

Gender inequality in returns to education

Assaf Rotman

Hadas Mandel

Do men and women differ in the returns they receive to their education?

Why is the link between gender and returns to education important?

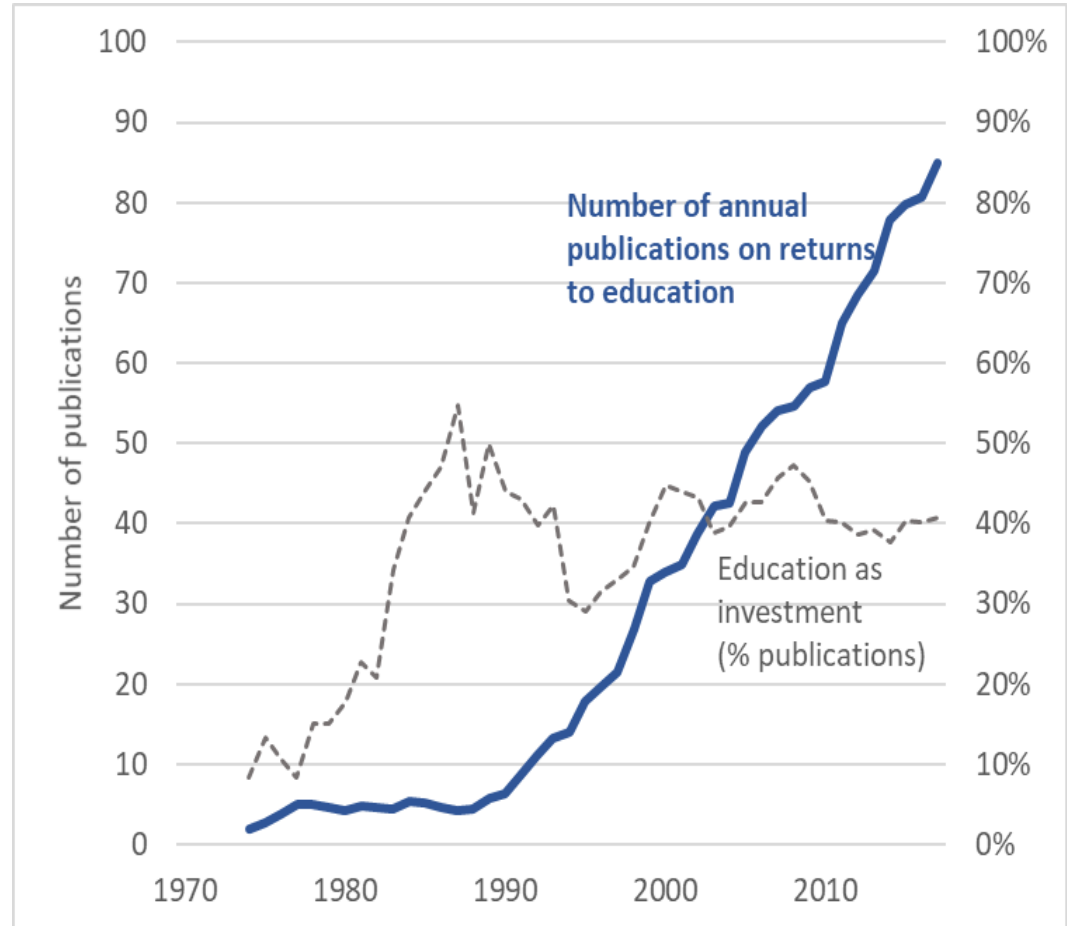
Few processes should be mentioned:

- Education's economic value has increased substantially. It is the main determinant of earnings, and the main driver of the rising income inequality of the last four decades.
 - College graduates earned approx. 30% more than high school graduates in 1980, compared to approx. 70% more in 2015.
- Dramatic expansion of women's education. Women are more educated than men, and the gap in their favor keeps growing.
- Gender segregation in fields of study – declining but still substantial.
- We could expect that the gender wage gap disappear, but its decline has stalled during the 2000s.

>>> How could it be? Is it because women receive lower returns to their higher education?

'Returns to education' in the academic literature

- Great and constantly growing interest in returns to education.
 - Dozens of publications per year.
 - Frequently refer to education as investment, inspired by the human capital theory.
- The main question in this context is whether (and how much) the benefits from education worth the investment.



Do men and women differ in the returns they receive to their education?

Two approaches to answer this question:

- Returns to education as rewards for individuals' investments in human capital
- Returns to education as a factor that shapes labor market inequalities

In light of these two approaches we introduce the distinction between '*gender differences*' and '*gender inequality*' in returns to education.

