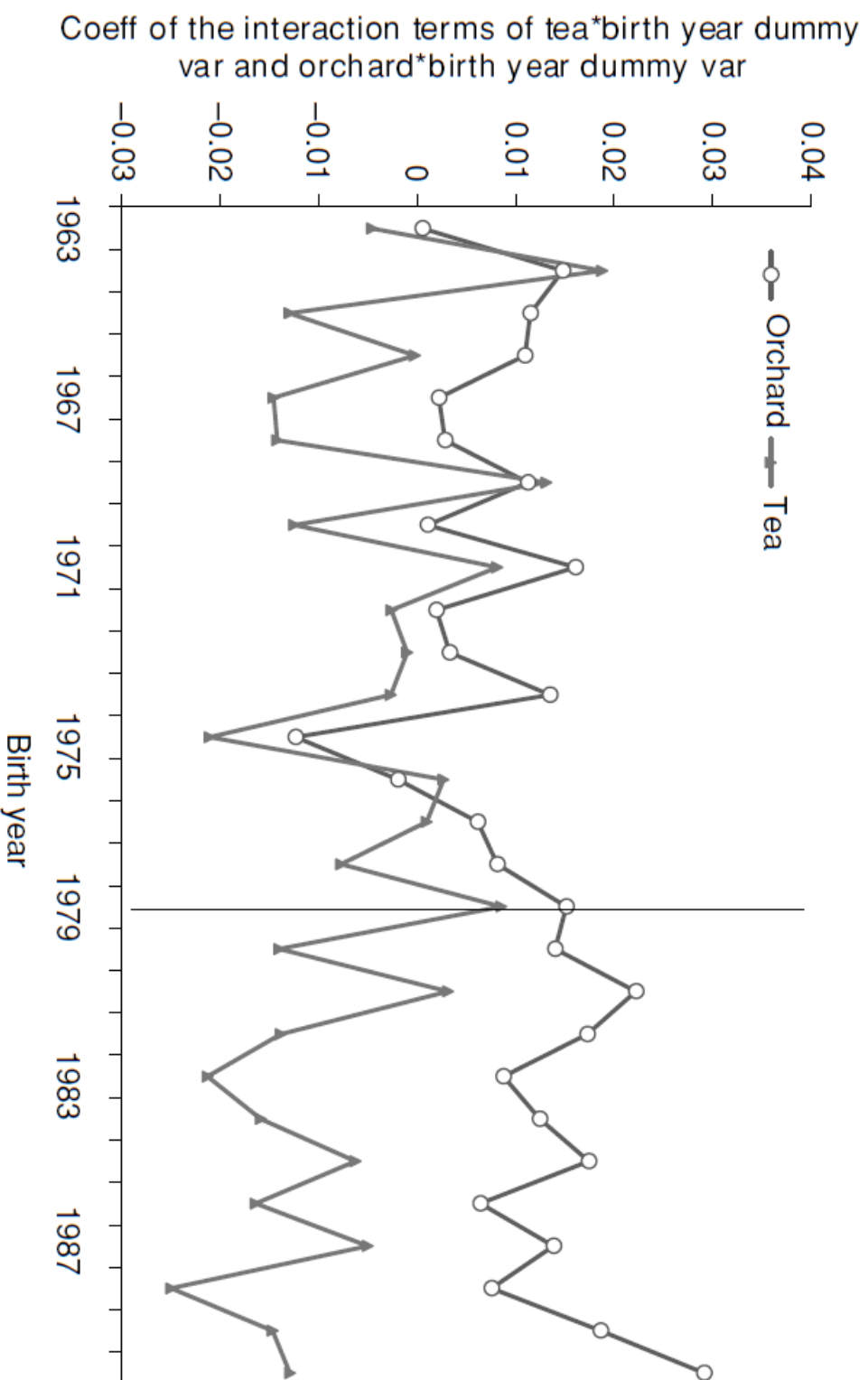


FIGURE V  
The Effect of Planting Tea and Orchards on Sex Ratios

# Instrumental variables approach

- Tea grows only under particular conditions: on warm and semihumid hilltops.
- Use slope of land (i.e. hilliness) as an instrument for tea planting.
- Condition 1: Relevance, easily tested.
- Condition 2: Validity, not testable.

# Arguments for validity

- Hilliness varies gradually while county boundaries are straight lines.
- Estimation with a sample including only adjacent counties gives similar results.
- Unless potentially confounding factors change discretely across county boundaries, this increases our belief in the validity.

# IV Results

TABLE III  
OLS AND 2SLS ESTIMATES OF THE EFFECT OF PLANTING TEA AND ORCHARDS ON SEX RATIOS CONTROLLING FOR COUNTY LEVEL LINEAR COHORT TRENDS

	Dependent variables					
	Fraction of males		Tea × post		Fraction of males	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	1st	IV	IV
Tea × post	-0.012 (0.007)	-0.013 (0.006)	-0.012 (0.005)		-0.072 (0.031)	-0.011 (0.007)
Orchard × post	0.005 (0.002)					
Slope × post	-0.002 (0.002)			0.26 (0.057)		
Linear trend	No	No	Yes	Yes	No	Yes
Observations	28,349	37,756	37,756	37,756	37,756	37,756

# Education

- Planting tea increased female and male educational attainment.
- On the other hand, planting orchards decreased female educational attainment and had no effect on male educational attainment.



