Do New Male and Female College Graduates Receive Unequal Pay?

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ABSTRACT

We analyze the female-male gap in starting-salary offers for new college graduates using data from the annual surveys of the National Association of Colleges and Employers (NACE), unique (and proprietary) data that have not previously been used for this purpose. A major advantage of working with a data set on salaries for new college graduates is that we can remove the possible influence of gender differences in experience, promotions, job changes, and other factors on the salary gap. We find that as much as 95 percent of the overall gender gap in starting-salary offers can be explained by differences in college majors selected.

I. Introduction

It is well known that the overall gender pay gap in the United States has fallen over the past 25 years. Also well known are the reasons for gender earnings differences, although the relative importance of these reasons remains open to debate (see Altonji and Blank 1999 and Polachek 2004 for recent surveys). Considerably less attention has been directed to the gender earnings gap for college graduates and the underlying reasons, especially the difference between female and male earnings immediately after graduation. In recent years the female-male annual earnings ratio for young college graduates with a bachelor's degree has generally

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averaged about 0.90.[1] However, because the reported earnings averages are for persons in the 18–24 age range, they reflect starting salaries upon graduation as well as possible gender differences in other factors, including earnings growth for several years after graduation, attending graduate school after college, and working before college. Using data on starting salaries from the National Association of Colleges and Employers (NACE), we find that as much as 95 percent of the overall gender gap in starting-salary offers in the NACE data can be attributed to differences in college majors selected.

In this paper we analyze the female-male gap in starting-salary offers for new college graduates using a data set that, with the exception of Paglin and Rufolo (1990), has not previously been used by economists in their research on gender pay differentials. A major advantage of working with a data set on *starting* salaries for new college graduates is that we can remove the possible confounding effects of gender differences in experience, promotions, job changes, and other factors on the gender earnings gap. The difficulty in controlling for such factors has been in part responsible for the disagreement among researchers as to just how much of the gender earnings gap is attributable to labor-market discrimination.

The data set we use is taken from the annual surveys of NACE (previously known as the College Placement Council), which since 1967 has surveyed beginning salary offers for a large sample of male and female college graduates. We seek to determine the extent to which differences in the overall gender gap in starting-salary offers made to new college graduates in the NACE data can be explained by differences between men and women in the majors they have selected.

In the next section we review the prior studies in the labor economics literature that have attempted to determine how much of the gender earnings gap can be attributed to male-female differences in college majors. As O'Neill (2003, p. 313) says, college major contributes significantly to the wage gap, but the magnitude of the effect is far from certain, as will be seen below. We then discuss the NACE salary surveys (along with their limitations) and use data from the surveys to construct an annual time series of the ratio of female-male average starting-salary offers from 1969-2001. Using simulation we then estimate what these salary ratios would have been if women had the same distribution of majors and numbers of offers as men.

II. Previous Studies of the Effect of College Major on the Gender Pay Gap

Over the past several decades there has been a marked shift in the college major decisions of women: As women's expected years in the labor force have risen, they have chosen traditionally more lucrative fields of study, as the human-capital model would predict (see, for example, Polachek 2004; and Manning and Swaffield 2005). Women have been moving away from majors in

1. This ratio, calculated from the P-60 series, is based on average annual earnings of persons 18–24 with a bachelor's degree working year-round full-time. (Calculated from U.S. Census Bureau, ''Money Income in the United States,'' Current Population Reports, P-60 series, 1995–2001.) The standard errors associated with annual earnings estimates for each group are rather high, and there is sometimes considerable year-to-year variation in the estimates and therefore in the ratio.

which they were disproportionately concentrated (such as education and the liberal arts) and into majors in which they have been underrepresented (such as business, computer science, and engineering); see, for example, Joy (2000), Turner and Bowen (1999), and Eide (1994).

Although there has been much prior research analyzing gender differences in the choice of college majors, only a handful of studies have attempted to estimate how much of the gender wage gap among college graduates might be due to differences in the majors selected. No previous study is quite comparable to ours, however, as only two—Gerhart (1990) and Graham, Hotchkiss, and Gerhart (2000)—have analyzed starting salaries, but both focused on single institutions. The NACE surveys, on the other hand, cover about 350 U.S. colleges and universities. Table 1 summarizes the results of the previous studies.

