Trends in U.S. Wage Inequality: Reproduction and Extension

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Abstract

Using the March CPS for survey years 1963 to 2020, this paper studies the evolution of U.S. wage inequality in the last six decades. I replicate and extend a section of the results of Autor, Katz, and Kearney (2008), and find that wage inequality continues growing at similar pace, continuing a secular trend that has been occurring in recent decades. Moreover, changes in the relative supply of and demand for skilled workers, attributable to skill-biased technical change, explain some of the changes in the evolution of the college and high school wage differential.

1. Introduction

The growth in U.S. wage inequality is an often contested topic. During the previous six decades, workers at the 90th percentile of the wage distribution saw their wages increase by more than 80 log points relative to the wages of workers at the 10th percentile. Several studies find that shifts in the supply of and demand for skilled workers can in part explain the rise in U.S. wage inequality during the 1980s (Katz and Autor 1999; Goldin and Katz 2001). The literature argues that the rapid increase in wage inequality during the 1980s reflected an ongoing secular rise in the relative demand for skilled workers (Juhn, Murphy, and Pierce 1993) which, when met with a dramatic slowdown in the relative supply of skilled workers, caused the wage gap to expand rapidly (Katz and Murphy 1992). (DiNardo, Fortin, and Lemieux 1996; Card, Lemieux, and Riddell 2003) find that the decline of labor unions and a falling real minimum wage also contributed to the rise of wage inequality during the 1980s.

Autor, Katz, and Kearney (2008) revise claims in the literature that find that the rise in U.S. wage inequality during the 1980's was a one time event. The claims attribute the raise in inequality to the decline of the real minimum wage and conclude that the skill-biased technical change hypothesis provides a weak explanation for the evolution of U.S wage inequality during the 1980s. Autor, Katz, and Kerney find that the growth of wage inequality is not a one-time episodic event that only occurred during the 1980's. They find that, wage inequality in the upper tail (90/50) of the wage distribution continued growing from 1980 to 2005 at about 1 log point per year, marking a secular trend. Moreover, they find that models that emphasize growth in the relative demand for skills, attributable to skill biased technical change, and a sharp decline in the relative supply of college workers in

the 1980s, capture the evolution of the college wage gap from the early 1960s to the early 2000s.

In this paper I replicate a section of Autor, Katz, and Kearney (2008)'s findings and extend the analyzed period through the earning year 2019. I find that wage inequality continues growing at a similar pace to previous decades and that the changes in the relative supply and demand for skilled workers can explain some of the changes in the evolution of the college/high school wage differential.

2. Data and Methods

Data

I obtain data from the March Current Population Survey (CPS), for survey years 1964 to 2020 (covering earnings from 1963 to 2019). The data set contains information on annual earnings, weeks worked, and various other demographic variables. I select workers ages 16 to 64 with up to 39 years of experience, who are full-time, full-year (FTFY) workers, defined as working 35-plus hours per week and forty-plus weeks in the prior year. Weekly earnings equal annual earnings divided by weeks worked last year. All calculations are weighted by CPS sampling weights, and weekly earnings are deflated to earnings in 2000 dollars using the personal consumption expenditure (PCE) deflator. Finally, I drop allocated earnings observations as well as workers with weekly earnings below 67 dollars a week in 1982 dollars.

To construct the relative supply measures, also referred to as the supply of college workers relative to high school workers, I follow the methods described in the data appendix of Autor, Katz, and Kearney (2008). The relative supply series consists of assigning efficiency units to individual cells. Cells are created based on sex, five schooling categories, and 40 experience categories (0-39 years of experience), generating 400 cells per year. These efficiency units per cell are then summed up based on education, to generate the total labor supply for college workers and high school workers per year. To construct the relative wage series, also referred to in this paper as the college /high school wage differential, I again follow the methods of the authors, described in the data appendix. The relative wage series consists of obtaining predicted log wages of full-time, full-year workers, which are then weighted by the average share of total hours worked by each cell/group over the sample period. The construction of both series' are described in further detail in the data appendix of the above cited paper.

To calculate years of experience beginning in 1992 and onward, I follow the instructions described in the data appendix by Autor, Katz, and Kearney (2008). I use numbers from Park (1996) to assign years of completed education to each worker based on race, gender and grade completed. Years of experience are then computed by subtracting age minus years of education minus 6, and are rounded to the nearest integer.

Methods

I replicate and extend a section of the results of Autor, Katz, and Kearney (2008) to look at the evolution of U.S. wage inequality in the last six decades. Autor, Katz, and Kearney challenge the claims made by Card and DiNardo (2002), who claim that the rise in wage

inequality is a one¬time, nonrecurring event, that occurred during the early 1980s. Card and DiNardo attribute much of the rise in inequality to the decline of the real minimum wage and other factors such as declining unionization. Most importantly, they conclude that the skill-biased technical change (SBTC) hypothesis cannot adequately explain the evolution of U.S. wage inequality observed during the 1980s and 1990s. Like Autor, Katz, and Kearney, to reevaluate these claims, I look at the evolution in wage inequality and look at changes in the demand, attributable to skill-biased technical change, and supply of skilled workers.

To determine if the rise in wage inequality is an episodic event that only occurred during the 1980s, I look at the evolution of various inequality concepts: changes in overall inequality, represented by the (90/10) log wage differential; changes in upper tail and lower tail inequality, represented by the (90/50) and the (50/10) log wage differiental; between group wage inequality, represented by the college/high school wage differential; and within group (residual) wage inequality, given by the 90/10 residual wage gap. Analyzing the different wage differential series allows one to see if the rise in wage inequality was a one-time episodic event or if it continues growing at a steady pace.

Autor, Katz, and Kearney (2008) conclude that a part of the increase in U.S earnings inequality during the ’80s can in part be explained by the shifts in the supply of and demand for skilled workers. I look at the shifts in the supply of and demand for skilled workers and through OLS regressions estimate their effect on the evolution of the college/high school wage differential. These regressions incorporate a relative supply variable to account for the shifts in the supply of college workers relative to high school workers, as well as different time trends, which substitute for shifts in the demand for skilled workers. Also, I include institutional factors such as the real minimum wage, to see its effect on the college/high school wage differential. Moreover, the college/high school wage premium is separately estimated by experience group, and the models are augmented to include a relative supply variable by experience group. Finally, I briefly cover the skill-biased technical change (SBTC) hypothesis which serves as the driving force, affecting the demand and supply for skilled workers.

3. Results

Trends in Wage Inequality, 1963-2005

Figure 1 demonstrates the widening of U.S. wage inequality for both men and women across four decades. The figure plots the change in log real weekly wages by percentile for men and women from 1963 to 2005. The figure illustrates a substantial expansion of wage inequality, the wages of workers at the 90th percentile increase by roughly 50 log points more than the wages of workers at the 10th percentile.

Figure 2 demonstrates the growth in wage inequality in three different inequality measures. It shows the development of the 90/10 overall and residual wage gaps for males as well as the college/ high school log wage premium. The residual 90/10 series represents the 90/10 difference in wage residuals from a regression of the log of weekly wages on a full set of variables described in the notes under Figure 2 in Autor, Katz, and Kearney (2008). All three plots follow a similar trend beginning in the 1980s demonstrating a sharp growth in inequality during the decade. The growth in inequality continues during the ’90s and

Figure 1. Change In Log Real Weekly Wage By Percentile, Full-Time, Full-Year Workers, 1963-2005

