fondazione RODOLFO DEBENEDETTI

Men-Women Gap: Discrimination, Family and Field of Study

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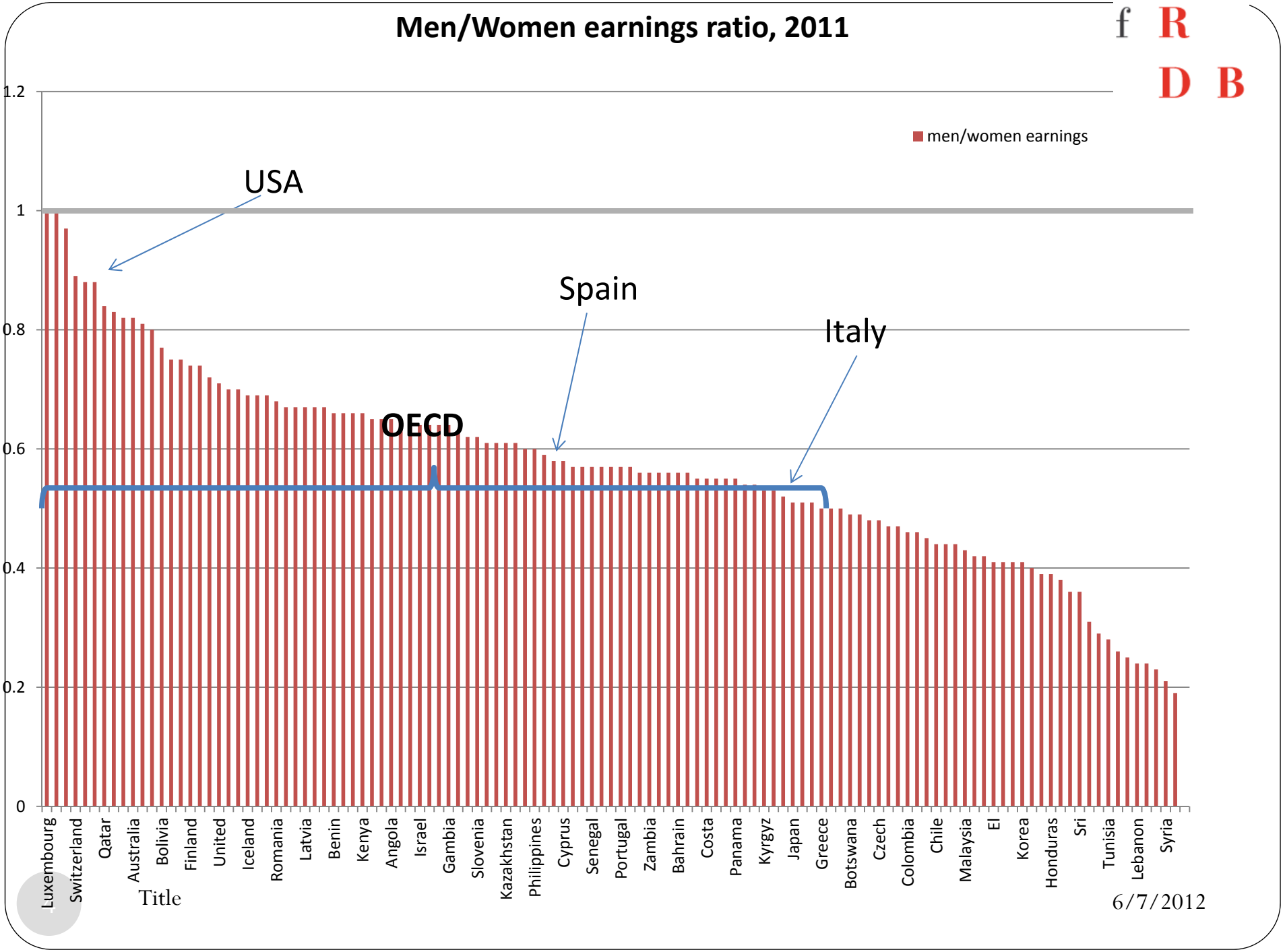
Gender Gap in the Labor Market

- Discrimination/Prejudice
- Different role in the family and in raising children (affects the early career)
- Different skills driving different choices (Communication/Math)
- Different preferences driving different choices (of study and occupation)

The Gender Gap is a pervasive Phenomenon

- In most countries women exhibit lower wage, income, and labor-force participation than men as of 2011.
- There are large differences in the Gap across countries.
- We chose USA (low gap), Spain (intermediate gap), Italy (large gap among OECD).


Men/Women earnings ratio, 2011
men/women earnings
USA
Spain
Italy
OECD
1.2
1
0.8
0.6
0.4
0.2
0
Luxembourg
Switzerland
Qatar
Australia
Bolivia
Finland
United
Iceland
Romania
Latvia
Benin
Kenya
Angola
Israel
Gambia
Slovenia
Kazakhstan
Philippines
Cyprus
Senegal
Portugal
Zambia
Bahrain
Costa
Panama
Kyrgyz
Japan
Greece
Botswana
Czech
Colombia
Chile
Malaysia
El
Korea
Honduras
Sri
Tunisia
Lebanon
Syria
Title
6/7/2012

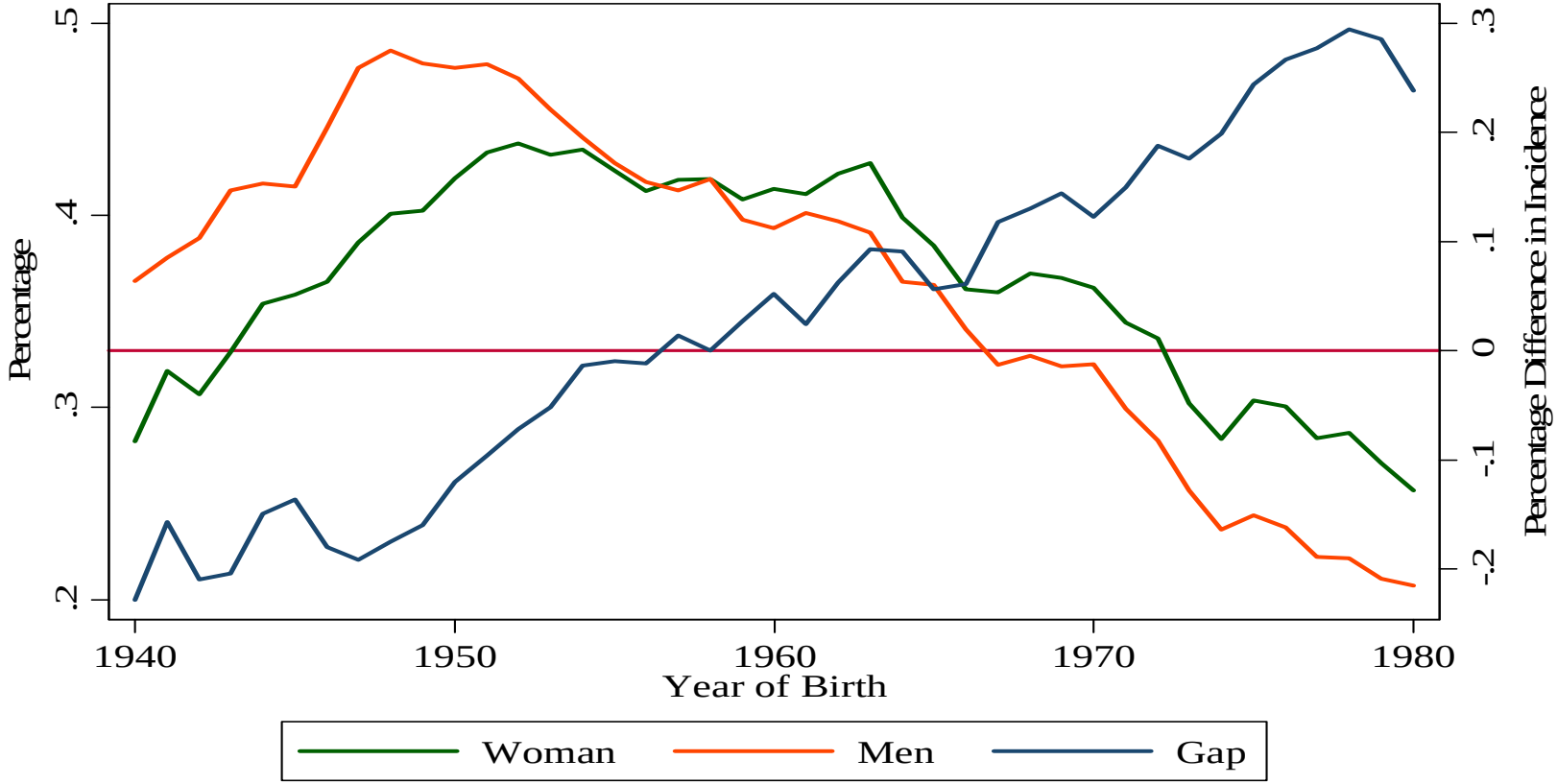
We analyze different components of the Gap