As the table shows, previous studies have found that the choice of major has had some effect on the gender earnings gap for college graduates. However, depending on the study, gender differences in major have been found to explain from less than 10 percent to nearly 50 percent of the gender earnings gap. Of course, differences in the approaches taken, years studied, and control variables used are partially responsible for the variability in the findings. In most prior research the salaries studied were for college graduates with several years of work experience, however, and as a result we cannot tell whether the gap begins immediately upon graduation. Another characteristic of most studies is the very high degree of aggregation in the definition of major. Lumping majors together in such broad categories may mask sizeable field-specific salary differences.

As we will see in the next section, use of the NACE data set allows us to overcome many of the limitations of previous studies. The NACE data on average salary offers by college major are currently reported for about 80 major fields. In addition, salaries are beginning salaries and thus control for the effects of experience. Perhaps most importantly, the NACE survey can be used to compare gender differences for a relatively long period of time, with annual data on average male and female starting salaries by major available for the period from 1974 through 2001.

III. The NACE Survey

The National Association of Colleges and Employers began its annual salary survey of college graduates in 1960. The survey reports beginning salary offers made to new graduates by employers in business, industry, government, and nonprofit institutions each year over the period September through August, what NACE calls the recruiting year. The NACE survey is currently based on information solicited from about 350 career planning and placement offices of colleges and universities across the United States. The institutions participating in the survey are broadly representative of all colleges and universities with respect to size, region, and public-private mix. (See Appendix 1.)

Average salary offer information in the NACE salary survey is currently reported separately for women and men in each of nearly 80 different majors (as detailed as, for example, accounting, history, and civil engineering) and also in more than 80 different functional areas or types of first jobs (for example, insurance, design/graphic

Table 1
Principal Studies of the Effect of College Major on the Gender Pay Gap

Study	Years Studied	Majors Studied	Sample Size	Salary Variable	Control Variables	Principal Findings
Angle and Wissmann (1981)	1967–75	6	4,508 (NLS of Labor Market Experience)	3–10 years after graduation (women); 3–12 years after graduation (men)	Age, race, post-secondary degrees received and years of enrollment, prestige of father's occupation	About 10 percent of the gender difference in hourly wages can be explained by major
Black et al. (2005)	1993	144	74,613 from NSCG	3–4 years after graduation	Premarket factors: age, highest degree and race	Inclusion of majors causes the log wage gap to fall by approximately 0.10
Brown and Corcoran (1997)	1984 and 1986	15 (NLS72); 20 (SIPP)	3,545 (1984), SIPP college grad; 2,007 (1986), NLS72 college grad	1–42 years after grad. (SIPP); 10–12 years after graduation (NLS72)	Demographics, experience and training, education, ability	Differences in college majors account for just under half of the observed earnings gap
Daymont and Andrisani (1984)	1978	10	2,835 (NLS72)	2 years after graduation (NLS72)	Work experience, preferences, family situation, highest post-secondary degree	Differences in major account for 28–43 percent of gender earnings gap

(*continued*)

Table 1 (*continued*)

Study	Years Studied	Majors Studied	Sample Size	Salary Variable	Control Variables	Principal Findings
Eide (1994)	1979 and 1986	5	2,116 (1979), NLS72; 954 (1986), HSB	2–3 years after graduation	Ability measures, experience, demographics	Gender differences in majors account for about 27 percent of wage gap
Gerhart (1990)	1976–86	65	2,895 college grads; hiring by a single large firm	Starting and current salaries	Tenure, performance rating, job title, potential experience	Gender differences in distribution of majors account for 43 percent of differences in starting salaries
Graham, Hotchkiss, and Gerhart (2000)	1985–88	5	951 graduates of a single "prestigious" university	Starting salaries (from annual placement survey)	Occupation, GPA, industry, race, job region, trainee status, year of graduation, no. of job offers	The primary reason women were paid less than men is different fields of study—they account for between 19–38 percent of the gender pay gap
Hecker (1998)	1993	27	NSF sample of 215,000 people	4–13 years after graduation ("young" group)	Occupation	About 1/3 of the gender earnings gap for all college graduates can be attributed to choice of major