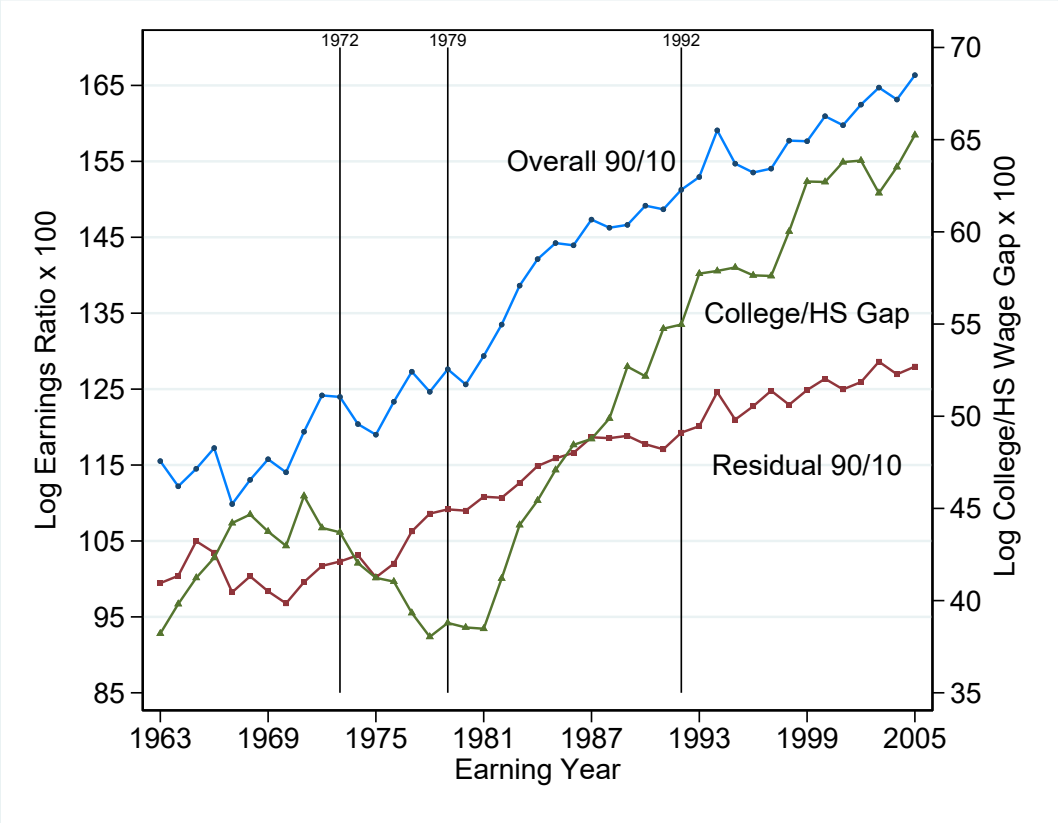
early 2000s but at a slower rate than in the 1980s. The series diverge during the '60s and '70s. In the decade of the '70s, there is a sharp drop in the college wage premium and a moderate increase in overall and residual inequality. In the '60s, there is a rapid increase in the college wage premium, however, overall and residual inequality remain still. Autor, Katz, and Kearney (2008) note that the divergent paths imply that the growth in inequality is not likely to be explained by a single factor. In Figure 3, I further analyze the evolution of wage inequality in the upper and lower halves of the wage distribution, to see inequality trends at the top and bottom of the wage distribution.

Figure 3 demonstrates the rapid increase of upper tail (90/50) and lower tail (50/10) wage inequality for men and women beginning in the early 1980s. These trends corroborate the trends observed in figure 2, demonstrating a significant jump in inequality beginning in the 1980s. For the upper tail groups, inequality continues to trend up through 2005. However, for the lower tail groups the rapid increase in inequality during the early 1980s tails off in the late 1980s and plateaus from thereon. As the findings show, there is a divergence in inequality trends at the top and bottom of the wage distribution. The rapid growth of wage inequality during the 1980s does not recur for lower tail groups. However, for upper tail groups wage inequality increases steadily from the 1980s and onward, demonstrating an ongoing growth in the rise of wage inequality.

Trends in Wage Inequality, 1963-2019

I extend the analyses for figures 1 through 3, to cover the evolution of the different trends through the year 2019. Figure 4 demonstrates the continued expansion of wage inequality

Figure 2. Three Measures of Wage Inequality, (Full-Time, Full-Year Workers), 1963-2005



among both sexes. From 1963 to 2019, the change in wages for women who are top earners (90th percentile and above) ranges from 100 log points to greater than 120 log points. For the period between 1963 to 2005, the change in wages for women at or greater than the 90th percentile ranged from 80 to 90 log points. This demonstrates an increase of roughly 30 log points for women at the top of the distribution, from 2005 to 2019 alone.

For men who are top earners, a similar change can be observed, having roughly an increase of 30 log points from the period between 2005 and 2019. At the bottom of the distribution (10 percentile or less), for both sexes there is an increase of roughly 10 log points from the period between 2005 and 2019. This demonstrates a much more rapid increase in the wages of top earners relative to the wages of earners at the bottom of the distribution.

In Figure 5, I find similar results. The overall 90/10 wage gap, the residual wage gap, and the college wage premium continue to trend up. The overall 90/10 wage gap, drops briefly after 2005, and then begins a rapid increase until 2014. It again drops briefly from 2015 to 2018 and jumps to previous levels in the following year. The overall 90/10 wage continues to trend up at a similar rate as observed from the ’90s and onward, but grows at a slower rate than in the 1980’s. Nonetheless, the evolution of the overall 90/10 wage gap from 2005 and onward, extends the secular trend observed during the previous decades.

The college wage premium follows a modest increase from 2005 to 2011. It briefly

Figure 3. 90/50 and 50/10 Weekly Wage Inequality in March (Full-Time, Full-Year Workers) CPS, 1963-2005

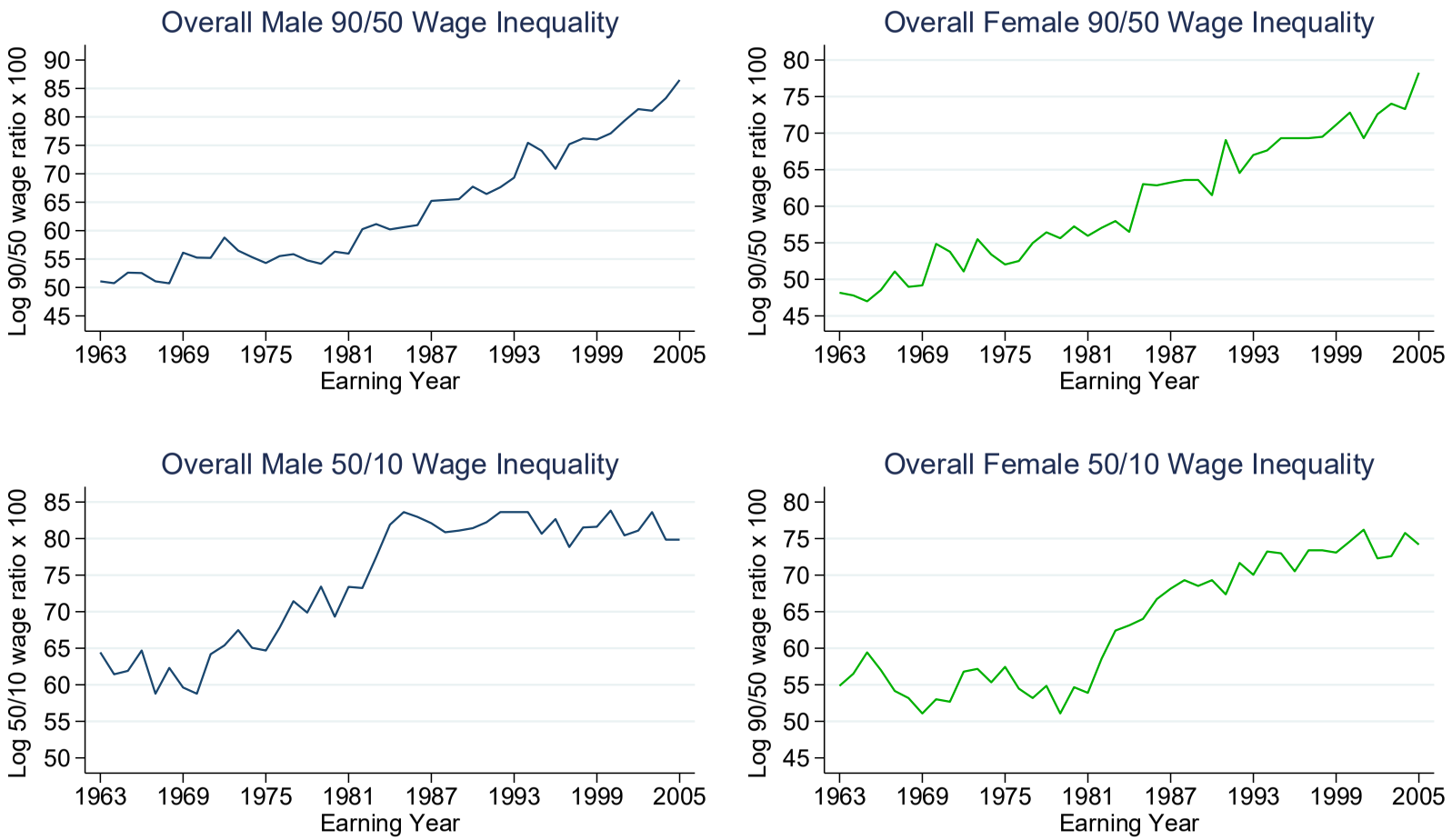


Figure 4. Change In Log Real Weekly Wage By Percentile, Full-Time, Full-Year Workers, 1963-2019

drops thereafter, and remains relatively flat from 2013 and onward. Although the college wage premium continues on growing, it is growing at a slower pace than previous decades. This is evident by looking at the growth of collage wage premium from 2013 and onward. Finally, the residual wage gap continues growing at a similar rate to previous decades, demonstrating a constant growth in wage inequality within groups.

