# From Pink Collar to Lab Coat: Cultural Persistence and Diffusion of Socialist Gender Norms

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# Culturally transmitted gender norms and economic behavior

Influence of culture in a wide array of domains

- trust(Antecol, 2001; Algan and Cahuc, 2010; Alesina et al., 2013); political attitudes (Alesina and Fuchs-Schündeln, 2007); fertility and labor market participation (Fernández and Fogli, 2009); development (Ashraf and Galor, 2013; Spolaore and Wacziarg, 2013); violence (Grosjean, 2014); household behavior (Lippmann, Georgieff, and Senik, 2020).

This paper focuses on the way culture influences **females'** educational choices, occupational choices, and labor market behavior.

# Persisting Gender Gaps

Despite gender convergence in educational attainment and labor force participation, we see **persistent occupational segregation** (Goldin 2014; Blau and Kahn 2015, 2017; Cortes and Pan, 2018.)

- Under-representation of women in math and science domains, in school and at work.
- Weaker labor market attachment of women (Chiappori, Salanié and Weiss, 2017; Chiappori, Dias and Meghir, 2018;Landais et al., 2019)
- Role of gender identity (Akerlof and Kranton, 2000; Nollenberger et al. 2016)

These characteristics form a **cultural equilibrium**. However, different institutions may generate different equilibria.

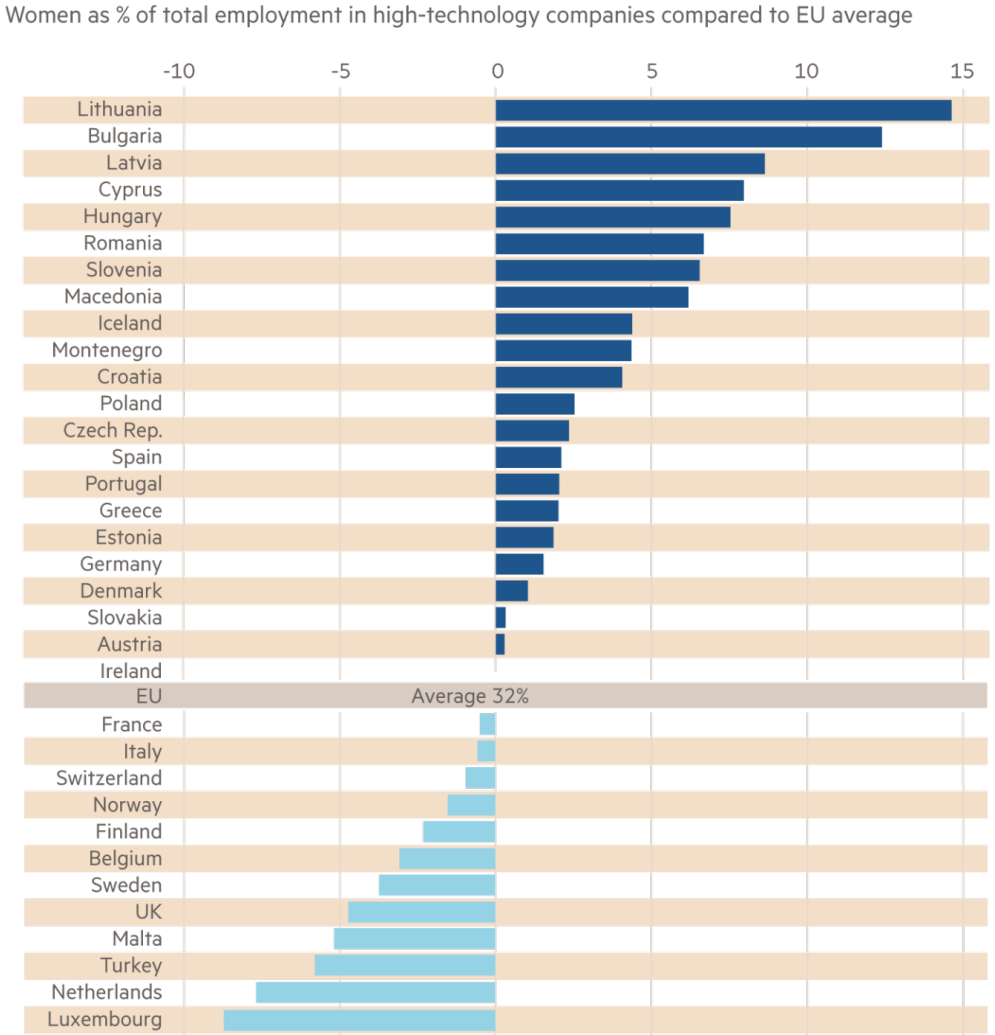
# Cultural equilibrium in the former Soviet Union (FSU)- two Features

- **Valorization of science and engineering in education, research and the economy**
  - Priority of the military-industrial sector (Graham, 2004).
- **Female attachment to work** FSU female employment, by sector
  - Institutions aimed at promoting full employment (and fertility) of both men and women, harnessed to the objective of rapid industrial growth
  - Ensuing gender equality on the labor market affected work values of women and in turn changed conception of gender roles.

    (Buckley, 1981; Wolchik, 1981, 2019; Haan, 2012)

# Persistence of Soviet style gender norms

- Labor force statistics from Eastern European countries reveal distinct gender patterns
- Causal evidence from the German Unification reveals the persistence of socialist gender-equal culture in terms of: labor market outcomes; family arrangements and performance in math.



# The meeting of two cultural equilibria- FSU immigrants in Israel- the setting

Our setting:

- Natural experiment: within 5 years (1989-1995) 800,000 immigrants from the former Soviet Union (FSU) entered Israel, a country of 4.5 million people.
- Population: a cohort of female students born in 1988-1989, of which 15% born in FSU and 4% in other countries
- Data: administrative educational data, labor force survey and income survey.

# The meeting of two cultural equilibria- FSU immigrants in Israel- preview of the results

We identify two types of cultural transmission of Soviet gender norms:

- **Vertical** inter-generational transmission. FSU young women:
  - Are over-represented in STEM study fields in secondary and tertiary education
  - Avoid tertiary study fields leading to Pink-Collar occupations, such as education and social work.
  - exhibit stronger labor force attachment
- **Horizontal** diffusion. As early exposure to FSU immigrants increases, native women are:
  - more likely to choose STEM tertiary study fields
  - less likely to choose Pink-Collar study fields

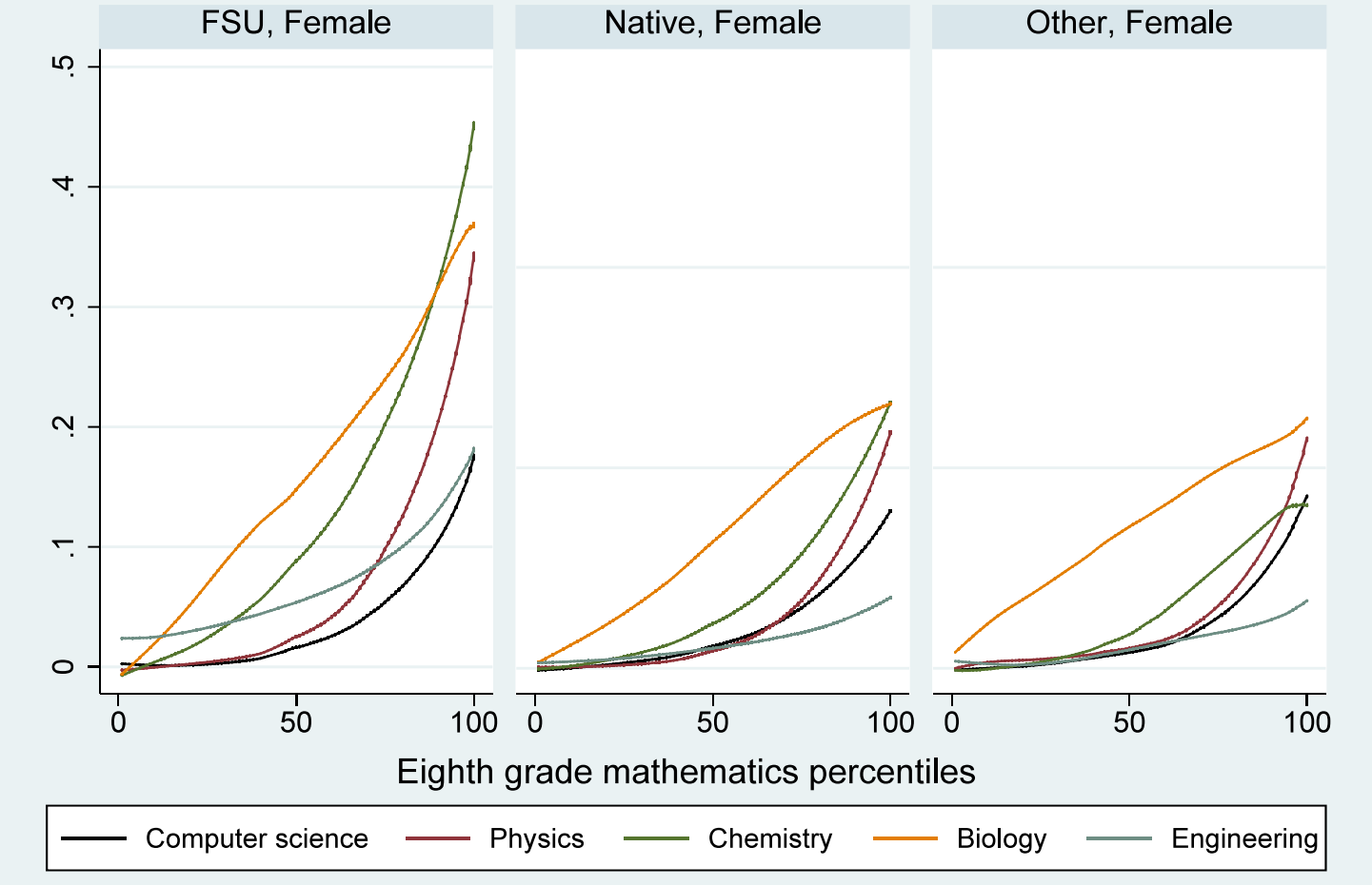
# Education pipeline in Israel- longitudinal data structure

- **Lower secondary education**- 8th grade, age 13-14
  - Standardized test scores (GEMS)- Hebrew, mathematics, English and science
  - Family income quintile and parents' years of schooling
  - School identifier
- **Upper secondary education**- 12th grade, age 17-18
  - Dropout and graduation
  - Matriculation mandatory and elective subjects- level and scores
  - School identifier
- **Tertiary education**- average starting age 23.5
  - Psychometric (SAT) scores (for test takers)
  - All applications to Israeli tertiary institutions
  - Study field and specific program