Joy (2003)	1994	26	4,502 (NCES) Baccalaureaet & Beyond 1993/94	1 year after graduation	Student qualifications, race, age, marital status, college type, family background, job qualities, occupation, industry	On average, majors account for less than 10 percent of the male-female wage gap
Loury (1997)	1979 and 1986	3	2,568 (1979), NLS72; and 1,647 (1986), HSB	3 years after graduation (NLS72); 2 years after graduation (HSB)	Ability measures, marital status, tenure on current job, weeks worked, union member, college graduate	Only a small part of the decline in gender earnings gap in the 1980s was due to changes in the distribution of majors
Weinberger (1998)	1985	12 and 246	5,952 (NCES) Survey of Recent College Graduates (SRCG)	1–2 years after graduation	Race, experience, weekly hours worked, region, college attended, parental college data, GPA	Differences in broadly defined college major explain less than half the wage gap relative to white men. (Adding controls for narrowly defined college major has no additional effect.)
Weinberger (1999)	1985	12	5,025 (NCES SRCG)	Same as above	Same as above and math content of each major	The gender gap falls from 17 percent to 9 percent with inclusion of majors

arts, quality control, and social work). (See Appendix 2.) The NACE salary data are reported only as averages, and salary data by individual or by institution are neither published nor available. The number of salary offers reported varies over the years (see Table 2); for example, the total for 2001 was 26,899.

There are a number of limitations of the NACE data. In describing its survey methods and scope, NACE states that its *Salary Surveys* report salary offers rather than acceptances. It should also be noted again that the NACE survey period is truncated, with information collected for each graduating class only through the recruiting year. This corresponds roughly to a student's senior year in college and the summer following graduation. This means that salary offers in those majors where job offers are plentiful—those majors most in demand by employers—are overrepresented in the NACE data.

The NACE data are not detailed enough to allow us to control for exogenous factors, for example, job location or college quality, which might differ by gender and thus bias our results. Also, although only about 10 percent of graduates nationally find their jobs through college placement centers (Choy and Geis 1997, p. 25), the NACE data probably overrepresent students in this category as well. Students are more likely to use these centers while on campus than they are after they graduate. However, there is no way to measure the degree of overrepresentation because the NACE survey is not restricted only to those students who use college placement centers. For all these reasons, it is not necessarily correct to label the averages reported by NACE as representing average salary offers of *all* college graduates.

Despite these limitations, however, the NACE data still possess the considerable advantages of providing us with a series on starting salaries broken down by gender for a large number of college major categories. Moreover, the salary surveys have been conducted annually over nearly a 30-year period.

IV. The Female-Male Starting-Salary-Offer Gap: What the NACE Data Show

In Table 2 we have presented our calculations of the overall ratios of average female-male beginning salary offers (for all majors combined) along with the number of reported offers using NACE data for each year since 1969. Several interesting observations can be made. First, with their values fluctuating around 0.90 from 1976 on, the overall female-male salary ratios in Table 2 are high and comparable both to those based on Current Population Survey (CPS) data for young college graduates with a bachelor's degree and also to those of the Graham, Hotchkiss, and Gerhart (2000) and Gerhart (1990) studies (which were based on data from one university and one firm respectively). These two studies, it should be noted from Table 1, also analyzed average *starting salaries* of new college graduates. However, the gender salary ratios in Table 2 are somewhat higher than those found in most of the other studies summarized in Table 1, but these studies examined average salaries within broader age ranges. This observation suggests that the gender pay gap begins to widen shortly after college graduation.