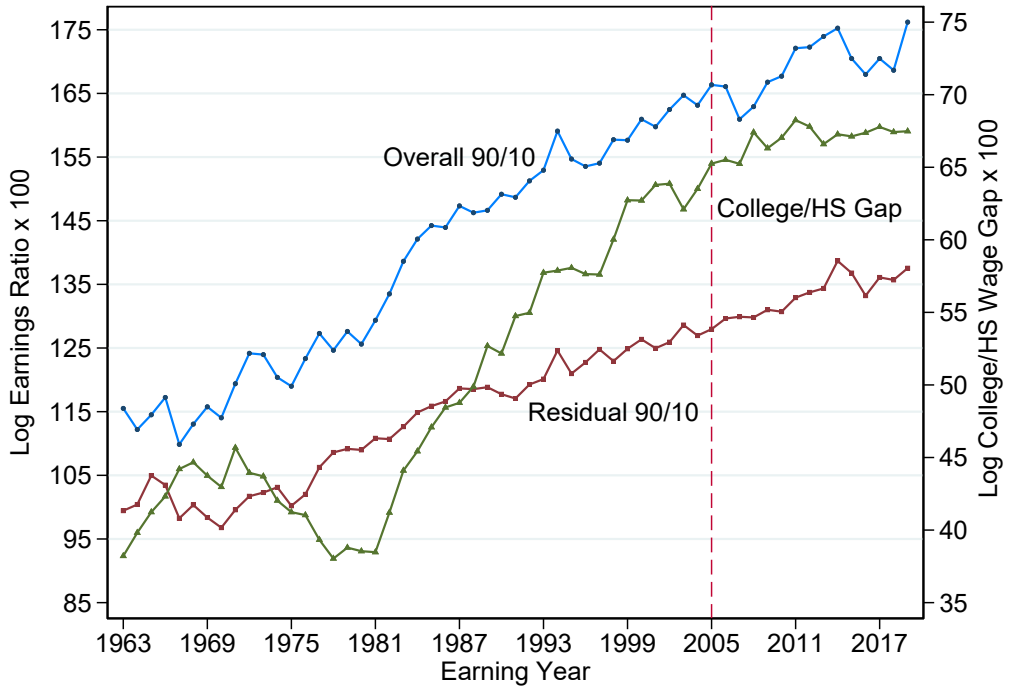
In figure 6, upper tail (90/50) wage inequality for both men and women continuing to trend up, continuing a trend that has been occurring over the last several decades. For lower tail (50/10) wage inequality in men, a sharp increase begins in 2005, however, it is followed by a sharp decline after 2013. Thereafter, inequality increases again and results in an overall increase in inequality from 2005 to 2019. For lower tail wage inequality in women, inequality remains still with no sharp increases or decreases during the years after 2005.

The series extensions corroborate the assertion that the growth in U.S. wage inequality has become a secular trend, as observed in the evolution of wage inequality for upper tail (90/50) groups and the overall (90/10) wage gap. Moreover, I find that the college wage premium is growing at a slower pace than previous decades. Finally, I find an overall increase in wage inequality for men in lower tail (50/10) groups, which deviates from the relatively horizontal trend observed in previous decades.

Sources of the Rising College/ High School Wage Premium, 1963-2005

I look at the shifts in the supply of and demand for skilled workers, to explain the evolution in the college/high school wage differential. Figure 7 plots the detrended supply of college

Figure 5. Three Measures of Wage Inequality, (Full-Time, Full-Year Workers), 1963-2019



workers relative to high school workers and plots the detrended college/high school log wage differential. A rapid increase in the relative supply of college workers in the early '70s, is followed by a sharp decrease starting in 1982. In the college/high school wage differential, there is a sharp decrease during the early '70s and a subsequent increase beginning in 1982. The figure demonstrates that changes in the relative supply series roughly match the changes in the college/high school wage differential and provide a good explanation of the evolution of the college wage premium from 1963 to 2005.

In Table 1, I estimate eight regressions models for the college/high school log wage differential on different various variables. To capture shifts in the demand for skilled workers, I add various time trends. A measure of labor market cyclical conditions is given by the unemployment rate of males aged 25-54 years. Also, I include a measure of the relative supply of college workers to high school workers, as well the log real minimum wage. The first column uses the Katz and Murphy (1992) model and covers the 1963 to 1987 period, which is the period analyzed by Katz and Murphy. This model only includes a linear time trend along with the relative supply variable. One can observe that as the supply of college workers relative to high school workers increases, the wage gap decreases. Moreover, the time coefficient gives an estimated growth of the wage gap of 2.4 percent per year.

Columns 2 and 3 cover the full 1963 to 2005 period, with column 3 incorporating a trend break in 1992. Column 2 demonstrates a reduced effect of the relative supply variable, as it accounts for the sample period until 2005. In column 3 there is a jump in the effect of relative supply, as a trend break is added, with the trend break demonstrating a reduction

Figure 6. 90/50 and 50/10 Weekly Wage Inequality in March (Full-Time, Full-Year Workers) CPS, 1963-2019