# Timing of the education effects

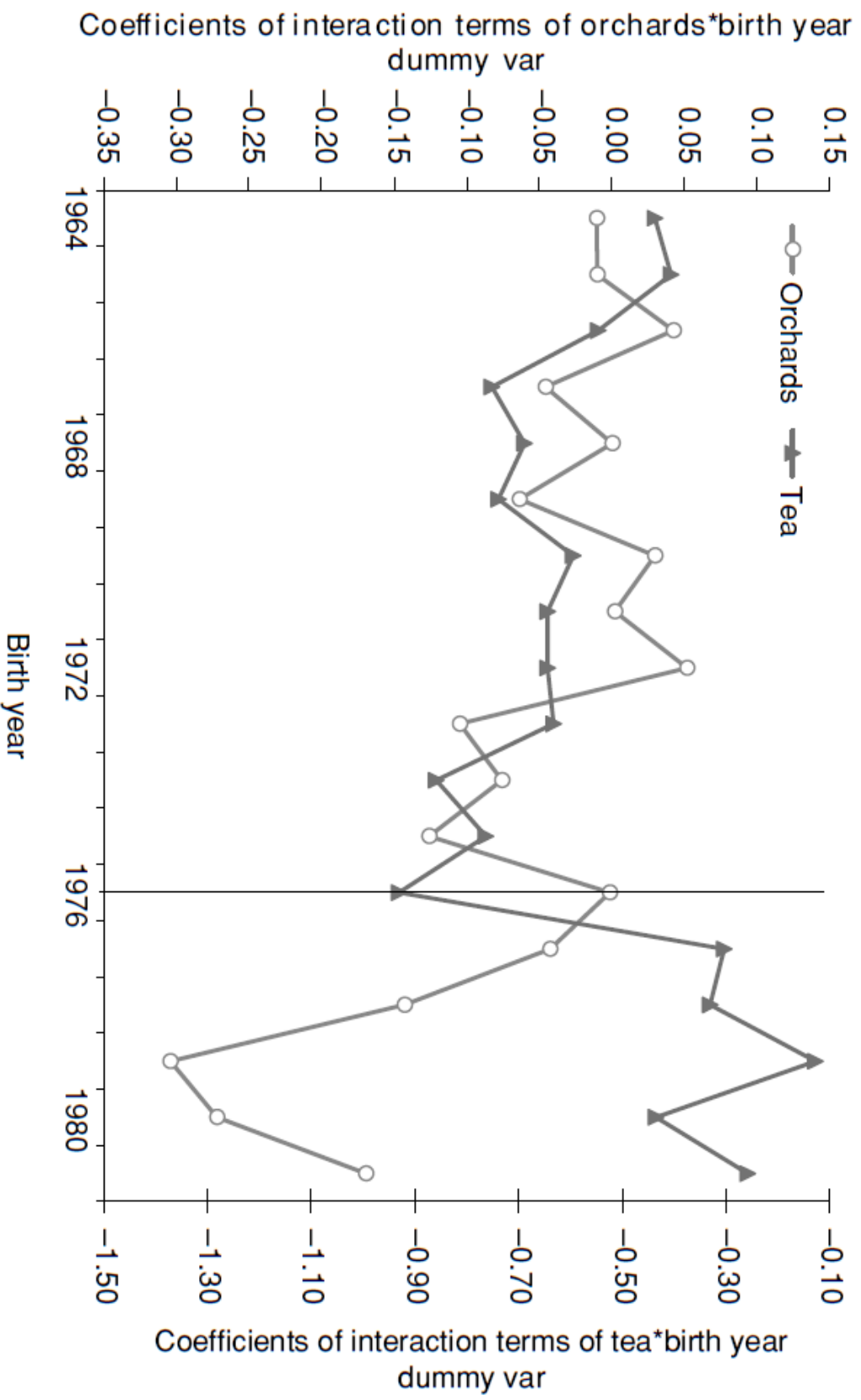


FIGURE VI

The Effect of Planting Tea and Orchards on Girls' Educational Attainment

# Mechanisms: 4 potential channels

- Changed perceptions of daughters' future earnings.
- Girls may be luxury goods. (ruled out by orchard results)
- If mothers prefer girls and if it improves mothers' bargaining power.
- Pregnancies are costlier as women's labor is valued more. (ruled out by education results)

# Cultural change.

- Can we expect change to happen rapidly?
- Does change have to come from policies and what is the role of markets?

# Detour on Norms

- Social norms influence expectations, values, and behaviors.
- They define and constrain the space for people to exercise their agency.
- As such they can prevent laws, better services, and higher incomes from removing constraints to agency.
- Social norms are typically most resilient in areas that directly affect power or control.

# Jensen and Oster 2009

- **Research question: Does cable tv affect women's status?**
  - Interesting? Yes: Important topic (empowerment, especially in India), market based mechanism for cultural change.
  - Original? Yes: Few rigorous empirical studies of the impacts on social outcomes.
  - Feasible? Yes: By using panel data and Diff in diff.

# Why should we care about television?

- Number of TV's exploded in Asia.
- Television increases the availability of information about the outside world and exposure to other ways of life.
- Especially true in rural areas.
- Main argument: Exposing rural households to urban attitudes and values via cable tv may improve the status for rural women.

# Data

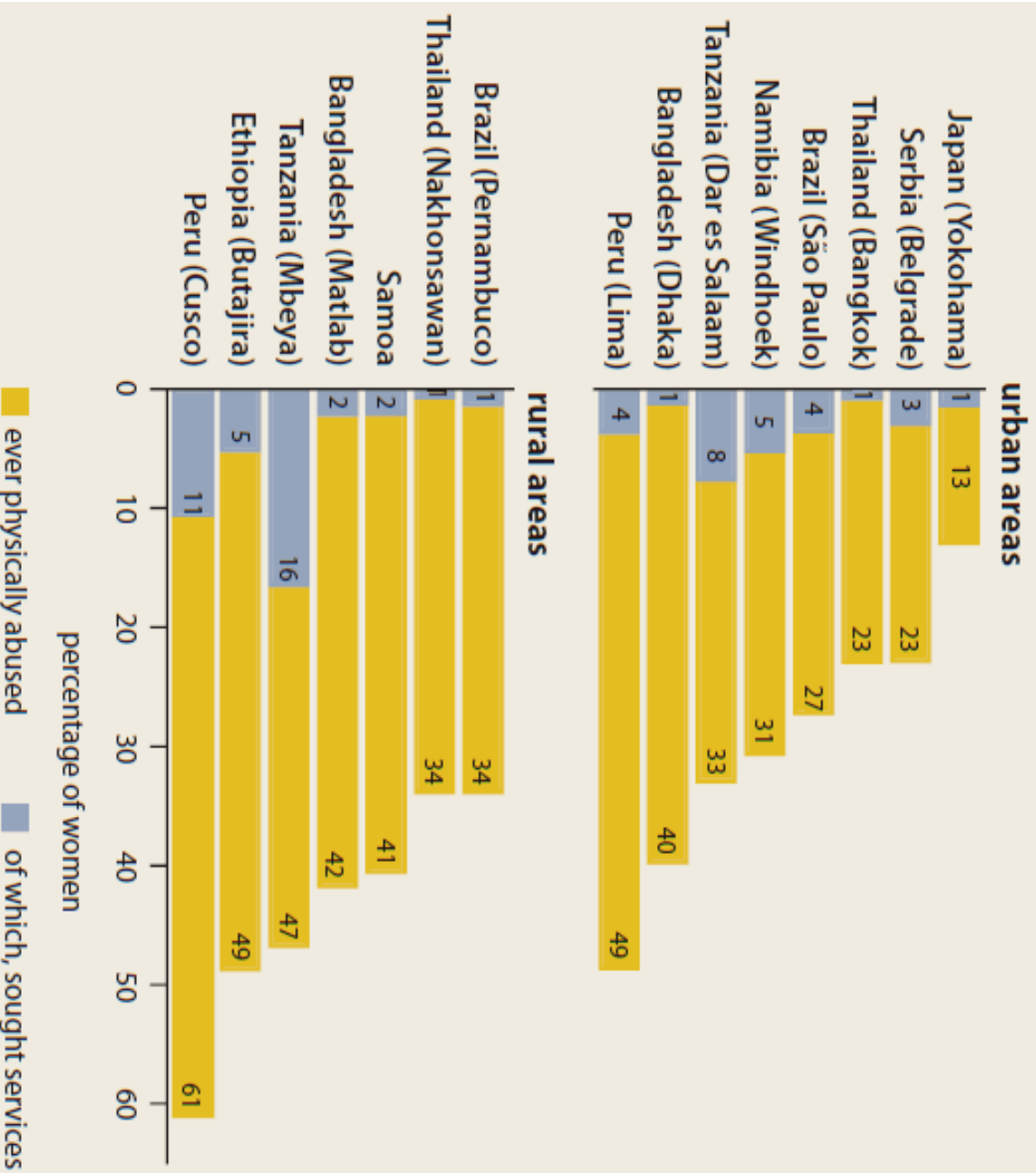
- Main data set: A three year panel between 2001 and 2003.
- 180 villages.
- Cable was introduced in 21 of the villages.