Interestingly, the gender salary offer ratios in Table 2 show remarkable long-term stability, varying from 0.90 in most years over the past two decades by no more than

Table 2
Female-Male Starting Salary Ratios,[a] *1969–2001*

Year	Female/Male Salary Ratio	Number of Offers Reported in NACE Survey	Year	Female/Male Salary Ratio	Number of Offers Reported in NACE Survey
2001	0.876	26,899	1984	0.896	42,393
2000	0.894	27,866	1983	0.897	33,604
1999	0.893	29,777	1982	0.895	51,290
1998	0.880	27,625	1981	0.902	62,835
1997	0.898	21,634	1980	0.902	62,887
1996	0.897	21,280	1979	0.904	61,792
1995	0.897	18,319	1978	0.891	52,670
1994	0.909	15,862	1977	0.895	38,697
1993	0.907	18,926	1976	0.893	27,525
1992	0.902	19,654	1975	0.862	24,451
1991	0.897	24,279	1974	0.861	32,306
1990	0.908	33,844	1973	0.839	24,226
1989	0.912	39,018	1972	0.799	15,757
1988	0.922	32,708	1971	0.775	13,907
1987	0.911	24,990	1970	0.772	18,545
1986	0.904	32,965	1969	0.762	39,451
1985	0.904	44,479			

Source: Annual Salary Surveys of the National Association of Colleges and Employers, 1969–2001.
a. Ratios for each year are calculated as $(\Sigma_{c=1}^{n} \overline{w}_c^f N_c^f / \Sigma N_c^f) / (\Sigma_{c=1}^{n} \overline{w}_c^m N_c^m / \Sigma N_c^m)$ where f = female, m = male, $\overline{w}$ is the average salary offer for each major, N refers to the number of salary offers reported for each major (c), and n is the total number of majors. The number of major fields reported by NACE in its salary surveys varies by year (see Column 4 of Table 5), but is currently 79. For a complete list of the majors used by NACE for which salary information is reported, see Appendix 2.

a percentage point or two. It is also clear that the period of the early 1970s was one of a substantial narrowing of the gap. During the span of only eight years (1969–76) the female-male starting-salary ratio rose by about 13 percentage points. Furthermore, this increase in the ratios based on the NACE data seems to lead the increase in the ratios based on the CPS series for all females and males by about 10 years. Female-male earnings ratios based on the CPS series began to rise in the early 1980s (O'Neill and Polachek 1993, p. 206).[2] Such a lead-lag relationship is reasonable, since it would take time for the effects of changes in the earnings ratios for *recent* college graduates to show up in the general series for all men and women.

How much of the gender starting-salary gap in the NACE data can be explained by gender differences in majors and offers? We make use here of a simple simulation technique similar to that used by Chiswick et al. (1974) and Treiman and Hartmann

2. O'Neill and Polachek (1993) attribute the narrowing of the general gender earnings gap primarily to the convergence in measurable work-related characteristics (such as schooling and experience) as well as to an increase in women's returns to experience.

Table 3
Actual and Simulated [a] Female-Male Starting Salary Ratios, Based on Average Salary Offers by Curriculum (Major Field), 1974–2001

Year	Actual Salary Ratio	Simulated Salary Ratio	Year	Actual Salary Ratio	Simulated Salary Ratio
2001	0.876	0.993	1987	0.911	0.991
2000	0.894	0.992	1986	0.904	0.994
1999	0.893	0.992	1985	0.904	0.996
1998	0.880	0.987	1984	0.896	0.991
1997	0.898	0.996	1983	0.897	0.993
1996	0.897	0.989	1982	0.895	0.996
1995	0.897	0.989	1981	0.902	0.996
1994	0.909	0.990	1980	0.902	0.997
1993	0.907	0.998	1979	0.904	1.003
1992	0.902	0.993	1978	0.891	1.002
1991	0.897	0.992	1977	0.895	1.006
1990	0.908	0.994	1976	0.893	1.006
1989	0.912	0.994	1975	0.862	1.003
1988	0.922	0.993	1974	0.861	0.990

a. Simulated salary ratios indicate what the female-male salary ratio would be if the number of female salary offers in each curriculum (major) were identical to that of males. In other words, simulated ratios for each year are calculated as: $(\Sigma_{c=1}^{n} \overline{w}_c^f N_c^m / \Sigma N_c^m)/(\Sigma_{c=1}^{n} \overline{w}_c^m N_c^m / \Sigma N_c^m)$ with the symbols defined as in the footnote of Table 2. The number of major fields reported by NACE in its salary surveys varies by year (see Column 4 of Table 5), but is currently 79. For a complete list of the majors used by NACE for which salary information is reported, see Appendix 2.