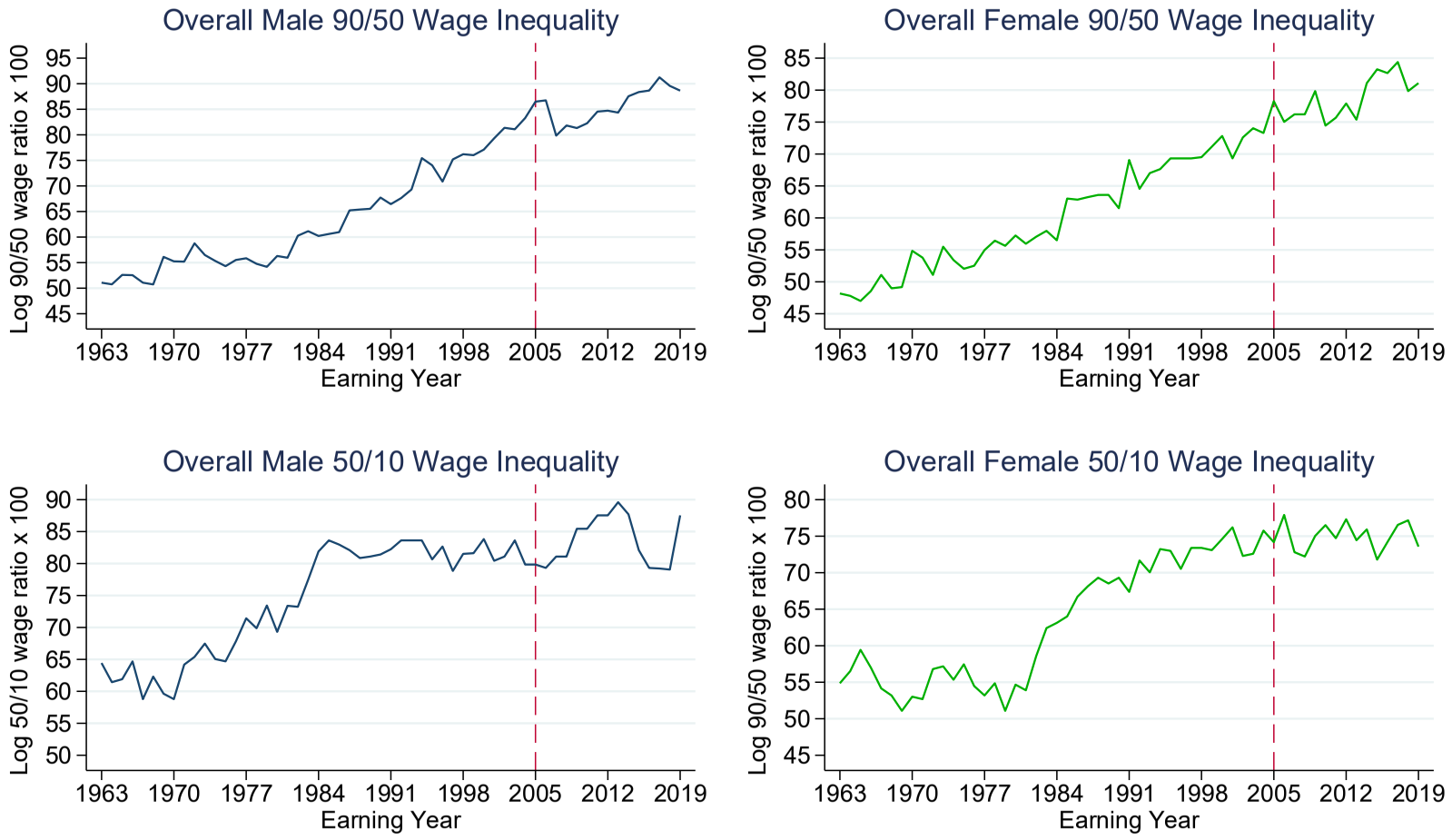
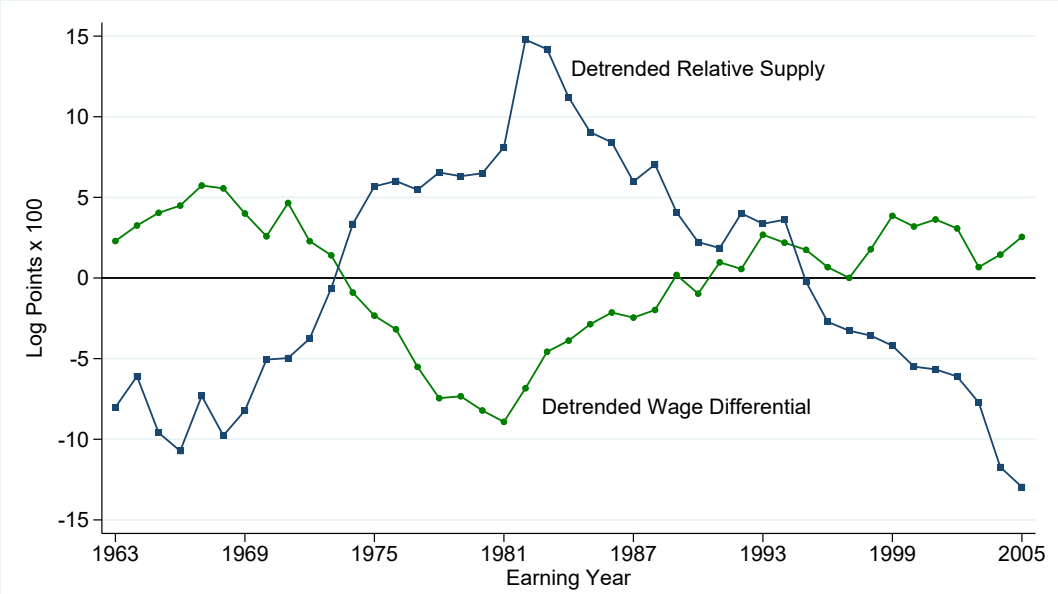


Figure 7. Detrended College/High School Wage Differential and Relative Supply, 1963-2005



in the relative demand for college workers after 1992. Columns 4 to 6 incorporate either quadratic or cubic time trends. All models still demonstrate a large effect by the relative supply as well as a decay in the demand for college workers reflected in the time trend coefficients. Columns 6 and 7 incorporate the unemployment rate of males aged 25 to 54 as well as the log minimum wage.

The addition of the log minimum wage and the unemployment rate of prime age workers slightly increases the explanatory power of the models; however, they do not change the effect of the relative supply variable by much. The log minimum wage has the expected signs, implying a reduction in the wage gap with an increasing minimum wage, however, the effect of the male unemployment rate is ambiguous as the coefficients switch from positive to negative. Finally, in column 8, I include a model without the relative supply variable. In this model, there is a modest increase in the effect of the real minimum wage; however, the model has less explanatory power than the previous models. Moreover, the male unemployment rate, has a larger effect as well, however in the opposite expected direction, as an increase in unemployment should widen the wage gap, not decrease it.

In Figure 8, I plot the Katz-Murphy model from column 1 of table 1 and predict the college wage gap for the sample period between 1963 through 2005, and evaluate the predicted and actual college wage gap series. The basic model is superb in predicting the college wage gap through the year 1992, except for the late ’70s. However, after 1992 the model overpredicts the wage gap as it is not able to account for the the severe drop in the relative supply of college workers beginning in 1992.

Table 1. Regression Models For The College/High School Log Wage Gap, 1963-2005

	1963-1987	1963-2005						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CLG/HS relative supply	-0.603	-0.438	-0.642	-0.547	-0.560	-0.625	-0.442	
	(0.143)	(0.050)	(0.073)	(0.123)	(0.110)	(0.165)	(0.072)	
Log real minimum wage						-0.073	-0.135	-0.148
						(0.053)	(0.048)	(0.067)
Male prime-age unemp.rate						0.002	-0.001	-0.018
						(0.004)	(0.004)	(0.003)
Time	0.024	0.019	0.026	0.025	0.017	0.021	0.018	0.006
	(0.006)	(0.001)	(0.003)	(0.006)	(0.006)	(0.008)	(0.002)	(0.001)
$\text{Time}^2/100$				-0.006	0.040	0.027		
				(0.006)	(0.015)	(0.017)		
$\text{Time}^3/100$					-0.007	-0.005		
					(0.002)	(0.002)		
Time x post-1992			-0.007					
			(0.002)					
Constant	-0.108	0.029	-0.145	-0.073	-0.052	0.010	0.269	0.677
	(0.123)	(0.038)	(0.060)	(0.111)	(0.100)	(0.188)	(0.110)	(0.122)
Observations	25	43	43	43	43	43	43	43
R-squared	0.501	0.933	0.949	0.935	0.950	0.953	0.945	0.890

Standard errors in parentheses. Each column presents an OLS regression of the fixed-weighted college/high school wage differential on the indicated variables. The U.S. federal minimum wage is deflated by the personal consumption expenditure. Source of for labor supply and earnings measures is the March CPS, earnings years 1963-2005.

Sources of the Rising College/ High School Wage Premium, 1963-2019

In Figure 9, I extend the analysis of Figure 7 through the year 2019, and I again plot the detrended supply of college workers relative to high school workers and the detrended log college/high school wage differential. The figure demonstrates that the supply of college workers increases after 2005, peaks in 2010 and bottoms out in 2016, and increases thereafter. In comparison to the college wage differential, which slightly decreases after 2005, increases in 2008 and beginning in 2011 slowly trends down afterward. This corroborates with the evolution of the college wage premium observed in figure 5 which demonstrates a slower growth rate of the college wage premium from 2013 and onward. Unlike the period from 1963 to 2005, where there is a clear match between the changes of the relative supply and wage differential, from 2005 and onward, the relation losses a bit of clarity in the latter years. If one looks at the series' beginning in 2003 to 2012, the series seem to fit the changes in each other. However, this relation breaks down after 2012, where the wage differential decreases even though there is a decrease in the supply of college workers.

