Economics 270c
Development Economics

Lecture 13 – April 17, 2007

Lecture 1: Global patterns of economic growth and development (1/16)

The political economy of development
Lecture 2: Inequality and growth (1/23)
Lecture 3: Corruption (1/30) – Guest lecture by Ben Olken
Lecture 4: History and institutions (2/6)
Lecture 5: Democracy and development (2/13)
Lecture 6: Ethnic and social divisions (2/20)
Lecture 7: Economic Theories of Conflict (2/27)
Lecture 8: War and Economic Development (3/6)

Human resources
Lecture 9: Human capital and income growth (4/3)
Lecture 10: Increasing human capital (4/10)
Lecture 11: Health and nutrition (3/13)
Lecture 12: The Economics of HIV/AIDS (3/20)

Lecture 13: Labor markets and migration (4/17)

Lecture 14: Environment and development (4/24)
Lecture 15: Social Learning and Technology Adoption (5/1)

- Problem set #2 has been posted online, and it will be due in one week (it is easier than problem set #1!)

- I will pass back graded problem set #1's next week (sorry for the delay)

- Please come by my office hours to discuss your 7-8 page research proposal (due May 8th). Some of you have still not stopped by or have not been able to fit in my office hours

Lecture 13 outline

(1) Labor markets and migration in economic development

(2) Rosenzweig (1988) on labor markets and migration

(3) Hamory and Miguel (2007) and Hanson (2006) on "selective" migration

(4) Munshi and Rosenzweig (2006)

(1) Labor markets and migration

- The nature of people's work changes dramatically during the process of economic development

- The shift from rural agricultural work to urban wage labor is central to the "structural transformation" (Lewis 1954)

(1) Labor markets and migration

- The nature of people's work changes dramatically during the process of economic development
- The shift from rural agricultural work to urban wage labor is central to the "structural transformation" (Lewis 1954)
- How does this process occur? How to workers get from here to there?
- Migration is a central issue in the labor markets of many less developed countries

(1) Labor markets and migration

- Today focus on migration and on urban labor markets

- Stylized facts:
  -- Urban areas are growing rapidly
  -- Urban wages are higher than rural wages
  -- Urban unemployment / underemployment is high

(1) Labor markets and migration

- Today focus on migration and on urban labor markets

- Stylized facts:
  -- Urban areas are growing rapidly
  -- Urban wages are higher than rural wages
  -- Urban unemployment / underemployment is high

- What models can explain these patterns? What do we know empirically about the process of migration and about the functioning of urban labor markets?

(2) Rosenzweig (1988, Handbook chapter)

- Influential review article on rural, urban labor markets

- Written at a time when migration was central to development economics: “a large proportion of the development economics literature is concerned with these questions of the mobility of labor” (p. 744)

4.1. The basic human capital model of migration

The beginning point in modeling the migration decision of agents is the human capital model. In this framework, migration is viewed as an income-augmenting investment in which costs are incurred initially and returns accrue over time. An individual compares the direct costs of migrating with the discounted present value of income gains, if any, from each potential destination; he or she thus finds the maximum of a set of potential migration gains across all possible destinations, where the gain G_j for any destination j is:

$$G_j = \int_0^T e^{(g-r)t}\left(Y_{Dj} - Y_o\right) dt - c_j, \tag{25}$$

c_j is the cost of migration (transportation costs) to destination j, Y_{Dj} is the per-period income the individual would receive by migrating to j, Y_o is per-period origin income, and r is the discount rate. Y_o, Y_D and c may also have time subscripts, may vary with age, although direct migration costs are incurred all at once. If $\max\{G_j\}$ is positive, then the potential migrant will choose to move to that destination with the highest gain.

(2) Rosenzweig (1988, Handbook chapter)

- This human capital migration model has the following predictions:

  -- Younger people have longer time horizons and thus will be more likely to move than older people

  -- Greater costs (distances) c_j between areas will reduce migration flows among them

  -- Greater wage differences between areas / sectors $Y_{Dj} - Y_0$ induce larger flows between them

(2) Rosenzweig (1988, Handbook chapter)

- This human capital migration model has the following predictions:

  -- Younger people have longer time horizons and thus will be more likely to move than older people

  -- Greater costs (distances) c_j between areas will reduce migration flows among them

  -- Greater wage differences between areas / sectors $Y_{Dj} - Y_0$ induce larger flows between them

- How can we account for the fact that flows between two cities, say, are often in both directions? → Heterogeneity across individuals (in wages, returns to skill, network connections, costs, idiosyncratic tastes, job "shocks")

(2) Rosenzweig (1988, Handbook chapter)

- It has long been observed that individuals from a particular “sending” region tend to cluster in the same “receiving” region

(2) Rosenzweig (1988, Handbook chapter)

- It has long been observed that individuals from a particular "sending" region tend to cluster in the same "receiving" region

  -- Plausible explanations to be disentangled:

  (1) individuals from the same region share some unobserved characteristic that yields high returns Y_{Dj} there (e.g., a particular industrial skill, location)

  (2) The presence of others from one's home location reduces the migration cost / job search costs c_j (Carrington 1996 models this in the context of the U.S. Great Migration of African-Americans from the South)

  → persistent migration patterns / path dependence

(2) Rosenzweig (1988, Handbook chapter)

- How to understand high urban unemployment? The classic explanation is by Harris-Todaro (1970 *AER*)

- Let urban labor markets be partially regulated such that the urban wage W_U^* is greater than its free market level

  -- Could be due to union strength, rents provided to government elites with state posts, government fear of urban political discontent

is modified so that the per-period income flow in the urban sector is weighted by the probability of obtaining a job in that sector; G_j becomes G_j'.

$$G_j' = \int_0^T e^{(g-r)t}\left(p(t) Y_{Dj} - Y_o \right) dt - c_j, \tag{26}$$

where $p(t)$ is the destination (urban) employment probability. G_j' is now the expected net return from migration, and is clearly lower than G_j as long as $p(t) < 1$.

Harris and Todaro (1970), based on the model of Todaro (1969), embed the notion of employment risk into a two-sector general equilibrium model of migration, employment and wage determination. In this model, wages are determined competitively (by supply and demand) in the rural sector, but the wage rate in the urban sector is an institutionally set ("politically determined") rigid minimum wage set above the initial rural wage. Employment is a Bernoulli process in which the probability of employment in the urban sector is equal to the number of urban jobs (E_U) divided by the size of the urban labor force or number of job-seekers (N_U). Since all agents are assumed to maximize G' (are risk neutral), and are perfectly mobile, and the rural wage (= marginal product in agriculture) is origin income, the unemployment equilibrium condition is:

$$W_R = W_U(E_U/N_U), \tag{27}$$

(2) Rosenzweig (1988, Handbook chapter)

- Who migrates to urban areas? Selection possible

- Individuals move to exploit wage differences across sectors/regions (Roy 1951):

  Rural income (Y_R) and urban income (Y_U) may depend on heterogeneous individual ability (h_i), and individual migration costs $c_i > 0$

  → Migrate if $Y_U(h_i) - Y_R(h_i) - c_i \geq 0$

(2) Rosenzweig (1988, Handbook chapter)

- Let the rural-urban wage gap at ability level h be denoted

  $g(h_i) \equiv Y_U(h_i) - Y_R(h_i)$

- Migration costs are a function of observed (X_i) and unobserved (e_i) household and individual characteristics

  $c_i = -X_i'b - e_i$

  $\rightarrow$ $Migrate_i = 1\{g(h_i) + X_i'b + e_i \geq 0\}$

(2) Rosenzweig (1988, Handbook chapter)

- Let the rural-urban wage gap at ability level h be denoted

  $g(h_i) \equiv Y_U(h_i) - Y_R(h_i)$

- Migration costs are a function of observed (X_i) and unobserved (e_i) household and individual characteristics

  $c_i = -X_i'b - e_i$

  $\rightarrow$ $Migrate_i = 1\{g(h_i) + X_i'b + e_i \geq 0\}$

- Higher ability people are more likely to migrate if there are greater returns to ability in the urban sector

  $Y_U'(h_i) > Y_R'(h_i)$

(3) Hamory and Miguel (2007)

- We study out-migration among young adults living in a rural district of Western Kenya in 1998

- The most commonly studied measure of "ability" is schooling attainment

- We instead focus on an arguably preferable measure, a pre-migration academic test score, when the individual was in grade 3-7

  -- Consider another aspect of ability, pre-migration health, which was exogenously improved by deworming

(3) Hamory and Miguel (2007)

- Representative sample of adolescents from the Kenya deworming project (Miguel and Kremer 2004)

- Survey data on 5200 young adults collected in 2003-05.
  - Includes panel information on all residences (for a period of > four months) between 1998 and 2005.
  - We focus on the 3100 individuals with 1998 baseline survey data and academic test scores.

(3) Hamory and Miguel (2007)

- Representative sample of adolescents from the Kenya deworming project (Miguel and Kremer 2004)

- Survey data on 5200 young adults collected in 2003-05.
  - Includes panel information on all residences (for a period of > four months) between 1998 and 2005.
  - We focus on the 3100 individuals with 1998 baseline survey data and academic test scores.