(1981) in estimating what the overall female-male starting pay ratios would have been if women had the same distribution of offers by major as men. In other words, we apply female average salary offers by major to the male distribution of the number of offers by major and recalculate the overall gender salary ratios for each year. The resulting simulated gender salary ratios are reported in Table 3 along with the actual gender salary ratios calculated in Table 2.[3] What is remarkable is that the simulated gender pay ratio rises to about 0.99 in most years and for several years in the late 1970s actually reaches unity. In other words, almost all, that is, about 95 percent of the roughly ten percentage-point overall gender starting-salary gap present in the NACE salary data, is explained by gender differences in majors and number of offers.[4] This finding differs from those of the previous studies that found that college major

3. In Table 3 we were unable to calculate the simulated ratios before 1974. Prior to that year, female salaries were not reported by major but only by functional (job) area.

4. We also calculated what the overall female-male starting pay ratios would have been if men had the same distribution of majors and number of offers by major as women. In other words, we apply male average salary offers by major to the female distribution of the number of offers by major and recalculate the overall gender salary ratios for each year. The resulting simulated ratios were about 1.0–1.5 percentage points lower than the set of simulated ratios presented in the text.

could generally explain somewhere between 10–50 percent of the earnings gap. Again, though, most of these prior studies did not look at *starting* salaries immediately after graduation, and most also used extremely broad major groupings.[5] On the other hand, the NACE data only reflect salary offers during the recruiting year.

College major, of course, is one indicator of the types of occupations that college graduates enter after graduation. Fortunately, the NACE survey also reports information on starting salaries by functional area, or type of job, as well. For 2001, 84 different detailed functional areas were reported, such as public relations, bioengineering, insurance, and social work. (See Appendix 2.) In Table 4 we have presented the results of a similar set of simulations, the result of our computing what the overall female-male starting pay ratios would have been if women had the same distribution of job offers by functional area as men. As can be seen from the table, the resulting simulated salary ratios are very similar to those presented in Table 3. In most years, about 80–90 percent of the roughly ten percentage-point gender salary gap disappears, being explained by differences in the types of job offers that men and women receive.[6]

V. Discussion

In light of the simulation results and subject to the limitations of the NACE data, can we conclude that the magnitude of salary discrimination against females immediately after college graduation is neither large nor pervasive? Table 5 presents yet another look at gender differences in starting salaries from a different perspective using the NACE data. In the second column of the table we have calculated the mean difference in average annual starting salary offers (nominal and real) averaged across all reported majors for each year from 1974–2001. (The salary offers have not been weighted for the number of offers reported within each major field.)

As can be seen for each year over this period, average male starting salaries exceeded average female starting salaries across all major fields. Although male salaries are not higher than female salaries for all major fields, the third column of Table 5 shows that this is the case about two-thirds of the time. Furthermore, this fraction is

5. In using a small number of highly aggregated major fields, previous studies may well have underestimated the proportion of the gender salary gap that college major can explain. When we repeated our simulation for the year 2000 using the ten more general major categories that NACE provides, we found that the simulated gender salary ratio fell from 0.992 to 0.977. As expected, by aggregating majors into far fewer categories, the proportion of the gender earnings gap that college major can explain falls. Therefore, the smaller proportion of the gender salary gap that college major has been able to explain in previous studies is probably due in part to the highly aggregated specification of major field of study.

6. Because the NACE data are based on salary offers received by students during the recruiting year, they overrepresent some majors, particularly engineering. To ascertain how much of a difference this made, we calculated the actual and simulated female/male salary ratios for engineering majors only and found that female salary offers on average exceeded those of males both with and without controls for the gender differences in the engineering specialties. When we recalculated the female/male salary ratios with offers for engineering majors excluded, we found that the actual gender salary ratio *rose* by several percentage points.

