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# The \$16,819 Pay Gap For Newly Trained Physicians: The Unexplained Trend Of Men Earning More Than Women

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**ABSTRACT** Prior research has suggested that gender differences in physicians' salaries can be accounted for by the tendency of women to enter primary care fields and work fewer hours. However, in examining starting salaries by gender of physicians leaving residency programs in New York State during 1999–2008, we found a significant gender gap that cannot be explained by specialty choice, practice setting, work hours, or other characteristics. The unexplained trend toward diverging salaries appears to be a recent development that is growing over time. In 2008, male physicians newly trained in New York State made on average \$16,819 more than newly trained female physicians, compared to a \$3,600 difference in 1999.

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**W**omen now represent nearly half of all US medical students and were projected to make up approximately one-third of the total physician population by the start of this decade.<sup>1-7</sup> Despite their increasingly prominent role in the medical profession, the debate persists as to whether or not women receive pay comparable to their male colleagues.

Studies have yielded mixed findings. Some prior work has shown a convergence of male and female physician pay after a number of observable factors including specialty, work hours, and practice type are controlled for. However, other studies found pay disparity between male and female physicians.<sup>1,8-15</sup> Because each of these studies had limitations, no clear conclusion on this issue has been reached.

Two key elements of the compensation debate involve potential gender differences in on-the-job productivity and the greater tendency for women to pursue primary care specialties compared to men. The productivity element, much like the larger topic, has produced two divergent findings. Some researchers have found evidence of lower productivity for female physicians,

whereas others uncovered no such productivity gap between genders.<sup>6,13,15-17</sup> Furthermore, productivity is often crudely measured in terms of patients seen over a specified time period and may not reflect relevant dimensions such as quality of care or patient outcomes. Thus, productivity is perhaps not the strongest explanation for any salary divergence.

For the second common explanation, historically women have disproportionately chosen primary care specialties compared to men, and the literature has tended to support this explanation by focusing on the absolute number of female physicians in primary care fields.<sup>16,18,19</sup> Although the absolute number of female physicians in primary care has indeed been rising, proportionally a decreasing percentage of female physicians have chosen to enter primary care fields.<sup>2</sup> And in fact, with many more women choosing subspecialization, one might expect the gender gap in physician salaries to lessen in recent years.

We used survey data from physicians exiting training programs in New York State from the time period 1999–2008 to examine the extent to which salary differences by gender have changed over time. The survey allowed for control over numerous observable factors, including spe-



cialty type, hours worked, designation of hours, immigration status, age, and practice location. Additionally, by focusing on starting salaries, we could avoid confounding variables such as experience, rank within an institution, and on-the-job productivity that become evident once a person has been working for a number of years.

The analysis demonstrated that the gap in starting salaries between male and female physicians existed throughout the ten-year survey period, despite the fact that proportionally fewer women were entering the lower-paying primary care fields. The power of physicians' observable characteristics (such as gender and specialty choices) to explain the difference in salaries diminished over time, which has created a widening unexplained starting salary gap between male and female physicians in recent years. Our findings should provide clearer insight into this ongoing debate and reveal new considerations for medical institutions and policy makers.

### Study Data And Methods

**PHYSICIAN DATA SOURCE** Data for our study came from the New York State Survey of Residents Completing Training, conducted by the Center for Health Workforce Studies of the State University of New York at Albany from 1999 through 2008. New York State is home to more residency programs and more resident physicians than any other state.<sup>20</sup>

The survey has been conducted annually each May and June beginning in 1998, although it was not fielded in 2004 and 2006 because of budget constraints. The data set provided information on graduating residents' citizenship, demographic characteristics, education, residency training, specialty, educational debt, practice setting and location, future job plans, and other variables.

Because of a major change in the way hours of work were coded beginning with the 1999 data, the data from 1998 were omitted. The aggregate response rate for 1999–2008 was 62.6 percent (23,640 responses from 37,777 physicians surveyed).<sup>21–28</sup>

We focused on graduating residents and fellows who reported that upon completing their current training program, their primary activity would be “patient care and clinical practice (in a nontraining position).” In addition, analysis was limited to respondents who had been offered and accepted a job. The resulting sample size for the analysis was 8,233.