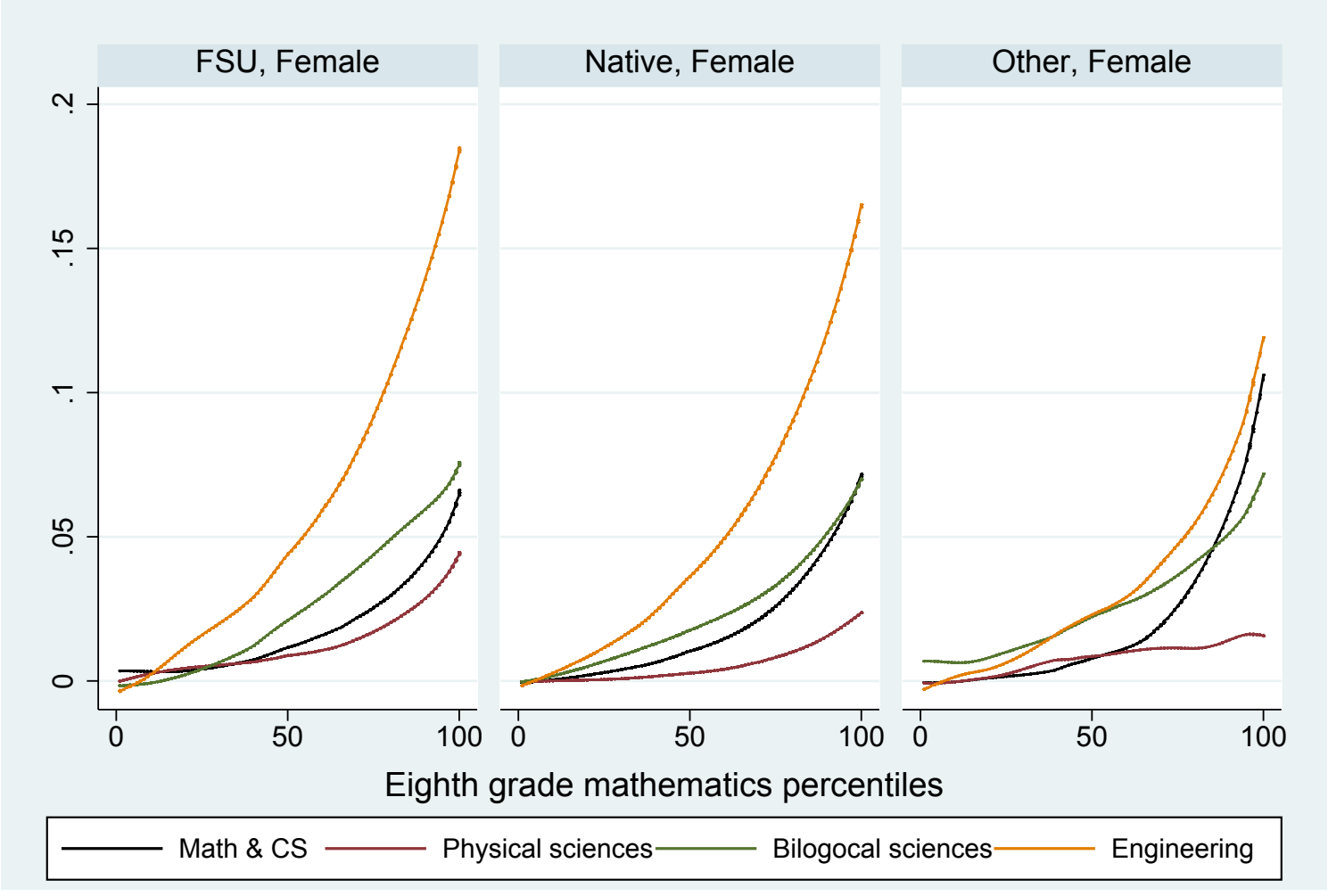
# Demographics

| | FSU immigrant | Native | Other immigrant |
|---|---|---|---|
| Father's years of schooling | 13.13 | 13.01 | 13.19 |
| Mother's years of schooling | 13.35 | 13.12 | 12.82 |
| *Family income quintiles* | | | |
| Lowest | 0.14 | 0.11 | 0.27 |
| Second | 0.28 | 0.15 | 0.21 |
| Third | 0.30 | 0.20 | 0.16 |
| Fourth | 0.21 | 0.25 | 0.13 |
| Highest | 0.07 | 0.29 | 0.22 |
| N | 4,458 | 25,054 | 1,283 |
| Share | 0.14 | 0.81 | 0.04 |

# High school STEM choices conditional on 8th grade mathematics achievement



# Tertiary STEM choices conditional on 8th grade mathematics achievement



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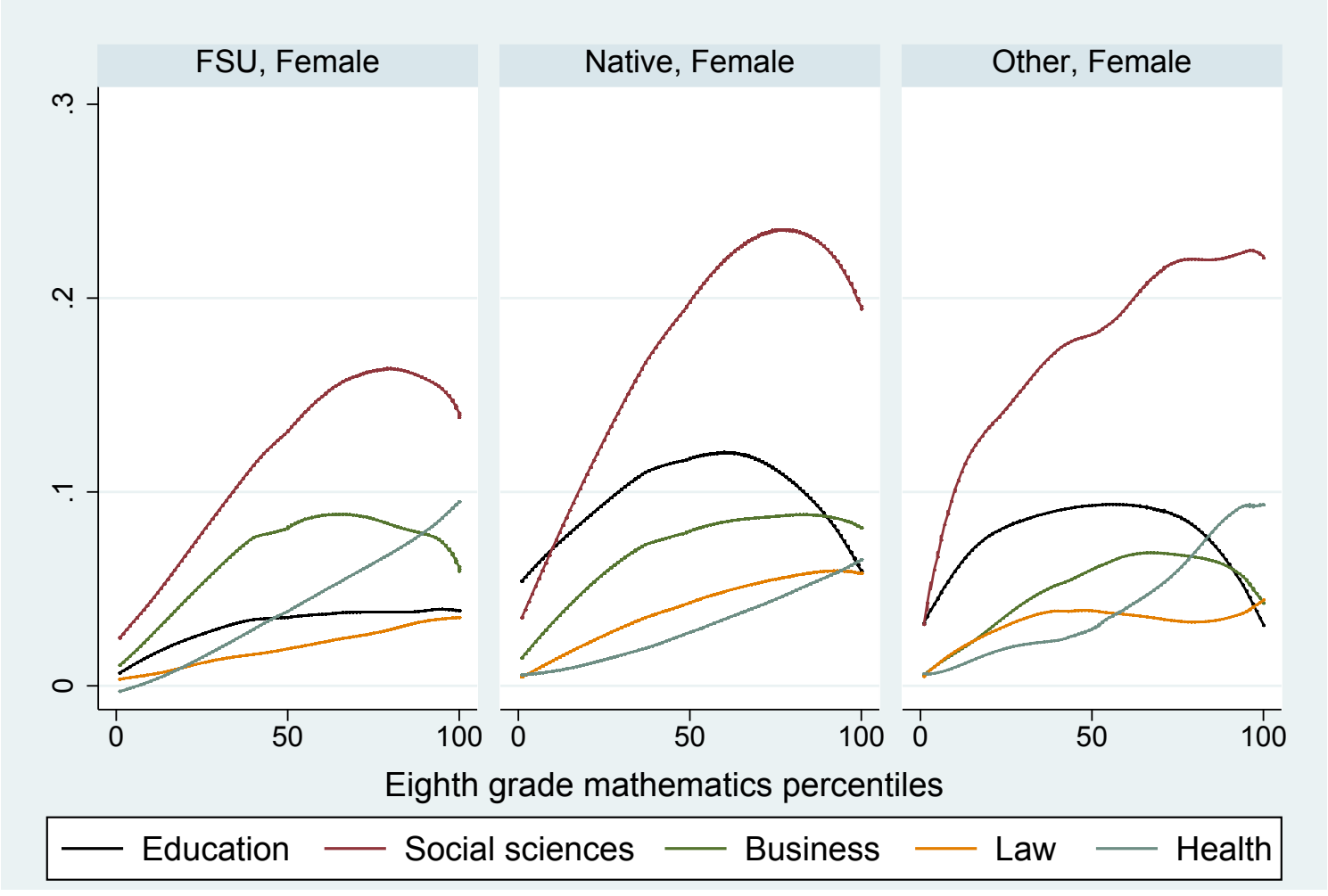


# STEM study fields choice in tertiary education

FSU immigrants are at least 30% more likely to choose STEM study fields than natives and other immigrants. Estimation equation

| | STEM study field | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | Full sample | | | College bound | |
| Native | −0.028*** | −0.029*** | 0.003 | −0.050*** | −0.012 |
| | (0.005) | (0.005) | (0.005) | (0.009) | (0.009) |
| Other immigrant | −0.050*** | −0.040*** | −0.005 | −0.074*** | −0.012 |
| | (0.009) | (0.009) | (0.009) | (0.016) | (0.016) |
| Constant | 0.128*** | 0.106*** | 0.012* | 0.224*** | 0.145*** |
| SES | | yes | yes | | yes |
| GEMS scores | | yes | yes | | yes |
| Matriculation scores | | | yes | | yes |
| Prior choice | | | yes | | yes |
| Psychometric scores | | | | | yes |
| N | 30,795 | 30,795 | 30,795 | 17,092 | 17,092 |

Coefficients are obtained from a LPM with school-level clustered standard errors and a dummy for cohort.

# Pink collar study fields choice in tertiary education

Natives and other immigrants are twice as likely to choose pink collar study fields than FSU immigrants. Estimation equation

| | Pink collar study field | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | Full sample | | | College bound | |
| Native | 0.077*** | 0.067*** | 0.041*** | 0.100*** | 0.020** |
| | (0.005) | (0.005) | (0.005) | (0.008) | (0.009) |
| Other immigrant | 0.063*** | 0.062*** | 0.029*** | 0.107*** | 0.038** |
| | (0.010) | (0.010) | (0.010) | (0.018) | (0.018) |
| Constant | 0.065*** | 0.039*** | −0.002 | 0.113*** | 0.136*** |
| SES | | yes | yes | | yes |
| GEMS scores | | yes | yes | | yes |
| Matriculation scores | | | yes | | yes |
| Prior choice | | | yes | | yes |
| Psychometric scores | | | | | yes |
| N | 30,795 | 30,795 | 30,795 | 17,092 | 17,092 |

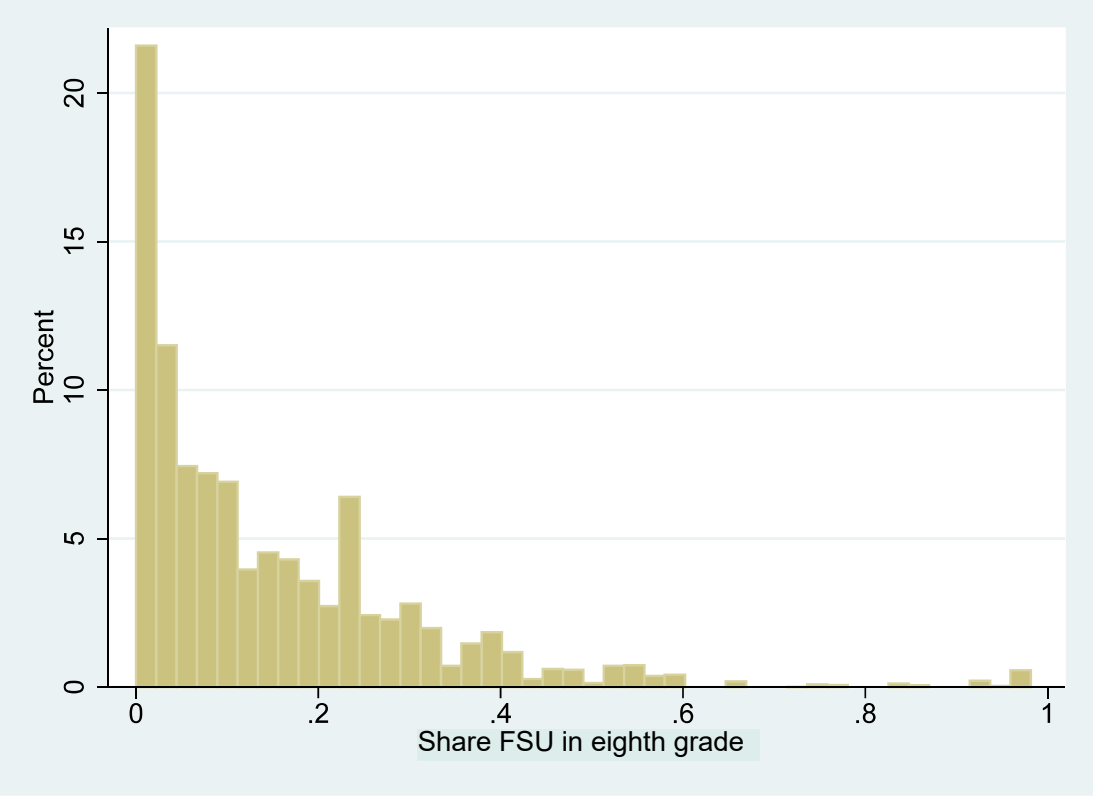
Coefficients are obtained from a LPM with school-level clustered standard errors and a dummy for cohort.