Table 4
Actual and Simulated [a] Female-Male Starting Salary Ratios, Based on Average Salary Offers by Functional Area (Type of Job), 1974–2001

Year	Actual Salary Ratio	Simulated Salary Ratio	Year	Actual Salary Ratio	Simulated Salary Ratio
2001	0.876	0.984	1987	0.911	0.991
2000	0.894	0.974	1986	0.904	0.992
1999	0.893	0.979	1985	0.904	0.995
1998	0.880	0.977	1984	0.896	0.992
1997	0.897	0.986	1983	0.897	0.990
1996	0.897	0.984	1982	0.895	0.999
1995	0.896	0.985	1981	0.902	0.999
1994	0.909	0.983	1980	0.902	1.002
1993	0.907	0.990	1979	0.904	1.007
1992	0.902	0.988	1978	0.891	1.006
1991	0.895	0.983	1977	0.895	1.009
1990	0.907	0.990	1976	0.893	1.005
1989	0.912	0.986	1975	0.862	0.998
1988	0.922	0.994	1974	0.861	0.982

a. Simulated salary ratios indicate what the female-male salary ratio would be if the number of female salary offers in each functional area (occupation) were identical to that of males. In other words, simulated ratios for each year are calculated as: $(\Sigma_{j=1}^{n} \overline{w}_j^f N_j^m / \Sigma N_j^m) / (\Sigma_{j=1}^{n} \overline{w}_j^m N_j^m / \Sigma N_j^m)$ with the symbols defined as in the footnote of Table 2 and j here referring to occupation. The number of functional areas (job types) reported by NACE in its salary surveys varies by year and is currently 84. For a complete list of the functional areas used by NACE for which salary information is reported, see Appendix 2.

relatively constant over most of the 1974–2001 period. Just as Eide (1994) observed, pay disparities between males and females still exist within most major fields.[7]

A closer examination of gender differences in salary offers by specific major fields (not shown in the table) reveals some further interesting patterns. For example, NACE reported average salary offers by gender for 20 different engineering major fields in 2001. In 12 of these engineering major fields, average starting-salary offers for females exceeded those of males. On the other hand, in three other broad major categories (business, with ten different major fields reported; humanities and social sciences, with 12 different major fields; and physical sciences, with nine different major fields), average salary offers for males usually exceeded those for females (in 23 of 31 major fields). Moreover, this pattern persists over virtually the entire period from 1974–2001. Usually in more than half of the engineering major fields,

7. A similar pattern is observed when we compare the mean difference in average starting-salary offers across functional areas. Average male starting-salary offers by functional area exceed those of females in every year over the period 1974-2001 and by a somewhat larger magnitude than that observed across majors. Furthermore, the proportion of functional areas where average salary offers for males exceed that of females generally ranged from 70-90 percent. (These and other results are available from the authors upon request.)

Table 5
Gender Differences in Starting Salaries Averaged across Major Fields

Year	Average Gender Difference in Annual Starting Salary Offers across Major Fields[a]		Proportion of Major Fields Where Average Starting Salary Offer of Males Exceeds that of Females	Number of Major Fields Compared
2001	$1,443	($815)	0.72	78
2000	1,212	(704)	0.69	78
1999	1,122	(673)	0.65	75
1998	1,099	(674)	0.69	77
1997	827	(515)	0.65	74
1996	1,084	(691)	0.68	77
1995	1,010	(663)	0.68	72
1994	724	(489)	0.64	72
1993	818	(566)	0.62	68
1992	1,238	(882)	0.66	70
1991	1,215	(892)	0.71	68
1990	1,068	(817)	0.68	68
1989	1,003	(809)	0.70	67
1988	796	(673)	0.74	42
1987	305	(268)	0.58	26
1986	327	(298)	0.64	25
1985	856	(796)	0.64	25
1984	494	(475)	0.64	25
1983	460	(462)	0.67	24
1982	557	(577)	0.56	25
1981	497	(547)	0.67	24
1980	556	(675)	0.75	24
1979	373	(514)	0.67	24
1978	344	(528)	0.61	23
1977	141	(233)	0.62	21
1976	83	(146)	0.52	21
1975	272	(506)	0.65	20
1974	248	(503)	0.65	20

Source: Authors' calculations from Annual Salary Surveys of the National Association of Colleges and Employers, 1974–2001.
a. For example, in the average major field reported by NACE in 2001, male graduates were offered starting salaries averaging $1,443 higher than salaries offered to female graduates. The average gender differences in starting salaries are not weighted by the number of offers within each major field. Real dollar differences [1982-84=100] are given in parentheses.

average starting-salary offers for women exceed those for men. But in the business, humanities and social sciences, and physical science major field groupings, average salary offers for females only rarely exceed those for males (about 15 percent of the time over the period studied).