**STARTING SALARY** Starting salary was computed by summing self-reported base salary and self-reported expected incentive compensation. Reported base salary was recorded as a

bracketed value starting with “under \$70,000,” increasing in multiples of \$10,000 through \$150,000. After \$150,000, the value increased in increments of \$25,000 up to the top code.

From 1999 to 2001 the top code was “over \$200,000”; in 2002 it was increased to “over \$225,000”; in 2003 and later it was “over \$250,000.” Physicians were also asked to report additional anticipated incentive income, such as from an annual bonus. Incentive income was bracketed in units of \$5,000 from zero to \$50,000.

To produce a continuous value for salary, we used the midpoint of the category. For the bottom-coded “under \$70,000” category, we set the salary at \$60,000. We applied a conservative rule to ascribe the value of the top-coded salary level: We added \$15,000 in cases when a physician reported earning the top-coded salary. This “add-on” was to take account of the fact that the artificial salary ceiling would not appropriately reflect those who earned above the top-coded value. An arbitrary multiplier of this sort is frequently used in economic research in the presence of top-coded income data.<sup>29</sup>

Only 5.9 percent of the reported salaries in the sample were top-coded by either gender. The fact that more men were top-coded than women (8.3 percent versus 2.3 percent) implies that the imputation approach probably understated the difference between men's and women's salaries. We included an indicator variable in the regression model to control for the presence of a top-coded salary value, although our results were not sensitive to the exclusion of top-coded salary observations.

The self-reported salary data were taken as given; no effort was made to validate the information. Salary values were adjusted for inflation using the Consumer Price Index and were based on real 2008 dollars.

**EXPLANATORY VARIABLES** Using indicator variables, we controlled for forty-five categories of specialty training. The regression models controlled for ten categories of variables (see the Appendix).<sup>30</sup>

Finally, a supporting set of analyses on a subset of the data controlled for local cost of living using the cost of living index constructed by the Council for Community and Economic Research. The cost-of-living index could be included only in a subset of observations because not all respondents reported the city name or ZIP code of their employer's location.

When respondents failed to include the location of their upcoming employment or included an invalid ZIP code, observations were lost. In addition, data on city practice location for 2005 were not transcribed by the Workforce Center



staff, which necessitated dropping that year for the cost-of-living analysis.

Analyses that included the cost-of-living measure did not substantively alter the results. Regression results are available from the authors on request.

**STATISTICAL ANALYSIS** Ordinary least squares regressions were used to estimate the adjusted differences in salary between men and women over time, controlling for the variables outlined above. To account with flexibility for differential trends in salary for men and women over time, year dummies (indicating “yes” or “no” for that year) were included in the model, as were interaction terms between the gender variable and the year dummies.

Analyses were performed using the statistical software Stata, version 10.1. The study was exempted from review by the Institutional Review Board at the University of Illinois at Chicago.

## Study Results

The sample included 4,918 men and 3,315 women. In line with national trends, the proportion of the sample that was women increased over time, from 38 percent in 1999 to 43 percent in 2008.

**PHYSICIANS’ CHARACTERISTICS** Exhibit 1 dis-

plays personal and job characteristics by gender. There are few noteworthy differences in most characteristics. One important difference is the greater proportion of women who planned to devote fewer than forty hours per week to patient care (38.1 percent versus 24.5 percent of men) and the lower proportion of women who planned to devote more than fifty hours per week to patient care (23.4 percent versus 37.3 percent of men). However, when we restricted the analysis to only those working forty or more hours per week in patient care, our findings were not substantively altered. Additional longitudinal descriptive statistics are available in the Appendix.<sup>30</sup>

**SALARIES** Exhibit 2 ranks select specialties by mean starting salary for women. It is evident that women have a larger representation than men in lower-paying specialties (for example, 13.9 percent of women are in pediatrics, versus 5 percent of men) and a smaller representation in higher-paying specialties (1.3 percent of women are in cardiology, versus 4.1 percent of men; 1.8 percent of women are in diagnostic radiology, versus 3.4 percent of men; 2.6 percent of women are in anesthesia, versus 5.0 percent of men).