- Direct contact with 83.0% of target restricted sample respondents: 81.5% surveyed, 0.7% dead, 0.7% refused

  -- Have residential information on 88.2% of restricted sample (from respondent or relatives), Table 1

Table 1: Summary statistics on sample attrition and residential location

Means		Tracking Wave		Treatment Group			Gender	
	All	1	2	1	2	3	Female	Male
Panel A: Sample attrition, KLPS H-module								
Found (effective tracking rate)[b]	0.830	0.834	0.826	0.823	0.822	0.850	0.817	0.843
Surveyed (effective response rate)	0.815	0.818	0.812	0.809	0.804	0.837	0.800	0.830
Not surveyed, dead	0.007	0.008	0.006	0.009	0.006	0.006	0.007	0.008
Not surveyed, refused	0.007	0.008	0.006	0.005	0.012	0.005	0.010	0.005
Panel B: Residential location information								
Have residential location information	0.882	0.897	0.867	0.862	0.879	0.913	0.871	0.893
Among those with residential location information:								
Residence in Busia district	0.804	0.815	0.792	0.790	0.812	0.814	0.773	0.833
Residence in districts neighboring Busia district[a]	0.046	0.042	0.049	0.048	0.037	0.051	0.064	0.028
Residence outside of Busia and neighboring districts	0.150	0.142	0.159	0.161	0.151	0.135	0.163	0.139
In Nairobi	0.057	0.045	0.071	0.056	0.064	0.053	0.064	0.052
In Mombasa	0.029	0.032	0.026	0.040	0.028	0.017	0.036	0.023
In Nakuru	0.012	0.015	0.009	0.018	0.006	0.011	0.011	0.013
In Kisumu	0.006	0.007	0.005	0.004	0.007	0.008	0.006	0.005
Number of Observations	3333	1634	1699	1170	1088	1075	1641	1692

Table 5: Reasons for migration, among individuals who migrated out of local areas

		Tracking Wave		Gender		1998 Grade Group	
	All	1	2	Males	Females	3-4	5-7
Reasons for Migration[a]							
Schooling	0.367	0.332	0.399	0.405	0.329	0.364	0.369
To look for work	0.318	0.346	0.293	0.502	0.133	0.255	0.345
To start a new job	0.058	0.065	0.052	0.050	0.067	0.061	0.058
Other training	0.028	0.017	0.038	0.016	0.041	0.040	0.023
Parents moved	0.109	0.121	0.097	0.124	0.094	0.098	0.113
Marriage	0.092	0.094	0.090	0.007	0.177	0.065	0.104
Visiting	0.062	0.034	0.087	0.040	0.083	0.049	0.067
Return to permanent home	0.036	0.032	0.039	0.050	0.022	0.090	0.013
Parent/guardian died	0.011	0.007	0.015	0.000	0.023	0.025	0.005
Other	0.201	0.213	0.190	0.114	0.288	0.213	0.196
Number of observations[b]	345	160	185	174	171	84	261

Table 5: Reasons for migration, among individuals who migrated out of local areas

		Tracking Wave		Gender		1998 Grade Group	
	All	1	2	Males	Females	3-4	5-7
Reasons for Migration[a]							
Schooling	0.367	0.332	0.399	0.405	0.329	0.364	0.369
To look for work	0.318	0.346	0.293	0.502	0.133	0.255	0.345
To start a new job	0.058	0.065	0.052	0.050	0.067	0.061	0.058
Other training	0.028	0.017	0.038	0.016	0.041	0.040	0.023
Parents moved	0.109	0.121	0.097	0.124	0.094	0.098	0.113
Marriage	0.092	0.094	0.090	0.007	0.177	0.065	0.104
Visiting	0.062	0.034	0.087	0.040	0.083	0.049	0.067
Return to permanent home	0.036	0.032	0.039	0.050	0.022	0.090	0.013
Parent/guardian died	0.011	0.007	0.015	0.000	0.023	0.025	0.005
Other	0.201	0.213	0.190	0.114	0.288	0.213	0.196
Number of observations[b]	345	160	185	174	171	84	261