# Horizontal diffusion

Does the concentration of culturally distinct (FSU) immigrants in natives' early social environment affects the choice behavior of natives?

- We construct a variable indicating the share of FSU immigrants among eighth grade pupils, by school and grade level.
- The magnitude of the FSU immigration wave generated significant variation in the share of FSU immigrants in schools

# Share of FSU immigrants in grade 8, by school

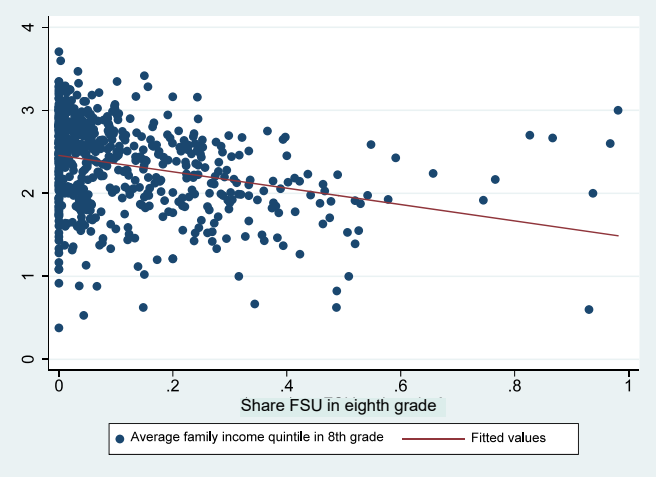


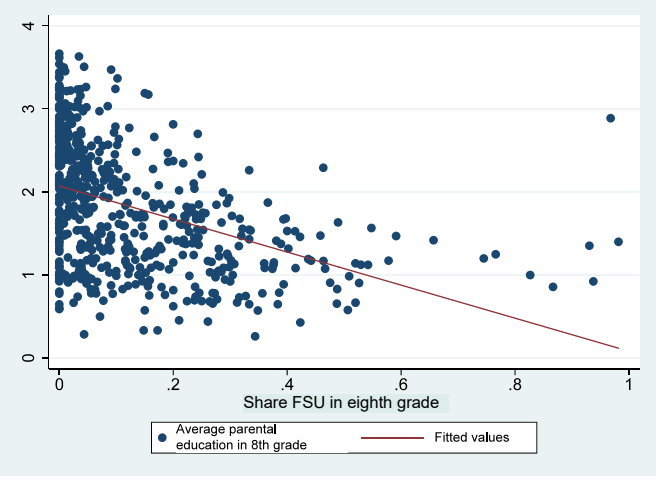
# Self-selection versus horizontal diffusion

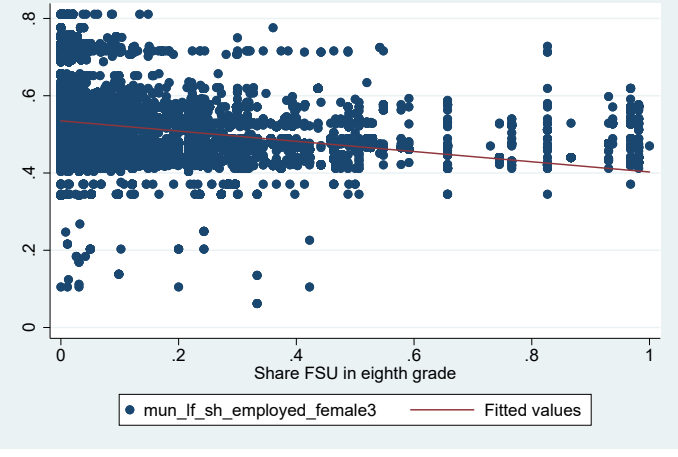
Do FSU immigrants self-select into neighborhoods which are characterized by:

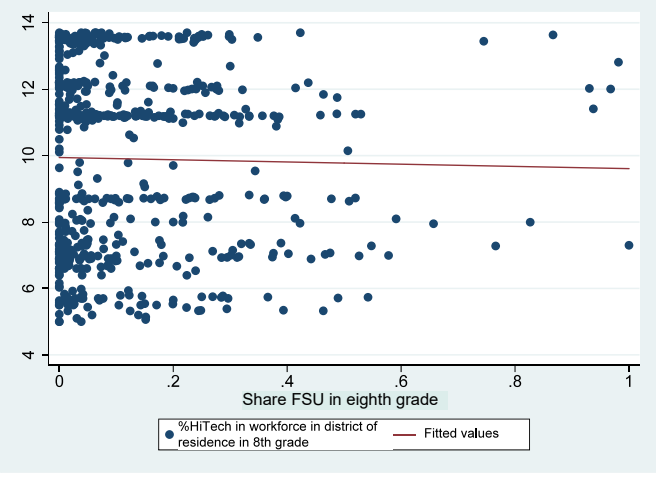
- higher SES
- high share of the labor force in STEM occupations
- high labor force attachment

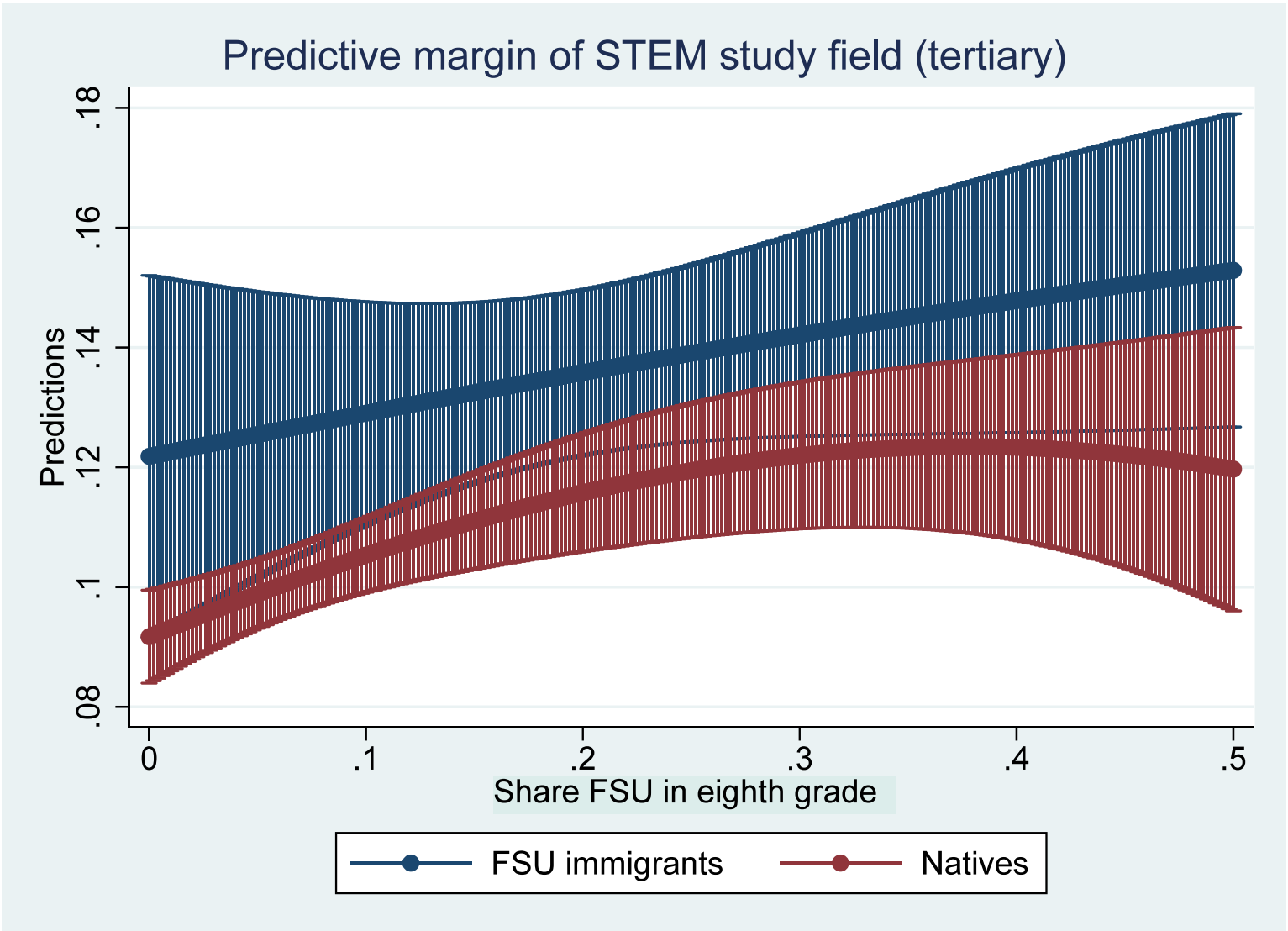
# Share of FSU immigrants and school/municipality of residence characteristics