Women had lower average starting salaries than men for nearly all specialties. When women did make more than men, the difference was not

### EXHIBIT 1

Selected Characteristics And Starting Salaries Of New Physicians By Gender

	Percentage of physicians		Mean starting salary (\$)	
	Men	Women	Men	Women <sup>a</sup>
<b>PRACTICE TYPE</b>				
Solo practice	3.6	2.3 <sup>b</sup>	182,937	139,530
Partnership	8.7	6.4	185,816	157,160
Group practice	47.5	44.9	195,781	162,538
Hospital, inpatient	18.6	18.1	179,219	159,290
Hospital, ambulatory care	7.0	13.6	153,885	141,844
Hospital, emergency department	8.6	7.2	206,758	189,109
Health center	2.8	3.7	159,791	140,092
Other	3.2	3.9	165,025	147,021
<b>LOCATION TYPE</b>				
City	45.2	51.2 <sup>b</sup>	184,395	157,320
Suburb/small city	47.6	42.6	192,450	160,541
Rural	6.6	5.1	172,716	160,441
Missing	0.6	1.1	173,741	145,462
<b>PATIENT CARE HOURS PER WEEK</b>				
0–19	1.5	3.3 <sup>b</sup>	181,573	131,554
20–29	3.8	9.9	162,068	132,242
30–39	19.2	24.9	184,793	159,594
40–49	38.3	38.5	177,593	157,641
50 or more	37.3	23.4	201,591	174,635

**SOURCE** Authors’ calculations from New York State Survey of Residents Completing Training, 1999–2008. **NOTES** Sample included 4,918 men and 3,315 women. Salary is in real 2008 dollars. <sup>a</sup>The difference in mean starting salary for women compared to men was statistically significant in all categories except “other” ( $p < 0.05$ ). <sup>b</sup>Significantly different within group by gender ( $p < 0.05$ ).

EXHIBIT 2

Starting Salary For Selected Physician Specialties, By Gender

Specialty	Percentage of physicians		Mean starting salary (\$)	
	Men	Women <sup>a</sup>	Men	Women
All physicians	100.0	100.0	187,385	158,727 <sup>b</sup>
Pediatrics (general)	5.0	13.9	125,343	116,950 <sup>b</sup>
Geriatrics	1.8	2.5	147,881	137,221 <sup>b</sup>
Family practice	6.4	8.5	147,874	139,504 <sup>b</sup>
Psychiatry	3.3	4.4	156,668	141,852 <sup>b</sup>
Internal medicine (general)	18.2	16.0	154,900	142,526 <sup>b</sup>
Pediatrics (subspecialty)	1.7	3.5	161,119	143,675 <sup>b</sup>
Nephrology	2.0	0.8	162,190	146,668 <sup>b</sup>
Pulmonary disease	2.3	0.9	197,398	153,078 <sup>b</sup>
Otolaryngology	1.4	0.4	207,329	175,122 <sup>b</sup>
Urology	2.1	0.3	199,314	175,407
Obstetrics and gynecology (general)	2.5	10.5	203,789	182,047 <sup>b</sup>
Dermatology	1.0	2.2	217,799	194,818 <sup>b</sup>
Surgery (general)	1.4	0.7	185,881	196,721
Cardiology	4.1	1.3	228,188	204,671 <sup>b</sup>
Emergency medicine	9.1	6.6	218,767	206,114 <sup>b</sup>
Gastroenterology	2.7	1.0	206,158	209,392
Cardiothoracic surgery	0.9	0.1	241,371	214,268
Anesthesiology (general)	5.0	2.6	229,915	220,576
Radiology (diagnostic)	3.4	1.8	250,709	233,532
Orthopedic surgery	3.7	0.5	248,288	242,052

**SOURCE** Authors' calculations from New York State Survey of Residents Completing Training, 1999–2008. **NOTES** Sample included 4,918 men and 3,315 women. Specialties ranked by mean starting salary for women. Salary adjusted for inflation using the 2008 Consumer Price Index. <sup>a</sup>The difference in percentage of physicians was statistically significant for women in all categories ( $p < 0.05$ ). <sup>b</sup>Significantly different by gender ( $p < 0.05$ ).

statistically significant. The full list of specialties is available in the Appendix.<sup>30</sup>

Exhibit 3 displays the unadjusted trend in real physician starting salaries by gender from 1999 to 2008. Overall, new women physicians earned \$151,600 in 1999 versus \$173,400 for men—a 12.5 percent salary difference. The gender difference grew to nearly 17 percent in 2008 (\$174,000 versus \$209,300).