'Returns to education' in the academic literature

With the question of whether the benefits from education exceed its costs in mind, studies estimate the returns to education in one of three ways:

1. The internal rate of return

The relative increase of earnings (in percentages) associated with additional years of education, given the costs

2. The college wage premium

The extra earnings gained by college graduates relative to the earnings of high-school graduates

3. The effect of education on lifetime earnings

Estimates of the effect of education on the total earnings accumulated over the course of workers' entire career

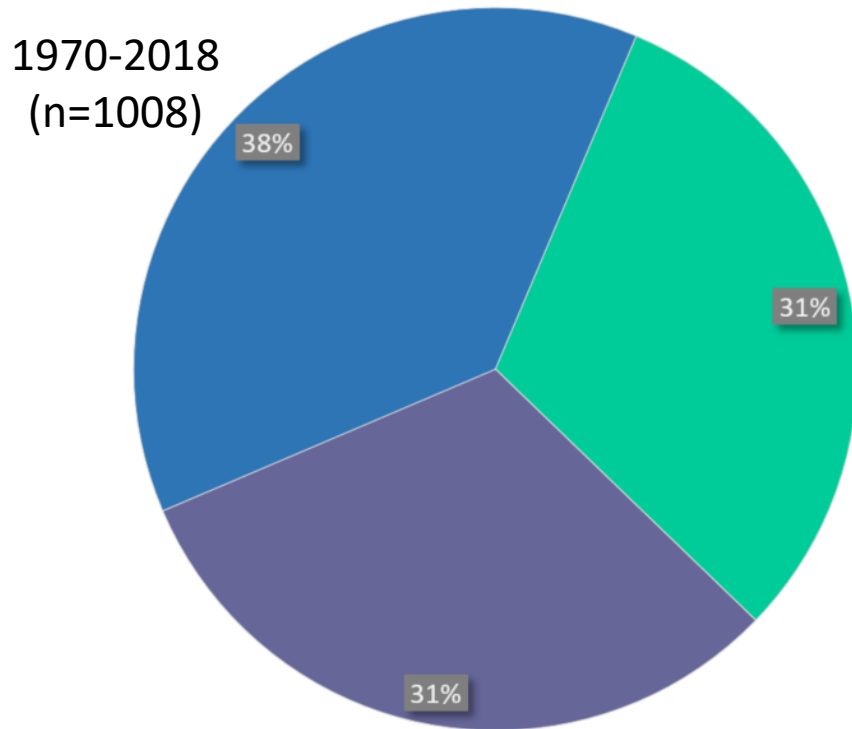
The first two dominate the literature, and share a common feature: They are based on the Mincerian earnings function, in which returns to education are measured in **relative terms**, i.e., the *percentage* increase of earnings associated with higher levels of education.

The focus is on the earnings of the highly educated workers *relative* to the less educated workers. This focus has major consequences when cross-group comparisons are made.

The limits of relative measures of returns to education

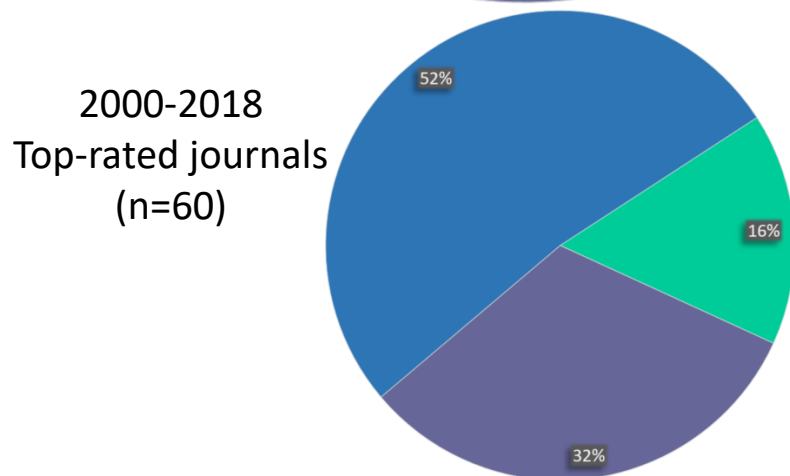
- Relative measures fit *within-group* analysis, but problematic for *between-groups* comparisons.
- The percentage increase of earnings due to education is compared between groups that have different distributions of earnings, and therefore each percentage point has different 'real value'.
- Comparing **relative returns** to education between groups is informative when the question is which group has a greater incentive to invest in education.
- Comparing **absolute returns** to education between groups is informative when the question is what are the gaps between the groups in the rewards for this investment.
- For example, in 2000 Black women had a college wage premium of 144% compared to 69% for white men. Yet in absolute terms their premium was lower: 11,927\$ compared to 12,353\$ for white men.
(Diprete & Buchmann, 2006)

Gender and the research on returns to education



Gender is a neglected topic in the vast research on returns to education

Most studies either focus on men or only control for gender.



