

Academic Salary Differentials — Some Evidence from an Irish Survey*

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Abstract: Using data from a survey of the Irish academic labour market, this paper examines whether or not females in the Irish academic system are paid less than comparable males. Variables which adjust for comparability include academic discipline, qualifications, research output, teaching and administrative experience, and career-breaks. The results, which support the findings of similar studies based on US data, suggest that, other things being equal, Irish females are paid 10 per cent less than their male counterparts. Comparison of academics *appointed* before and after 1975 suggests that, correcting for age, the gap between male and female salary differentials may be narrowing.

I INTRODUCTION

For some time, sex discrimination in all areas of employment, including recruitment, promotion, salary levels and choice of occupation has been a controversial issue. Empirical analyses in this area are especially difficult because of the heterogeneity of the labour market. Consequently, many studies concerned with identifying and examining the implications of sex discrimination have focused on relatively small homogeneous sub-groups of the labour force rather than the whole labour force.¹

One of the more frequently analysed groups is academics in different types of third-level colleges. This well-defined market has the advantage of a high

*We are very grateful to Brendan Whelan for assistance with the computational analysis and to the Higher Education Authority for permission to use its survey data. The very helpful comments of the editor and two anonymous referees are also gratefully acknowledged.

1. For an introduction to and overview of the issues involved, see Blau and Ferber (1986).

degree of homogeneity, reasonably objective criteria for appointment and promotion, and a variety of data sources. In the United States, the academic labour market has afforded researchers an opportunity to evaluate the efficacy of both the Equal Opportunity and the Affirmative Action legislation passed during the 1960s and 1970s. The results of their studies have shown that although their position relative to males is improving, females are still paid less than males with comparable qualifications.

Two main arguments about male-female salary differentials can be distilled from the studies which have been carried out. The first is that salary differentials primarily reflect differences in both the amount and kind of investment in human capital undertaken by individuals. The second argument is that sex discrimination operating in favour of males is the principle reason for salary differentials. In practice, these arguments may not be entirely separable, as the existence of sex discrimination may influence individual decisions about investment in human capital, i.e., females rationally invest in lower levels of human capital because of the lower expected return to their investment compared with males.

Contrasting with the growth and sophistication of US studies in this area is the absence of analyses of differentials in participation rates and wage rates in academic labour markets in Europe. This reflects at least in part the lower political profile of employment equality issues in Europe, where participation rates are traditionally higher than in the US. It also reflects the lower range of variation in university salaries in Europe, where academics are paid according to well-publicised salary scales, which typically relate more to length of service rather than to productivity. This paper examines the issue of sex discrimination using data on academic salaries in the Republic of Ireland, hereafter referred to as Ireland. The results of this study are compared and contrasted with the results obtained from similar US studies.

Previous US studies in this area are reviewed in Section II with a view to developing the issue of sex discrimination and salary differentials more fully. Section III provides a brief overview of certain institutional aspects of the Irish academic labour market, while Section IV discusses the data set used in the analysis. Section V analyses the results obtained from the study and Section VI presents some conclusions.

II PREVIOUS STUDIES

An individual's salary can be explained by a number of different factors of varying importance. By extension, variations in individuals' salaries can be explained by differences in the value and impact of these factors.² In any

2. In terms of the regression equations estimated below, the value and impact of these factors is reflected in the size and significance of the coefficients in the equations determining salary.

academic institution, one of the most important factors which would be expected to positively influence an individual academic's salary is the quality and quantity of his/her *actual* and *expected* research output.³ In practice, *actual* research output is usually measured by the total number and/or the average annual number of academic publications, appropriately weighted, from some particular date (e.g., completion of Ph.D.). In the case of journal articles, publications would typically be weighted by the quality of the journals in which they are published, and by length, where this is appropriate. In the case of monographs, the number of favourable book reviews and the status of the publishing company would usually be the relevant weighting factors.⁴ At an early stage in an academic's career, *expected* research output is estimated from the level and quality of qualifications attained and at a later stage from his/her previous publication rate. Thus, the more time invested in augmenting the level of one's human capital, through education and research activities, the higher the salary one can expect.⁵

The second major factor positively influencing salaries in academic institutions is the level of one's experience, as measured by the length of time spent in both teaching and administrative roles.⁶ This factor, together with research, form the main precept of the *human capital* theory of salary determination, according to which salaries are determined by both the amount and pattern of human capital invested in the individual's career. In the context of male and female academics, this human-capital theory suggests that female earnings would be expected to be exceeded by male earnings, both because the careers of many female academics are interrupted by child-rearing and because this expected interruption may encourage lower investment in human capital (either education or research) by females.

