

## Claudia Goldin

**Editor's Note:** *This is an abbreviated version of EF's conversation with Claudia Goldin. For the full interview go to our website: [www.richmondfed.org/publications](http://www.richmondfed.org/publications)*

Harvard University economist Claudia Goldin is passionate about detective work. As a student at the Bronx High School of Science, she indulged that passion with a microscope and planned to study microbiology as a student at Cornell University. But it wasn't long before she discovered economics as a tool to delve into life's mysteries, and since then she has become known as an economic historian whose research sheds new light on the roots of present-day policy questions.

Goldin's 1990 book, *Understanding the Gender Gap: An Economic History of American Women*, was the first detailed accounting of how women's labor force participation and earnings evolved in the United States. Contrary to conventional wisdom at the time, she showed that the gender gap in earnings and wage discrimination were not historical constants, but rather varied across industries and over time in response to both social and economic forces. More recently, she has studied the role that workplace attitudes and policies regarding flexible working arrangements play in the persistence of the earnings gap.

In *The Race between Education and Technology*, her 2008 book with frequent co-author Lawrence Katz, Goldin studied the interplay between technological change, educational attainment, and wage inequality. Goldin and Katz demonstrated that the returns to education have changed over time in response to changes in the supply of and demand for educated workers. Beginning around 1980, they found, a slowdown in the pace of educational attainment sharply increased the returns to education, leading to greater wage inequality.

Prior to joining Harvard University — where she was the first woman to earn tenure in the economics department — Goldin taught at Princeton University and the University of Pennsylvania. She served as president of the American Economic Association (AEA) from 2013-2014 and is a member of the National Academy of Sciences. Jessie Romero interviewed Goldin at the National Bureau of Economic Research in Cambridge, Mass., in December 2014.



**Econ Focus:** Much of your work has focused on the history of women's employment in the United States. You've described the past few decades of that history as a "quiet revolution." What do you mean by that?

**Goldin:** The quiet revolution is a change in how young women perceive the courses their lives are going to take. One of the places we see this is the National Longitudinal Survey, which began in 1968 with women who were between 14 and 24 years old. One of the questions the survey asked was, "What do you think you're going to be doing when you're 35 years old?" In 1968, young women essentially answered this question as if they were their mothers. They would say, "Well, I'm going to be a homemaker, I'm going to be at home with my kids." Some did say they would be working in the labor market, but the fraction that said they would be out of the home was much smaller than the fraction that actually did end up working outside the home.

But as these women matured and as successive cohorts were interviewed, their perceptions of their futures, their own aspirations, began to change. And so their expectations when young about being in the labor force began to match their actual participation rates once they were older. That meant these young women could engage in different forms of investment in themselves; they attended college to prepare for a career, not to meet a suitable spouse. College women began to major in subjects that were more investment oriented, like business and biology, rather than consumption oriented, like literature and languages, and they greatly increased their attendance at professional and graduate schools.

**EF: What changed in society that allowed this revolution to occur?**

**Goldin:** One of the most important changes was the appearance of reliable, female-controlled birth control. The pill lowered the cost to women of making long-term career investments. Before reliable birth control, a

woman faced a nontrivial probability of having her career derailed by an unplanned pregnancy — or she had to pay the penalty of abstinence. The lack of highly reliable birth control also meant a set of institutions developed around dating and sex to create commitment: Couples would “go steady,” then they would get “pinned,” then they would get engaged. If you’re pinned or engaged when you’re 19 or 20 years old, you’re not going to wait until you’re 28 to get married. So a lot of women got married within a year or two of graduating college. That meant women who pursued a career also paid a penalty in the marriage market. But the pill made it possible for women who were “on the pill” to delay marriage, and that, in turn, created a “thicker” marriage market for all women to marry later and further lowered the cost to women of investing in a career.