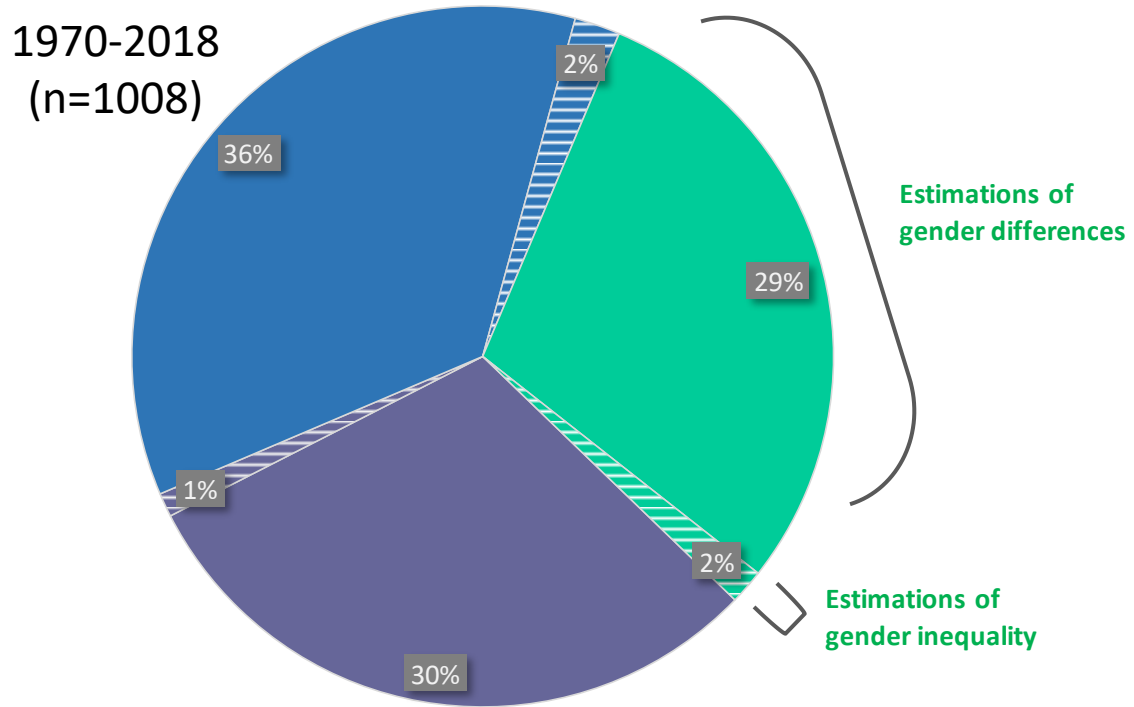
Estimations of returns to education:

■ Control for gender differences

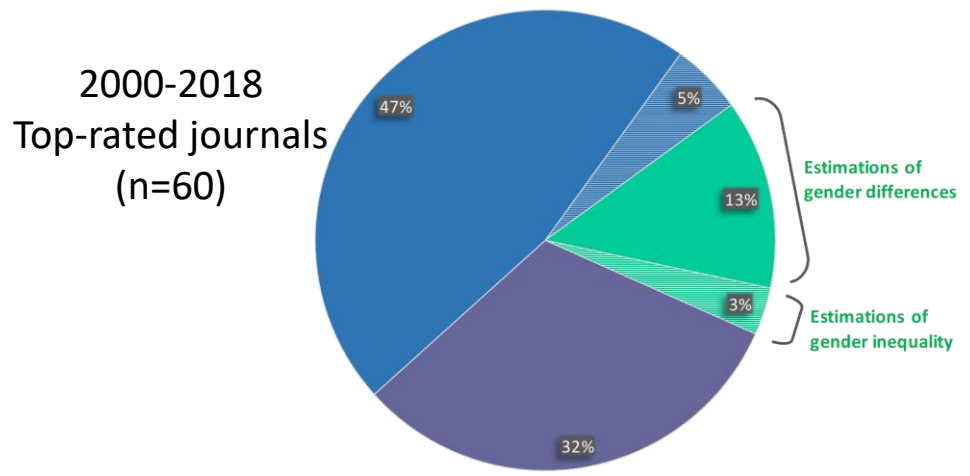
■ Not accounting for gender

■ Differentiated by gender

Gender and the research on returns to education

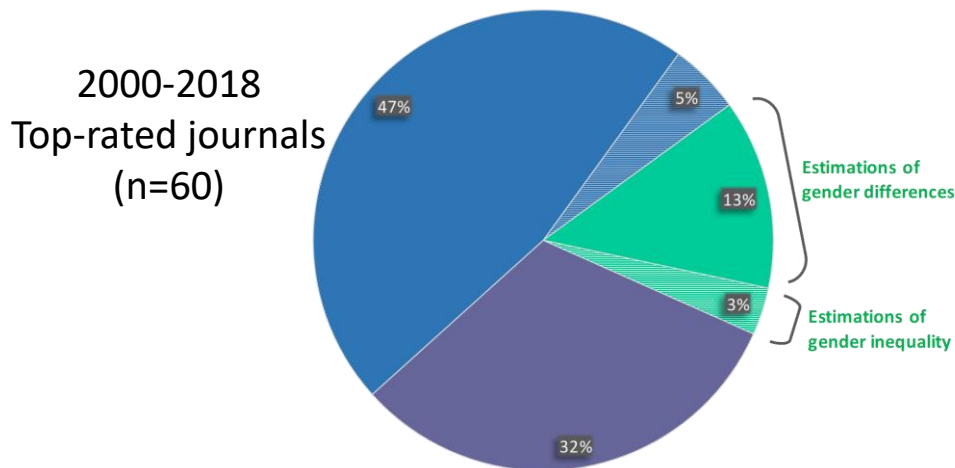
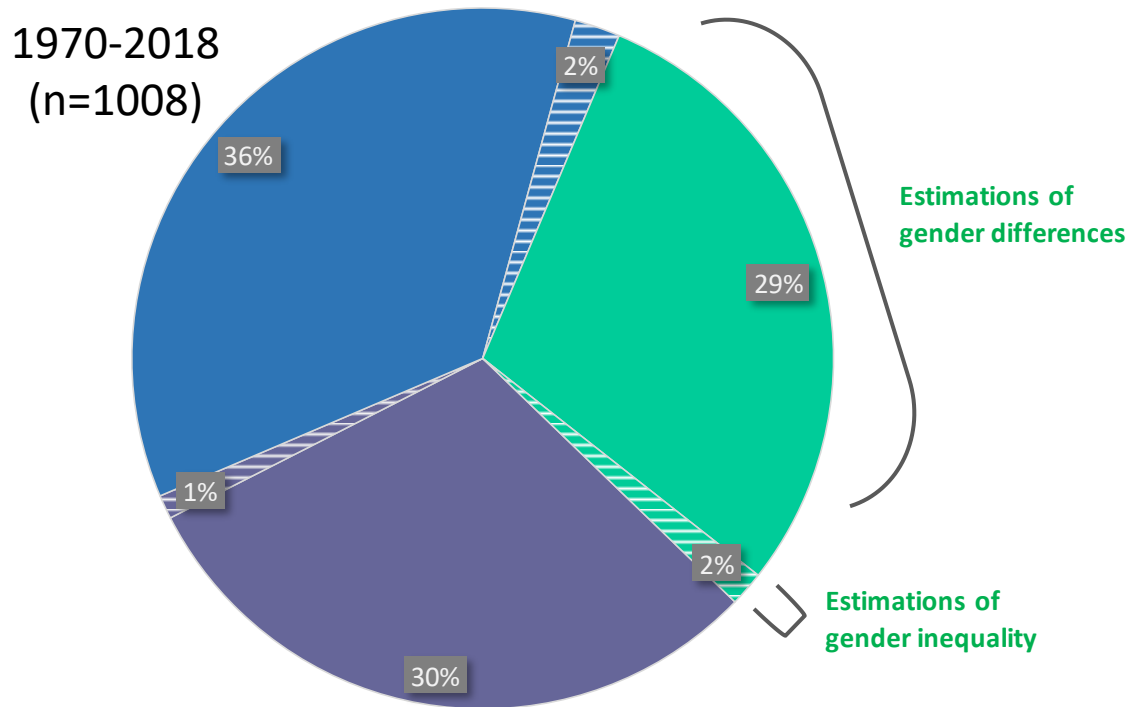


Studies that report gender differentiation almost always use relative measures of returns to education.



- Estimations of returns to education:**
- Control for gender differences
 - Not accounting for gender
 - Differentiated by gender
 - Absolute measurement

Gender and the research on returns to education



The uniform conclusion: women receive *higher* education premiums as compared to men.

The meaning is that wage differences between more and less educated women (*in percentages*) are higher than among men.

But the misinterpretation of women's higher education premiums is prevalent.