In Table 2 the regression are extended to cover the full sample period from 1963 to 2019. The first column uses the Katz and Murphy specification with only a time trend and the relative supply. The model demonstrates a considerable reduction in the effect of the

Figure 8. Katz-Murphy Prediction Model for the College/High School Wage Gap, 1963-2005

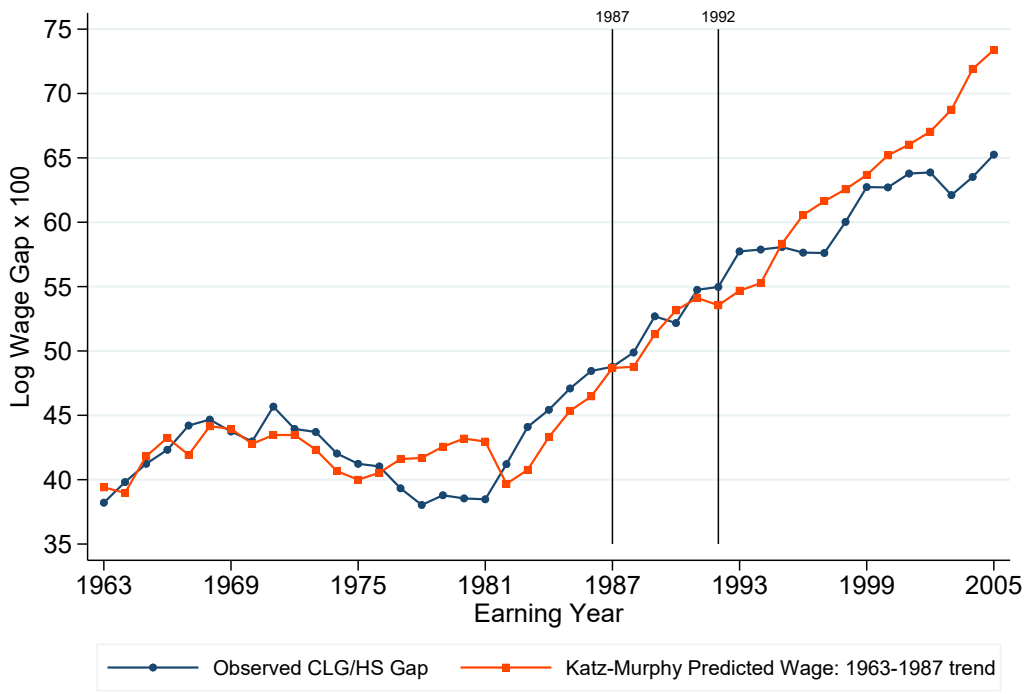
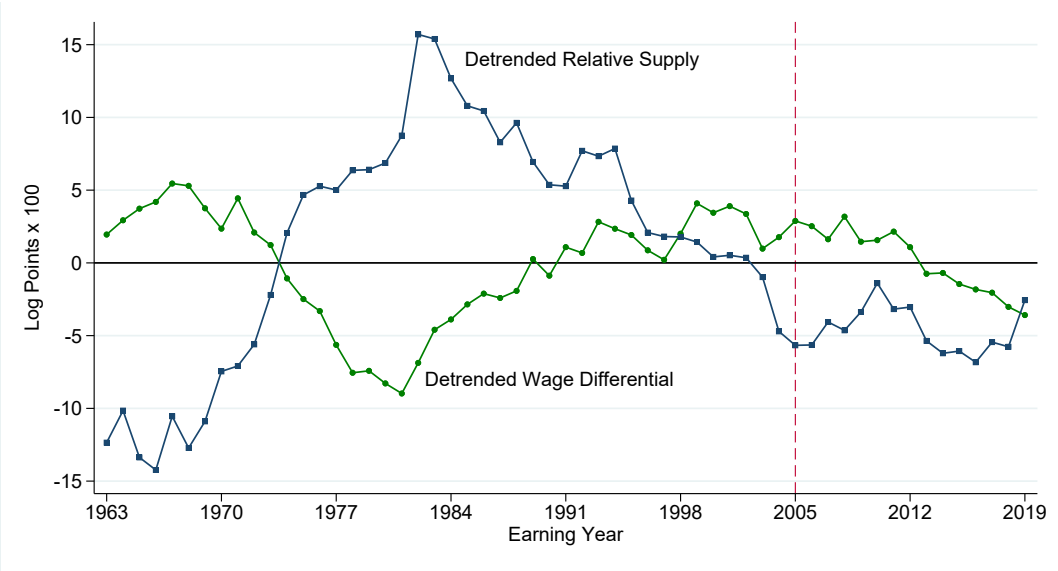


Figure 9. Detrended College/High School Wage Differential and Relative Supply, 1963-2019



relative supply, as well as a decrease in the time trend coefficient reflecting a reduction in the yearly estimated growth of the wage gap. These results are in line with the results from

Table 2. Regression Models For The College/High School Log Wage Gap, 1963-2019

	1963-2019						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CLG/HS relative supply	-0.296	-0.650	-0.633	-0.418	-0.483	-0.423	
	(0.051)	(0.056)	(0.066)	(0.088)	(0.114)	(0.058)	
Log real minimum wage					-0.075	-0.192	-0.050
					(0.040)	(0.042)	(0.052)
Male prime-age unemp.rate					0.002	0.004	-0.007
					(0.002)	(0.002)	(0.003)
Time	0.014	0.027	0.030	0.014	0.017	0.016	0.006
	(0.001)	(0.002)	(0.003)	(0.005)	(0.007)	(0.001)	(0.000)
$\text{Time}^2/100$			-0.013	0.025	0.016		
			(0.002)	(0.011)	(0.013)		
$\text{Time}^3/100$				-0.004	-0.003		
				(0.001)	(0.001)		
Time x post-1992		-0.008					
		(0.001)					
Constant	0.151	-0.152	-0.156	0.062	0.131	0.379	0.466
	(0.036)	(0.045)	(0.056)	(0.082)	(0.109)	(0.065)	(0.090)
Observations	57	57	57	57	57	57	57
R-squared	0.934	0.970	0.963	0.969	0.971	0.953	0.905

Standard errors in parentheses. See notes on table 1 for details on data processing.

Source for labor supply and earnings measures is the March CPS, earnings years 1963-2019.

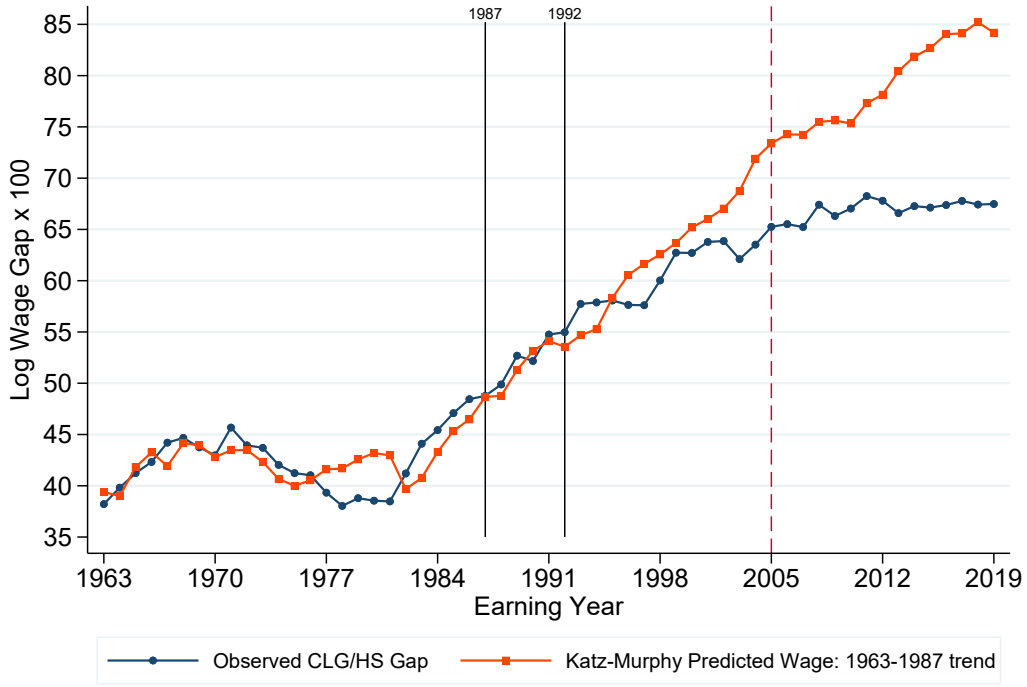
column 2 of Table 1, demonstrating a reduced effect of the relative supply variable on the wage differential.