Regression coefficients are available in Appendix Table 1,<sup>30</sup> the regression-adjusted predicted salary values for men and women over time are summarized in Exhibit 3. When other observable characteristics were controlled for, starting salary differences between men and women were statistically insignificant in 1999 ( $p = 0.08$ ). However, by 2008 there was a substantial (\$16,819) unexplained starting salary difference between men and women ( $p < 0.001$ ). Despite controlling for the influence of confounding variables, the difference in 2008 in percentage terms was roughly half that observed in the unadjusted salary figures displayed in Exhibit 3.

**ROLE OF PRIMARY CARE** A decreasing proportion of women entered primary care specialties (where *primary care* was defined as internal

medicine, family practice, and pediatrics) during the study period, from 49 percent in 1999 down to 33.9 percent in 2008, as demonstrated in Exhibit 4. The proportion of men entering primary care fields stayed relatively constant over the same time period. The regression results, however, suggest that despite the growing numbers of women in specialty fields that have historically paid more than primary care, salary differences largely persisted. There were no other striking trends over time in observable characteristics that would account for the growing inability to explain the gender difference in salary.

In a related analysis, we stratified our regression model by primary care and non-primary care fields, to test whether the divergent salary trend was restricted to non-primary care fields, where women have been making recent inroads. We found similarly divergent trends in salary between women and men that tracked the aggregate analysis for both primary care fields and non-primary care fields (analyses available upon request).

Another set of sensitivity analyses examined whether incentive compensation affected the



pattern of findings. Our findings were not sensitive to the exclusion of incentive compensation (analyses available upon request).

## Discussion

In the mid 1990s, studies suggested that female and male physicians' pay did not differ when observable characteristics of the physician and the practice setting were controlled for.<sup>11</sup> Other studies suggested that the gender gap in pay was narrowing at a rate of nearly 1 percent per year and would be eliminated within the next twelve years.<sup>19</sup> Although we explicitly restricted our investigation to starting salaries for new physicians, our findings are consistent with this earlier research in suggesting that by the late 1990s, women and men earned roughly equivalent salaries after observable factors were adjusted for.

In accordance with national data,<sup>2</sup> our findings also demonstrate that female graduates of training programs in New York State were increasingly likely to enter non-primary care fields. By 2008 the proportion of male physicians entering primary care had remained roughly constant; however, the proportion of female physicians entering primary care had undergone a striking drop, from nearly 50 percent to just above 30 percent. Thus, by 2008 female physicians were no more likely than their male counterparts to enter primary care fields.

**PROBING THE WIDENING GAP** In spite of the accelerating entry of female physicians into formerly male-dominated and traditionally higher paying subspecialties, there was a widening gap in physician compensation during our study period. To our knowledge, only one other study has found a pay disparity that increased in recent times.<sup>8</sup> But that study was not focused on starting salaries, only reported a slight widening of pay difference, and was limited by the fact that the authors were unable to control for the amount of time physicians spent in clinical practice, as opposed to other activities.

### ROLE OF MARITAL AND FAMILY STATUS

Although the data in our study allowed us to include a large number of observable characteristics for physicians, the survey did not question respondents about marital and family status. Many studies have examined the roles of marriage and parenting and their subsequent effects on physicians' practice and labor-market decisions.<sup>2-7,9,13-15,17,31,32</sup>

Importantly, much of the previous research has found that family status typically has a comparatively small effect on female physicians' incomes, practice type, and general career satisfaction, when other factors such as specialty are controlled for.<sup>5,6,9,13-15,17</sup> Furthermore, the best

## EXHIBIT 3

**Physician Starting Salaries Over Time, Mean And Controlling For Observable Characteristics, By Gender, Selected Years 1999–2008**