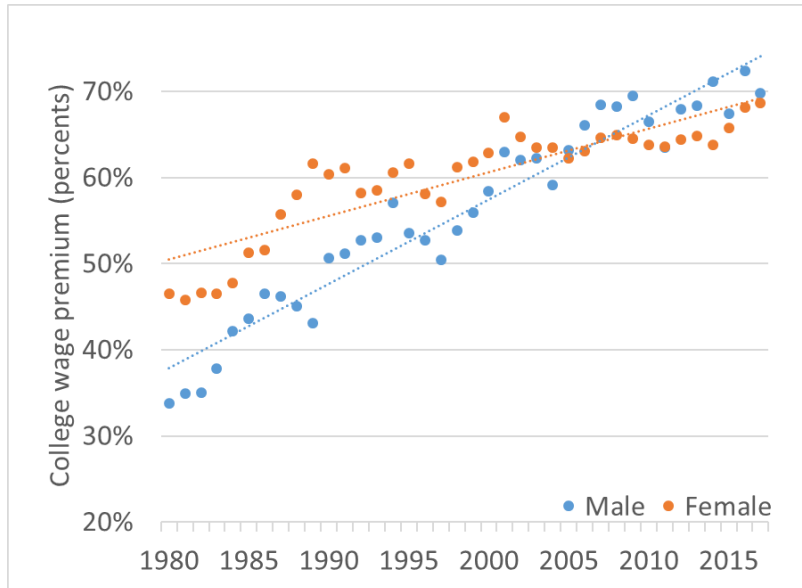
Gender inequality in absolute education premiums is not acknowledged.

What do we offer?

- Estimations of gender differences in college wage premium in relative and absolute terms.
- Using CPS data on working age employees, 1980-2017.
- Regressions include gender, college education and their interaction, and control for working hours, age, race, marriage, number of children, public sector and overwork.
- Wages are adjusted to inflation (2017\$).

Estimated returns to education, OLS models, 1980-2017

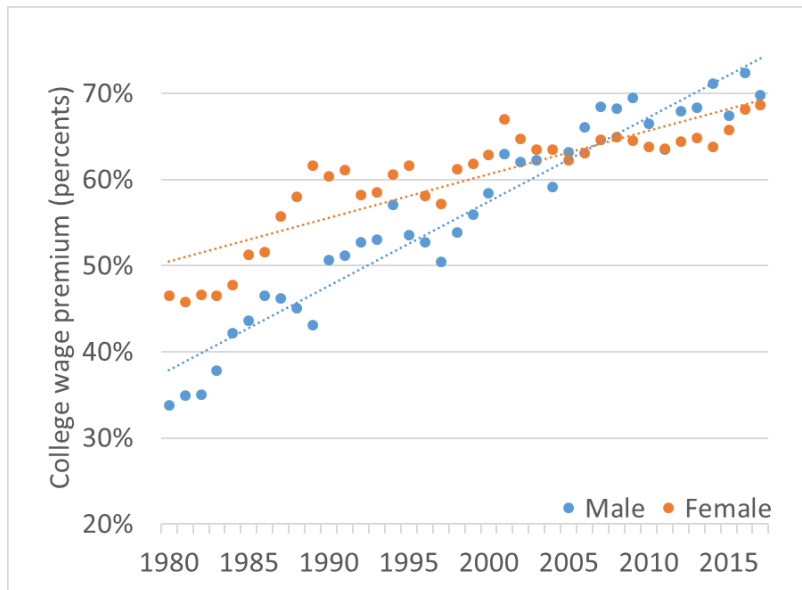
Relative returns (log-wages)



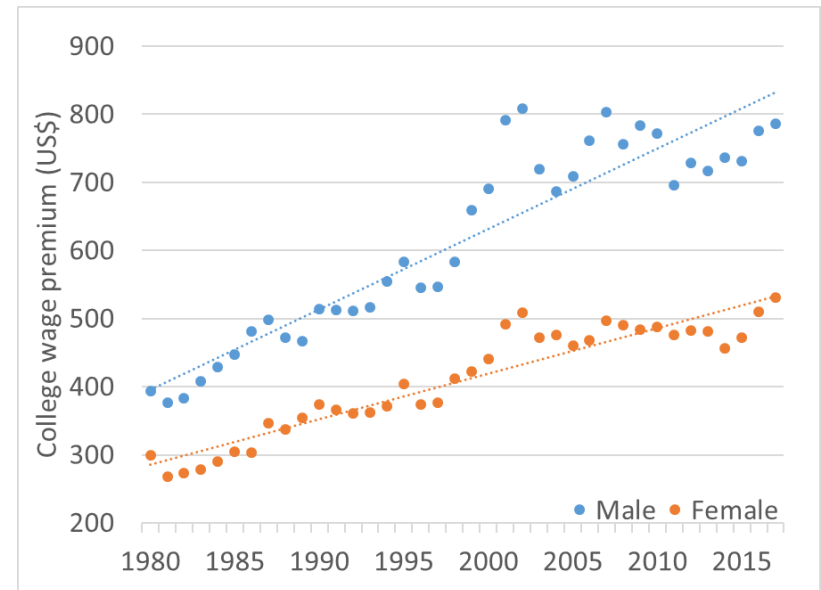
- In line with previous studies: Until the new millennium, women received higher relative education premiums than men.