- Focus on college Educated
  - Women are more educated than men on average.
  - College educated are the engine of innovation and growth.
  - USA: Role of prejudice/discrimination vs. productivity/frictions
  - Spain: Role of family and children on early career.
  - Italy: Role of the choice of college major, skills, preferences and social pressures.

Gender Gap in the U.S.:

- Women acquire more college education than men since 1959

Figure 1b: Gender Gap in Percentage of College Graduates by Cohort



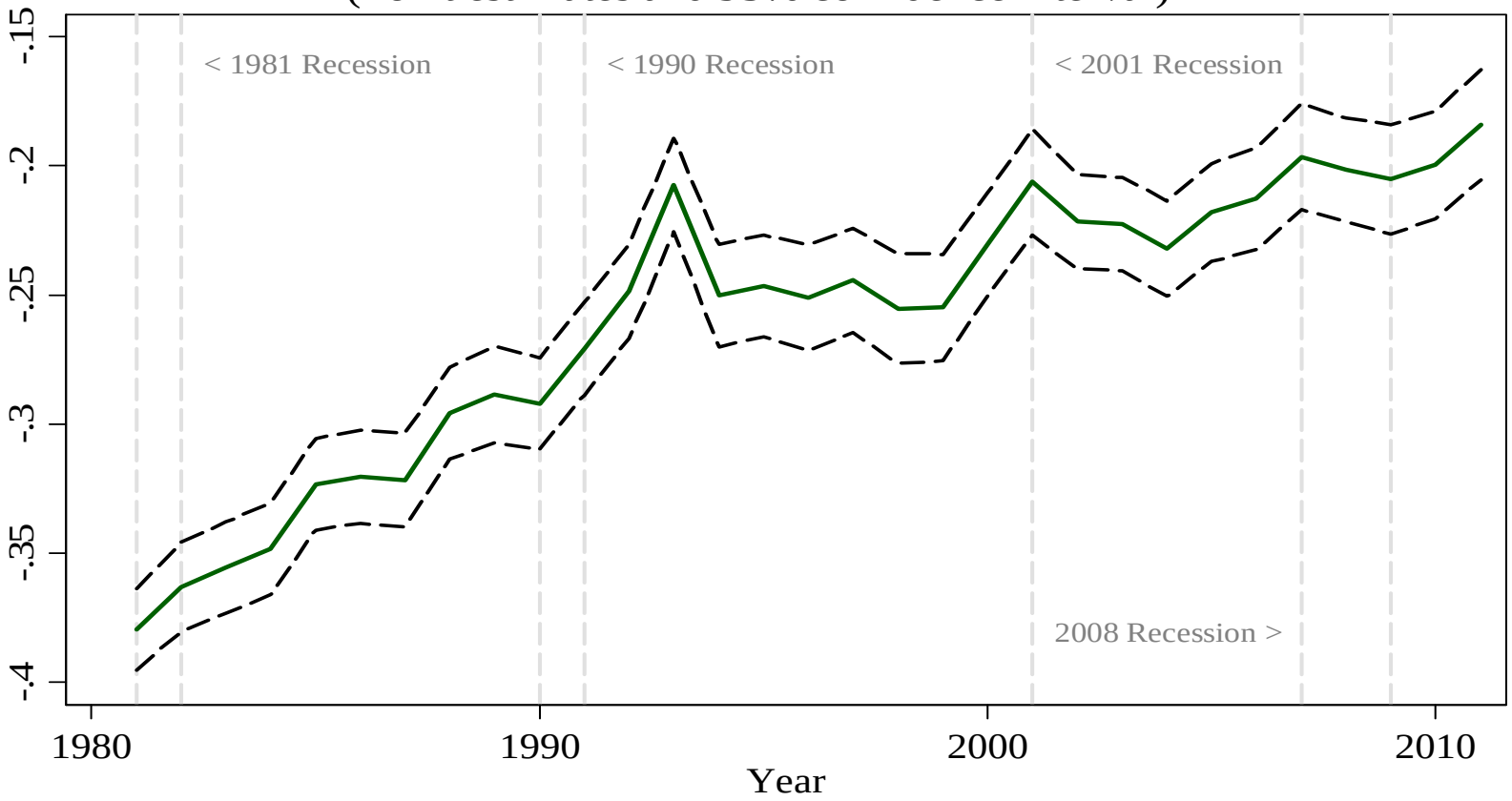
Gender Gaps in the U.S.: Descriptive Evidence – Labor Supply

- Women participate less than men to employment and work fewer hours.
- The wage gap still exists but it has decreased substantially and is much smaller than in other countries.
- Among highly educated the gap is due to smaller access of women to top positions

Gender Gaps in the U.S.: Descriptive Evidence – Wages

Figure 11a: Gender Earnings Differential Over Time, Unconditional Case

(Point estimates and 95% confidence interval)