# Main measures

- Son preference: “Would you like your next child to be a boy, a girl, or it doesn’t matter?”
- Domestic violence: A husband is justified in beating his wife if X, Y, Z.
- Autonomy: Who decides on X, Y, Z? Need permission to X, Y?
- Fertility: Currently pregnant, and birth histories.



**FIGURE 4.9** *Few women seek services in case of domestic violence*



# Empirical strategy

”...relies on comparing changes in gender attitudes and behaviors between survey rounds across villages based on whether (and when) they added cable television” (p. 1059).

= Difference in differences (DD).

## Recap DD

- Typical DD assumption: “villages that added cable would not otherwise have changed differently than those villages that did not add cable.”

# The typical DD problem

- “... we cannot rule out with our data is that there is some important unobservable that simultaneously drives year-to-year cable introduction and year-to-year variation in our outcome measures. Although this seems unlikely, and we are unable to think of plausible examples, it is important to keep this caveat in mind.”

# They are concerned about omitted variables

- “A central empirical concern is the possibility that trends in other variables (e.g., income or “modernity”) affect both cable access and women’s status.”
- First of all, they have to describe the factors determining which villages got cable.

# Determinants of cable

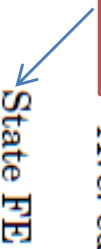
- Interviews with cable operators: access to electricity and distance to the nearest town.
- A survey of cable operators: main reason for no cable was that the village was too far away or too small.
- Merge villages with administrative data from an education database and the SARI data

# Determinants of cable

## B. Regression analysis of cable placement

Dependent variable:	Have cable 2008	Year cable introduction	Have cable in 2003
Sample:	Tamil Nadu	Tamil Nadu	SARI SARI
Explanatory variables			
Electricity (0/1)	.2301*** (.029)	-1.1834*** (.353)	.276** (.109)
Log dist. to nearest town	-.1111*** (.021)	.6463*** (.233)	-.076 (.050)
Village pop., age 6-14, (in '000s)	.1808*** (.036)	-1.4351*** (.35)	
Pop. density (in '000s)			.590* (.313)
Ave. log HH income PC			-.015 (.049)
Ave. education			.074*** (.021)
State FE	N/A	N/A	NO
Number of observations	1,039	670	136
R <sup>2</sup>	.13	.07	.26

Only within state variation



## But this is hardly enough

- “Under the assumption that these variables constitute the primary determinants of access, controlling for them should allow us to more convincingly attribute the changes in the outcomes to the introduction of cable.”
- Well, yes, but “we certainly cannot rule out that there is some important variable that drives cable introduction that was not mentioned by cable operators and that also has an impact on our outcomes of interest.”



# Estimation

$$(1) \quad S_{iut} = \beta_{C_{ut}} + \gamma_{i_v} + \delta_t + \tau \mathbf{X}_{iut} + \epsilon_{iut},$$

Large jumps (and of similar magnitude)  
precisely when they get cable

Get tired of it,  
nothing new.

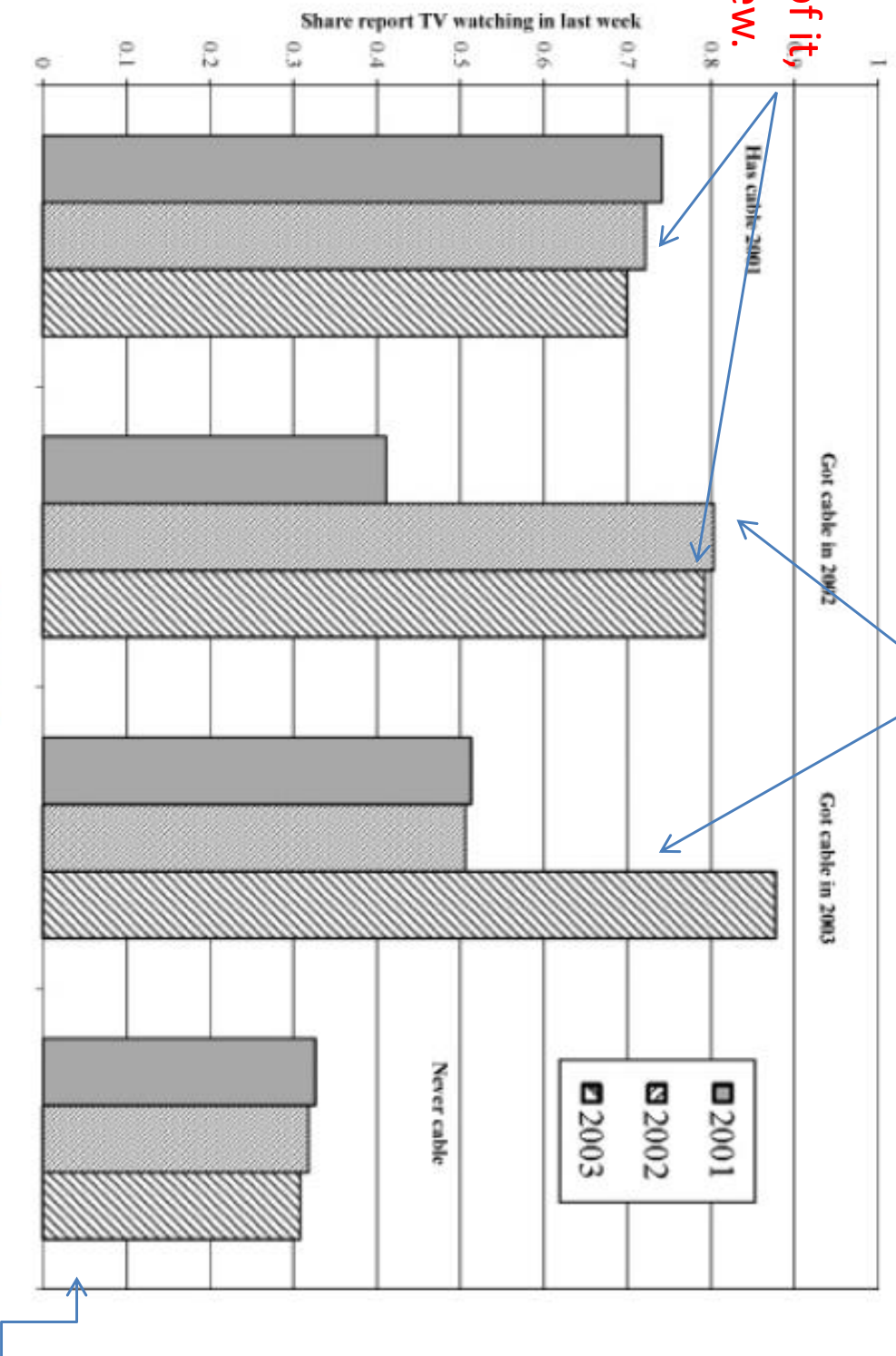


FIGURE I

Lower level, and similar trend,  
nothing new on tv.