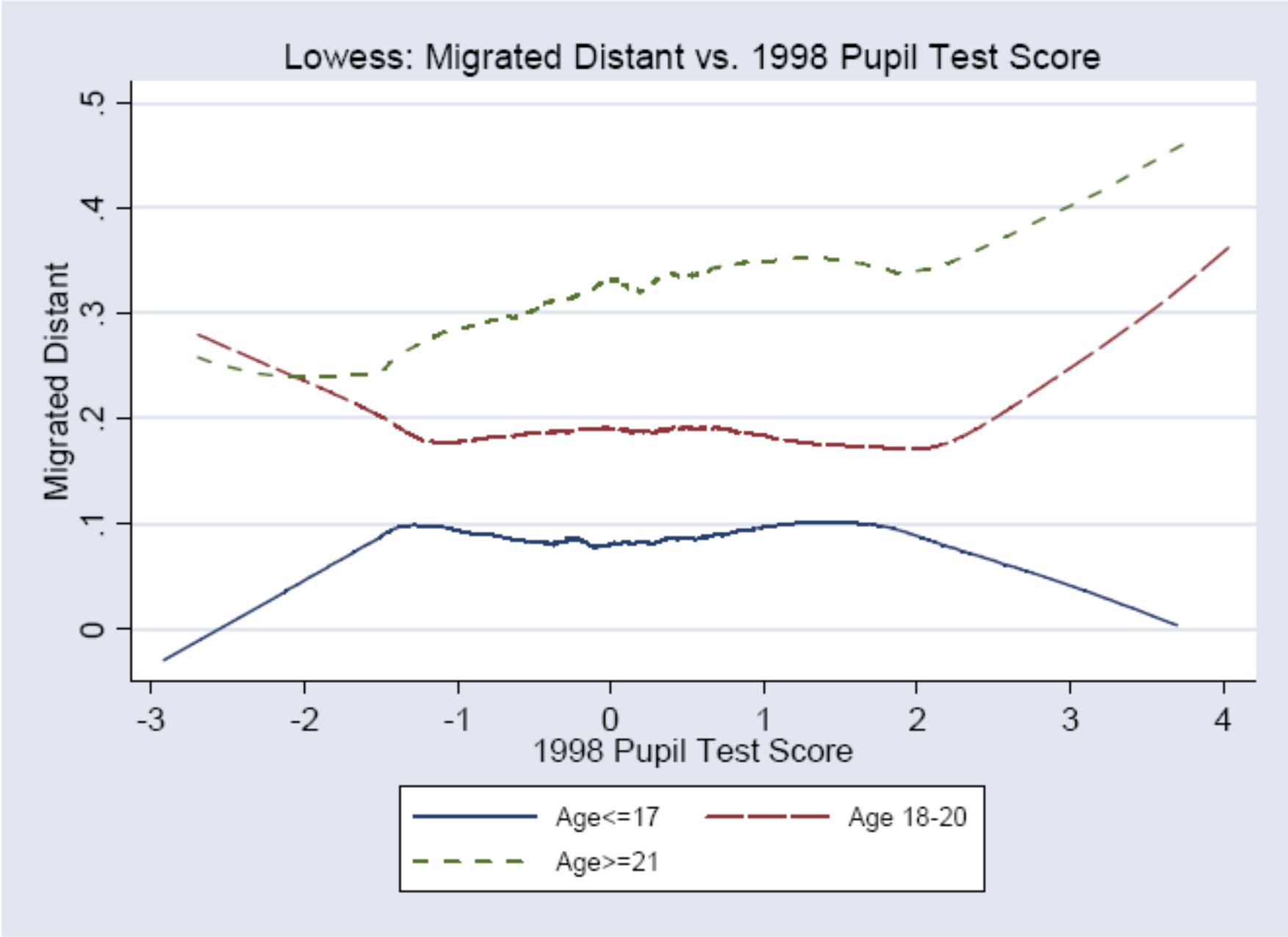
Table 7: Impact of deworming treatment and test score on migration

	Dependent Variable: Indicator for Moved Out of Local Areas		
	(1)	(2)	(3)
Years assigned deworming	0.018	0.019	0.011
	[0.009]**	[0.009]**	[0.011]
Pupil test score (1998)	0.017	0.017	-0.028
	[0.010]*	[0.010]*	[0.022]
Years assigned deworming * Pupil test score			0.013
			[0.007]*
Years assigned deworming * Female			0.012
			[0.018]
Years assigned deworming * Age at tracking			0.003
			[0.004]
Pupil test score * Female			0.007
			[0.024]
Pupil test score * Age at tracking			0.013
			[0.006]**
Average school participation, 1998		-0.025	
		[0.052]	
Age at tracking, demeaned	0.033	0.033	0.026
	[0.008]***	[0.008]***	[0.014]*
Controls for gender, grade, wave	Yes	Yes	Yes
Observations	3089	3089	3089
Mean [std dev] of dependent variable	0.224 [0.417]	0.224 [0.417]	0.224 [0.417]

Table 8: Impact of test score on migration, fixed effect specifications

	Dependent Variable: Indicator for Moved Out of Local Areas		
	(1)	(2)	(3)
Pupil test score (1998)	0.027	0.027	-0.013
	[0.011]**	[0.011]**	[0.023]
Pupil Test Score * Years assigned deworming			0.012
			[0.007]*
Pupil test score * Female			0.01
			[0.026]
Pupil test score * Age at tracking			0.012
			[0.006]**
Average school participation, 1998		-0.05	
		[0.052]	
Age at tracking, demeaned	0.032	0.032	0.03
	[0.008]***	[0.008]***	[0.015]**
Controls for gender, grade, wave	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes
Observations	3089	3089	3089
R-squared	0.117	0.117	0.121
Mean [std dev] of dependent variable	0.224 [0.417]	0.224 [0.417]	0.224 [0.417]

Figure 5: Lowess Plot of Moving Out of Local Areas on Test Score



(3) Hamory and Miguel (2007)

- Higher ability young adults are more likely to migrate
  - The use of cognitive test scores, as well as the randomized health intervention, to measure ability sets this analysis apart from previous work

(3) Hamory and Miguel (2007)

- Higher ability young adults are more likely to migrate
  - The use of cognitive test scores, as well as the randomized health intervention, to measure ability sets this analysis apart from previous work