The rest of the columns in Table 2 resemble the results in Table 1. However, as the regressions take into consideration the full sample period from 1963 to 2019, the coefficients of the relative supply variables are moderately reduced across all regressions. The time trend representing the demand for college workers slightly increase across certain models. The real minimum wage has the expected signs, with column 7 demonstrating a significant reduction in its coefficient, showing a reduced impact of the real minimum wage on the evolution of college wage premium from 2005 and onward. The male unemployment rate is also reduced, however it still has a contrarian negative effect. Overall, the real minimum wage and the male unemployment rate do not alter the role of the relative supply variable by much, and do not have a major effect on the development of the college wage premium.

In Figure 10, I use the Katz-Murphy model from column 1 of Table 1 to plot the full sample period from 1963 to 2019. The figure yields similar results to figure 8. The predicted wage gap continues to overpredict as the model does not account for the rapid decrease of the relative supply of college workers after 1982.

In figure 11, I plot the Katz-Murphy model from column 1 of table 2. The regression model includes the entire period from 1963 to 2019, instead of only the period from 1963

Figure 10. Katz-Murphy Prediction Model for the College/High School Wage Gap, 1963-2019

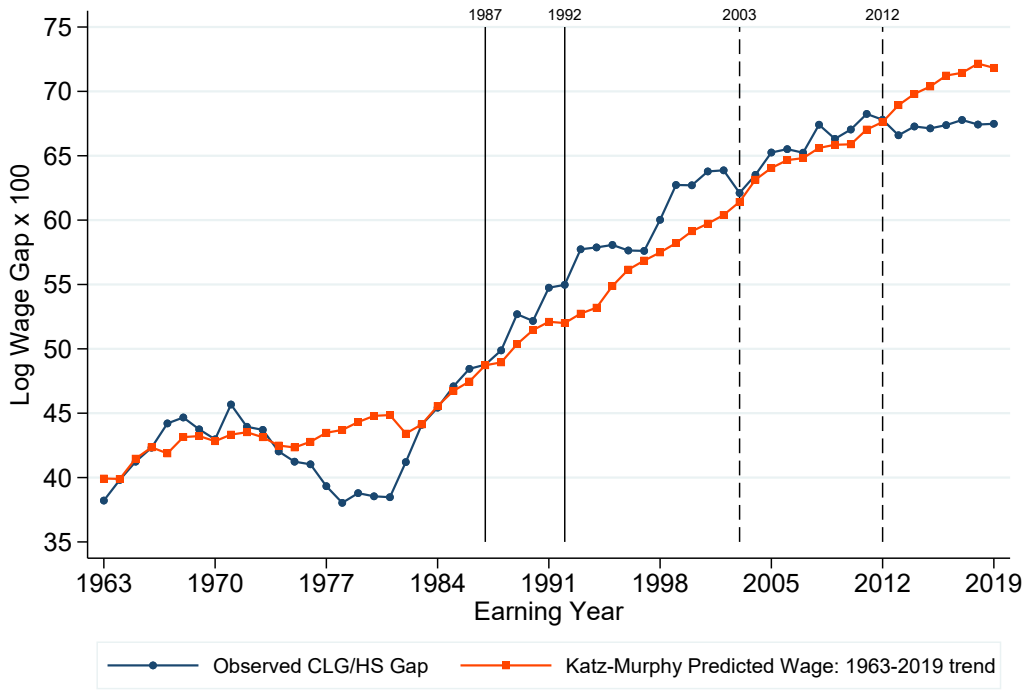


to 1987. The model overpredicts the observed college wage gap during the late '70s, and it starts to underpredict the wage gap from the late 1980s to 2003. It underpredicts the observed college wage gap as it most likely accounts for the sharp decrease that occurred in the relative supply of college worker after 1982. Beginning in 2003 the predicted wage gap matches closely the observed college wage gap, however, starting in 2012, it significantly overpredicts the wage gap it again. This overprediction most likely happens as the model is not able to account for the downward trend of the college wage differential happening in 2011 and onward, which one can see in Figure 9. The model does not perform as well as its predecessor did (Figure 8), however, the model still highlights the predictive power of the college/high school relative supply, as the predicted wage gap matches closely the observed college wage gap for certain years.

College/High School Wage Gap by Experience, 1963-2005

Autor, Katz, and Kearney (2008) further analyze the college/high school gap based on experience groups. In Figures 12 and 13, I plot the evolution of the college wage gap and college relative supply for young workers, those with 0 to 9 years of experience, and for older workers, those with 20 to 29 years of experience. In Figure 12 one can see that beginning in the 1980s the return to college increases considerably more for younger workers than for older workers. A possible explanation for this pattern can be found by looking at Figure 13 and observing a slower growth rate in the supply of younger workers beginning in 1975. As the figures suggest, a slowdown in the relative supply of young workers, appears to lead to a

Figure 11. Katz-Murphy (1963-2019) Prediction Model for the College/High School Wage Gap, 1963-2019



faster expansion of the college wage gap for young workers. This view is consistent with the analysis by Card and Lemieux (2001) in which one should expect own group relative supply as well as overall relative supply to influence the evolution of the college/high school wage gap by experience.

In Table 3, I estimate regression models for the college/high school wage gap by experience group and augment the basic model in Table 1 to incorporate own group supply. Own group supply is the college/high school relative supply per experience group minus the college/high school relative supply. The first two columns of Table 3 represent regressions that incorporate all four experience groups. The first two models demonstrate large effects by own group supply and aggregate supply on the evolution of the college wage gap by experience group. Moreover, the models have similar time trends, demonstrating an increasing college wage gap per year at a decreasing rate.

The remaining columns estimate the college wage gap by individual experience groups. Own group supply and aggregate supply have large effects on the college wage premium for young workers, 0 to 9 years, and for prime age workers, 10 to 19 years. However, for older workers, own group supply and aggregate supply have reduced effects on the college wage premium by experience group. Demand changes as reflected by the time variables have a larger effect for younger workers, 0 to 9 years compared to the older experience groups. Finally, the real minimum wage has a considerable effect on the college wage premium for younger workers, 0 to 9 years, and its effects are significantly reduced for older workers.