Why are there differences in starting-salary offers to men and women within the same major field? Because the aggregate nature of the NACE data does not allow us to address this question, we can only offer possible explanations from the literature. Several researchers have suggested that women are not as willing (or able) as men to negotiate, thus failing to obtain the best possible starting salary (see, for example, Chen, Katuscak, and Ozdenoren 2005; Gerhart 1990, p. 430; and Babcock and Laschever 2003). Joy (2003, p. 617) notes that young women may engage in limited job searches to remain in proximity to family or friends. She also claims that women are more likely than men to relocate for their partners' careers. Graham, Hotchkiss, and Gerhart note that women are more apt to work for smaller firms that tend to pay less (2000, p. 15), and Kirby (2003) finds that men are three times as likely as women to be work centered.

But what could account for the singular exception of engineering, where the NACE data show that female graduates have on average received higher starting salaries than males? One plausible explanation is that it is the effect of affirmative action and preferential hiring. Engineering is one of a shrinking number of professions that still attract far fewer women than men. With so few women, the demands for gender diversity in the workplace could lead to salary premiums for women. Morgan found that female engineering graduates in the past were offered higher salaries than comparable men because there were very few women and all companies were ''compet[ing] for the same limited pool'' (2000, p. 320). Still, without further evidence the explanation for the unique case of engineering remains elusive.

VI. Conclusions

The NACE surveys provide us with an interesting look at the gender salary gap for new college graduates with a unique data set that, because of its proprietary nature, has not been generally available to economists. We have found that a high proportion of the gender gap in starting-salary offers to candidates during the recruiting year is attributable to gender differences in college major. Specifically, about 95 percent of the roughly ten percentage-point gender difference in starting salaries in the NACE data disappears once we control for major. Our results are also robust with respect to time, since there is little variation in our findings over a period of about 25 years.

The *magnitude* of the gender starting-salary gap notwithstanding, there is still evidence consistent with the differential treatment of male and female college graduates with respect to starting-salary offers. With the exception of engineering, for most major fields (and for most occupations) surveyed by NACE, men are still likely to be offered higher starting salaries than women. This phenomenon is also one that has remained virtually unchanged over the three decades for which we have NACE data.

Appendix 1

The Scope and Method of the NACE Survey

There are several different ways that NACE collects its salary information. NACE furnishes to participating college placement offices a standardized two-page

questionnaire requesting information about individual students with respect to salary offer, curriculum (major), type of employer (for example, manufacturing, service, and nonprofit), and job function (for example, insurance and sales). Some college placement offices simply ask students who have accepted an offer of employment to fill out the questionnaires and return them to the college placement office, which in turn sends them back to NACE. Other placement offices distribute their own questionnaires to students and then use this information to fill in all or part of the NACE questionnaire. And still other colleges conduct their own salary-offer surveys and then send the results to NACE. The response rate of students is unknown. However, the annual response rate of the approximately 350 institutions that are listed in the NACE reports as participating institutions in the survey is about 50–55 percent. According to the NACE director of research, there is a certain core of schools that participate every year while others respond to the surveys in some years but not in others.

The NACE survey reports are published four times a year — in Winter, Spring, Summer and Fall; but it is the Fall issue that contains complete information on all offers reported over the recruiting year.