- These findings may or may not generalize beyond East Africa. If migration depends on the relative returns to skill across sectors, then the extent of technological sophistication in agriculture and the types of urban sector jobs will be critical in determining relative returns

- Observed rural-urban average wage differences may in part reflect selection, and may not apply for non-migrants

(3) Hamory and Miguel (2007)

- How selected are migrants in other settings?
- Most papers focus on years of schooling

- The largest literature is on Mexico-U.S. migration

  -- Hanson (2006, *JEP*) finds evidence that most immigrants are drawn from the middle of the Mexican educational distribution, less in both left and right tails

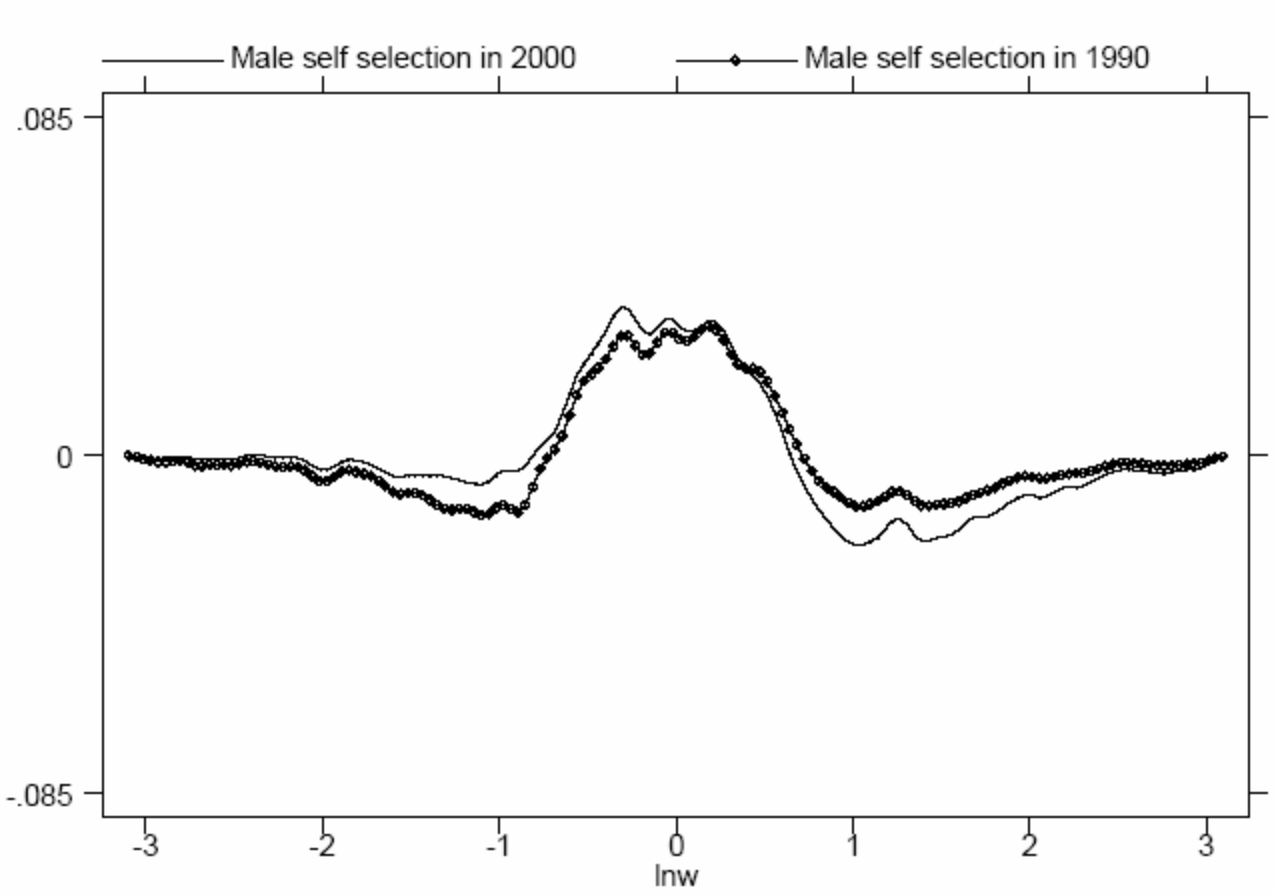


Figure 10: Immigrant (counterfactual) – Resident (actual) Wage Densities, 1990 and 2000
(counterfactual density for Mexican immigrants minus actual density for Mexican residents)

(3) Hamory and Miguel (2007)

- How selected are migrants in other settings?
- Most papers focus on years of schooling

- The largest literature is on Mexico-U.S. migration

  -- Hanson (2006, *JEP*) finds evidence that most immigrants are drawn from the middle of the Mexican educational distribution, less in both left and right tails

  -- This empirical "inverted-U" shape is the opposite of the theory predictions of Banerjee and Newman (1998)

- Inequality in the returns to skill in both Mexico and the U.S. matters (Borjas 1987), as does potentially unequal access to credit to cover the fixed costs of moving