Figure 12. College/High School Wage Gap by Potential Experience, 1963-2005

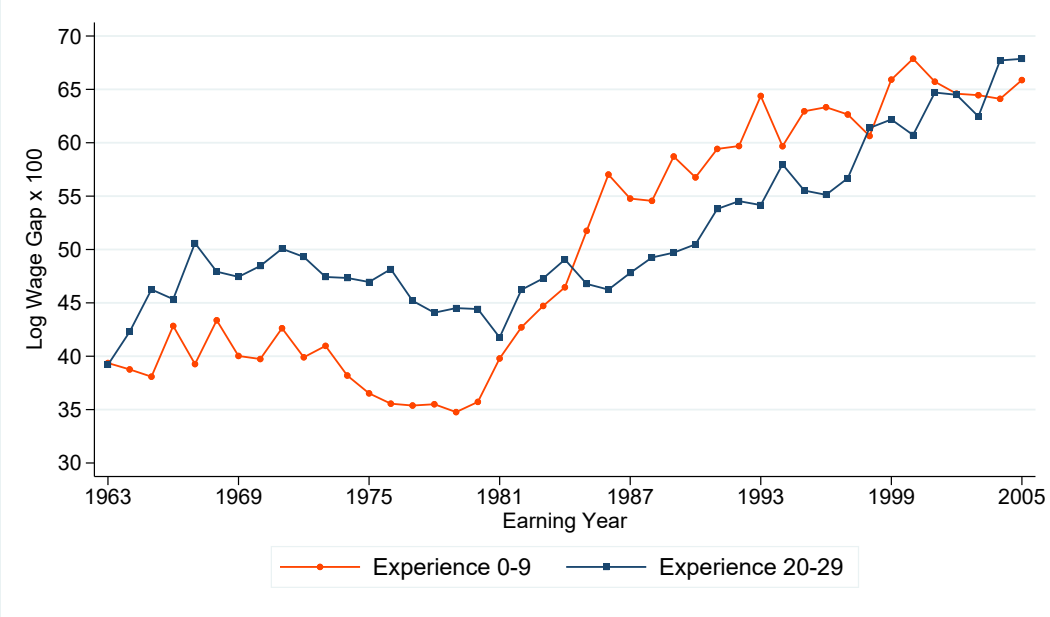
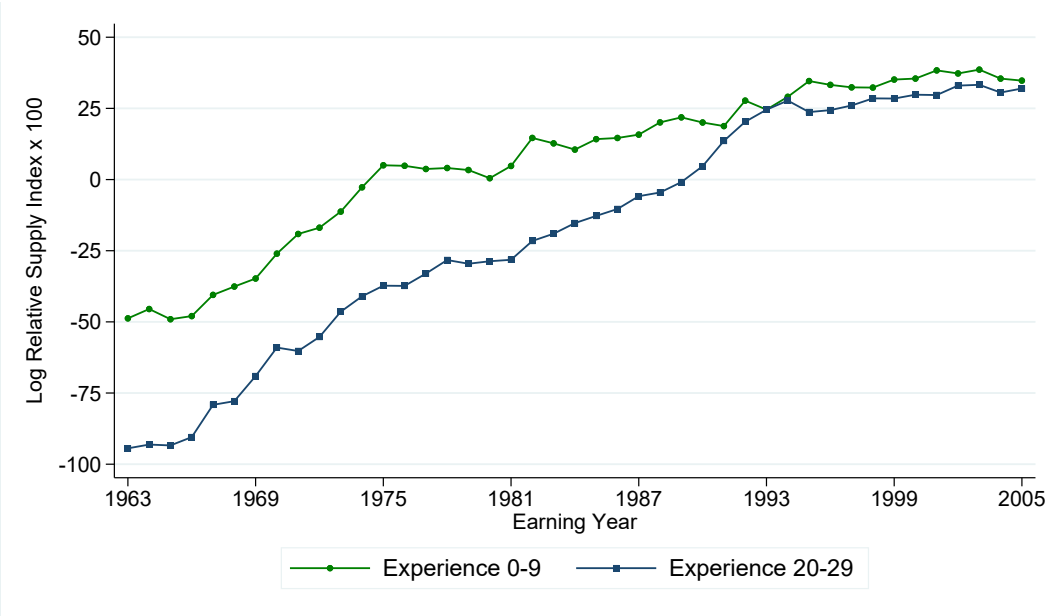


Figure 13. College/High School Relative Supply by Potential Experience, 1963-2005



College/High School Wage Gap by Experience, 1963-2019

I extend the analysis of Figures 12 and 13 to cover the full sample period up to the year 2019. In Figure 14 one can see that after 2005, the return to college has been greater for experienced workers than for younger workers. A possible explanation for this pattern can be found by looking at Figure 15 and observing a faster increase in the supply of young workers relative

Table 3. Regression Models for the College/High School Log Wage Gap by Potential Experience, 1963-2005

	All	All	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs
Own supply minus aggregate supply	-0.281	-0.279	-0.232	-0.366	0.116	0.036
	(0.028)	(0.027)	(0.126)	(0.091)	(0.076)	(0.119)
Aggregate Supply	-0.559	-0.618	-0.741	-0.457	-0.317	-0.438
	(0.092)	(0.136)	(0.266)	(0.198)	(0.205)	(0.251)
Log real minimum wage		-0.107	-0.354	-0.184	0.086	-0.036
		(0.038)	(0.076)	(0.054)	(0.051)	(0.070)
Prime-age male unemployment		0.002	0.003	0.002	0.002	-0.003
		(0.003)	(0.007)	(0.005)	(0.005)	(0.006)
Time	0.024	0.025	0.033	0.013	0.011	0.020
	(0.005)	(0.006)	(0.012)	(0.009)	(0.009)	(0.011)
$\text{Time}^2/100$	-0.004	-0.005	-0.018	0.013	0.007	-0.013
	(0.005)	(0.006)	(0.011)	(0.009)	(0.009)	(0.012)
Constant	0.013	0.151	0.447	0.466	0.060	0.171
	(0.079)	(0.145)	(0.284)	(0.225)	(0.219)	(0.274)
N	172	172	43	43	43	43
R-squared	0.866	0.873	0.928	0.965	0.914	0.690

Standard errors in parentheses. Each column presents an OLS regression of the fixed-weighted college/high school wage differential on the indicated variables. The college/high school wage premium is calculated at the midpoint of each potential experience group. Real minimum wage is deflated by the personal consumption expenditure deflator. Columns 1 and 2 also include dummy variables for the four potential experience groups used in the table.

to experienced workers. This faster increase in the relative supply of young workers appears to level the growth of the college wage gap for young workers from 2005 and onward.

In Table 4 the analysis of Table 3 is extended to cover the full sample period up to the year 2019. In the first two columns, the coefficients for own group relative supply decrease slightly and the coefficients of overall supply moderately increase. This implies that aggregate supply has a slightly bigger effect on the college wage premium as compared to before. Nonetheless, both coefficients in each column remain large and show their significant impact on the college wage premium by experience group. For the remaining four columns, the same occurs. The coefficients for own group relative supply slightly decrease, and the coefficients for aggregate supply increases across all groups, demonstrating a higher impact by the aggregate supply variable on wage premium by experience group. Like the previous table, own group supply and aggregate supply have a larger effect on the college wage premium for young workers, 0 to 9 years, and for prime age workers, 10 to 19 years relative to the more experience groups. Demand changes reflected by the time trend variables remain roughly similar to previous estimates, with modest increases or decreases in the various columns. Finally, the real minimum wage continues to have a larger impact on the college wage premium for younger workers, 0 to 9 years, and its effects are diminished for older workers.

As the findings demonstrate, models that emphasize growth in the relative demand for

Figure 14. College/High School Wage Gap by Potential Experience, 1963-2019

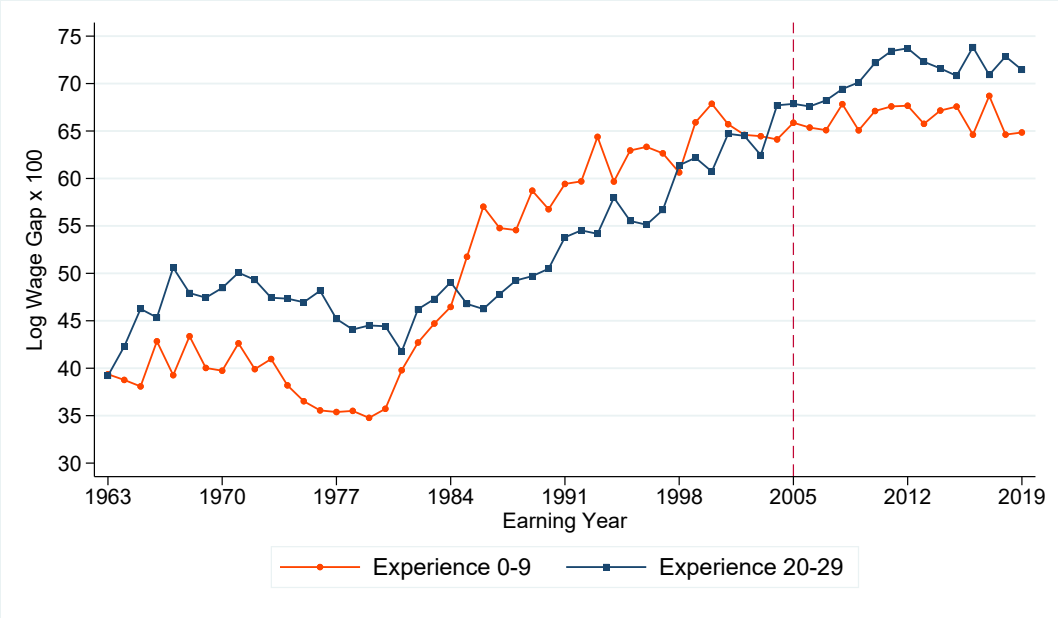
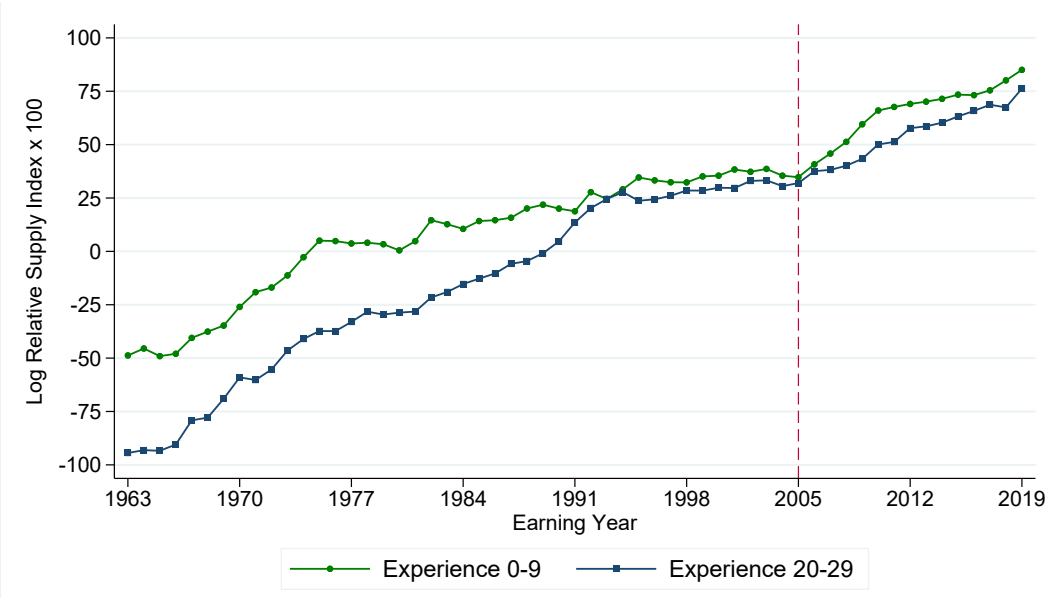