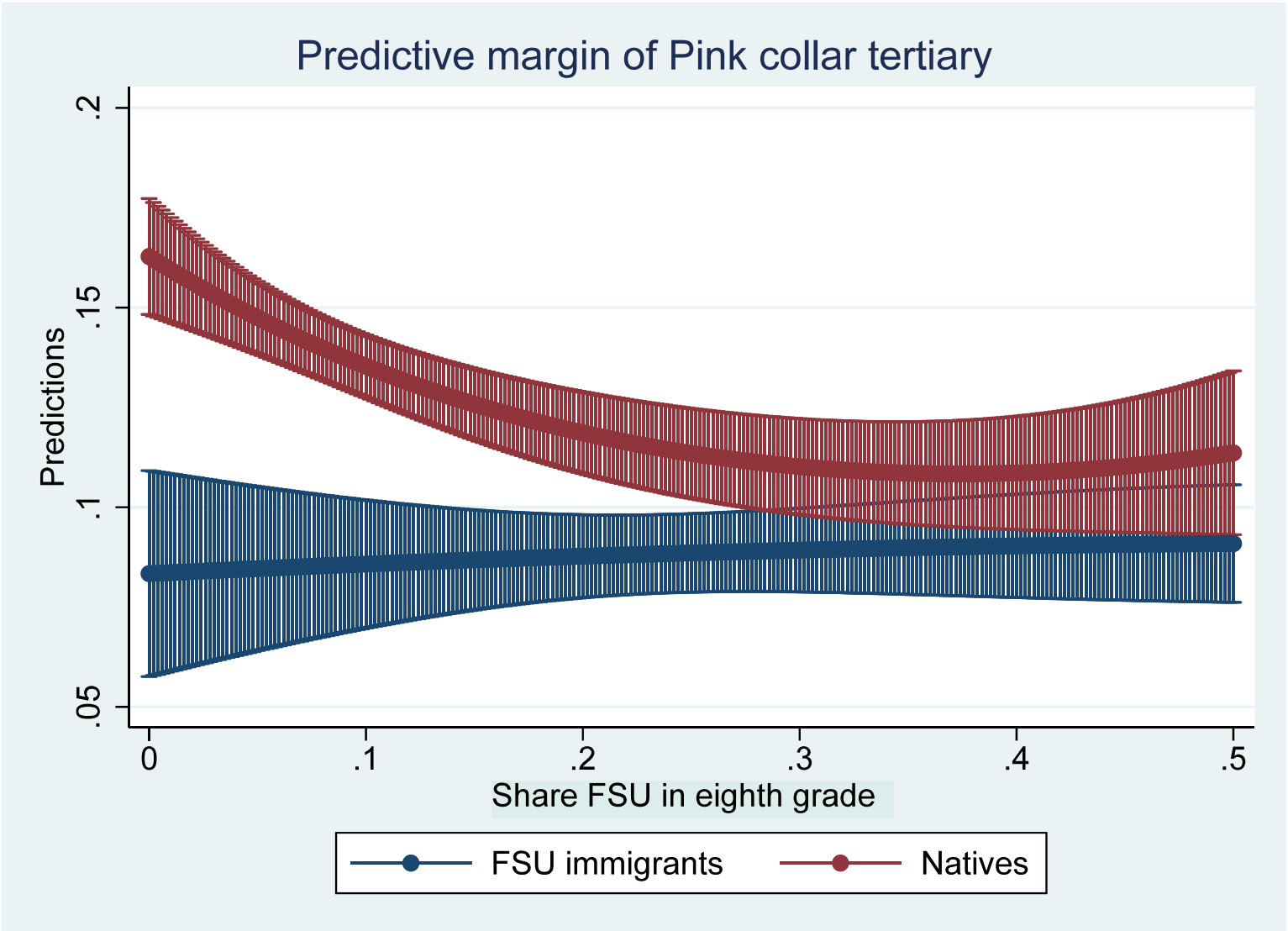






Regressions




Regressions

# Persisting influence of Soviet-style gender culture

- Institutions generate a cultural equilibrium
- We find that this culture persist despite being transplanted into a different institutional setting
- In turn this culture influences local gender norms



# Thank you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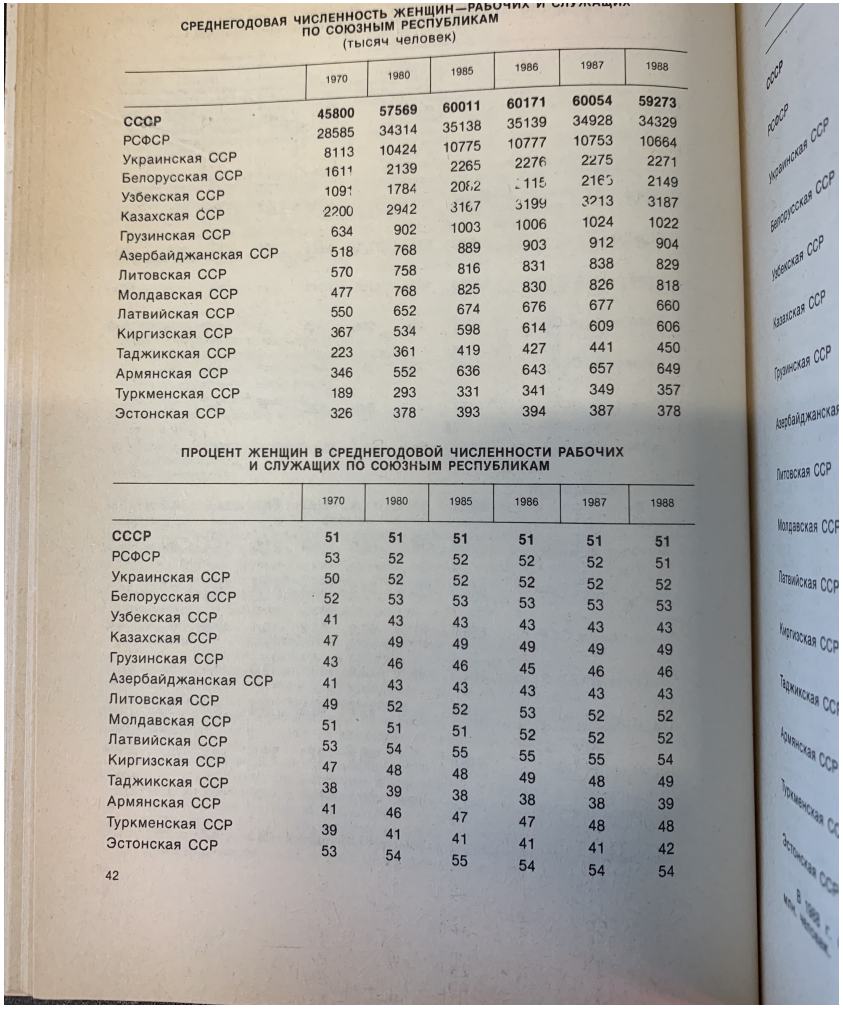
- Descriptive Background Outcomes
- GEMS Mathematics Hebrew English Science
- Matriculation choices Regressions HS STEM HS non-STEM
- Labor market outcomes Occupations Hours worked Occupations, hours Occupations, wages
- Horizontal diffusion Regressions, GEMS Regressions, choice Marginal effect matriculation Marginal effect STEM HS

# FSU gender-equal culture of work



СРЕДНЕГОДОВАЯ ЧИСЛЕННОСТЬ ЖЕНЩИН—РАБОЧИХ И СЛУЖАЩИХ ПО СОЮЗНЫМ РЕСПУБЛИКАМ
(тысяч человек)

| | 1970 | 1980 | 1985 | 1986 | 1987 | 1988 |
|---|---|---|---|---|---|---|
| **СССР** | **45800** | **57569** | **60011** | **60171** | **60054** | **59273** |
| РСФСР | 28585 | 34314 | 35138 | 35139 | 34928 | 34329 |
| Украинская ССР | 8113 | 10424 | 10775 | 10777 | 10753 | 10664 |
| Белорусская ССР | 1611 | 2139 | 2265 | 2276 | 2275 | 2271 |
| Узбекская ССР | 1091 | 1784 | 2062 | 2115 | 2165 | 2149 |
| Казахская ССР | 2200 | 2942 | 3167 | 3199 | 3213 | 3187 |
| Грузинская ССР | 634 | 902 | 1003 | 1006 | 1024 | 1022 |
| Азербайджанская ССР | 518 | 768 | 889 | 903 | 912 | 904 |
| Литовская ССР | 570 | 758 | 816 | 831 | 838 | 829 |
| Молдавская ССР | 477 | 768 | 825 | 830 | 826 | 818 |
| Латвийская ССР | 550 | 652 | 674 | 676 | 677 | 660 |
| Киргизская ССР | 367 | 534 | 598 | 614 | 609 | 606 |
| Таджикская ССР | 223 | 361 | 419 | 427 | 441 | 450 |
| Армянская ССР | 346 | 552 | 636 | 643 | 657 | 649 |
| Туркменская ССР | 189 | 293 | 331 | 341 | 349 | 357 |
| Эстонская ССР | 326 | 378 | 393 | 394 | 387 | 378 |

ПРОЦЕНТ ЖЕНЩИН В СРЕДНЕГОДОВОЙ ЧИСЛЕННОСТИ РАБОЧИХ И СЛУЖАЩИХ ПО СОЮЗНЫМ РЕСПУБЛИКАМ

| | 1970 | 1980 | 1985 | 1986 | 1987 | 1988 |
|---|---|---|---|---|---|---|
| **СССР** | **51** | **51** | **51** | **51** | **51** | **51** |
| РСФСР | 53 | 52 | 52 | 52 | 52 | 51 |
| Украинская ССР | 50 | 52 | 52 | 52 | 52 | 52 |
| Белорусская ССР | 52 | 53 | 53 | 53 | 53 | 53 |
| Узбекская ССР | 41 | 43 | 43 | 43 | 43 | 43 |
| Казахская ССР | 47 | 49 | 49 | 49 | 49 | 49 |
| Грузинская ССР | 43 | 46 | 46 | 45 | 46 | 46 |
| Азербайджанская ССР | 41 | 43 | 43 | 43 | 43 | 43 |
| Литовская ССР | 49 | 52 | 52 | 53 | 52 | 52 |
| Молдавская ССР | 51 | 51 | 51 | 52 | 52 | 52 |
| Латвийская ССР | 53 | 54 | 55 | 55 | 55 | 54 |
| Киргизская ССР | 47 | 48 | 48 | 49 | 48 | 49 |
| Таджикская ССР | 38 | 39 | 38 | 38 | 38 | 39 |
| Армянская ССР | 41 | 46 | 47 | 47 | 48 | 48 |
| Туркменская ССР | 39 | 41 | 41 | 41 | 41 | 42 |
| Эстонская ССР | 53 | 54 | 55 | 54 | 54 | 54 |

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Statistical Yearbooks of the Soviet Union, 1988, 1989

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# Multivariate Estimates

Epidemiological approach (Fernandez and Fogli, 2009; Algan et al., 2010)

$$y_{ijst} = \alpha + \beta_{native} + \beta_{other} + X_i\theta_j + \sum_{a=0}^{t-1} A_{ia}\gamma_{ja} + y_{it-1}\delta_j + u_{ijs}$$

$$u_{ijs} = \omega_{j,2003} + \omega_{js} + \epsilon_{ijs}$$

- Choice $y$ of individual $i$ in origin group $j \in FSU, Native, Other$ in school $s$
- $X_i$ parental education and family income
- $A_{ia}$ second degree polynomials of achievement at prior stages
- $y_{it-1}$ earlier choices

Estimates

# Descriptive statistics- background

back

| | FSU immigrant | | Native | | Other immigrant | |
|---|---|---|---|---|---|---|
| | mean | s.d. | mean | s.d. | mean | s.d. |
| | | | Demographics | | | |
| Born 1987-89 | 0.99 | 0.10 | 1.00 | 0.05 | 0.98 | 0.13 |
| Emigrated prior to 1996 | 0.69 | 0.46 | — | — | 0.41 | 0.12 |
| Father's years of schooling | 13.13 | 2.84 | 13.01 | 3.03 | 13.19 | 4.99 |
| Mother's years of schooling | 13.35 | 2.69 | 13.12 | 2.78 | 12.82 | 4.55 |
| *Parents' maximal years of schooling* | | | | | | |
| <12 | 0.19 | 0.40 | 0.12 | 0.33 | 0.23 | 0.42 |
| 12 | 0.20 | 0.40 | 0.41 | 0.49 | 0.21 | 0.41 |
| 13-15 | 0.34 | 0.47 | 0.21 | 0.40 | 0.17 | 0.38 |
| 15< | 0.26 | 0.44 | 0.27 | 0.44 | 0.39 | 0.49 |
| *Family income quintiles* | | | | | | |
| Lowest | 0.14 | 0.34 | 0.11 | 0.31 | 0.27 | 0.44 |
| Second | 0.28 | 0.45 | 0.15 | 0.36 | 0.21 | 0.41 |
| Third | 0.30 | 0.46 | 0.20 | 0.40 | 0.16 | 0.37 |
| Fourth | 0.21 | 0.41 | 0.25 | 0.43 | 0.13 | 0.34 |
| Highest | 0.07 | 0.25 | 0.29 | 0.45 | 0.22 | 0.42 |
| | | | Eighth grade achievement | | | |
| Mathematics | 54.87 | 23.60 | 53.44 | 23.06 | 49.66 | 23.61 |
| Science | 63.70 | 19.81 | 65.05 | 17.30 | 62.03 | 18.83 |
| Hebrew | 62.99 | 21.71 | 69.34 | 16.73 | 63.95 | 20.42 |
| English | 81.62 | 19.08 | 81.04 | 18.97 | 82.65 | 19.49 |
| N | 4,458 | | 25,054 | | 1,283 | |
| Share | 0.14 | | 0.81 | | 0.04 | |