Appendix 2

Listing of Majors (Curricula) in Current NACE Survey

Agriculture and Natural Resources Majors
- Agricultural Business and Management
- Animal Sciences
- Conservation/Renewable Natural Resources
- Plant Sciences
- Other Agricultural Sciences

Business Majors
- Accounting
- Actuarial Science
- Business Administration/Management
- Business Systems Networking/ Telecommunications
- Economics/Finance
- Hospitality Services Management
- Human Resources
- Logistics/Materials Management
- Management Information Systems/ Business Data Processing
- Marketing/Marketing Management

Communications Majors
- Advertising
- Broadcast Journalism
- Communications
- Journalism
- Public Relations/Organizational Communications

Computer Sciences Majors
- Computer Programming
- Computer Science
- Computer Systems Analysis
- Information Sciences and Systems

Education Majors
- Elementary Teacher Education
- Physical Education Teaching/ Coaching
- Pre-Elementary Teacher Education
- Secondary Education
- Special Education
- Specific Academic/Vocational Teacher Education

Engineering Majors
- Aerospace/Aeronautical/ Astronautical Engineering
- Agricultural Engineering
- Architectural Engineering
- Bioengineering and Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering

- Electrical/Electronics and Communications Engineering
- Engineering Technology
- Environmental/Environmental Health Engineering
- Industrial Production Technologies
- Industrial/Manufacturing Engineering
- Materials Engineering
- Mechanical Engineering
- Metallurgical Engineering
- Mining and Mineral Engineering
- Nuclear Engineering
- Ocean Engineering
- Petroleum Engineering
- Quality Control/Safety Technologies
- Systems Engineering
- Textile Sciences and Engineering

Health Sciences Majors
- Allied Health
- Health Sciences
- Nursing
- Pharmacy

Home Economics Majors
- Clothing/Apparel/Textile Studies
- Home Economics

Humanities and Social Sciences Majors
- Criminal Justice and Corrections
- English Language and Literature/Letters
- Foreign Languages and Literatures
- History
- Liberal Arts and Sciences/General Studies
- Political Science/Government
- Psychology
- Social Work
- Sociology
- Visual and Performing Arts
- Other Humanities
- Other Social Sciences

Sciences Majors
- Architecture and Related Programs
- Biological Sciences/Life Sciences
- Chemistry
- Construction Science/Management
- Environmental Sciences/Studies
- Geological and Related Sciences
- Mathematics
- Physics
- Other Physical Sciences

Listing of Functional Areas (Occupations) in Current NACE Survey

Communications
- Design/Graphic Arts
- Media Planning
- Production
- Public Relations
- Reporting
- Writing/Editing

Computers
- Computer Programming
- Information Systems
- Systems Analysis and Design

Engineering
- Bioengineering
- Design/Construction
- Environmental/Sanitation
- Field Engineering
- Hardware Design and Development
- Industrial Hygiene/Occupational Safety
- Manufacturing/Industrial
- Power Systems
- Process Engineering
- Production Engineering
- Project Engineering
- Quality Control
- Research and Development
- Software Design and Development
- Systems/Programming
- Testing
- Other Engineering

Finance
- Accounting (Private)
- Accounting (Public)
- Auditing (Private)
- Auditing (Public)
- Commercial Banking (Consumer)
- Commercial Banking (Lending)

- Financial/Treasury Analysis
- Insurance (Claims)
- Insurance (Underwriting)
- Investment Banking (Corporate Finance)
- Investment Banking (Mergers and Acquisitions)
- Investment Banking (Real Estate)
- Investment Banking (Sales and Trading)
- Portfolio Management/Brokerage

Healthcare
- Administrative
- Dietician
- Medical Technology
- Occupational Therapy
- Pharmacist
- Physical Therapy
- Radiation Therapy
- Registered Nurse
- Respiratory Therapy
- Speech Pathology/Audiology
- Other Health Related

Marketing
- Advertising
- Brand/Product Management
- Buyer/Merchandising
- Customer Service
- Distribution
- Market Research
- Purchasing
- Sales

Public Administration
- Executive, Legislative and General
- Finance, Taxation, Monetary Policy
- Law Enforcement
- Military
- National Security
- Urban/Regional Planning

Social Services
- Administration
- Counseling
- Fundraising/Development
- Social Work

Other Functional Categories
- Actuarial
- Agricultural/Natural Resources
- Architecture
- Consulting
- Human Resources/Industrial Relations
- Management Trainee
- Mathematician/Statistician
- Paralegal
- Performing Arts/Entertainment
- Religious Occupation
- Research (Nontechnical)
- Research (Technical)
- Teaching

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