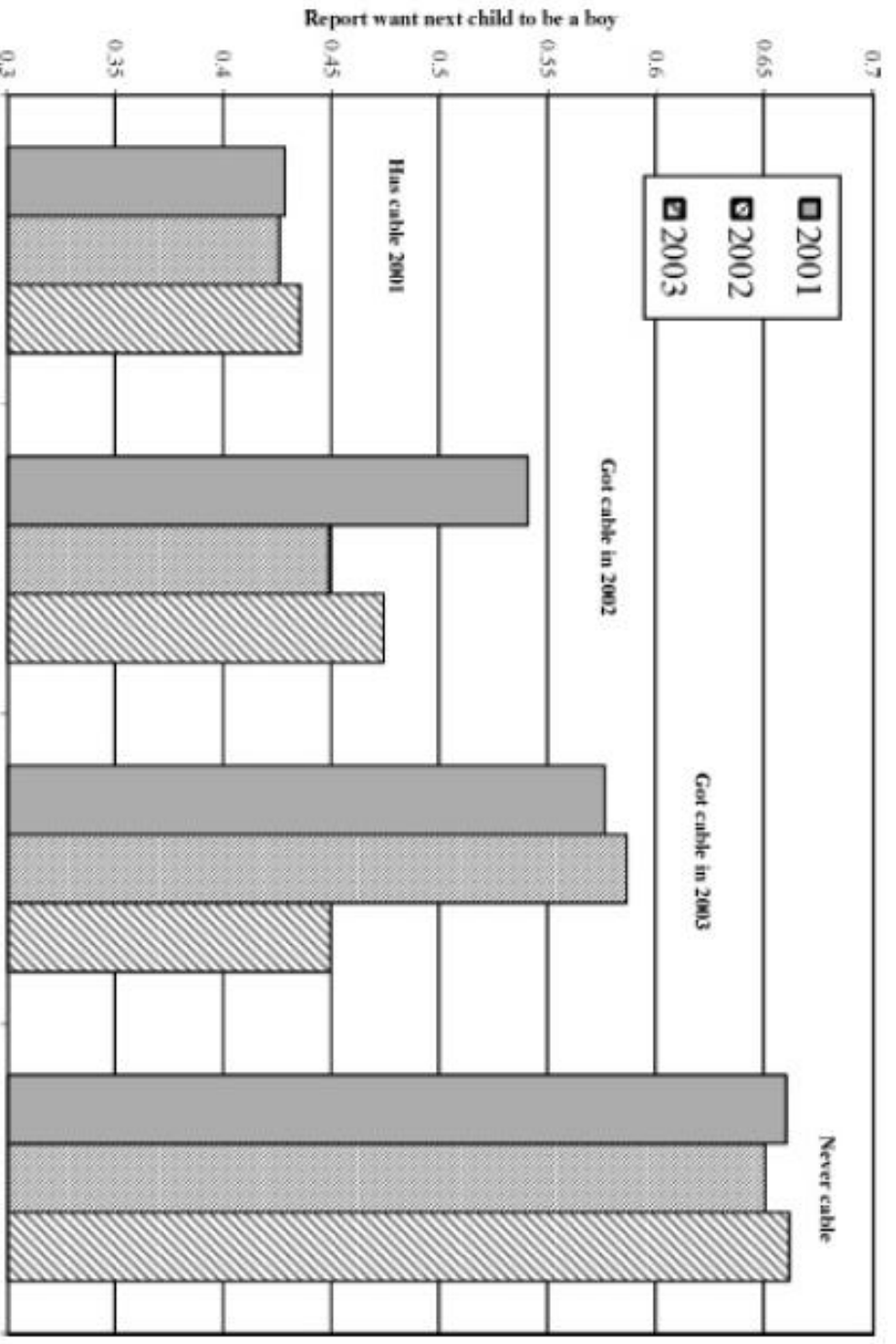


FIGURE III

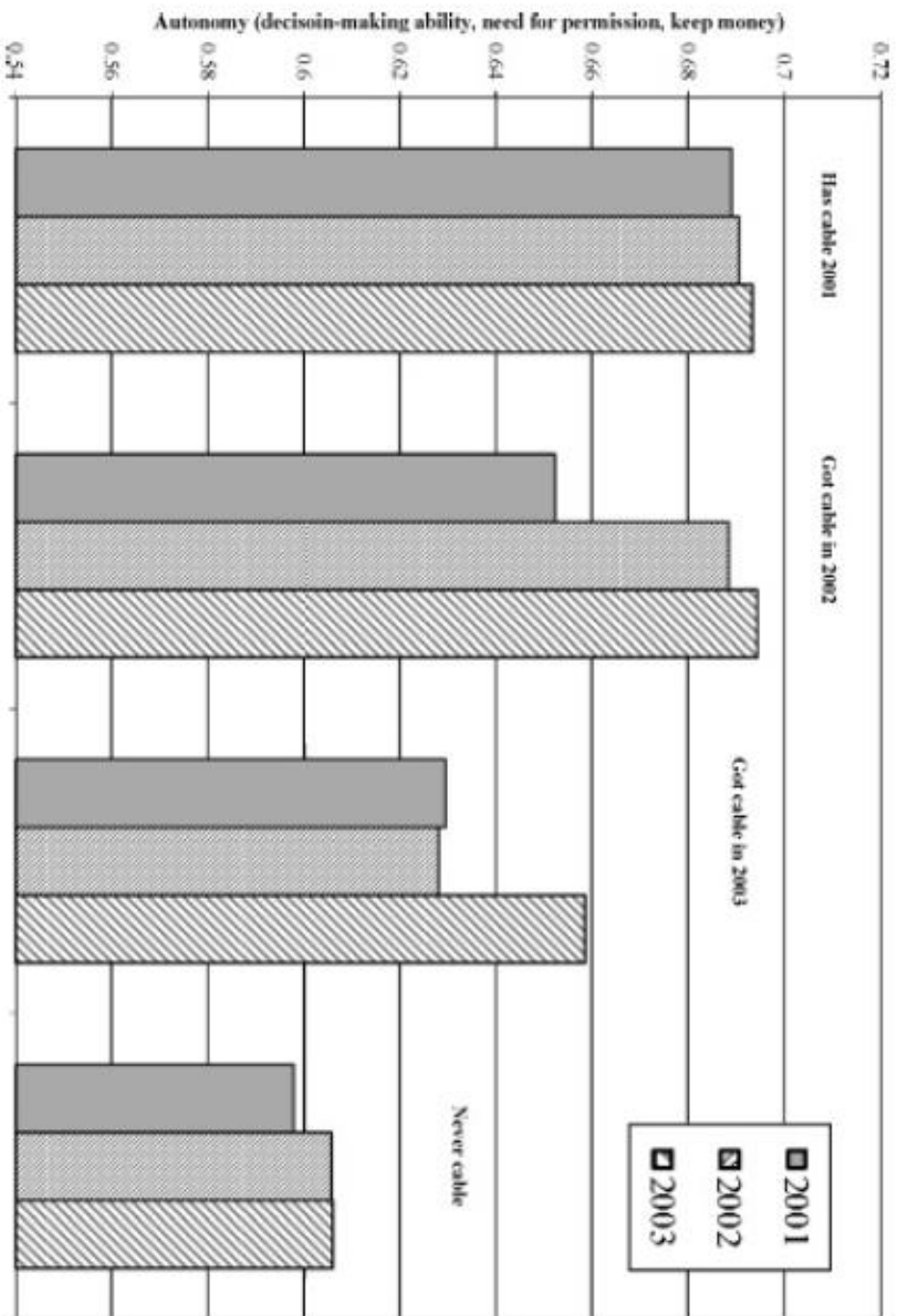