# Descriptive statistics- outcomes

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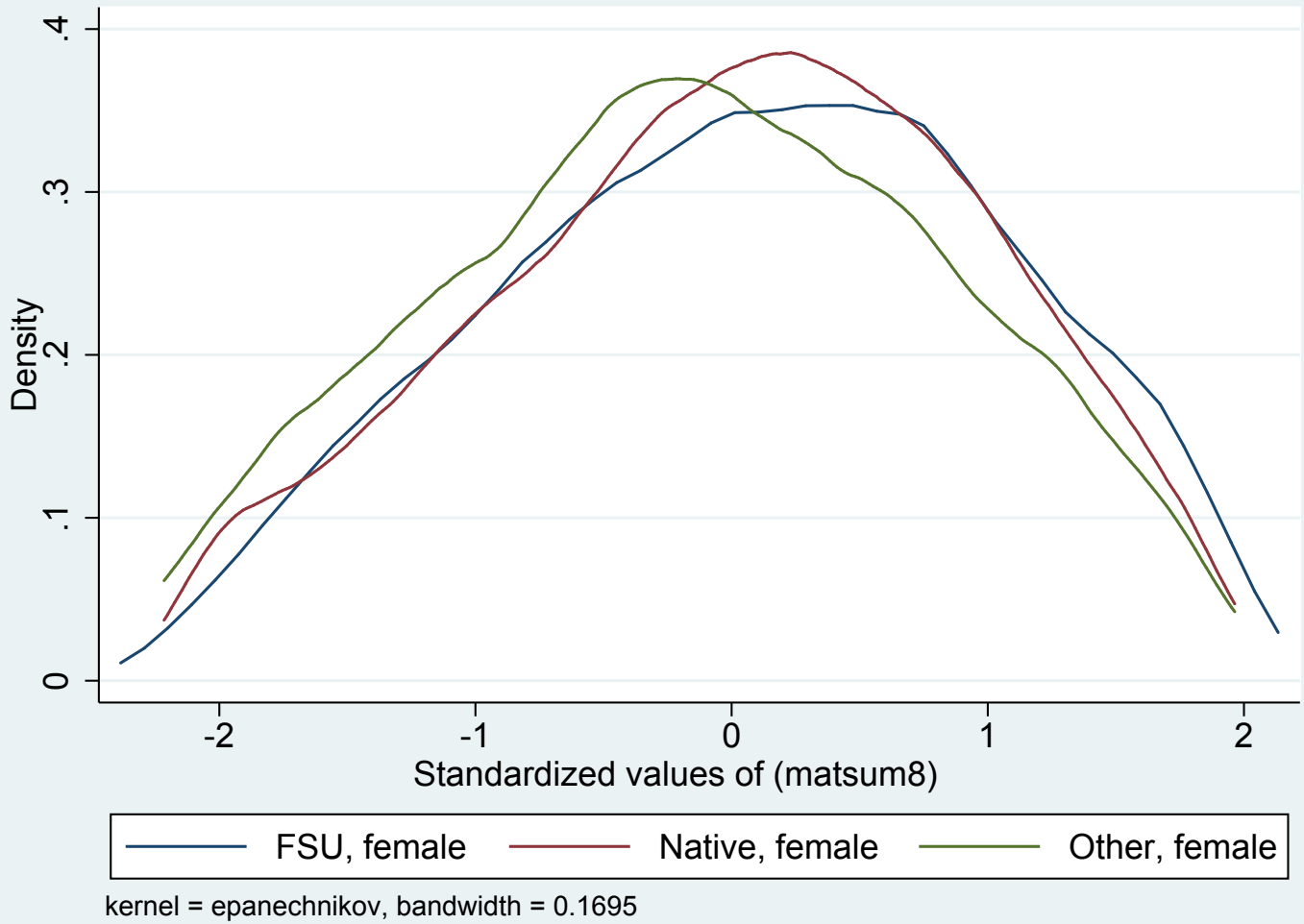
| | FSU immigrant | | Native | | Other immigrant | |
|---|---|---|---|---|---|---|
| | mean | s.d. | mean | s.d. | mean | s.d. |
| | | | Secondary education | | | |
| Retention, 12th grade | 0.89 | 0.31 | 0.97 | 0.17 | 0.93 | 0.26 |
| Full matriculation | 0.61 | 0.49 | 0.70 | 0.46 | 0.63 | 0.48 |
| *Matriculation electives* | | | | | | |
| Advanced mathematics | 0.18 | 0.39 | 0.14 | 0.35 | 0.12 | 0.32 |
| STEM | 0.33 | 0.47 | 0.26 | 0.44 | 0.24 | 0.43 |
| Social sciences | 0.28 | 0.45 | 0.34 | 0.47 | 0.27 | 0.44 |
| *Matriculation scores (weighted)* | | | | | | |
| Mathematics | 68.38 | 38.75 | 76.76 | 34.66 | 71.87 | 37.00 |
| Hebrew | 60.59 | 31.83 | 69.08 | 25.87 | 64.98 | 29.11 |
| English | 53.80 | 31.71 | 56.99 | 28.18 | 58.93 | 32.04 |
| | | | Tertiary education | | | |
| Took psychometric test | 0.55 | 0.50 | 0.56 | 0.50 | 0.53 | 0.50 |
| Entered tertiary education | 0.50 | 0.50 | 0.63 | 0.48 | 0.56 | 0.50 |
| *Psychometric scores* | | | | | | |
| Mathematics | 107.94 | 19.12 | 111.76 | 18.74 | 107.99 | 19.27 |
| Hebrew | 102.66 | 20.48 | 112.70 | 19.31 | 106.97 | 21.16 |
| English | 110.45 | 22.83 | 109.29 | 23.71 | 115.98 | 23.84 |
| *Study field* | | | | | | |
| STEM | 0.13 | 0.33 | 0.10 | 0.30 | 0.08 | 0.27 |
| Pink collar | 0.07 | 0.25 | 0.14 | 0.35 | 0.13 | 0.33 |
| Economics, business and management | 0.11 | 0.31 | 0.11 | 0.31 | 0.08 | 0.27 |
| social sciences | 0.10 | 0.30 | 0.16 | 0.37 | 0.16 | 0.36 |

# Eighth grade mathematics achievement

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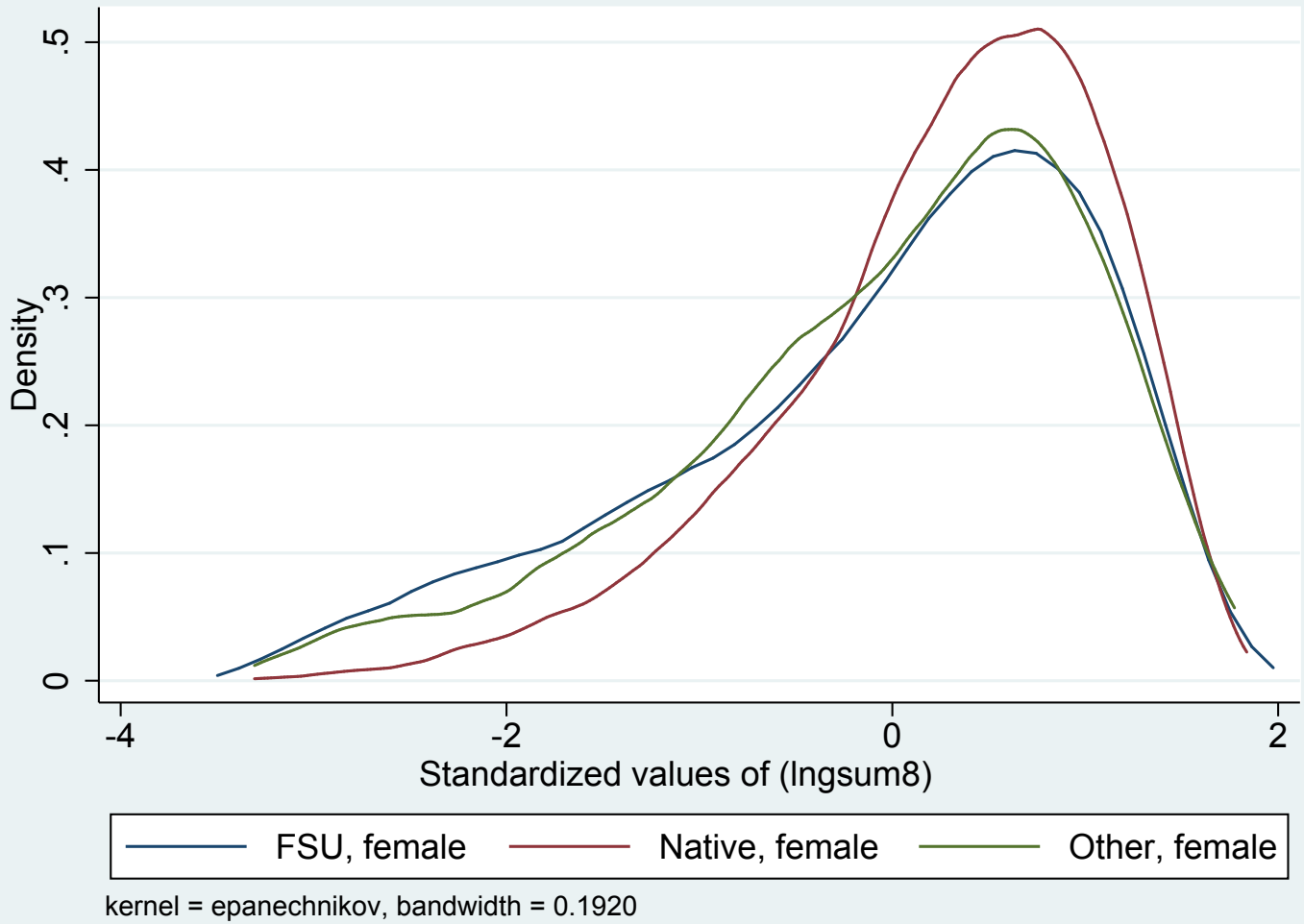
# Eighth grade Hebrew achievement