Estimated returns to education, OLS models, 1980-2017

Relative returns (log-wages)



Absolute returns (US\$)



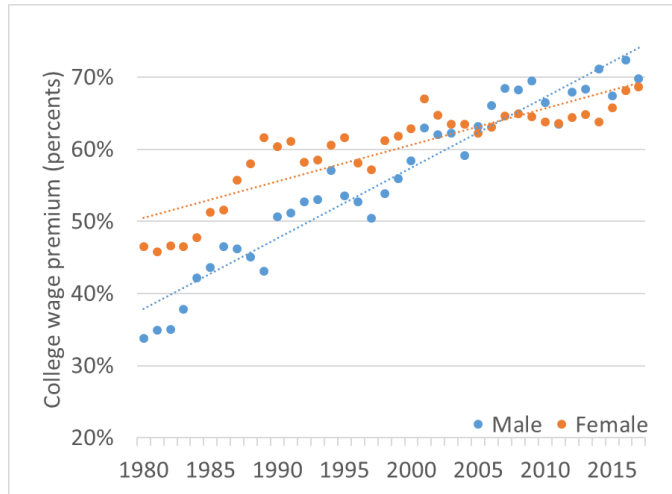
- In line with previous studies: Until the new millennium, women received higher relative education premiums than men.
- **In absolute terms, women receive lower returns to college education than men, and the gap is growing over time.**

Gender inequality in returns to education and the role of top earnings

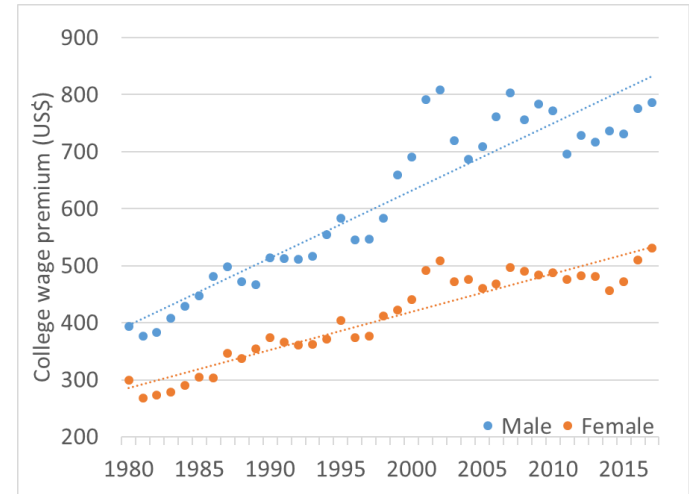
- The gender gap in returns to education grows as a result of the increasing returns to education over time (increasing class inequality)
- Much of this increase is driven by the rise of the earnings at the top of the distribution.
- Women are underrepresented at the top.
- We expect that the gender gap in returns to education is driven by men's overrepresentation at the upper segments of the wage distribution, where wages are disproportionately high.
- This leads to a further limitation of the relative measurement of returns to education that rely on the log-wages as the dependent variable.
- The log transformation compresses the right tail of the distribution, and by that it reduces the effect of the top wages.
- Therefore, using log-wages is not only problematic because of the within/between problem, but also because it downplays the effect of the top.

Estimated returns to education, OLS models, 1980-2017

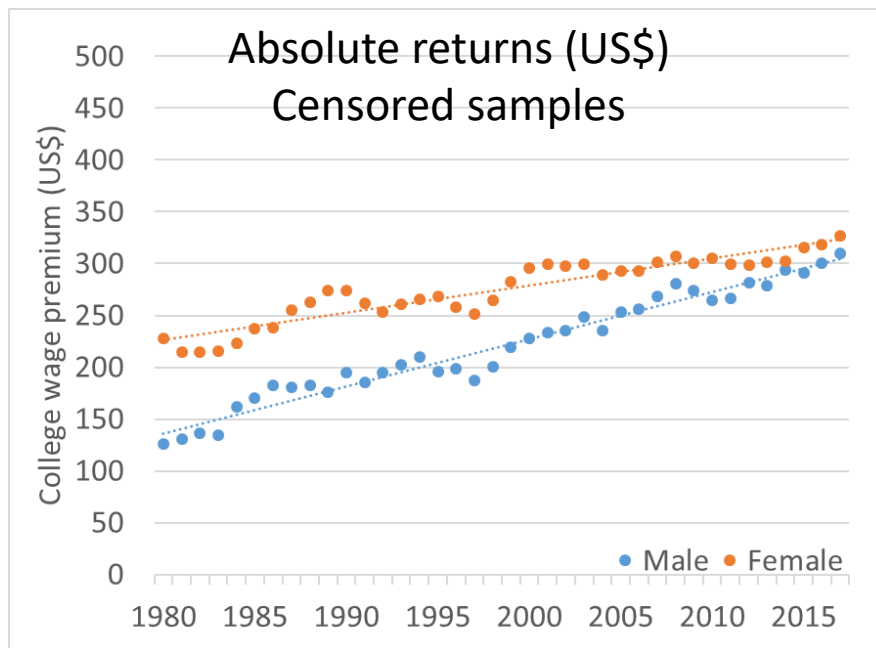
Relative returns (log-wages)