**EF: What happened during previous periods of change in women’s labor force participation?**

**Goldin:** A large fraction of employment in the early 20th century, outside of agriculture, was in manufacturing. And manufacturing jobs were not particularly nice jobs. White-collar jobs in offices greatly expanded in the 1910s and 1920s, but they required one to be literate and possibly numerate, and women who were older at the time would not have had the education to move into those jobs. And so there developed a social norm against married women working. It was OK if you were single, it was often OK if you were an immigrant or African American, but it wasn’t OK if you were an American-born white woman from a reasonable family, especially if you had kids.

New technologies further increased the demand for white-collar workers, and the high school movement produced a huge increase in women’s education during the early decades of the 20th century. More positions were created that were considered “good” jobs, those that young women could start after high school and keep after marriage with far less social stigma.

The income effect and the substitution effect come from a set of preferences. If individual families have more income in a period when there are various constraints on women’s work, they’re going to purchase the leisure and consumption time of the women in the family, and the income effect will be higher. But if well-paying jobs with lower hours and better working conditions open up, then the income effect will

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decrease and the substitution effect will increase and both will serve to move women into the labor force.

**EF: You’ve written about a “grand convergence” in men’s and women’s roles over the past century. Are there areas where that convergence is incomplete?**

**Goldin:** Women and men have converged in occupations, in labor force participation, in education, where they’ve actually exceeded men — in a host of different aspects of life. One can think about each of these parts of the convergence as being figurative chapters in a metaphorical book. And this metaphorical book, called “The Grand Convergence,” has to have a last chapter. But what will be in the *last* chapter?

I approached this question as a detective — I didn’t know what I was going to find. But I thought about Sherlock Holmes, and Sherlock Holmes would say it doesn’t make any sense to theorize until you have a couple of facts. So I went looking for facts, and I found two big pieces of information suggesting that the last chapter, which is about gender equality in pay per unit of time worked, must have greater temporal flexibility without large penalties to those who work fewer hours or particular schedules.

The first clue was that the gender gap in earnings per unit of time is fairly low when men and women first come out of college, or even out of high school. But then it widens enormously, until people are in their 40s, and then for older cohorts the gap starts to narrow again.

The second clue appeared when I broke down the data from the American Community Survey [an annual Census Bureau survey] by occupation. I ran a gigantic regression — there were more than 3 million observations and 469 occupations — and then graphed the residual gender gap for each separate occupation. I categorized each occupation by groups — corporate and finance, health, technology, science, etc. — and found that the occupations with the greatest gender gaps, conditional on age and some other factors, are almost all in the corporate and finance groups. Occupations with the lowest gender gaps are in the technology and science groups, although the gap is also small in some health occupations, particularly pharmacy.

One thing to note is that you can only do this breakdown for occupations with annual incomes above about \$60,000. It’s a different story in the lower part of the distribution, where most workers are paid on an hourly basis. Women earn less than men mainly because they work fewer hours, and those who work fewer hours earn less on an hourly basis.

Across the wage distribution, the vast majority of the gender gap is occurring within occupations, not between occupations. There’s considerable discussion about occupational segregation, but you could get rid of all occupational segregation and reduce the gender gap by only a small amount.

**EF: So it's not just that women tend to be nurses and men tend to be doctors.**

**Goldin:** Right. So then the question is, why are there some occupations with large gender gaps and others with very narrow gaps? There are some occupations where people face a nonlinear function of wages with respect to hours worked; that is, people earn a disproportionate premium for working long and continuous hours. For example, someone with a law degree could work as a lawyer in a large firm, and that person would make a lot of money per unit of time. But if that person worked fewer than a certain number of hours per week, the pay rate would be cut quite a bit. Or someone could work fewer or more flexible hours as general counsel for a company and earn less per unit of time than the large-firm lawyer. Pharmacy is the opposite — earnings increase linearly with hours worked. There's no part-time penalty.