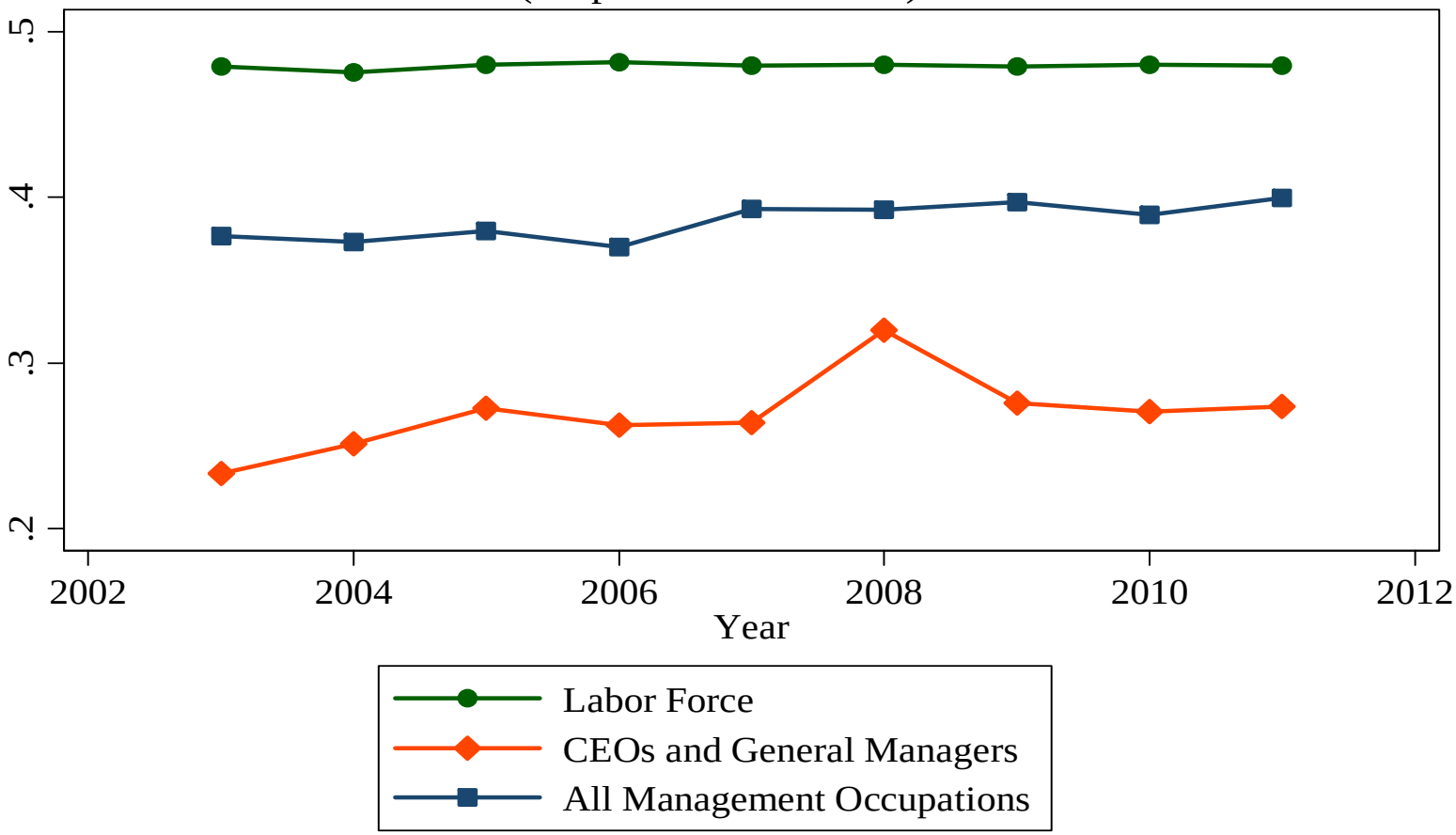


Note: Dashed Lines represent 95% confidence interval.

Gender Gap in Top Positions

Figure 12a: Gender Composition of Managerial Occupations

(Proportion of Women)



Gender Gaps in the U.S.: The Impact of Employer's Prejudice

- We focus on three determinants:
  - Productivity differences;
  - Employers' prejudice;
  - Search frictions.

- Prejudice is modeled as a loss of surplus for the employer from hiring women. Hence they will pay them less and/or hire fewer.

- The fact that some employer are prejudiced lower the outside option and bargaining power of all women and decreases their wages even with non-prejudiced employers.

Key data to identify prejudice from productivity

- If men and women have the same type of distribution of productivity across them (even with different average) and there is wage below which they will not work (reservation wage), then the actual distribution of wages of men and women should be similar.

- But it is not. This is because there is a concentration of women at lower than modal wages. From this concentration we can derive the percentage of prejudiced employers and the scale of prejudice.

Effects of Prejudice

- Once we have identified the share of prejudiced employers and the intensity of their prejudice we can do some experiments

- 1) What would be the wage gap eliminating the other differences (productivity and labor market conditions) only due to prejudice?

The Impact of Employer's Prejudice: Results

- Prejudice has a significant impact in explaining the wage gap but the impact is decreasing over time and it accounts for 30-35% of the gap as of 2005.

- For Master and PhD however prejudice seems more significant than for college educated. It also increased between 1995 and 2005

The Impact of Employer's Prejudice on wage gap 2005

Education:	Ph.D. and MA	College	High School
Wage gap due to prejudice only	12%	7%	7%
Actual wage gap	28%	22%	22%

Impact of Education

- High education does not allow to "escape" prejudice. Glass ceiling.
- Consistently with the results The "welfare return" of education was **lower for women than for men** in 2005.
- Without Prejudiced employers, the welfare returns to education between men and women would be the **same.**

Impact of Anti-Discrimination Policies

- The results of our policy Experiments show:
  - The *Equal Pay* (mandate same pay for men and women of same productivity) policy redistributes welfare from men to women but it is not able to fully close the gender gap.

  - The *Affirmative Action (transfer to employer for each woman hired)* policy has a smaller impact on closing the gap but it is more likely to generate net welfare gains because it distorts less the hiring decisions.

The role of Family in the Gender Gap: Evidence from Spain

1. Compare male and female behavior in labor supply and in performance along the life cycle and for different birth cohorts

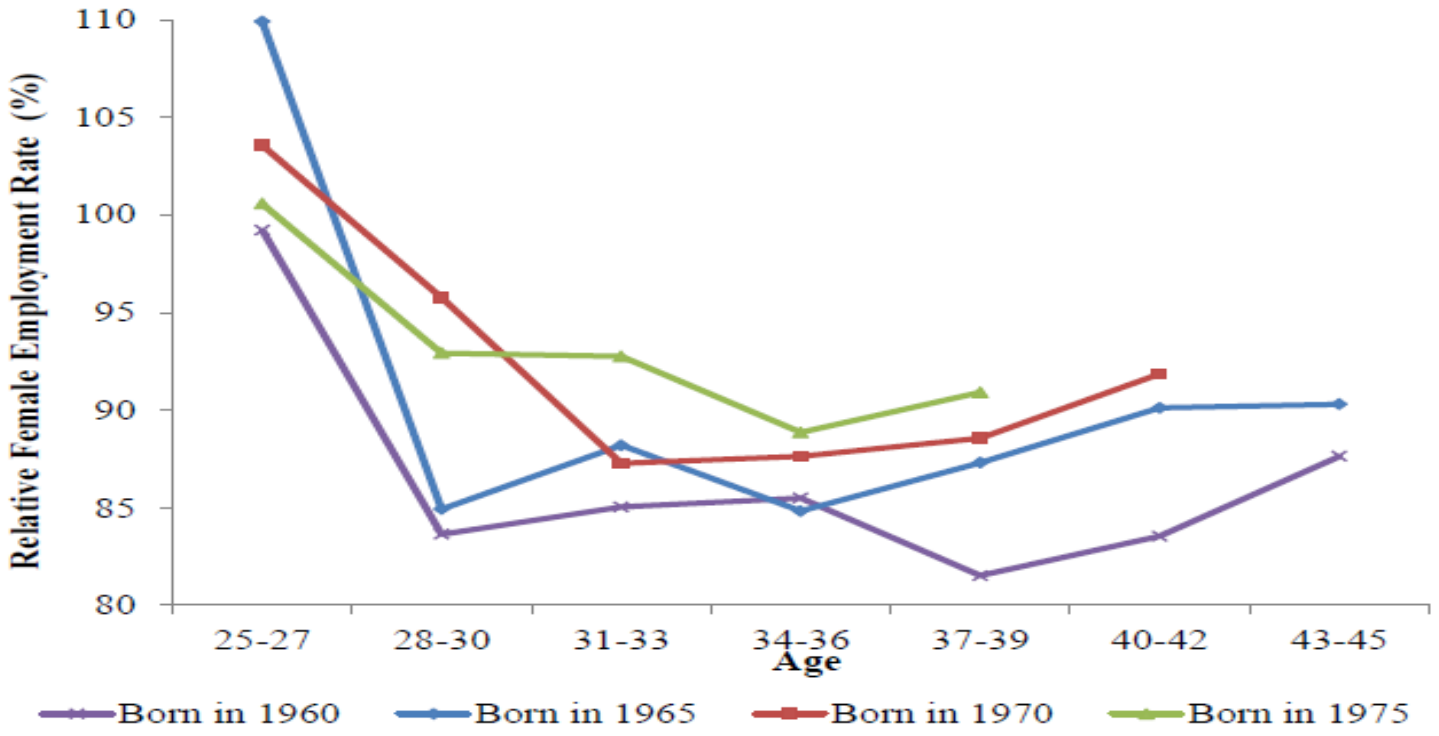
2. Estimate the impact of having children for males and females on labor market decisions (labor supply) and outcomes (wages)

Did it change between 1994 and 2008?