Absolute returns (US\$)



Absolute returns (US\$) Censored samples



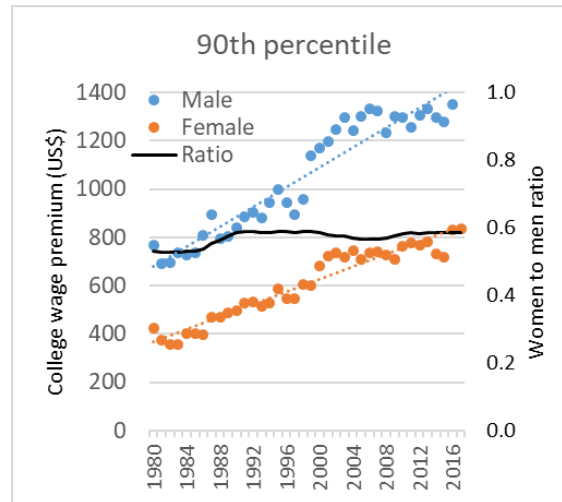
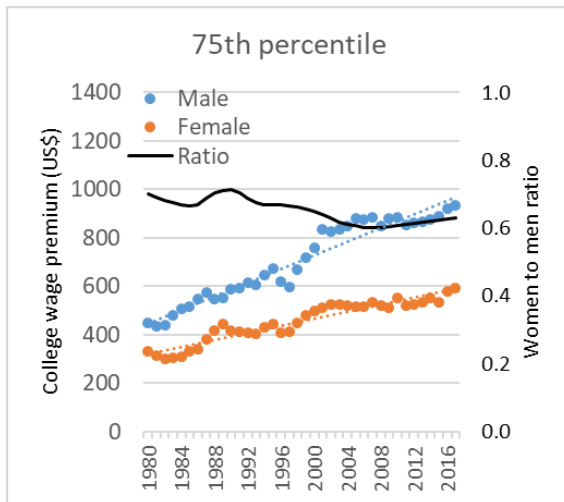
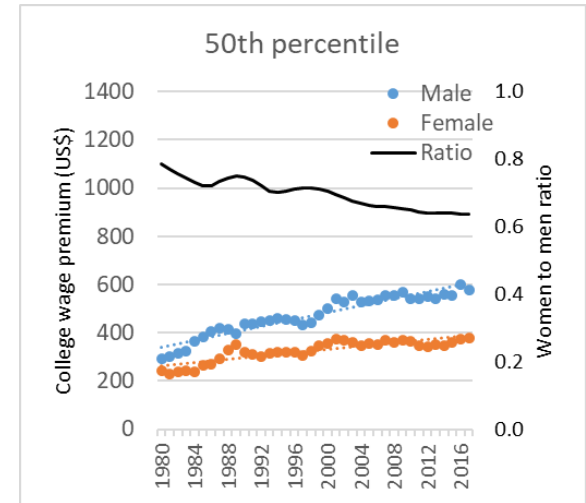
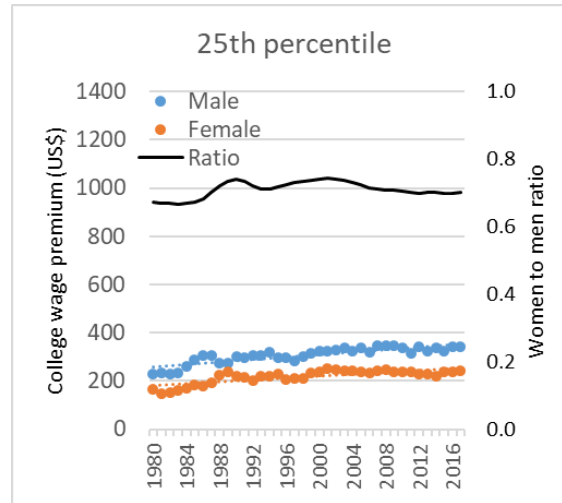
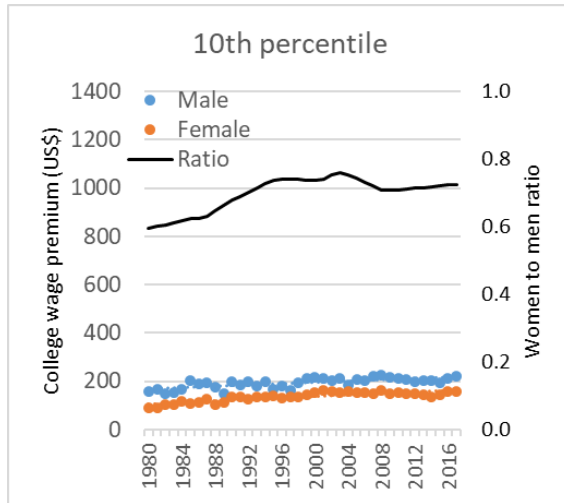
We set a maximum wage at the 80th percentile, to imitate the compression made by the log transformation.