FIGURE IV

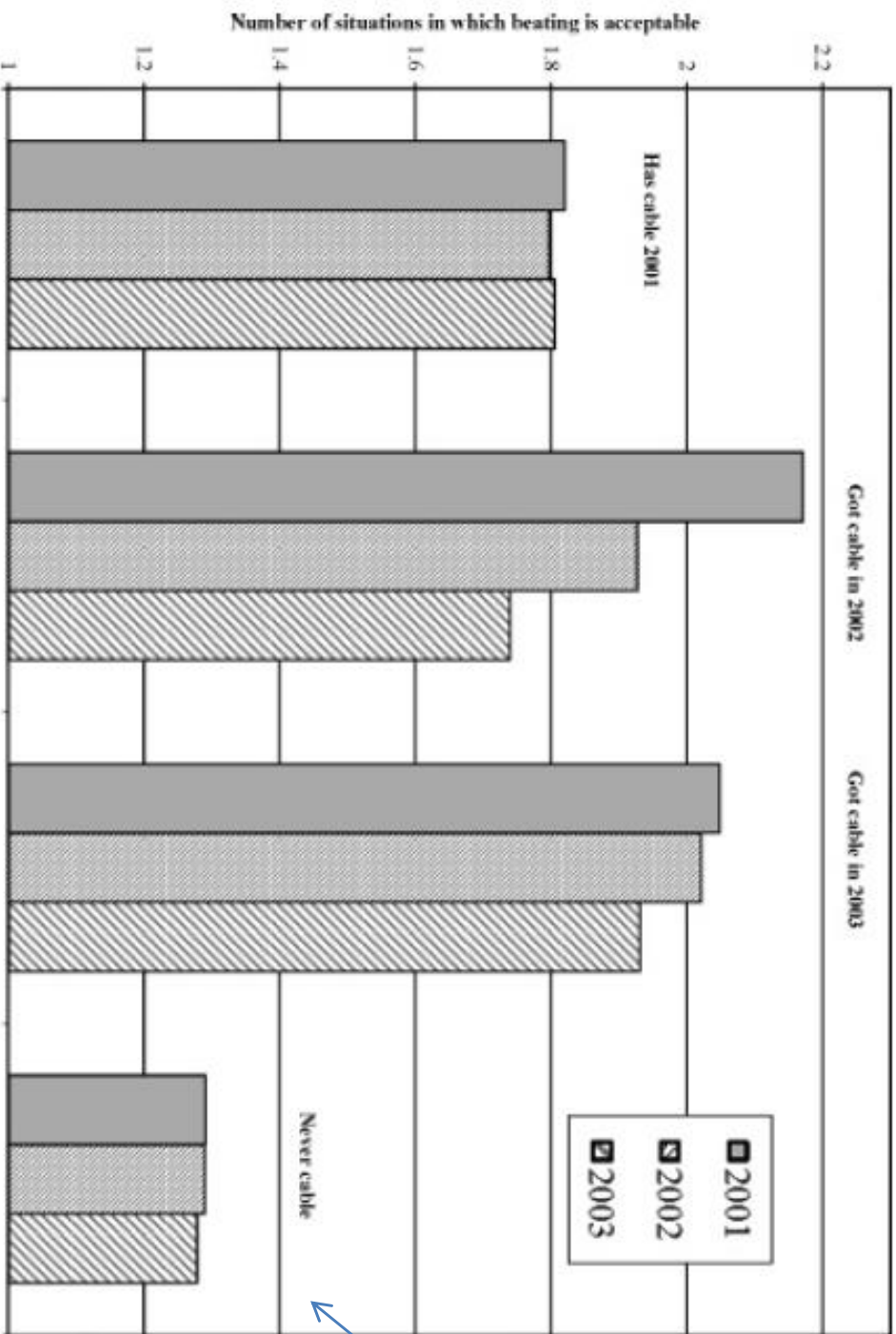
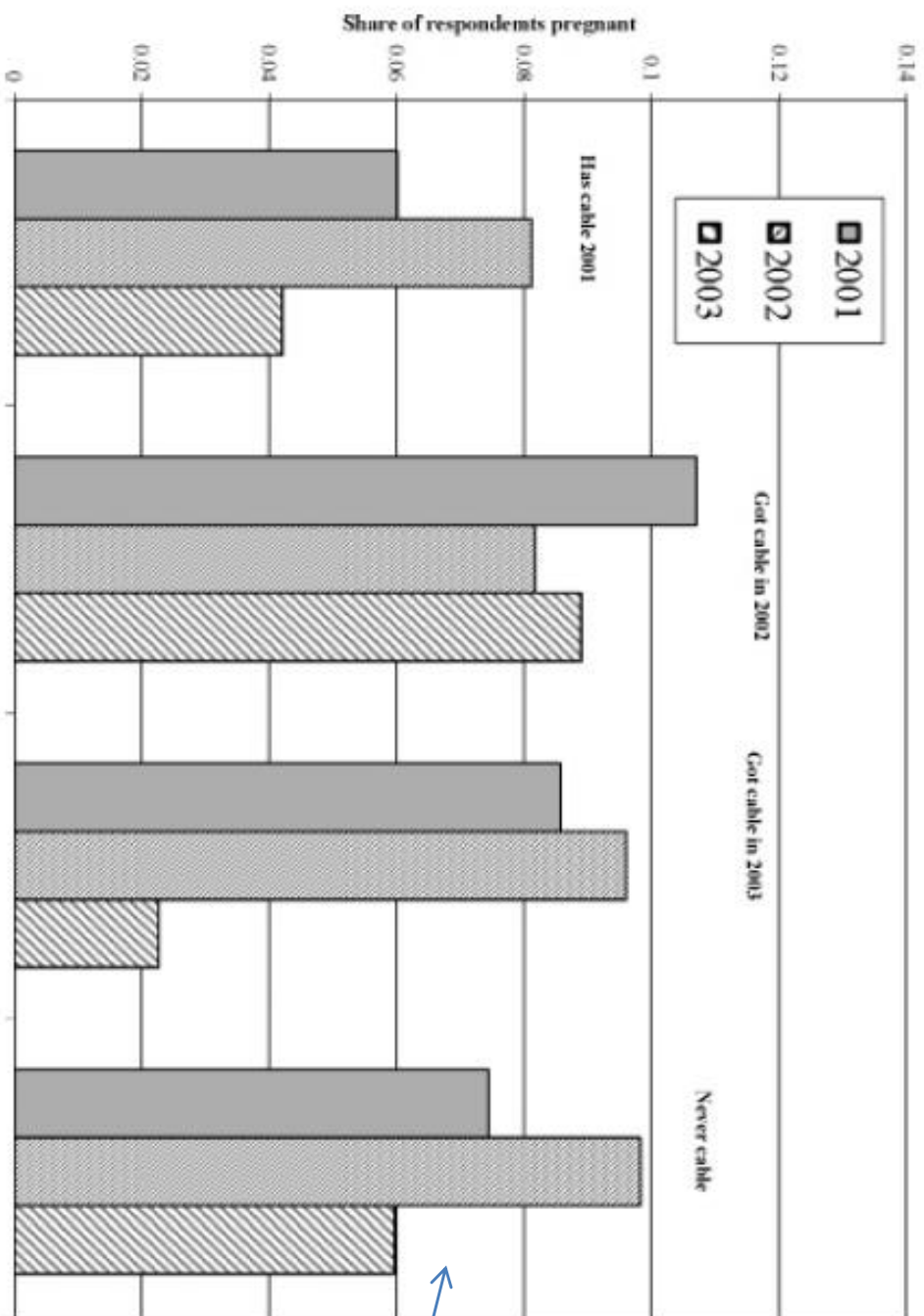