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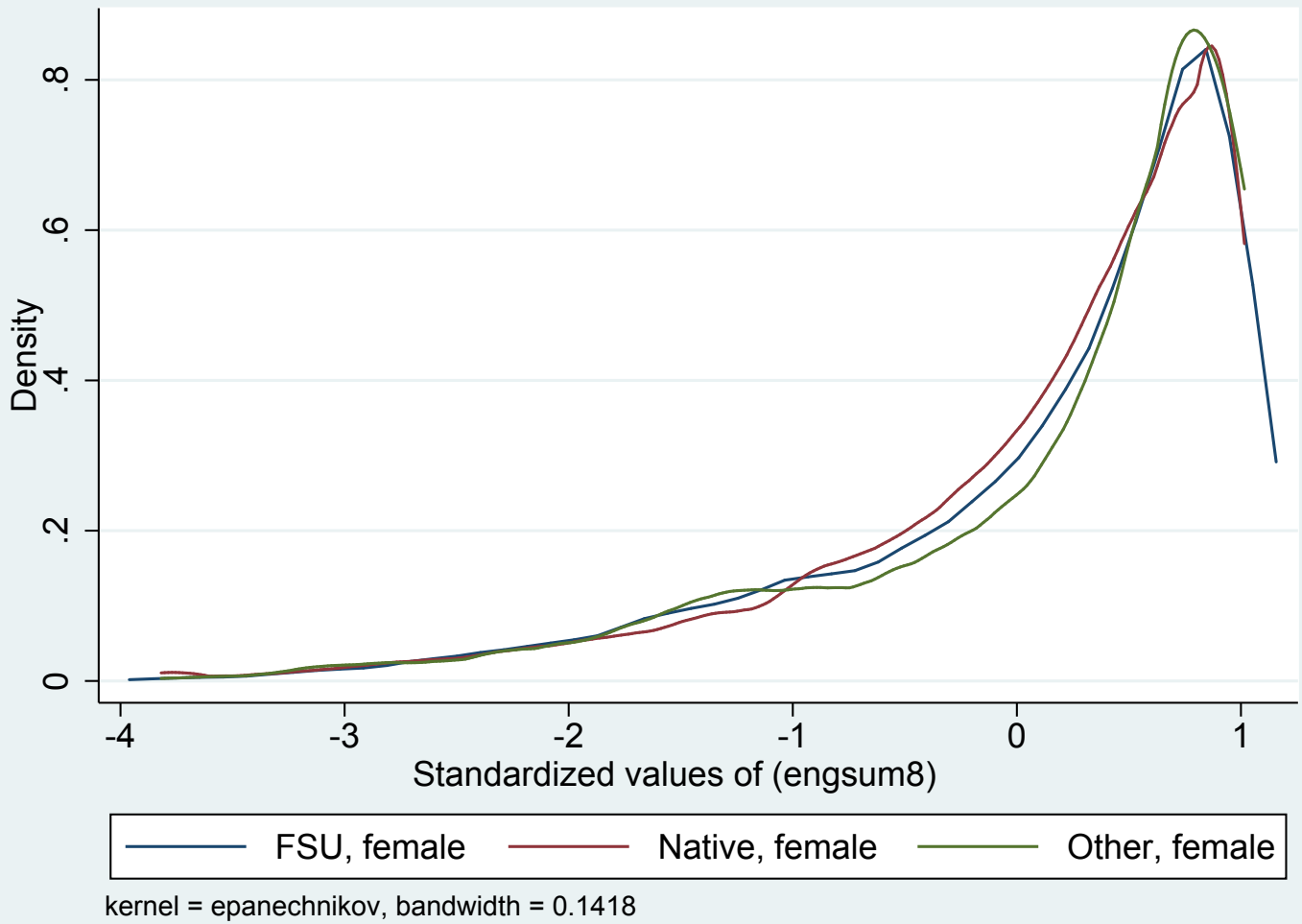
# Eighth grade English achievement

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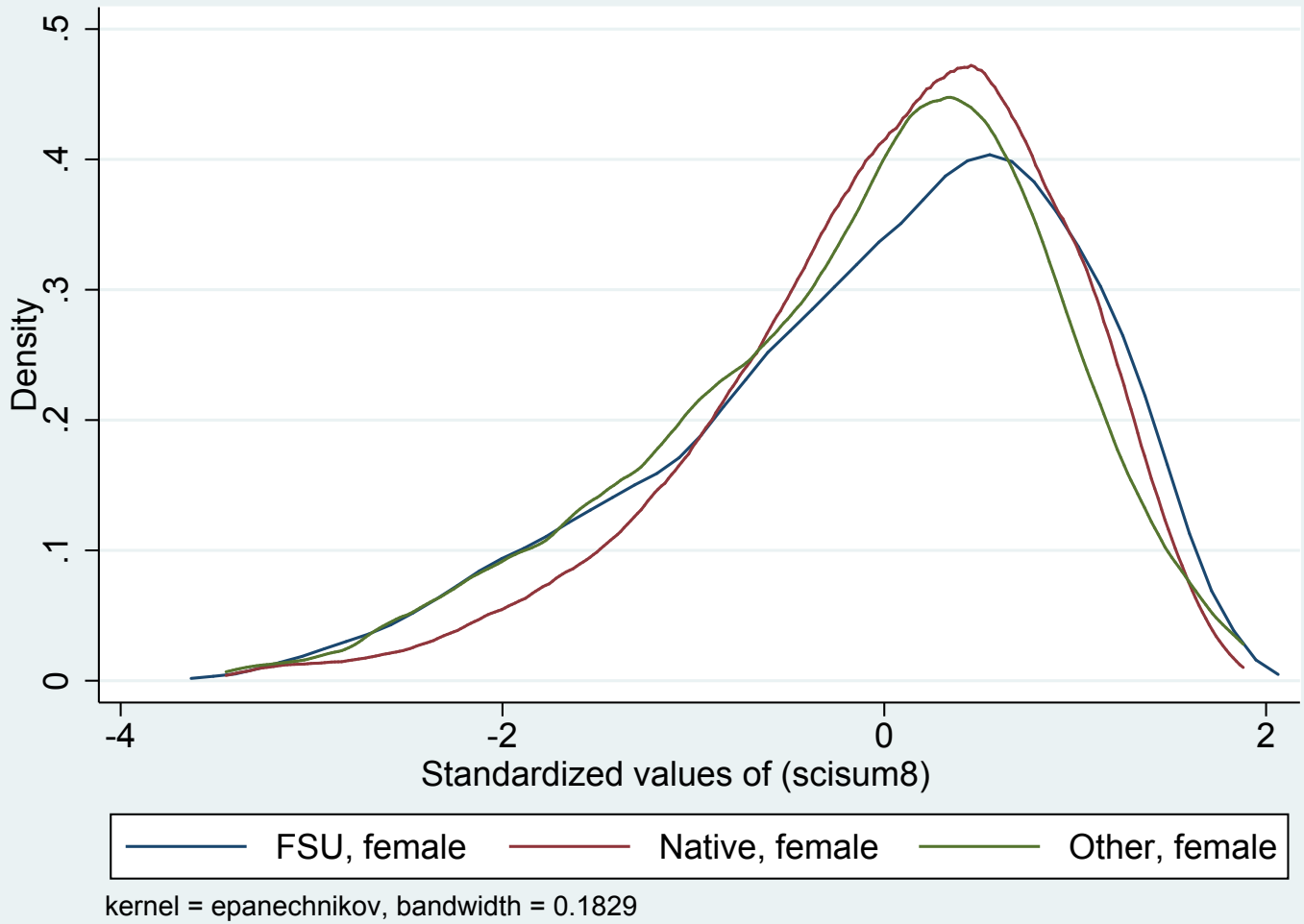
# Eighth grade science achievement

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# Secondary education choices

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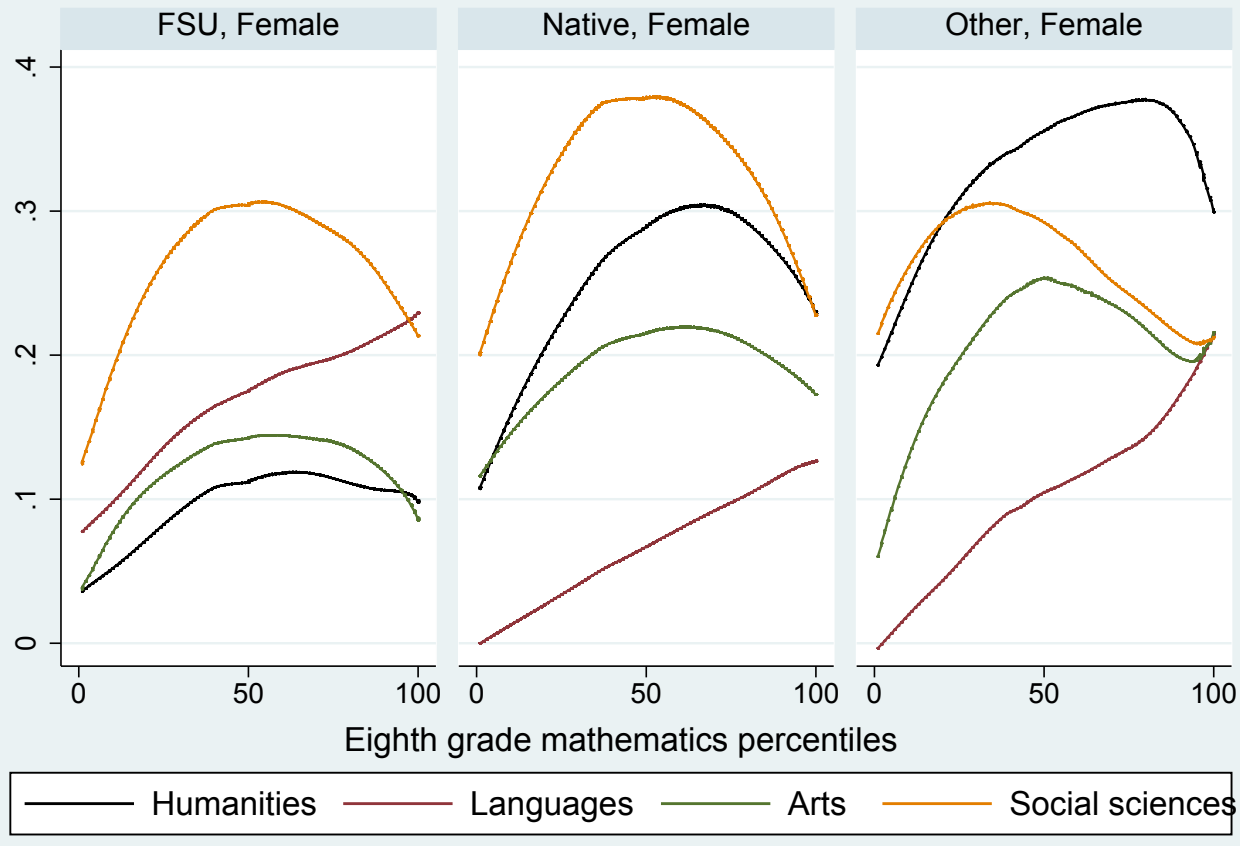
| | (1) | (2) | (3) |
|---|---|---|---|
| | Full matriculation | | |
| Native | 0.047*** | 0.023* | 0.025** |
| | (0.013) | (0.012) | (0.010) |
| Other immigrant | 0.002 | −0.003 | 0.022 |
| | (0.021) | (0.019) | (0.016) |
| Constant | 0.678*** | 0.609*** | 0.615*** |
| | Advanced mathematics | | |
| Native | −0.039*** | −0.054*** | −0.033*** |
| | (0.010) | (0.010) | (0.008) |
| Other immigrant | −0.064*** | −0.081*** | −0.041*** |
| | (0.014) | (0.013) | (0.011) |
| Constant | 0.183*** | 0.118*** | 0.137*** |
| *Controls* | | | |
| SES | | yes | yes |
| GEMS | | | yes |
| N | 30,795 | 30,795 | 30,795 |

| | (1) | (2) | (3) |
|---|---|---|---|
| | STEM elective | | |
| Native | −0.097*** | −0.115*** | −0.095*** |
| | (0.014) | (0.013) | (0.011) |
| Other immigrant | −0.106*** | −0.118*** | −0.076*** |
| | (0.020) | (0.018) | (0.016) |
| Constant | 0.355*** | 0.288*** | 0.295*** |
| | Social science | | |
| Native | 0.050*** | 0.035*** | 0.023* |
| | (0.013) | (0.013) | (0.013) |
| Other immigrant | −0.015 | −0.004 | −0.013 |
| | (0.018) | (0.018) | (0.018) |
| Constant | 0.294*** | 0.348*** | 0.341*** |
| *Controls* | | | |
| SES | | yes | yes |
| GEMS | | | yes |
| N | 30,795 | 30,795 | 30,795 |