Descriptive Evidence – Gaps along the Life Cycle

Labor Supply (extensive) - ***Employment Rates***

Figure 14 – Life Cycle Relative Female Employment Rates (%) – College Women/Men

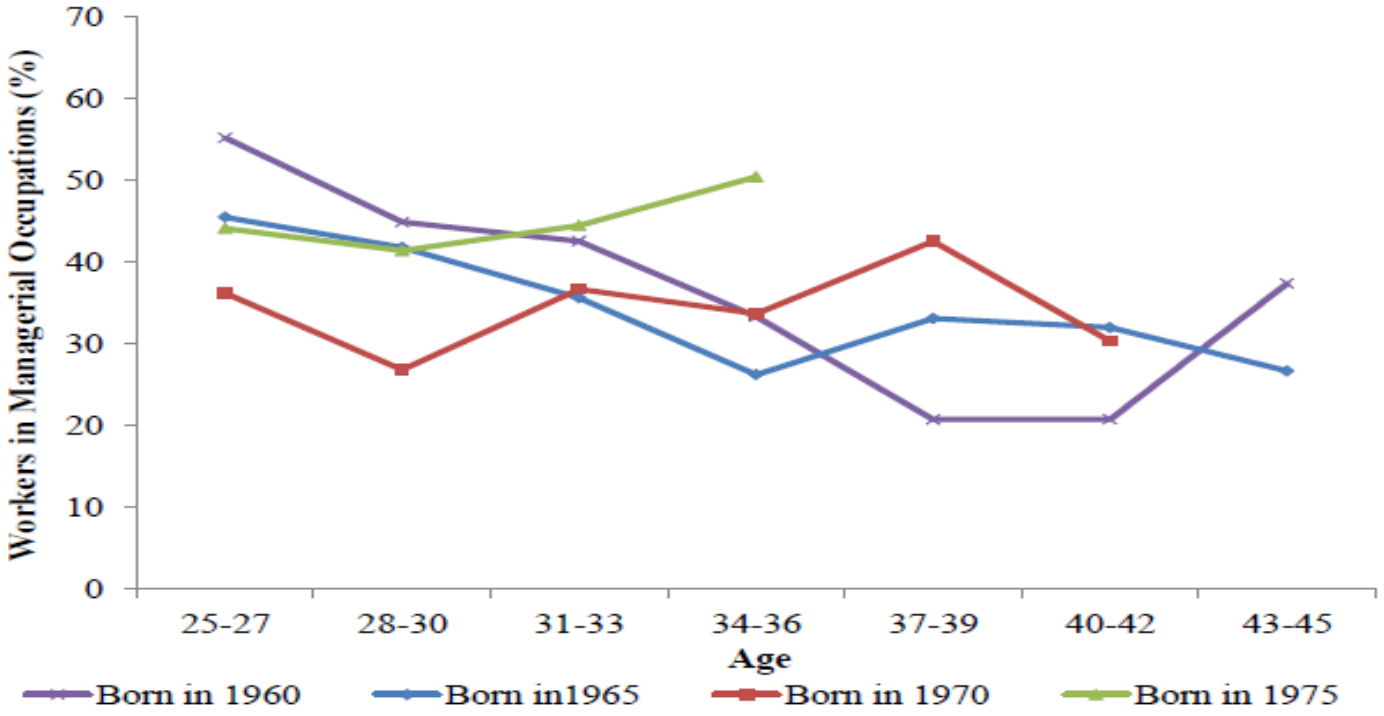


College female employment rates higher than males' for very young ages. By age 30 employment gender gap of 15% for the oldest cohorts and 7% for the youngest one. By the 40s, employment gap falls but parity in employment rates never reached.

Descriptive Evidence (II) - Gaps along the life cycle

Performance – Incidence in Top Jobs

Figure 18 – Life Cycle Relative Incidence of Females Working as Managers – College Women/Men



Although the absolute numbers are low, clear decrease in the relative incidence of females along the life cycle. Furthermore, very similar pattern across birth cohorts.

The Impact of Children in Gender Gaps on Labor Supply & Labor Performance

- Data: Spanish data from the European Household Panel (1994) and the 2008 wave of the Spanish data of the European Survey of Living Conditions (EUSILC) – (Highly comparable 14 years after).

- Sample: individuals between **25-45** years of age, when parenting affects labor choices more strongly and to those who have achieved the highest level of education (tertiary).

Gaps in Labour Supply and in Performance: 1994, 2008

Table 1. Labor Market Statistics of College Men and Women Age 25-45 in Spain 1994-2008 (Women-Men)

	Employment Rates		Part-Time Rates		Managers incidence		Log Hourly Wages	
	1994	**2008**	**1994**	**2008**	**1994**	**2008**	**1994**	**2008**
Gender Gap All	-24%	-6%	10%	12%	-5%	-2%	-6%	-12%
Gender Gap no child	-11%	-1%	12%	8%	-3%	-0%	10%	-11%
Gender Gap children	**-30%**	**-14%**	**9%**	**18%**	-7%	-5%	-13%	-13%

Estimation of the Impact of Children in Gender Gaps

Sample: 25-45 years, college educated.

Children Variable: Having Children (a dummy for having children)

- We estimate the Probability of Working versus Non-Working, Part-Time vs. Full-Time and Top Jobs vs. any other job

- There is an issue of omitted variables and possibly endogeneity. *Instrument: Fraction of women with children by region, age and marital status*.

3. For Wages, standard IV estimation of Log Hourly Wages – The same instrument as above.

Estimation of the Impact of Children on:

	Employment Rates		Part Time Rates		Incidence in Top Jobs		Log Hourly Wages	
	1994	2008	1994	2008	1994	2008	1994	2008
Female	-0.065 (0.064)	0.019 (0.019)	0.139** (0.060)	0.088*** (0.020)	-0.007 (0.041)	-0.007 (0.011)	0.118 (0.084)	**-0.064*** (0.022)**
Having Children	0.116 (0.082)	0.081** (0.045)	0.074 (0.096)	-0.086** (0.042)	0.044 (0.040)	0.045** (0.017)	0.083 (0.084)	0.228*** (0.033)
Female* Children	**-0.221** (0.088)**	**-0.257*** (0.043)**	-0.060 (0.080)	**0.129*** (0.047)**	-0.098 (0.058)	-0.028 (0.017)	**-0.232*** (0.097)**	-0.042 (0.038)

Also included: In ER Age, Age squared and regional fixed effects. In the rest, also controls for years of tenure in the actual job, industry dummies and occupations. Individual sampling weights are used in all estimations.

Interpretation of Results

- Very significant impact of children on Labor Supply of women– roughly stable between 1994 and 2008.
- In 1994 women were using part-time, independently of having children.
- By 2008, more women with children use part-time and they do not suffer of a family-specific wage gap.