FIGURE II

Is this a problem?



Is this a problem?

FIGURE V  
Cable Access and Pregnancy

TABLE IV  
EFFECT OF CABLE TELEVISION ON WOMEN'S STATUS, SARI DATA

Dependent variable:	Pregnant at survey time				
	Beating (1)	Son (2)	Autonomy (3)	2001-2003 (4)	1997-2003 (5)
A. Baseline effects of cable					
Explanatory variable					
Village has cable	-.1608** (.073)	-.0882** (.040)	.0260*** (.006)	-.0379*** (.013)	-.0678** (.028)
Dep. var. mean (SD)	1.70 (1.75)	0.57 (0.49)	0.64 (0.21)	0.072 (0.26)	0.13 (0.35)
Number of observations	7,014	1,699	7,014	7,014	11,488
R <sup>2</sup>	.01	.01	.01	.01	.01

We don't really explain that much. Is this a problem?



**TABLE IV**  
EFFECT OF CABLE TELEVISION ON WOMEN'S STATUS, SARI DATA

Dependent variable:	Pregnant at survey time				
	Beating attitudes preference (1)	Son preference (2)	Autonomy (3)	2001–2003 (4)	1997–2003 (5)
A. Baseline effects of cable					
Explanatory variable					
Village has cable	-.1608** (.073)	-.0882** (.040)	.0260*** (.006)	-.0379*** (.013)	-.0678** (.028)
B. Effects of future cable					
Explanatory variables					
Village has cable	-.1516** (.076)	-.0881** (.039)	.0248*** (.006)	-.0414*** (.013)	-.0762** (.031)
<b>PLACEBO</b> → Cable next year	.0440 (.049)	.0004 (.016)	-.0053 (.004)	-.016 (.011)	-.0253 (.024)
Number of observations	7,014	1,699	7,014	6,959	11,488
R <sup>2</sup>	.01	.01	.01	.01	.01

Similar magnitudes





# Mechanisms

- **Why does it have an effect?**
  - Provides information on birth planning?
  - Change the value of time?
  - Men's leisure time is higher?
  - Or, their pick: Exposure of urban lifestyles
- **We don't really know. More research is needed.**

# External validity and data issues

- Main dataset includes only hh with oldies.
- It is not really rural-urban, it's capital-rural.
- Men were not interviewed, would have helped for the mechanism discussion.