I started thinking about a very simple framework in which temporal flexibility is the important issue and I wondered if occupations with large gender gaps are those with relatively high penalties for not putting in the hours or not attending the meeting or not going to Japan to see the client. And those are things that might be particularly difficult for parents. If women have a greater burden with respect to child care, then these occupations will be the occupations where women pay the greatest penalties. So then I began to zero in on the occupations where the penalties were the lowest and ask what was so different about them.

To do so, I went to the Occupational Information Network (O\*NET), a directory supported by the Department of Labor. In O\*NET, each of the 469 occupations in the census is covered and some are further subdivided, often by industry. And for each of those occupations there are hundreds of details about the job gathered, in part, by observing or surveying workers — details ranging from the strength requirements to the lighting and other ambient conditions of the workplace. But relevant to my research, O\*NET provides information on: How important is face time? What types of interpersonal relationships are there? Do people work on projects independently or in teams?

This was a real beacon of light. Sure enough, the occupations in the corporate and financial sector were all skewed

## Claudia Goldin

### ► Present Position

Henry Lee Professor of Economics, Harvard University  
Director of the Development of the American Economy Program and Research Associate, National Bureau of Economic Research

### ► Selected Previous Positions

President, American Economic Association (2013-2014)  
President, Economic History Association (1999-2000)  
Associate Professor, and Professor of Economics, University of Pennsylvania (1979-1990)

### ► Education

Ph.D. (1972) and M.A. (1969), University of Chicago  
B.A. (1967), Cornell University

### ► Selected Publications

"A Grand Gender Convergence: Its Last Chapter," *American Economic Review*, 2014; *The Race between Education and Technology*, Belknap Press, 2008 (with Lawrence Katz); "The 'Quiet Revolution' That Transformed Women's Employment, Education, and Family," *American Economic Review, Papers and Proceedings*, 2006; numerous other articles in journals such as the *Journal of Political Economy*, *Quarterly Journal of Economics*, *American Economic Review*, *Journal of Economic Perspectives*, and *Journal of Economic History*

in the direction of having O\*NET characteristics that meant employees were required to be there. And in the technology occupations, people were working more independently and there wasn't a lot of face time. I also used longitudinal data on lawyers from the University of Michigan and survey data I collected on University of Chicago MBAs with Marianne Bertrand and Larry Katz. I also had access to data on a large sample of pharmacists. And from all these sources it became clear that the occupations with the largest gender gaps were those with the least temporal flexibility, where people are complements for each other rather than good substitutes.

Saying workers are good substitutes for each other sounds like you're commoditizing them. But it can be true even for very high-income professions. I got a note from my ophthalmologist after I had a minor procedure that essentially said, "You will probably never see me again because there are 20 different professionals in my group who can take care of you." And pharmacy, which is my favorite example, is very highly paid. For women, pharmacy is the third highest in terms of annual income for full-time employed workers. For men, it's the eighth highest.

**EF: Why do you refer to the 20th century in the United States as the "human capital century"?**

**Goldin:** In many different writings in the late 19th century and early 20th century in the United States, you start to sense that having more education, being more literate and more numerate, got you a lot further in the labor market. Contemporary economists noticed it too; Paul Douglas [who taught at the University of Chicago, among other schools, before becoming a U.S. senator] described it as an era of "noncompeting groups" — individuals who had a modicum of a high school education, let alone a college education, did phenomenally better than others, because high school education simply wasn't widespread.

Larry Katz and I used data from the 1915 Iowa state census to show that these pecuniary returns were not just a result of the shifting of individuals from blue-collar or agricultural occupations to white-collar occupations, but in fact, even within the agricultural sector more-educated

farmers did better than less-educated farmers. The reasons are pretty obvious: The educated farmer did his accounting better, could figure out which crops to plant, and could read about different breeds of animals and how to protect them from disease. More-educated workers also did better than less-educated workers in the manufacturing sector and in the construction trades.

Individuals observed the high returns to education, and this unleashed a nationwide movement — in large measure a decentralized, grassroots movement — to build and staff high schools across the country. In 1910, only 9 percent of 19-year-olds in the United States had a high school diploma. That climbed up to 51 percent by 1940. There was a huge shift during the century, as the physical capital we were using became relatively less important than the mental capital we carried inside ourselves.