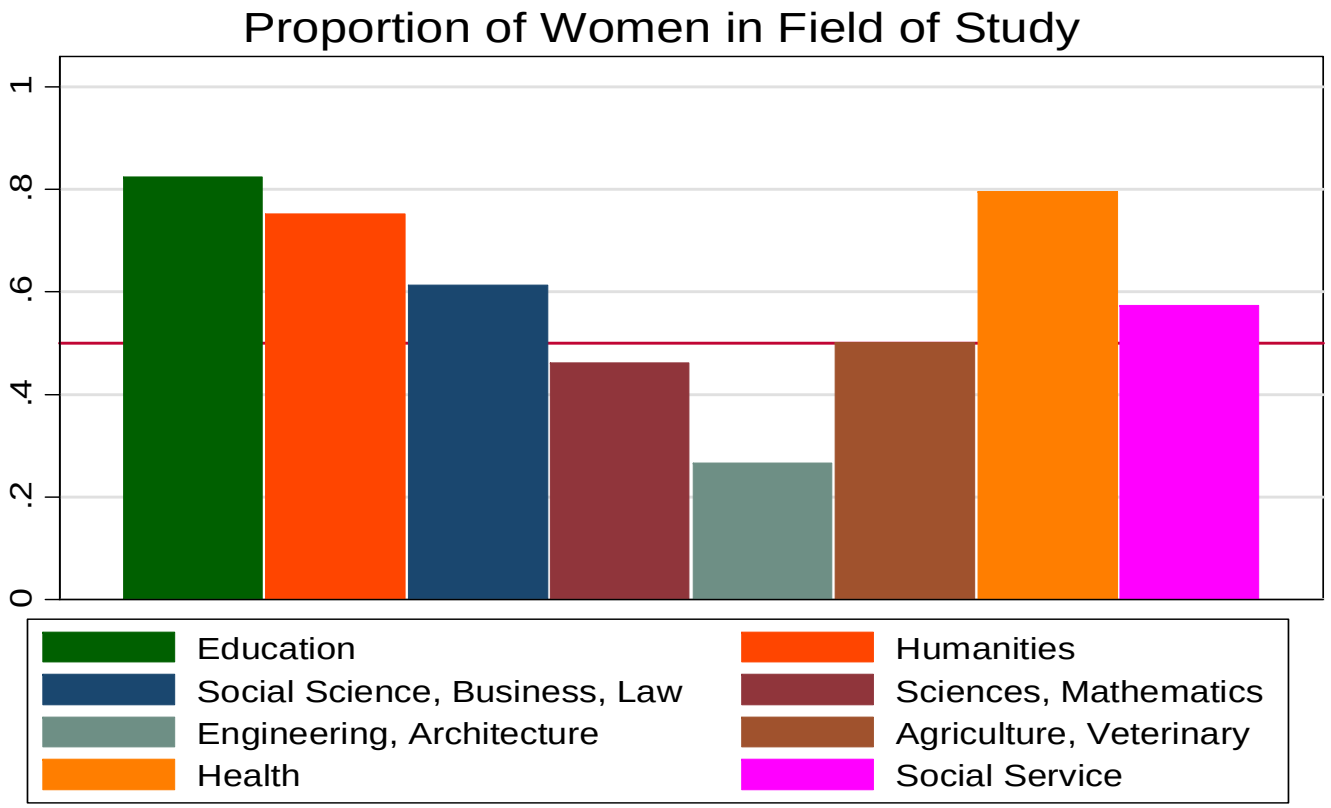
Choice of College major and income gap, in Italy

- Quantifying the **importance of the choice of University major in determining the gender gap** in labor market outcomes for 20-45 year old highly educated Italians.

- Determinants?
  - **Academic Ability?**
  - **Non academic skills** (competitiveness, social interactions)
  - **Family/Marriage Choice?**
  - **Social pressure, cultural norms** (effect of peer or teacher pressure on men/women)

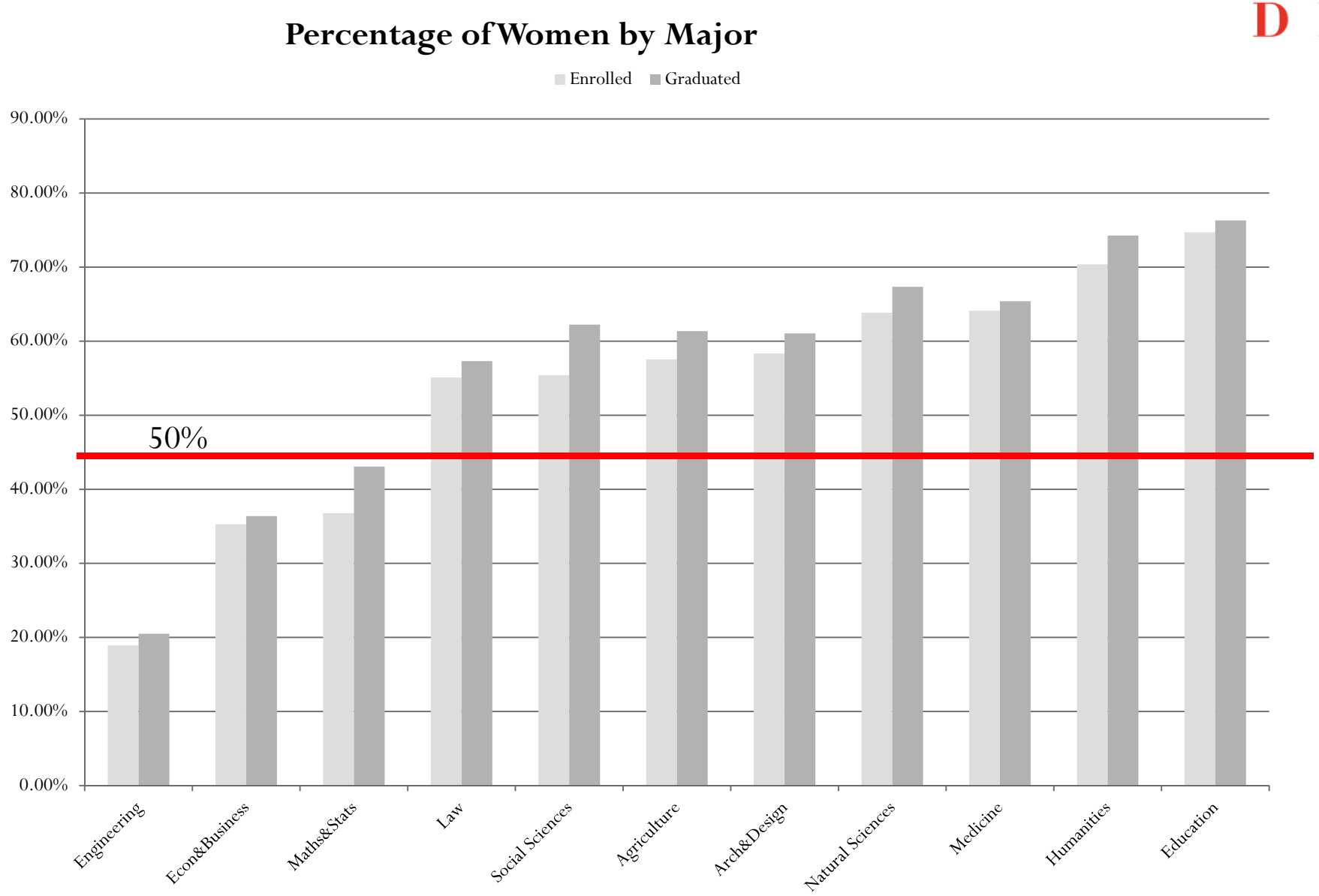
In All OECD Countries

- Women are less likely to choose engineering-math-science-business majors than men