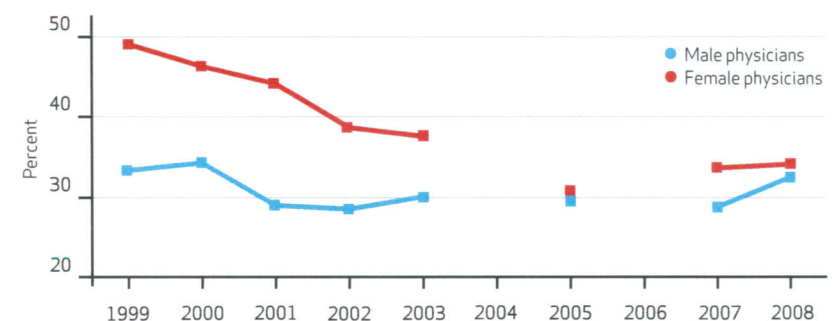
**SOURCE** Authors' calculations from New York State Survey of Residents Completing Training, 1999–2003, 2005, 2007–08. **NOTES** Sample included 4,918 men and 3,315 women. Salary included base plus anticipated incentive compensation, adjusted for inflation using the 2008 Consumer Price Index. Dotted lines in each color portray adjusted findings, controlled as follows. Ordinary least squares regression controlled for specialty (45 categories), race/ethnicity, age, citizenship, foreign medical graduate status, whether medical degree or doctor of osteopathy degree, educational debt, Health Professional Shortage Area work obligation, practice type, location type, patient care hours, year, and salary top-coding.

available evidence does not suggest that important changes in family status took place among residents during the time period of our study.<sup>33</sup> Hence, estimates of the change in the differential between male and female physicians' starting salaries are unlikely to be influenced solely by the omission of the marital and family status variables.

**DISCRIMINATION** Given that rapid changes in family status probably did not drive our findings, one hypothesis is that women face gender discrimination in the physician labor market in spite of the evolving role of women in the physician workforce.<sup>12,13,15</sup> Although this hypothesis cannot be proved or disproved based on our data,

## EXHIBIT 4

**New Physicians In Primary Care Specialties Over Time, By Gender, Selected Years 1999–2008**



**SOURCE** Authors' calculations from New York State Survey of Residents Completing Training, 1999–2003, 2005, 2007–08. **NOTES** Primary care includes internal medicine, family practice, and pediatrics. Sample included 4,918 men and 3,315 women.



it would be difficult to believe that discrimination, after a period of quiescence, has actually been on the rise in recent years. Moreover, our results indicate a trend toward diverging salaries not only in the traditionally male-dominated subspecialty fields, which experienced an influx of women in our sample, but also in primary care fields.

**UNOBSERVED ASPECTS OF FEMALE PHYSICIANS' JOBS** Given that the trend toward diverging salaries appears to affect female physicians regardless of specialty, an alternative explanation focuses on the unobserved aspects of jobs taken by women. It is possible that the continued influx of women into medicine has reached a tipping point, and physician practices may now be offering greater flexibility and family-friendly attributes that are more appealing to female practitioners but that come at the price of commensurately lower pay.

Such an explanation not only is consistent with the pattern observed in the data, but it also suggests that the continued integration of women into the physician workforce is reshaping the practice and business of medicine in ways that need to be measured by variables that are more subtle and comprehensive than salary. If true, it also implies that female physicians respond to nonmonetary elements in a given job offer and are willing to accept lower salaries in return for jobs that better reflect their broader employment preferences.

The changing employment preferences in medicine have been documented in the growing literature that demonstrates increased attention is being paid to physicians' quality of life.<sup>1,7,10,34,35</sup> However, this is probably only one dimension of female physicians' employment values because male and female medical students both care about quality-of-life issues.

**COMPARISON WITH LEGAL PROFESSION** Developments in the legal profession provide a comparison. Like physicians, lawyers acquire substantial human capital, are a self-selected group of driven and successful individuals, and have a range of postgraduate employment opportunities with variable occupational demands and wages. Additionally, law was once a male-dominated profession that now has a substantial number of women joining its ranks each year.<sup>36</sup>

Despite the greater number of female lawyers, a gender gap in earnings persists within this profession, even after observable variables are adjusted for.<sup>36-38</sup> Characteristics related to family status are estimated to account for approximately half of this pay gap.