Figure 15. College/High School Relative Supply by Potential Experience, 1963-2019



college workers and a decline in the relative supply of college workers, can explain some of the changes in the evolution of the overall college/high school wage differential and the college/high school wage differential by experience group. An important driving force behind the increase in the relative demand for skilled workers is often attributed to the skill-biased

Table 4. Regression Models for the College/High School Log Wage Gap by Potential Experience, 1963-2019

	All	All	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs
Own supply minus aggregate supply	-0.251	-0.253	-0.132	-0.267	0.063	-0.050
	(0.024)	(0.024)	(0.103)	(0.082)	(0.061)	(0.071)
Aggregate Supply	-0.645	-0.696	-0.674	-0.965	-0.571	-0.272
	(0.053)	(0.058)	(0.115)	(0.081)	(0.075)	(0.126)
Log real minimum wage		-0.089	-0.287	-0.172	0.083	-0.017
		(0.032)	(0.069)	(0.047)	(0.041)	(0.057)
Prime-age male unemployment		0.005	0.007	0.009	0.005	-0.002
		(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
Time	0.029	0.029	0.030	0.038	0.023	0.011
	(0.002)	(0.002)	(0.005)	(0.003)	(0.003)	(0.005)
$\text{Time}^2/100$	-0.011	-0.009	-0.013	-0.013	-0.005	0.001
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)
Constant	-0.081	0.029	0.343	-0.040	-0.165	0.240
	(0.043)	(0.076)	(0.147)	(0.115)	(0.101)	(0.154)
N	228	228	57	57	57	57
R-squared	0.911	0.915	0.935	0.974	0.965	0.863

Standard errors in parentheses. See notes on table 3 for deatails on data processing.

Source for labor supply and earnings measures is the March CPS, earnings years 1963-2019.

technical change hypothesis. The SBTC suggest that an increase in new technology raises the productivity of highly skilled workers more than the productivity of less skilled workers. This results in an increase in the demand for highly skilled workers which leads to a rise in wage inequality. Autor, Katz, and Krueger (1998), find rapid growth in relative skill demand during the 1980s and 1990s, as the share of labor for more educated workers increased within detailed industries. In certain case studies, there is a positive correlation between the use of new technologies and the increased employment of more educated workers across detailed industries and across plants within industries(Dunne, Haltiwanger, and Troske 1996; Autor, Levy, and Murnane 2002). Thus, as the STBC hypothesis explains the raise in the relative demand for skilled workers, it can in part explain the ongoing growth of wage inequality, especially at the top of the wage distribution. As seen in Figure 6, inequality continues growing at the top of the wage distribution almost continuously through the last six decades, likely reflecting the continued growth in the relative demand for skilled workers, a secular trend that is not observable in the bottom halve of the wage distribution.

4. Summary and Conclusion

I closely replicate and extend a part of the result by Autor, Katz, and Kearney (2008). My results corroborate the findings of the authors and find that the rapid growth in wage inequality during the early 1980's is not a one time occurrence, but rather an ongoing secular trend. This is evident by the evolution of wage inequality in the upper halve of the wage distribution and likely explained by the STBC theory, reflecting secular demand growth for skilled workers. Moreover, I find that the college wage premium grows at a slower rate than previous decades, and find a slight overall increase in wage inequality for men in lower tail (50/10) groups. Finally, through OLS regressions and the analysis of the college relative supply and wage differential, I find that the changes in the relative supply of and demand for skilled workers, attributable to skill-biased technical change, can explain some of the changes in the evolution of the overall college/high school wage differential and the college/high school wage differential by experience group.

References

Autor, David H., Lawrence F. Katz, and Melissa S. Kearney. 2008. "Trends in U.S. Wage Inequality: Revising the Revisionists." *Review of Economics and Statistics* 90 (2): 300–323.

Autor, David H., Lawrence F. Katz, and Alan B. Krueger. 1998. "Computing Inequality: Have Computers Changed the Labor Market?*." *Quarterly Journal of Economics* 113 (4): 1169–1213.

Autor, David H., Frank Levy, and Richard J. Murnane. 2002. "Upstairs, Downstairs: Computers And Skills On Two Floors Of A Large Bank." *Industrial and Labor Relations Review* 55 (3): 432–447.

Card, David and John DiNardo. 2002. "Skill-Biased Technological Change and Rising Wage Inequality: Some Problems and Puzzles." *Journal of Labor Economics* 20 (4): 733–783.

Card, David and Thomas Lemieux. 2001. "Can Falling Supply Explain the Rising Return to College for Younger Men? A Cohort-Based Analysis." *Quarterly Journal of Economics* 116 (2): 705–746.

Card, David, Thomas Lemieux, and W. Craig Riddell. 2003. "Unionization and Wage Inequality: A Comparative Study of the U.S, the U.K., and Canada." NBER working paper no. 9473.

DiNardo, John, Nicole Fortin, and Thomas Lemieux. 1996. "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach." *Econometrica* 64 (5): 1001–44.

Dunne, Timothy, John Haltiwanger, and Kenneth R. Troske. 1996. "Technology and Jobs: Secular Changes and Cyclical Dynamics." Working Paper 5656, National Bureau of Economic Research.

Goldin, Claudia and Lawrence F. Katz. 2001. "Decreasing (and then Increasing) Inequality in America: A Tale of Two Half Centuries." In *The Causes and Consequences of Increasing Inequality*, edited by F. Welch. Chicago: University of Chicago Press, 37–82. Backup Publisher: University of Chicago Press.

Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce. 1993. "Wage Inequality and the Rise in Returns to Skill." *Journal of Political Economy* 101 (3): 410–42.

Katz, Lawrence F. and David H. Autor. 1999. "Changes in the Wage Structure and Earnings Inequality." In *Handbook of Labor Economics*, vol. 3. Elsevier, 1463–1555.

Katz, Lawrence F. and Kevin M. Murphy. 1992. "Changes in Relative Wages, 1963-1987: Supply and Demand Factors." *Quarterly Journal of Economics* 107 (1): 35–78.

Park, Jin Heum. 1996. "Estimation of Sheepskin Effects and Returns to Schooling Using the Old and the New CPS Measures of Educational Attainment." *Economics Letters* 50 (3). Princeton University, Industrial Relations Section working paper no. 338.