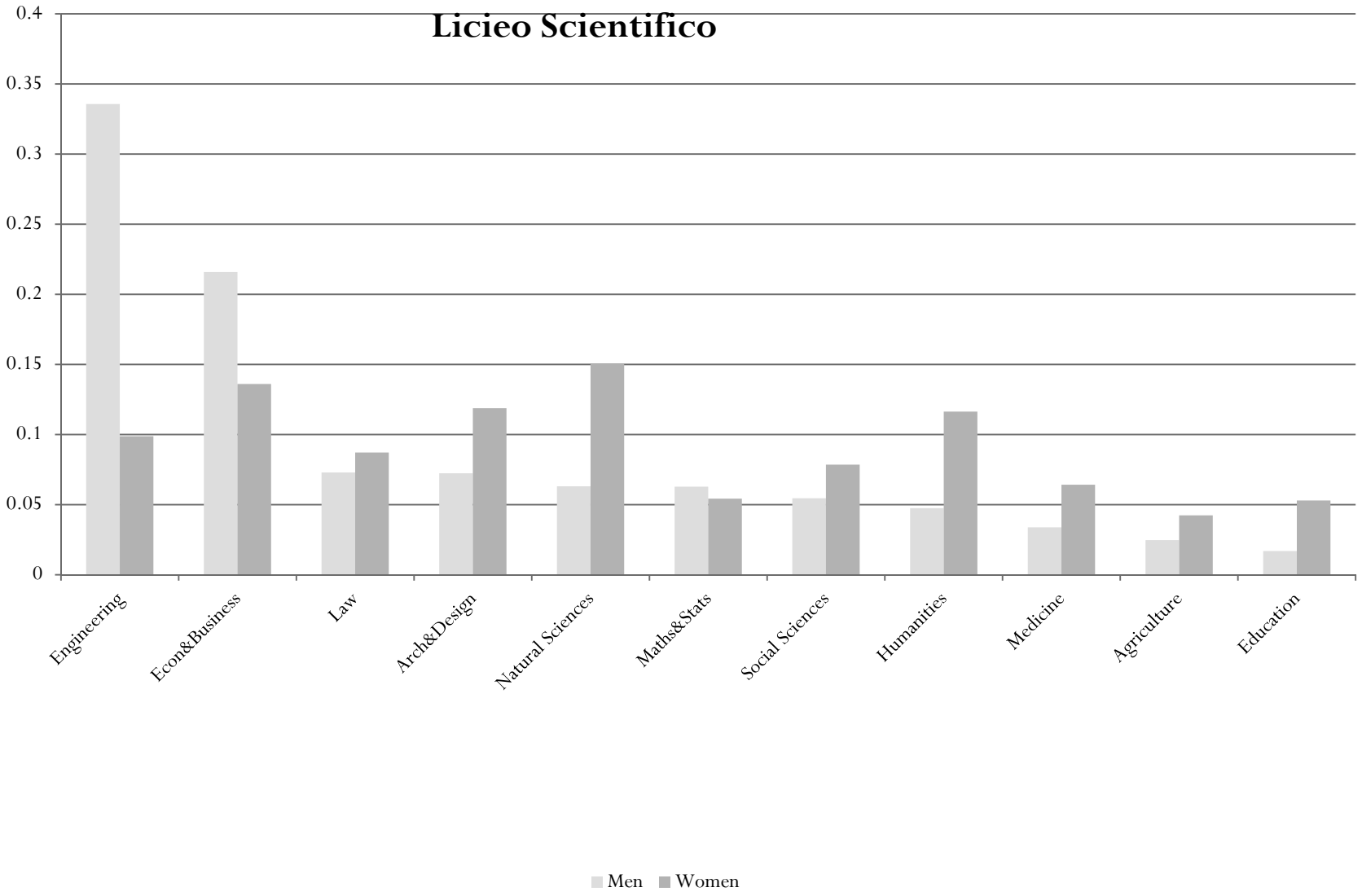


In Italy

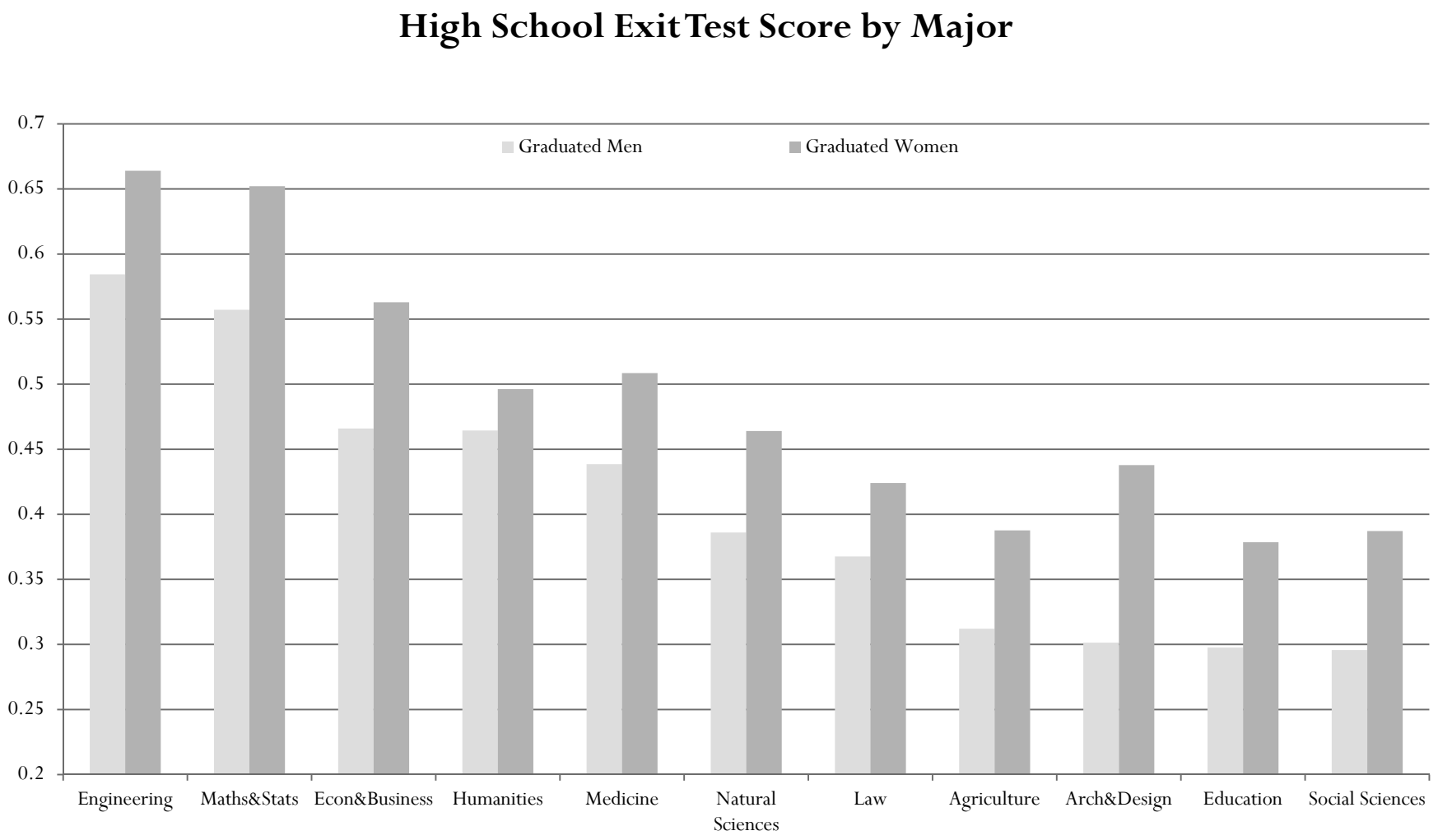
- Women are not very represented in Engineering, econ/business and Math Majors.
- Even those graduating from more science-based high schools
- Universe all individuals graduated from college preparatory (Licei Classici e Scientifici) high schools in Milano 1985-2005.
- These individuals have between 25 and 45 year of age. 30,000 individuals, followed in college, then in their labor market performance in 2005 and for a sub-sample (10%) in 2011 with interviews (by Carlo Erminero & Co.).