# High school non-STEM choices conditional on 8th grade mathematics achievement

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# Tertiary education choices

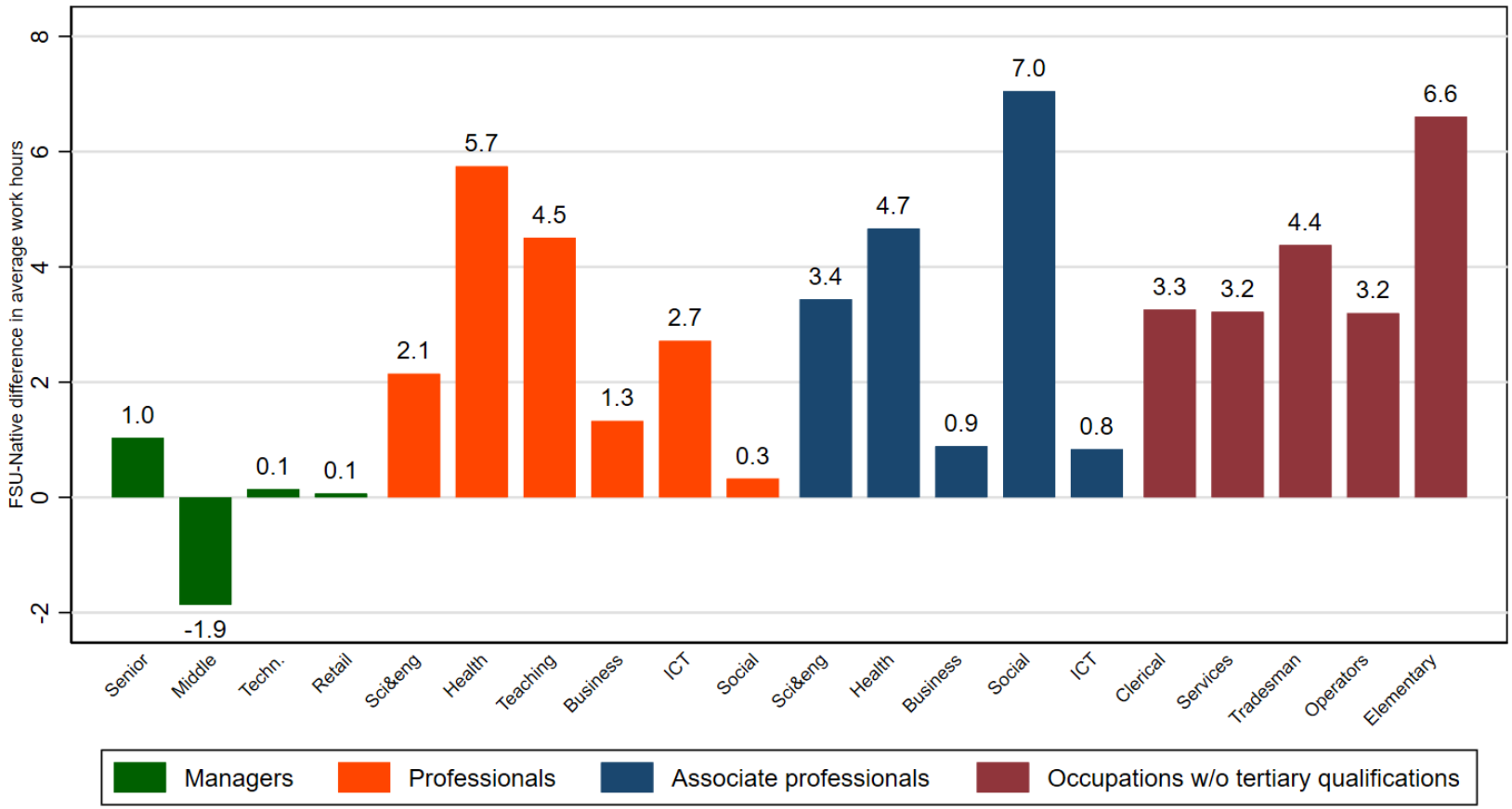
| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Studied in tertiary education | | | | |
| Native | 0.133*** | 0.087*** | 0.076*** | 0.108*** | 0.047*** |
| | (0.008) | (0.007) | (0.006) | (0.009) | (0.009) |
| Other immigrant | 0.060*** | 0.062*** | 0.042*** | 0.063*** | 0.041*** |
| | (0.016) | (0.014) | (0.012) | (0.017) | (0.015) |
| Constant | 0.486*** | 0.433*** | 0.231*** | 0.773*** | 0.680*** |
| GEMS scores | | yes | yes | | yes |
| Matriculation scores | | | yes | | yes |
| Prior choice | | | yes | | yes |
| Psychometric scores | | | | | yes |
| N | 30,795 | 30,795 | 30,795 | 17,092 | 17,092 |