**EF: What is the significance of the high school movement being a grassroots movement?**

**Goldin:** The education system in the early 20th century was a decentralized system that was very open, albeit with some important exceptions, such as African Americans and certain immigrant groups. But by and large, relative to Europe, America was educating all its children. European visitors would come to the United States and be shocked by how America was wasting its resources. European countries were cherry picking which students would get a good education; they set very high standards and had national exams. We didn't. We had more of a free-for-all, grassroots, local system in which until recently there were few state exams for graduation. That served us very well by getting a large number of students to graduate from high school. By the 1950s, U.S. high school enrollment and graduation rates were relatively high, much higher than Europe.

But then various European countries started looking more like the United States; they began to pull more individuals into high schools, some via technical schools but also by expanding more general education. And many of them did so without abandoning the higher standards of the more elitist period. The United States, on the other hand, has had a very hard time adopting uniform standards. The idea has been that the different parts of the country have different demands, so we don't need to have national standards. And it's true that we do have a far more heterogeneous population. But the enormous virtue of decentralization has more recently caused some difficulty.

**EF: You noted that high returns to education in the early 1900s were a major driver of the high school movement. But as you and Lawrence Katz documented in *The Race between Education and Technology*, the premium to education changes over time and sometimes actually declines.**

**Goldin:** Inequality measured by labor incomes is relatively high from the earliest that we can measure it, in the late 19th

century; educated workers did very well relative to everyone else until about 1920. But then the high school movement burst forth and the supply of educated workers increased, and the quasi-rents to higher education began to decline quite a bit, which was reinforced by the Great Depression and the narrowing of the wage structure in the 1940s that Bob Margo and I termed “the Great Compression.” But in the late 1970s and early 1980s both inequality and the education premium started rising again. (This is apart from what's happening at the very top; my book with Katz is about the bottom 99 percent.)

What's going on? You can see in the data that education, in terms of years of education or the fraction of the population that graduated high school or college, increases beginning around 1910, but then around 1980 the rate of increase slows down. The easiest way to think about it is as a race between education and technology, or between the supply of skilled workers and the demand for skilled workers. The demand for educated workers is moving out at a constant rate, and as long as the supply keeps moving out at a pretty sturdy rate it keeps the premium to education in check. But when the supply stops moving out there's a large increase once again in the premium to educated workers. That's the very simple one-graph story.

**EF: An increasing number of students are turning to for-profit colleges. What's driving those schools' recent proliferation?**

**Goldin:** As we've discussed, there are huge returns to education, and many people have great desire to gain a skill or learn a trade. But we haven't kept up with funding community colleges, and they're under tremendous strain. If you go to a community college, you may encounter various barriers; the courses you want are all full, or they're only offered at times when you can't attend because you have to work. Plus, many students arrive unprepared and might not have taken (or understood) algebra, for example. So they have to take remedial courses; they have to pay for these courses and find time to attend them, and yet they get no credit for them toward graduation.

But if they walk across the street to the school they've seen advertised on public transportation or on late-night TV, they will find a school that is going to help them apply for their Pell Grant and a student loan. It's going to provide career counseling and it's not going to make them take remedial courses. For-profits really know how to get people in the door. But students end up with very big bills, and those loans have to be paid off at some point.

**EF: Do students at for-profit schools earn the same returns as students at nonprofit schools?**

**Goldin:** That's an important question to answer, but it's hard to find evidence. We don't have IRS records matched with where a person earned their degree. So what I did with

David Deming, Noam Yuchtman, Amira Abulafi, and Larry Katz was to conduct an audit study. We sent out resumes designed to look like real resumes, but we varied them by where the person went to college, either a for-profit college (online or brick-and-mortar), a nonselective public college (where the students in many ways are indistinguishable from the ones who go to for-profit colleges), or a selective public college. We sent them out for two major types of jobs, business jobs and health jobs, and within those types, to jobs requiring or not requiring degrees. We then compared callback rates. Callback rates aren't perfectly mapped onto what people eventually earn, but if people don't get called back they're not going to do well in the job market. We found the callback rates for business jobs were considerably lower for the candidates from the for-profit schools, particularly the online ones.