(4) Munshi and Rosenzweig (2006)

- Movement across economic sectors (e.g., from traditional trades into modern industry) can be studied using many of the same tools as those used by geographic migration

- The costs to mobility can be interpreted broadly to include social and psychological costs to change

(4) Munshi and Rosenzweig (2006)

- Movement across economic sectors (e.g., from traditional trades into modern industry) can be studied using many of the same tools as those used by geographic migration

- The costs to mobility can be interpreted broadly to include social and psychological costs to change

- This paper embeds the model within the Indian caste system. If these mobility costs c_j vary with subcaste (occupation) and by gender, then we could expect to see different evolutions of sectoral mobility

(4) Munshi and Rosenzweig (2006)

- Indian males have much higher formal labor market participation than females, and much greater reliance on personal / network referrals for jobs

  -- These referral effects are particularly strong for working caste males, who get blue collar jobs this way

(4) Munshi and Rosenzweig (2006)

- Indian males have much higher formal labor market participation than females, and much greater reliance on personal / network referrals for jobs

  -- These referral effects are particularly strong for working caste males, who get blue collar jobs this way

- In the 1990s the returns to English language skills increased following major economic reforms and "opening" to international trade and investment

- Study how patterns of English language schooling (versus Marathi schools) evolve in Bombay, across caste and gender