A third factor which might affect an individual's relative salary is the operation of some form of discrimination (by sex, race, age, etc.). In this case, some arbitrary factors unrelated to the requirements for a particular position or the qualities of personnel result in unequal treatment for equally-qualified persons. In the case of inequality between the sexes, discrimination would reflect itself in the form of lower employment rates for women or lower

3. Clearly, the market conditions pertaining to different disciplines will influence salary levels within disciplines and salary differences across disciplines.

4. There is inevitably a great degree of subjectivity in determining such a weighting scheme.

5. Such investment would probably be subject to diminishing returns.

6. Some attempts have been made to measure the quality as well as the quantity of teaching undertaken, by using an index system to rank academics' quality of instruction according to student and employer evaluations. It is, however, a very subjective method and Katz (1973) found it to be an unsatisfactory means of constructing a variable to reflect teaching quality.

relative pay for women compared with equally-qualified men.⁷ This demand variable has received much attention in the United States and the results obtained from a variety of studies have all supported the need for the legislative action in this area in the 1960s and 1970s.⁸

One of the first papers to examine the issue of the actual determinants of academic salary levels was Katz (1973).⁹ Using cross-sectional data on almost 600 academics from the University of Illinois, he concluded that human-capital factors, that is, productivity, experience, and qualifications, were important determinants of salary levels. The results of his regressions, with salary regressed on these variables and also a binary variable accounting for sex, led Katz to conclude that "the empirical results tended to strongly support the hypothesis of sex discrimination"; he found that the coefficient on sex was negative and significant at the 1 per cent level, and he attributed 49 per cent of the difference between male and female mean salaries to sex discrimination.

A year later Johnson and Stafford (1974) tested the determinants of salary levels using an entirely different type of cross-sectional academic data set. Using data from the 1970 National Science Foundation register on Ph.D.s in various academic disciplines, they claimed to find strong evidence in support of the human-capital explanation of salary differences, with experience and qualifications being important determinants, and on that basis they argued that "the implementation of anti-discrimination policies can be reconsidered" (p. 902). (They were not in a position to measure research productivity as the Ph.D. graduates were employed in many different types of jobs.) Johnson and Stafford found that male-female salary differentials were smallest at the initial stage of the career path, but widened rapidly during the subsequent five to fifteen years and narrowed again only at advanced years of experience. They postulated that these results accorded with human-capital theory propositions when applied to females, because women who expect to have discontinuous career patterns (with career-breaks coinciding with their childbearing years), may be expected to have lower research productivity in anticipation of these breaks since the return to such research is lower. After these years women re-entered the labour force and the narrowing of the male/female salary differential corresponds to their subsequent continuous career pattern. None the less, Johnson and Stafford conceded that, taken over a thirty-five

7. As pointed out by one of the referees, it could also take the form of women being hired by colleges of lesser academic quality than men with similar academic records, and of women being given higher teaching and administrative loads, etc.

8. See, for example, the results of studies carried out by Bayer and Astin (1975), pp. 796-802, and Ferber and Green (1982), pp. 550-564.

9. See Katz (1973), pp. 469-477.

year work life, differences in human capital could only explain 60 per cent of the average salary disadvantage experienced by women and that the remaining 40 per cent of the disadvantage could be attributed to sex discrimination.¹⁰

Strober and Quester (1977), however, are highly critical of Johnson and Stafford's basic argument that women will invest less in human capital, because, they say, if women intend to withdraw only *temporarily* from the labour force, then they should *not* be expected to have lower initial productivity, i.e., to invest less in human capital. Strober and Quester also argue that the apparent narrowing of the gap in later years may be more the result of women simply catching up with men who have already reached the top of the salary scale at an early age, rather than a result of women re-acquiring skills supposedly lost during the child-rearing years. In response, Johnson and Stafford (1977) claim that they "did not maintain that direct labour market discrimination in the academic market place was unimportant" and they concede that their evidence is perhaps more consistent with discrimination than had been implied in the original paper.