**EF: What are you working on currently?**

**Goldin:** My current project is called "Women Working Longer." I'm working with a group of people who study aging, retirement, and health. We're interested in the fact that labor force participation rates for younger women peaked in the 1990s, but that participation for older women has increased enormously. Among college graduates today, about 60 percent of those aged 60-64 and 35 percent of those aged 65-69 are in the labor force. Even among those aged 70-74, about 20 percent are in the labor force.

This raises all sorts of interesting questions about why. Is it because these women were hit with divorce shocks? Do they want to retire but then they look at their savings and realize they can't retire? Or is it that the world of work has changed and they love what they're doing? There are a host of issues to study concerning family, occupations, education, health, financial resources, and retirement institutions.

**EF: You just noted that labor force participation for younger women peaked in the 1990s. Is that related to the trend — widely reported in the media — of highly educated women "opting out" of the labor force?**

**Goldin:** There really isn't any evidence for that. Heather Boushey has done some very nice work showing that there is no such thing as an "opting out" phenomenon. And Marianne Bertrand, Larry Katz, and I did a study of MBA graduates from the Booth School of Business at the University of Chicago. In our sample, which was individuals who received an MBA between 1990 and 2006, 17 percent of women were not working 10 or more years after graduation. But it's not clear that they have dropped out permanently — they might re-enter the labor force at another time. Women now have the ability to invest in their education, then marry and have kids later in life and possibly take some time off. But that

doesn't mean they aren't coming back. We aren't seeing declines in the older ages. These women have at least 30 years left to their employment histories.

**EF: You've spent a lot of your career digging through dusty archives or visiting old school buildings in Iowa — what excites you about historical research?**

**Goldin:** It goes back to my passion about being a detective. That's what it's all about. The world is filled with mysteries, and somehow I have this incredibly optimistic view that I can figure them out.

But there are many different moments when I look back and think, gosh, how could I have been so optimistic? For example, Cecilia Rouse and I decided that we would study the effect of orchestras switching to blind auditions. [In a 2000 paper in the *American Economic Review*, Goldin and Rouse found that the practice of having musicians audition behind a screen significantly increased the proportion of women in symphony orchestras.] Many orchestras did not know they had records on auditions. It wasn't that they weren't receptive to us — it was that they were disorganized. But it turned out that the orchestral manager of the New York Philharmonic had an interest in our research, and he opened up their archives (which are beautiful; they're a joy to work in). So we started writing letters to other orchestras, and they said, "Well, if you're working with the New York Philharmonic..." I remember Ceci and I went to Detroit and met the orchestral director, who said, "I don't know what we have but it's upstairs in some room, just go." Thank goodness these places didn't throw things out. Looking back, there was nothing that guaranteed we were going to find nine orchestras that had all this information about the auditions just sitting there.

**EF: You spoke about your optimism that you can use economics to solve life's mysteries. Which economists have most inspired you to try?**

**Goldin:** Gary Becker was in many ways the greatest influence. Gary's words, written and spoken, echo in my ears all the time. He is always there asking me, "Is this an equilibrium? Have you gotten to the heart of the issue?" He had this ability to use what I call the fine scalpel of the great economist to pare away all the fat and get to the heart of the problem. Bob Fogel, my other mentor, was a very bold empiricist from whom I learned a lot. There are also a host of great empiricists today, doing work like the research I mentioned earlier. These empiricists have the great ability and enormous belief that they can find some instrument to identify the effect, and I've learned a lot from their way of thinking. And, of course, Larry Katz is my constant guide and sounding board. **EF**