However, that still leaves a substantial portion of the pay difference unexplained, although Mary Noonan and colleagues observe, "If

## The continued integration of women into the physician workforce is reshaping the practice and business of medicine.

women, on average, work in less onerous or more personally rewarding kinds of practices than do men, there may be systematic unmeasured sex differences in the kinds of jobs and work experience these lawyers have."<sup>38(p867)</sup>

**EMPLOYMENT NEGOTIATIONS** A final consideration relates to the impact of gender on employment negotiations. Although early research was inconsistent and conflicting, recent studies have demonstrated gender differences driven by social contexts and constraints, as opposed to a deficient negotiating capacity in women.<sup>39-42</sup> However, we are unwilling to accept the theory that women have become worse negotiators in recent years. It is more likely that women are increasingly paying attention to family considerations as well as salary and advancement potential in their negotiations.<sup>42</sup>

The full compensation value of any occupation is difficult to infer from a large data set, particularly in professions that have many requirements unrelated to pay. For example, practicing doctors are required to be "on call" and to work night or weekend shifts that are often unpredictable. Such factors could correlate with the unexplained and growing difference in female and male physicians' pay.

Thus, instead of being penalized because of their gender, female physicians may be seeking out employment arrangements that compensate them in other—nonfinancial—ways, and more employers may be beginning to offer such arrangements.

**CONCLUSION** Our study involved data from a single state, even though that state trains the plurality of new physicians. The survey also lacked some potentially important correlates of physician pay, such as family and marital status. Nonetheless, our work represents an important contribution to the long-running discussion about physician salary differentials. By focusing on physicians at the very start of their clinical careers, before they have started work at their



# The growing number of female physicians will probably create a new set of provider preferences.

new jobs, we were able to eliminate potential differences in productivity as a confounding factor.

Considering our findings, and in light of the continuing rise in the number of female physi-

cians, policy makers, physician practice groups, and medical training programs should reconsider how they attract providers, how they construct their working arrangements, and how they pay. The growing number of female physicians will probably create a new set of provider preferences that includes more predictable schedules and less time pressures on other aspects of life. The need to retool the way in which female providers are recruited is likely to become more urgent as a consequence of the Affordable Care Act. In 2014 and beyond, the physician workforce will probably be strained by the demands of the anticipated thirty million or more newly insured Americans. The increased need for physicians, particularly in primary care fields, to treat the newly insured will place a brighter spotlight on physician compensation arrangements. ■

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Chiu-Fang Chou had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. The authors are grateful to the Center for Health Workforce Studies at the School of Public Health, State University of New York, Albany, for providing data for the study. The

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## ABOUT THE AUTHORS: ANTHONY T. LO SASSO, MICHAEL R. RICHARDS, CHIU-FANG CHOU & SUSAN E. GERBER



**Anthony T. Lo Sasso** is a professor and senior research scientist at the School of Public Health, University of Illinois at Chicago.

Anthony Lo Sasso, Michael Richards, Chiu-Fang Chou, and Susan Gerber explore a growing gender gap in physicians' starting salaries. They find that in New York State, where more residents are trained than in any other state, women leaving residency training programs earn considerably less than their male counterparts—and that the gap isn't explained by such factors as choice of specialties.

These authors brought different perspectives and expertise to the research, lead author Lo Sasso says. Their collaboration started at the University of Illinois at Chicago (UIC). Lo Sasso, a professor and senior research scientist in the UIC School of Public Health, supervised Chou's doctoral research at the school, and they soon began to collaborate on other work. Richards, then a medical student at UIC, joined them. Gerber, Lo Sasso's wife and frequent collaborator, was brought into this project for her expertise and her perspective as a female physician.

The authors were surprised by the striking difference in starting salaries that their research found

between male and female physicians. They accounted for every factor that might explain this finding, given previous research that found no difference in salary between sexes, but this made no difference. "We honestly tried everything we could to make it go away, but it wouldn't," Lo Sasso says. The authors hope that their research will highlight the uncertainty and unpredictability inherent in dynamic physician labor markets—a factor that will play into health reform, as demand grows for primary care providers and physicians in general.

In addition to his position at UIC, Lo Sasso is a technical adviser for the Center for Program Integrity at the Centers for Medicare and Medicaid Services. He also serves on the editorial boards of several health care policy journals. He received a doctorate in economics from Indiana University.



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