The findings are much more similar to those from the log-wage returns to education, indicating that **much of the gap is driven by men's high wages at the top.**

To examine this further, we use quantile regression and estimate the gender gap in returns to education across the distribution

Absolute returns to education, 1980-2017

Quantile regression models



Larger and growing gender gap at the 90th quantile.

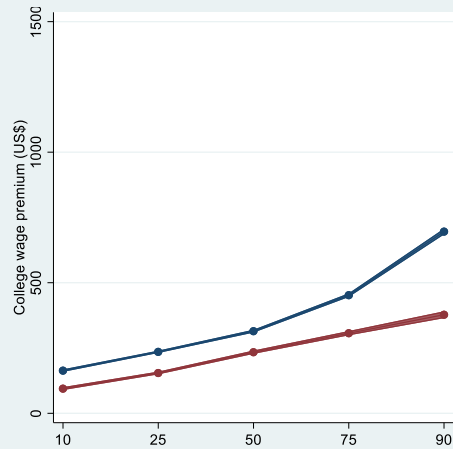
The women to men ratio of the college premium is lowest at the top.

I.e., the women who earn the most are also the most deprived relative to their male peers.

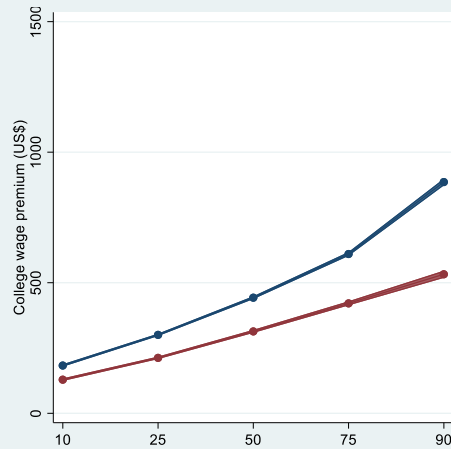
Absolute returns to education across the distribution, by period

Quantile regression models

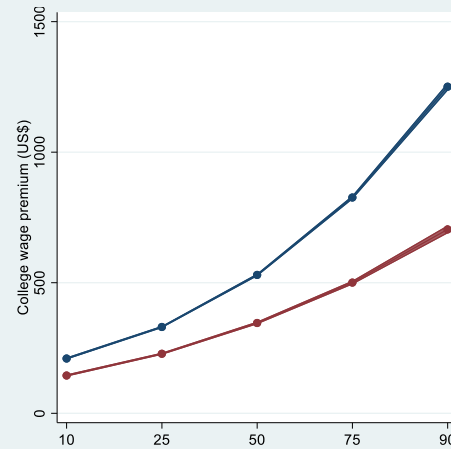
1980-1985



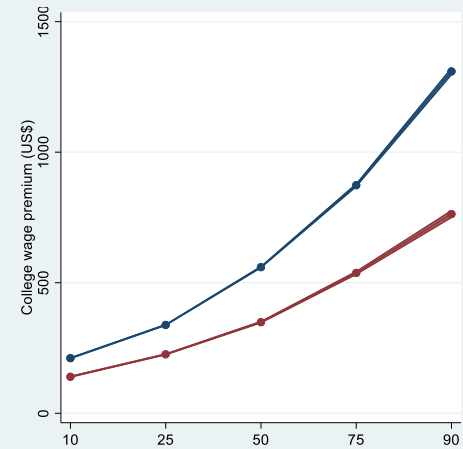
1990-1995



2000-2005



2010-2015



Gender inequality in returns to education: suggested mechanisms and explanations

- Glass ceiling – exclusion of women from top positions
- Gender segregation in fields of study, occupations and sectors (sure, but why?)
- Devaluation – female dominated fields of study and occupation pay less
- Gender roles in the family – women's care work impacts their labor market behavior
- Discrimination