Percentage of Women by Major
Enrolled
Graduated
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
50%
Engineering
Econ&Business
Maths&Stats
Law
Social Sciences
Agriculture
Arch&Design
Natural Sciences
Medicine
Humanities
Education

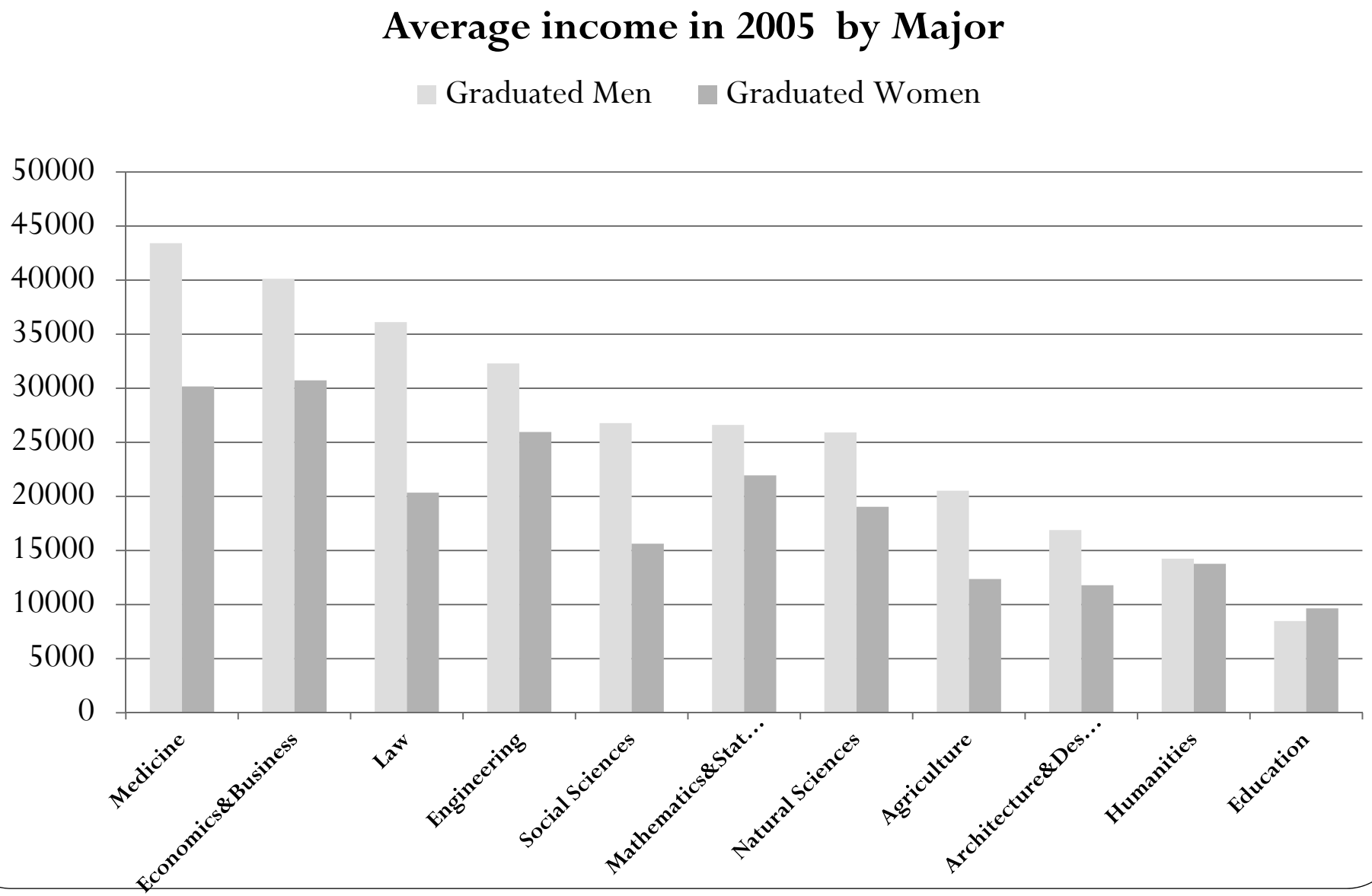
Distribution of Science-focussed High School Graduates over Majors



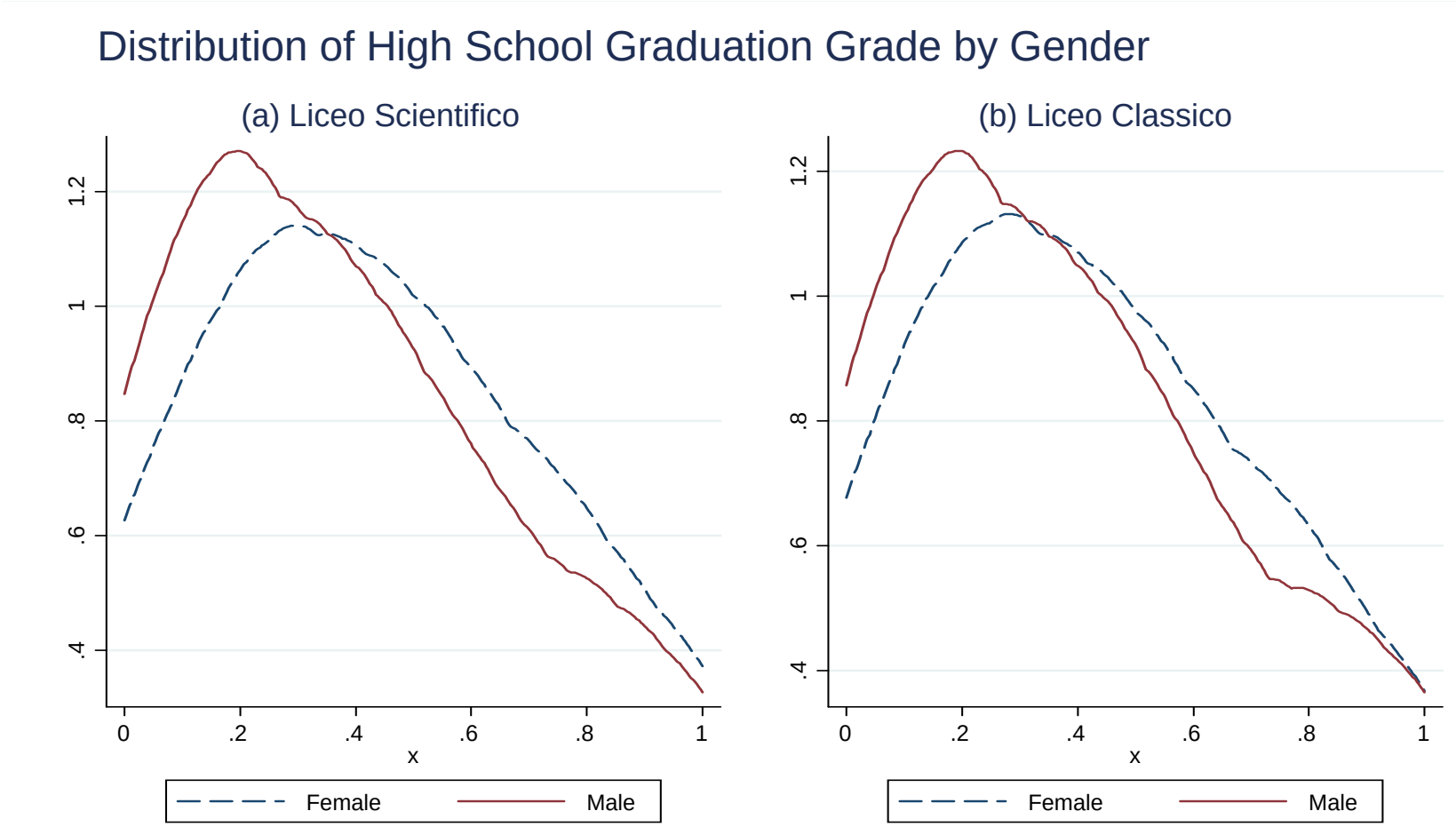
Is it because those major are harder?