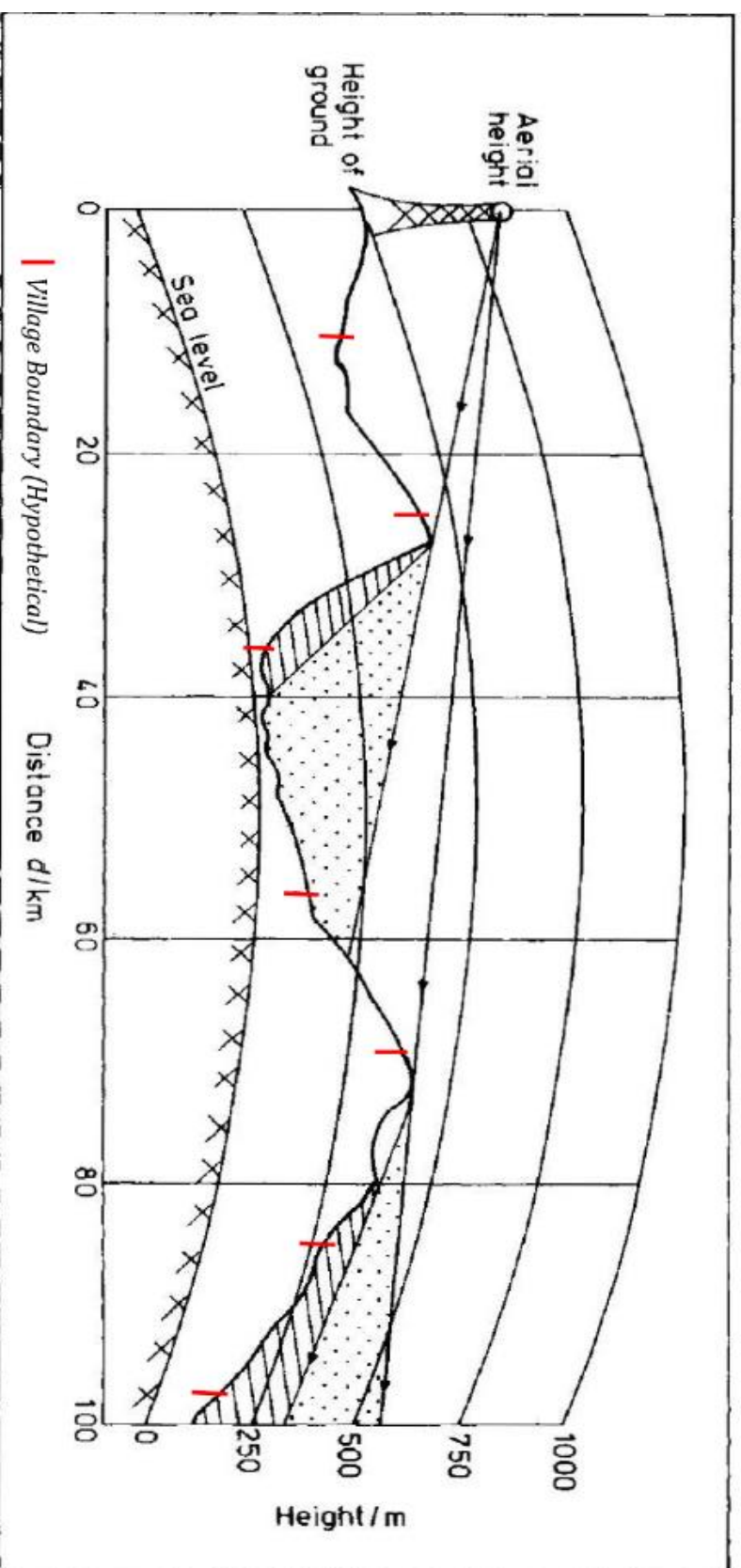
# What do you think?

- Did cable TV have an effect?
- Why did it have an effect?
- Is it policy relevant, should we subsidize cable tv?

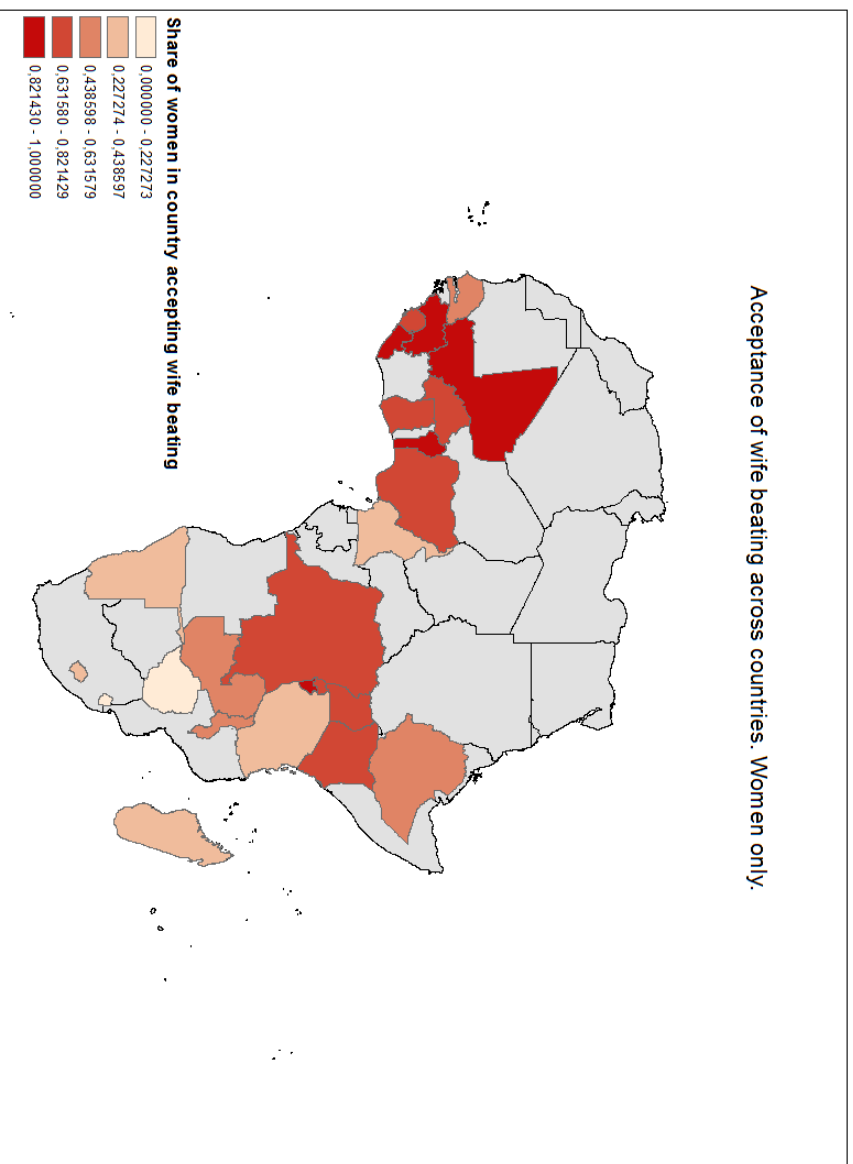
# Could they have done it differently?

- Why not exploit access to electricity and distance to the nearest town?
- Why not compare villages just outside of reach of the cable (Fuzzy RD or more comparable DD)?
- Why not use (plausibly exogenous) geographic factors? E.g. Yanagizawa-Drott 2010.  
“Propaganda and conflict, theory and evidence from the Rwandan genocide”.