Estimation equation

# Share of Native and FSU immigrants in occupations

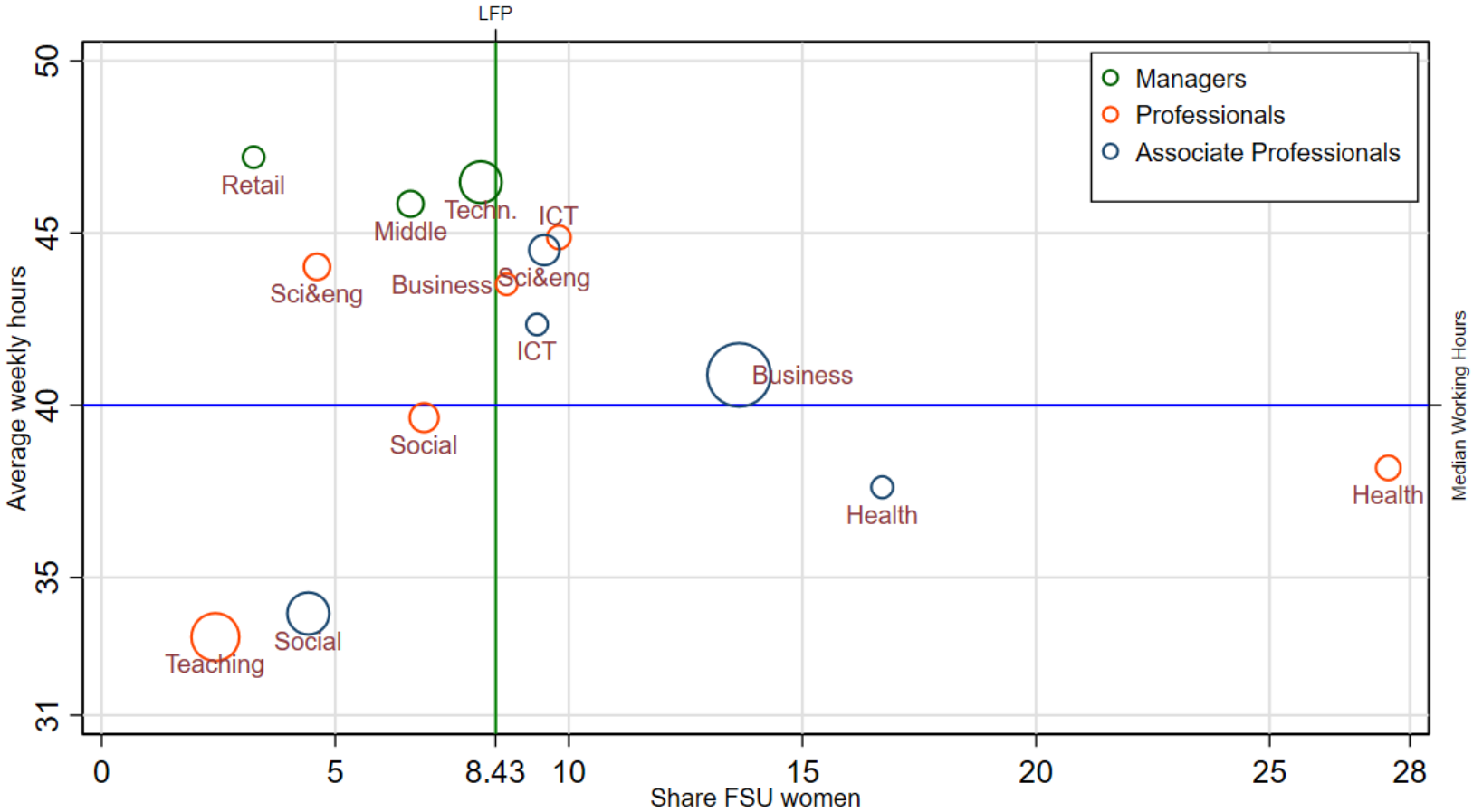

back

# Difference in average weekly working hours between native and FSU immigrant women, by occupation



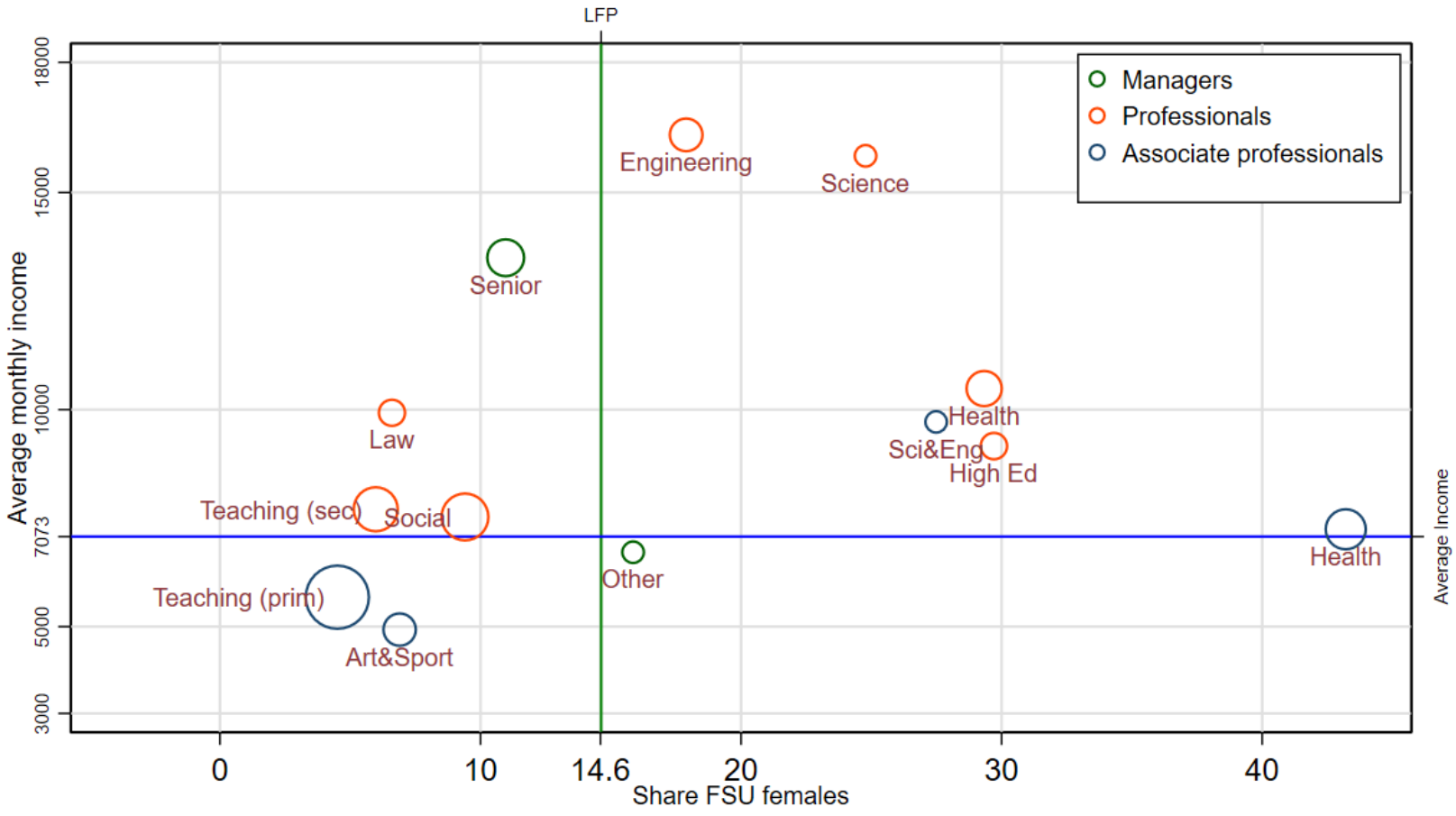

back

# Occupations by FSU share and average weekly working hours




back

# Occupations by FSU share and average monthly income




back

# Natives' eighth grade achievement and share of FSU immigrants in grade

| | (a) GEMS scores | | | |
|---|---|---|---|---|
| | English | Hebrew | Mathematics | Science |
| Without SES controls | | | | |
| % $FSU\ 8^{th}\ grade$ | -0.078*** | -0.124*** | -0.102*** | -0.031 |
| | (0.026) | (0.022) | (0.029) | (0.027) |
| % $FSU\ 8^{th}\ grade^2$ | -0.010 | 0.032** | 0.013 | 0.013 |
| | (0.016) | (0.015) | (0.018) | (0.017) |
| With SES controls | | | | |
| % $FSU\ 8^{th}\ grade$ | 0.079*** | -0.002 | -0.003 | 0.050* |
| | (0.023) | (0.023) | (0.032) | (0.030) |
| % $FSU\ 8^{th}\ grade^2$ | -0.036*** | 0.008 | 0.002 | 0.003 |
| | (0.012) | (0.013) | (0.017) | (0.015) |
| $N$ | 22,596 | 23,409 | 22,146 | 21,899 |

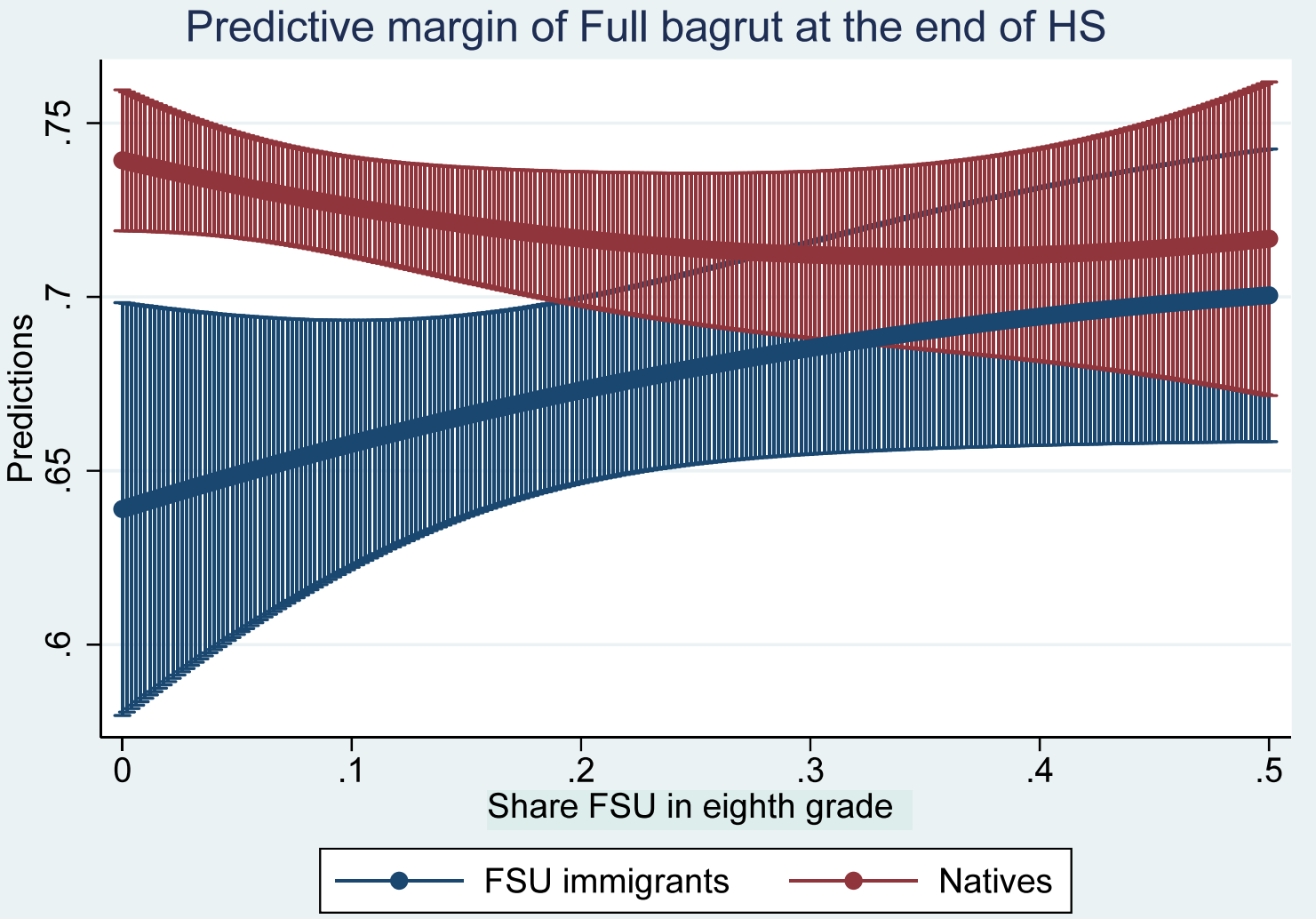
back

# Natives' choice outcomes and share of FSU immigrants in grade

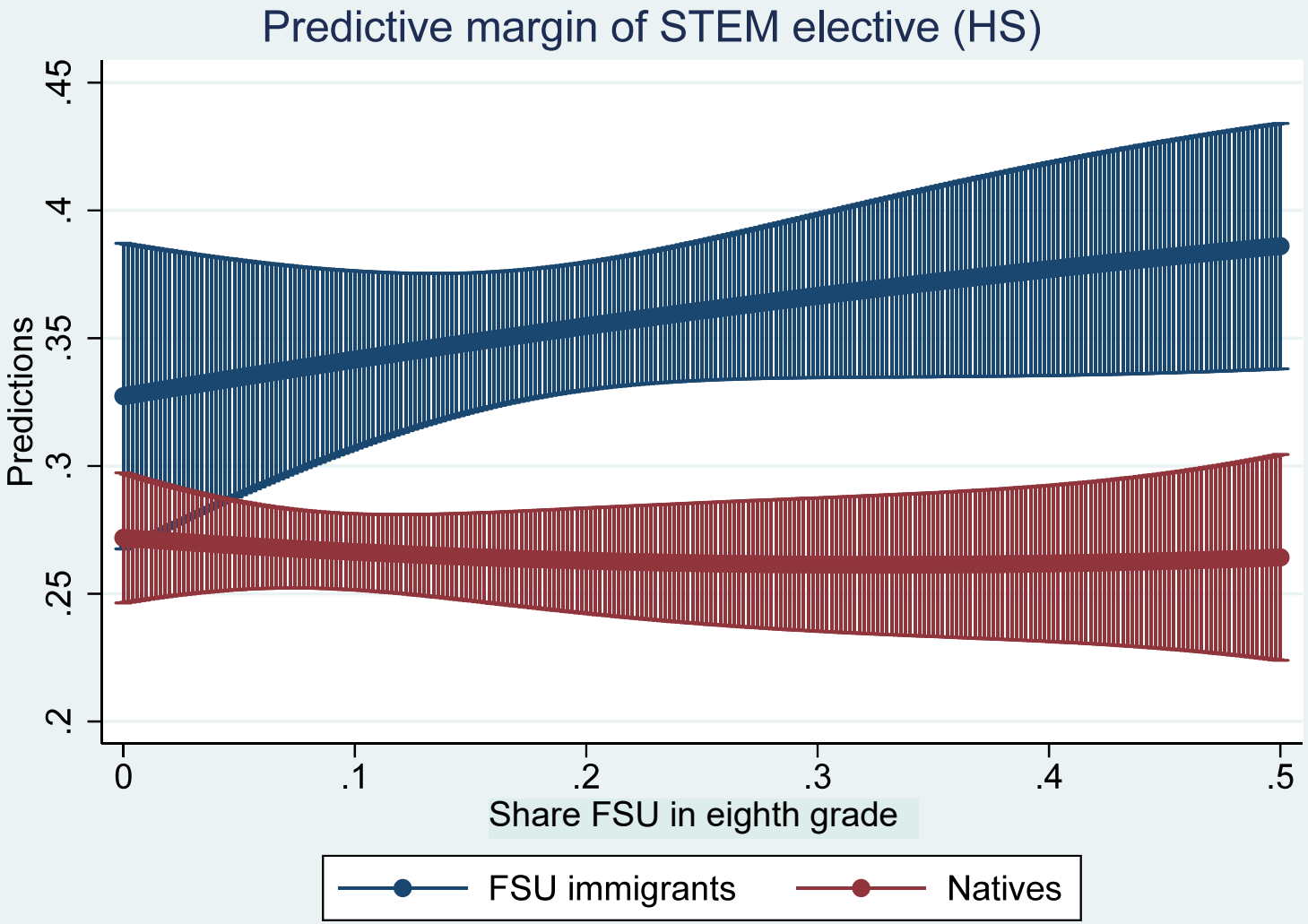
| | (b) Attainment and choice | | | |
|---|---|---|---|---|
| | Full matriculation | STEM matriculation | STEM tertiary | Pink-collar tertiary |
| Without SES controls | | | | |
| % $FSU$ $8^{th}$ $grade$ | -0.325*** | -0.120** | -0.046 | -0.469*** |
| | (0.053) | (0.055) | (0.047) | (0.056) |
| % $FSU$ $8^{th}$ $grade^2$ | 0.079** | 0.015 | -0.032 | 0.166*** |
| | (0.033) | (0.031) | (0.036) | (0.028) |
| With SES controls | | | | |
| % $FSU$ $8^{th}$ $grade$ | -0.081 | -0.030 | 0.178*** | -0.248*** |
| | (0.053) | (0.063) | (0.050) | (0.053) |
| % $FSU$ $8^{th}$ $grade^2$ | 0.032 | 0.013 | -0.062* | 0.087*** |
| | (0.031) | (0.032) | (0.033) | (0.030) |
| $N$ | 24,184 | 24,184 | 24,184 | 24,184 |

back Marginal effects pink collar Marginal effects STEM

back


Predictive margin of Full bagrut at the end of HS
Predictions
.6
.65
.7
.75
0
.1
.2
.3
.4
.5
Share FSU in eighth grade
FSU immigrants
Natives

back


Predictive margin of STEM elective (HS)
Predictions
.2
.25
.3
.35
.4
.45
0
.1
.2
.3
.4
.5
Share FSU in eighth grade
FSU immigrants
Natives