Does this affect their expected income?



Women are academically better in both types of high school



Women perform better in any type of university major

Measures of Performance in College and Gender-Ability

Dependent Variable	Probability of graduating	Time to Graduation	Final Grade in College	Final Grade in College
Specification	(1)	(2)	(4)	(5)
VARIABLES				
Female	0.063***	**-2.972*** **	0.038***	**0.046*** **
	(0.01)	**(0.769)**	(0.004)	**(0.008)**
(Female)X(grade)	-0.062***	-0.711	-0.054***	-0.003
	(0.022)	(1.281)	(0.007)	(0.012)
HS exit test grade	0.424***	-17.031***	0.263***	**0.247*** **
	(0.015)	(1.072)	(0.006)	**(0.007)**
Sample	enrolled	graduated	graduated	graduated in high paid majors
Observations	22,873	16,035	16,561	8,406
R-squared		0.165	0.392	0.265

Controlling for year, high school, and type of college major

Choice of Majors and Gender Income Gap: Income regressio...

Dependent variable: log income in 2005

SPECIFICATIONS	(1)	(4)	(5)	(6)	(7)
VARIABLES					
Female Dummy	**-0.466*** **	**-0.435*** **	**-0.432*** **	**-0.329*** **	**-0.292*** **
	(0.021)	**(0.03)**	**(0.031)**	**(0.028)**	**(0.029)**
High school exit-test grade		0.375***	0.395***	0.125**	0.032
		(0.047)	(0.047)	(0.051)	(0.054)
Value of real estate in Area		0.011	0.025	0.021	0.032
		(0.038)	(0.042)	(0.042)	(0.041)
College exit grade		-0.025	-0.039	0.720***	0.817***
		(0.092)	(0.09)	(0.096)	(0.11)
Year Dummies	X	X			
SchoolXYear Dummies			X	X	X
High Paid Majors Dummy				X	
Low Paid Majors Dummy				X	
Majors Dummies					X

In Euros

- The Gender Gap controlling for quality, school, age is about 8750 Euro on an average income of 25,000 Euros per year. Of that difference 2750 $ are due to the difference in choice of majors.

- The Difference in income between people graduated with the lowest and with the highest grade in high school was 11,000 Euros.

Choice of Majors

Dependent variable: probability of choosing a high-paying major Business, Engineering, Medicine, Law)

VARIABLES	(1) Probit	(2) OLS	(3) OLS
Female	-0.191***	-0.204***	**-0.218*** **
	(0.014)	(0.015)	**(0.014)**
Female X grade	-0.105***	-0.096***	
	(0.027)	(0.027)	
Fem X (grade low range)			-0.028*
			(0.015)
Fem X (grade intermediate range)			-0.029*
			(0.017)
Female X (grade high range)			**-0.070*** **
			(0.022)
HS exit test grade	0.262***	0.258***	**0.246*** **
	(0.021)	(0.021)	**(0.020)**
School Dummies			
Year Dummies			
School X Year Dummies	X	X	X

Why such difference in choice?

- In spite of higher quality in both type of high school and in college women choose systematically lower paid majors

- 1. Jobs in those major have more flexibility and possibility of part-time jobs (teaching).
- 2. Those majors are more competitive and women avoid competition. They are more "selfish" and women are more altruistic.
- 3. Women care more about marriage and those major allow higher probability of getting married or marrying a better partner.
- 4. Women are subject to teacher and peer pressure (women).

Competitiveness and social attitudes

- For a 10% sub-sample of our group we have conducted phone interviews. We know if they practiced competitive sport (at the time of high school) , and if they volunteered in charities.

- Are those behavior revealing some psychological characteristics (Large Experimental literature) and correlated with major choice?

- Sport: Men 27%, Women 14%
- Volunteering: Men 33%, Women 36%

Sport/ Volunteering and choice of Major

Specification	(2)	(5)	(6)
Method	Probit	OLS	OLS
Dependent Variable	Probability of choosing high paid major	Log of actual wage, controlling for Major	Probability of employment in 2011
Female	-0.158***	-0.172	-0.003
	(0.036)	(0.123)	(0.023)
Fem X HS Grade	-0.124*	-0.214	-0.039
	(0.065)	(0.190)	(0.040)
HS Grade	0.232***	0.275**	0.043*
	(0.049)	(0.131)	(0.024)
Sport	**0.055***	**0.274*****	-0.008
	(0.031)	**(0.087)**	(0.018)
Sport X Fem	-0.020	-0.228	0.006
	(0.052)	(0.153)	(0.033)
Volunteering	**-0.066****	-0.121	0.013
	(0.029)	(0.084)	(0.017)
Volunt X Fem	**0.076***	-0.060	-0.012
	(0.042)	(0.119)	(0.022)
Family controls	X	X	X
Year Dummies	X	X	X
School Dummies	X	X	X
Major Dummies		X	

Note: Standard errors clustered at School/Year level in parenthesis. Family controls: father wage, father education, mother education. *** p<0.01, ** p<0.05, * p<0.1.

Major and Marriage

- Are women attracted to low-paid major to signal their commitment to the family, and to increase the probability of getting married? Or the quality of the husband?

Major and probability of marrying/expected wag f of partner

Method	Probit	OLS
Dependent Variable	Probability of Marrying	Log wage of partner
HS Grade	-0.044	0.049*
	(0.047)	(0.027)
Father wage	0.082*	0.111***
	(0.048)	(0.025)
Father education	-0.042*	0.023*
	(0.023)	(0.013)
Mother education	0.032	0.130***
	(0.020)	(0.014)
High paid major=1	0.011	-0.008
	(0.037)	(0.020)
Low paid major=1	**0.001**	**-0.029**
	(0.037)	**(0.019)**
Year Dummies	X	X
School Dummies	X	X

Are students subject to peer pressure in the choice of Major?

- Controlling for other characteristics the percentage of people in the same class of high school choosing high paid majors significantly affects the probability of an individual to choose a high paid major. (going from 0 to all classmates in HP the probability increases by 23% for women and 18% for men)

- Women seems affected by all classmates while men only by men classmates.

- Teacher may also have a strong impact in the choice. Their "suggested" major is a strong predictor of the chosen one and has strong gender bias.

	Women		Men	
Specification	(2)	(3)	(5)	(6)
Method	Probit	Probit	Probit	Probit
Dependent Variable	Probability of choosing High paid major	Probability of choosing Low Paid Major	Probability of choosing High paid major	Probability of choosing Low Paid Major
Share of Classmates in HP	**0.238*** **	-0.088**	**0.184*** **	-0.070*
	(0.050)	(0.042)	**(0.049)**	(0.037)
Share of Classmates in LP	-0.019	**0.162** **	-0.049	**0.137*** **
	(0.053)	**(0.063)**	(0.057)	**(0.045)**
Share of Schoolmates in HP	0.108	0.122	0.057	0.060
	(0.131)	(0.086)	(0.117)	(0.077)
Share of Schoolmates in LP	0.020	-0.128	0.291*	-0.258**
	(0.145)	(0.160)	(0.154)	(0.131)

Conclusions

- Prejudice of employer still plays a role. In the US its relevance has declined and it explains at most 1/3 of the gender gap.

- Children Penalize women in their employment rate. In Spain part-time availability has allowed more women to participate and reduce wage gap.

- In spite of high academic quality in high school and college women choose low-paid majors. This may be due in part to different attitudes towards competition and altruism, to the role of peers and teacher. Most may be preference. The gender difference in the choice of major is responsible for 30% of the wage gap.