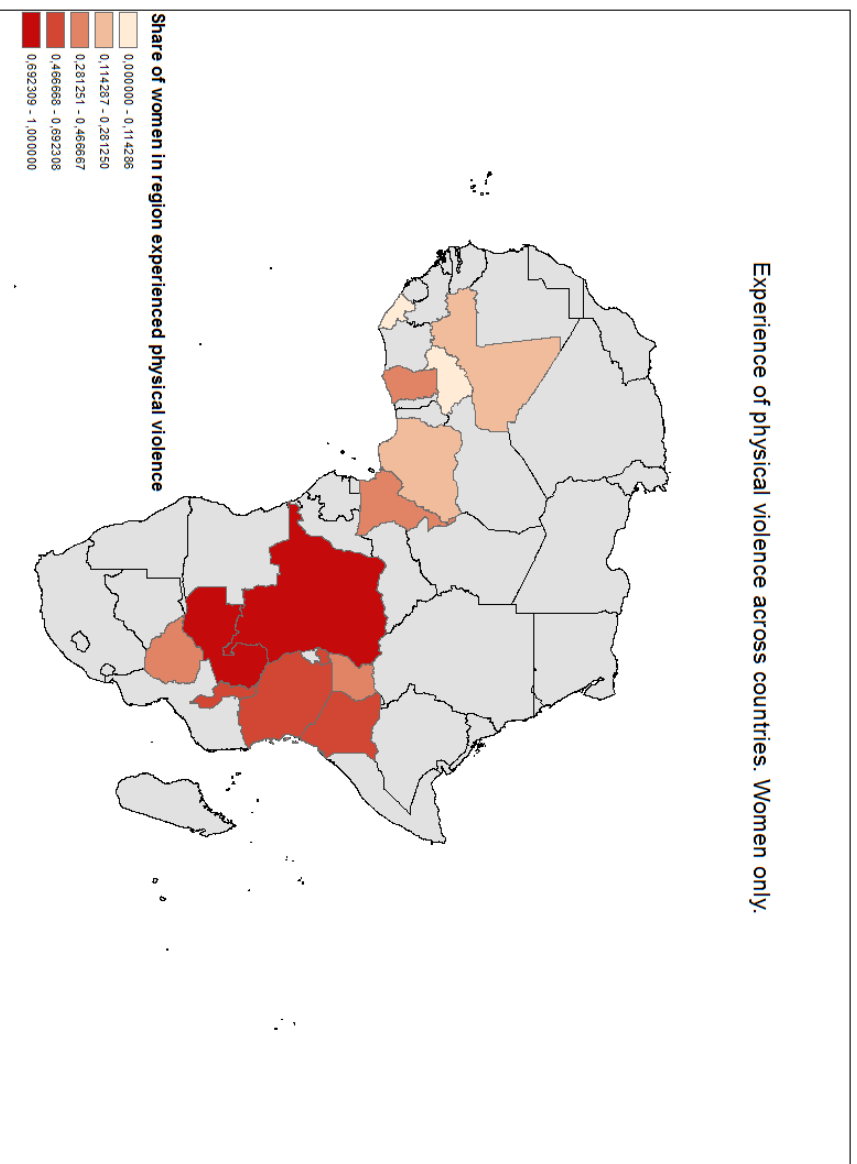
# Exploits The Topography of Rwanda.



# They only look at attitudes



# Correlation with actual beating?



# I ran some regressions

The relationship between attitudes and actual violence. Only women.

VARIABLES	The relationship between attitudes and actual violence. Only women.						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	baseline	controls	country fe.	cluster	cluster	region	region
beat	0.082*** (0.003)	0.079*** (0.003)	0.096*** (0.003)		0.074*** (0.003)		0.082*** (0.003)
urban		0.019*** (0.005)					
age		0.007*** (0.001)					
age2		-0.014*** (0.002)					
working		0.048*** (0.003)					
schoolyears		-0.002*** (0.001)					
husband_schoolyears		-0.003*** (0.000)					
number_children		0.010*** (0.001)					
wealth Quintile		0.002 (0.002)					
christian		-0.008 (0.008)					
muslim		-0.083*** (0.009)					
cluster_beat				0.180*** (0.009)	0.107*** (0.010)		
reg_beat						0.260*** (0.069)	0.178*** (0.017)

Observations	107,164	98,032	107,520	108,087	107,520	107,726	107,164
R-squared	0.136	0.139	0.096	0.094	0.098	0.092	0.099
Region FE	YES	YES	NO	NO	NO	NO	NO
Year FE	YES	YES	YES	YES	YES	YES	YES
Regional trends	YES	YES	NO	NO	NO	NO	NO
Country FE	NO	NO	YES	YES	YES	YES	YES
Country trends	NO	NO	YES	YES	YES	YES	YES

Robust standard errors in parentheses

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



# Appendix

# Duflo 2012

- How is women's empowerment related with economic development?
- Gender inequality is often greater among the poor, both within and across countries.
- **Ok, fine, but we also want to know:**
  - Does development cause empowerment?
  - Does empowerment cause development?
  - If both are true and/or there are other factors affecting both a virtuous cycle could be started.

# Does development cause empowerment?

- Common arguments:
  - Reduces discrimination.
  - Frees up women's time.
  - Changes expectations.
  - Technological changes (maternal health, washing machines etc.).

# Discrimination in everyday life

- Deaton compares  $\pi$ -ratios for boys and girls:

$$\pi_{ij} = \frac{\partial q_i / \partial n_j}{\partial q_i / \partial x} \cdot \frac{n}{x}$$

$q_i$ : consumption of adult good  $i$

$n_j$ : # of kids of gender-age group  $j$

$x$ : total expenditures

$n$ : # of HH members

# Discrimination under extreme circumstances

- Girls are treated differently when ill, e.g. more than twice as likely to die of diarrhea in India.
- The excessive mortality rate of girls, relative to boys, spikes during droughts.
- When the harvest is bad, due to droughts or floods, and food is scarce, the murder of “witches” is twice as likely to occur as in normal years in rural Tanzania.

# Policy implications

- General interventions to reduce poverty may help women more.
- Access to health services (health insurance or free medical care).
- Weather insurance and credit.

Rose (1999) makes these points clear

- In India, the excessive mortality rate of girls, relative to boys, spikes during droughts.
- Households that can buffer their consumption in a bad year do not show a dramatic increase in relative mortality of girls during droughts.

# Summary of general development

- Economic development reduces inequality by relaxing the constraints poor households face, thus reducing the frequency at which they are placed in the position to make life or death choices.
- By reducing the vulnerability of poor households to risk, economic development, even without specifically targeting women, disproportionately improves their well-being.



# Expanding women's opportunities

- Parents have lower aspirations for their daughters than for their sons due to women's fewer opportunities.
- Jensen (2012) did an experiment in India where young women's increased employment increased schooling and weight of girls.

## Maternal mortality also affects expectations

- Maternal mortality is also a source of lower parental investment.
- Since girls are more likely to die young, parents may choose to invest more in boys.
- Reduction in MMR in Sri Lanka led to convergence in education levels.

## But economic growth is not enough

- Sex ratios in China worsened despite growth.
- Women earn less than men in all countries.
- Legal rights are still worse for women and does not seem to follow economic development.
- Huge gender gap in political participation and power.

# Other crucial aspects

- Implicit biases.
- Stereotype threats.
- Attitudes toward risk and competition.
- Informal care.
- Rigid power structures.

# Does empowerment cause development?

- **Common arguments:**
  - Effects of female education.
  - Effects of female decision making in the hh. (Unitary vs. Collective models, see Qian).
  - Productivity effects in agriculture. (Unitary vs. Collective models, see Qian).
  - Effects of female political leaders.

# Effects of female education

- There is a clear correlation between mother's education and e.g. child health.
- **Potential empirical problems?**
- Some *effects* are found on fertility but the claim that increasing women's education, rather than men's, affects child health is shaky.