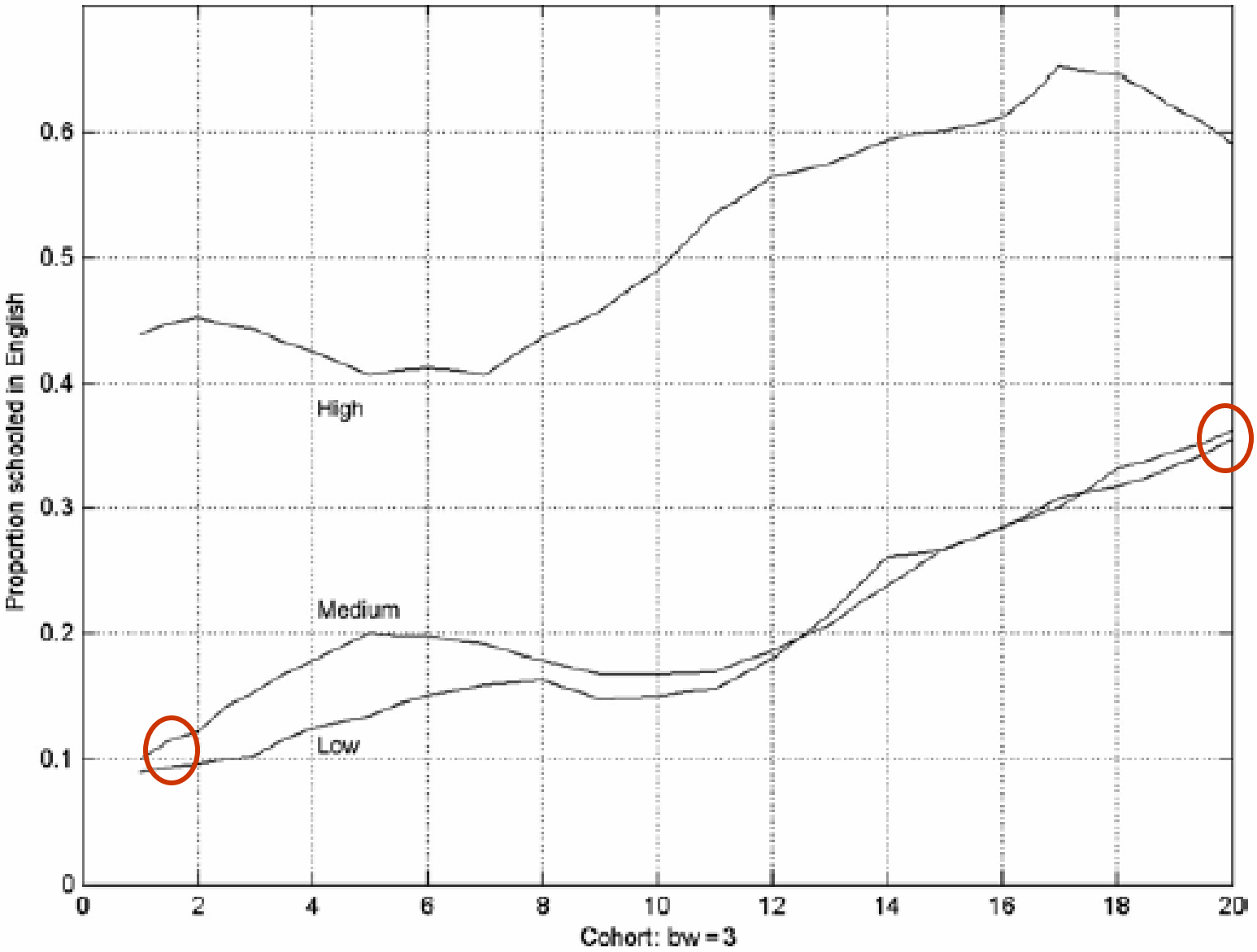


FIGURE 3. ENGLISH SCHOOLING: NET PARENTAL EDUCATION EFFECT—BOYS

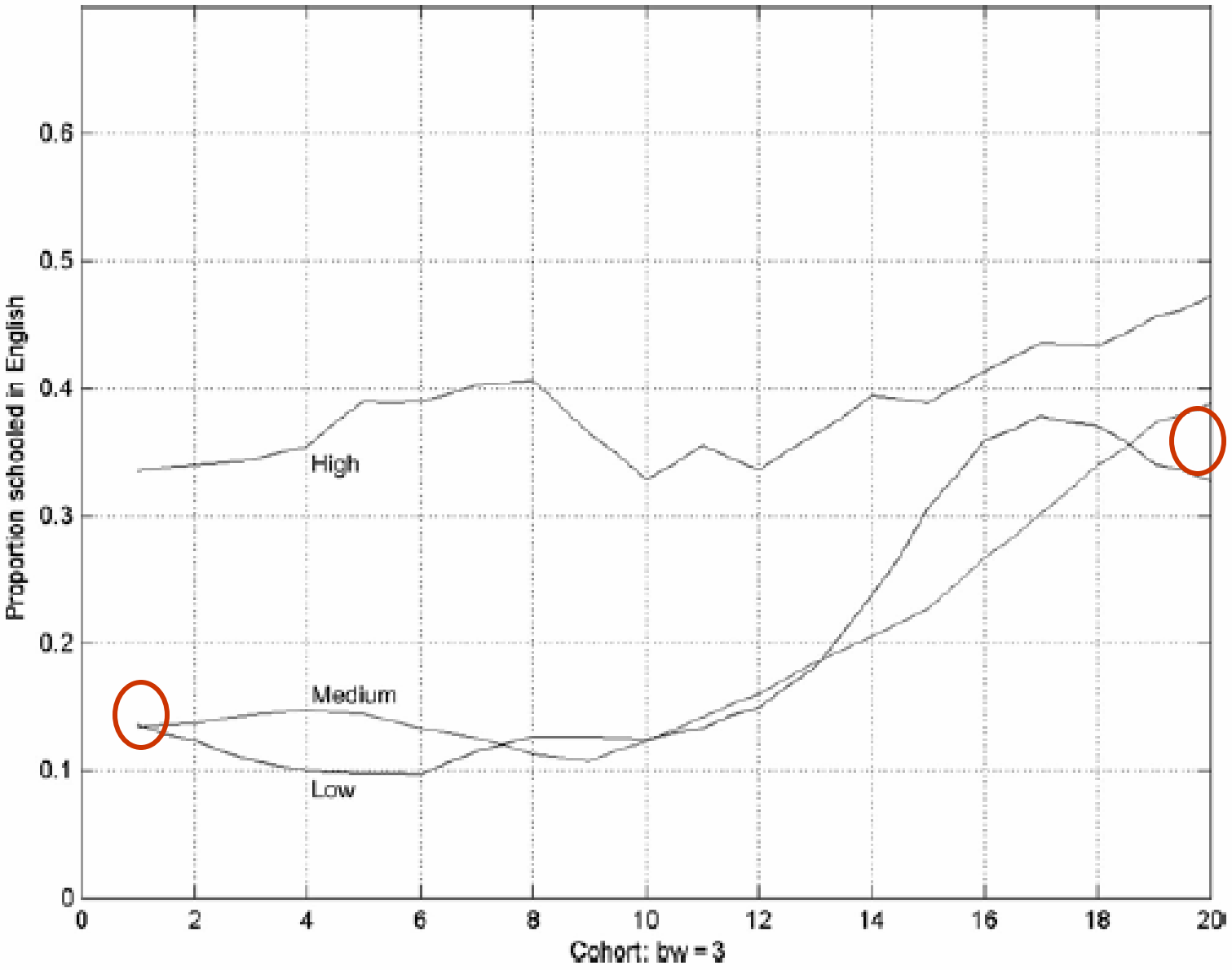


FIGURE 4. ENGLISH SCHOOLING: NET PARENTAL EDUCATION EFFECT—GIRLS

(4) Munshi and Rosenzweig (2006)

- Alternative explanation: the one group that is not showing increased enrollment in English medium schools are the high caste girls. Perhaps there are stronger social norms against their participation in the formal sector – is this the cause?

(4) Munshi and Rosenzweig (2006)

- Alternative explanation: the one group that is not showing increased enrollment in English medium schools are the high caste girls. Perhaps there are stronger social norms against their participation in the formal sector – is this the cause?

- The dataset consists of students who graduated from 28 local schools (grade 10) over the past ten years, plus current students in grades 1-10

  -- Issues of selective graduation; selective migration / school attendance elsewhere; selective attrition (only 40%, 8,092 of 20,596, students' families are in the area!)

(4) Munshi and Rosenzweig (2006)

- What is the take-away message of this paper?

- How much do the results generalize to other contexts? (without a caste system)

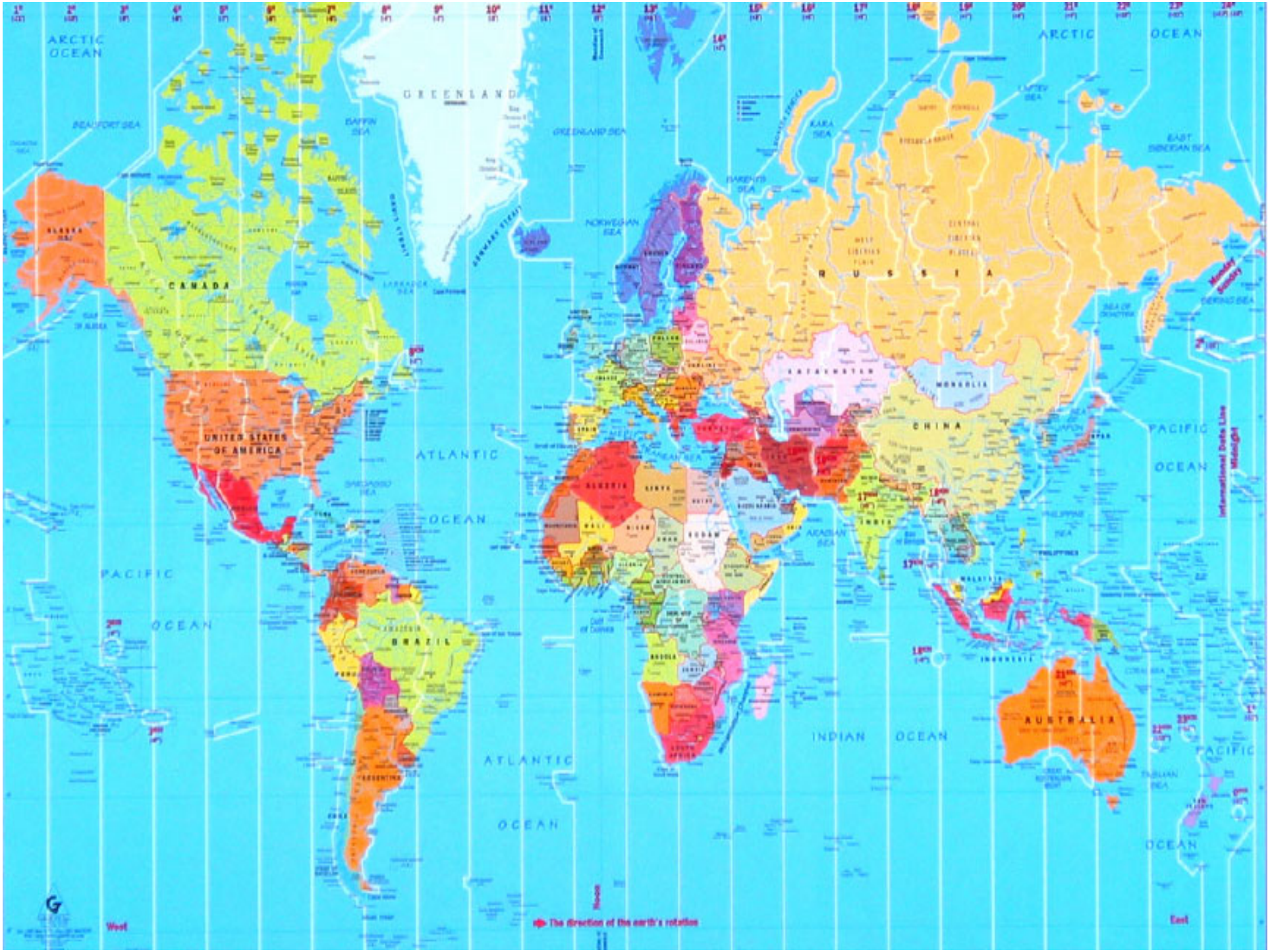
Whiteboard #1

Whiteboard #2

Whiteboard #3

Whiteboard #4

Whiteboard #5


ARCTIC OCEAN
GREENLAND
BEAUFORT SEA
BAFFIN SEA
GREENLAND SEA
NORWEGIAN SEA
BARENTS SEA
KARA SEA
LAPTEV SEA
EAST SIBERIAN SEA
CANADA
RUSSIA
KAZAKHSTAN
MONGOLIA
CHINA
UNITED STATES OF AMERICA
ATLANTIC OCEAN
PACIFIC OCEAN
BRAZIL
INDIA
ARABIAN SEA
AUSTRALIA
INDIAN OCEAN
International Date Line
Midnight
West
East
The direction of the earth's rotation