Following Johnson and Stafford's analysis, a large number of studies sought to identify if indeed female productivity was lower than male productivity and received lower rates of reward, and whether salary differentials did indeed narrow over the life cycle. Most of the studies used data samples from universities, and attempted to determine the relative importance of different factors influencing salary using regression analysis. For example, Gordon, Morton and Braden (1974) found a wage disadvantage for females attributed to discrimination of between 9.5 and 11.4 per cent, which was equivalent to 29-35 per cent of the mean salary differential, when controlling for rank, seniority, education, department and race.¹¹ They also tested the human-capital proposition of a narrowing differential over time (assuming sex to be a proxy for career commitment), by successively regressing the logarithm of income on all the independent variables for academics recruited in different years. No such narrowing was found and indeed the data showed a slight widening of the differential. Hoffman (1976), however, argued that, since discrimination against women may be manifest by their moving more slowly than men through the different academic levels, rank itself should *not* be included as an independent explanatory variable. Using a data set similar to that used by Gordon *et al.*, Hoffman estimated that, omitting rank as an explanatory variable,

10. Johnson and Stafford found that females also tended to be represented disproportionately in teaching positions which pay relatively high initial salaries but which rise at a lower rate than more research-oriented posts. England (1982), however, using longitudinal data (on academics and non-academics) refuted the assertion that human capital theory can provide a satisfactory explanation of occupational sex segregation.

11. They estimated regression equations run on each sex separately and together (with sex as a binary variable).

between 56 and 68 per cent of the salary differential by sex was due to discrimination, compared with the Gordon *et al.* estimate, with rank included, of only 29 to 35 per cent.

Also using cross-sectional data, Ferber, Loeb and Lowry (1978) found that women were paid less than men of comparable qualifications.¹² Further comparisons revealed that females were less productive at research than males, thereby lending some support to the Johnson and Stafford hypothesis. On the other hand, they found that females were more highly rewarded for research productivity than were males, so that contrary to Johnson and Stafford's hypothesis, there is an incentive for women to invest in research during their early careers. Furthermore, they also found that the proposition of a narrowing of the earnings differential after around 20 years was not supported by their data.

Ferber and Green (1982) examined data from the University of Illinois for the years 1975-1978. Their focus was on the recruitment conditions of academics. Whilst an investigation of the data showed men to be more productive in the fields of education and engineering with young women outpublishing men in the biological and social sciences, their estimates of the wage gap between the sexes showed females to be paid less than males of comparable qualifications at the time of recruitment.

Finally, a recent study by Bernstein-Megdal and Ransom (1985) using a longitudinal data set on academics in the University of Arizona found that after controlling for various merit and educational variables, females were paid less than males. Following a cohort of individuals over a ten year period (1972-1982), they found a persistent differential in favour of male academics but this differential did not worsen over the period considered. Curiously they found in contrast to Johnson and Stafford, that the largest gap was at the recruitment stage. This could reflect preconceptions on the part of academic employers as to the expected career patterns of males and females, or alternatively it could reflect the impact of Affirmative Action programmes by the recruitment of highly-qualified females to the "best" institutions displacing comparable males and leaving a glut of applicants for the remaining institutions for which highly-qualified males compete with females of average qualifications.¹³

In summary, it is possible that salary differentials are due to either actual performance differences between males and females or to sex discrimination.

12. This conclusion was drawn from the results of multiple linear regressions with salary regressed on various merit and experience variables.

13. As noted by one of the referees, the overall differential between male and female academic salaries was actually lower in 1977, compared with either 1972 or 1982, with 1982 only slightly lower than 1972. This may reflect a strong initial impact of the legislation passed in 1972, with a subsequent moderation.

Studies of the US academic labour market controlling for performance find evidence suggestive of sex discrimination, with females at a disadvantage relative to males. However, there is considerable variation in the extent of importance attributed to sex discrimination as a source of male-female salary differentials.

III THE IRISH ACADEMIC LABOUR MARKET

Before examining the issue of sex discrimination in the Irish academic labour market, it is necessary to note four features of this market which are important in interpreting the results obtained below and in comparing them with results for the US. These features are: (i) the financing of third-level education, (ii) the nature of employment contracts, (iii) the structure of academic salaries and (iv) the issue of employment equality.

(i) *The Financing of Third-Level Colleges in Ireland*

Apart from student fees, which account for some 25 per cent of funds, direct government subvention is the major source of income for third-level colleges in Ireland, accounting for 65 per cent of funds. For the most part this subvention is administered by the Higher Education Authority (HEA), which determines not merely the allocation of finance between institutions, but also controls much of the use of the funds within individual colleges.¹⁴ In particular, the HEA has rules which govern the overall ratio of senior to junior posts within the various colleges, and since the salaries associated with such posts are based on civil service salary scales, individual colleges enjoy very little flexibility in operating their personnel policies. Thus the range of promotional opportunities in different disciplines and the potential for rewarding academic excellence are limited, though not identical across colleges.

(ii) *The Nature of Employment Contracts*

The major difference between academic employment contracts in Ireland and North America is that while in Ireland tenure is available almost immediately on appointment,¹⁵ in North America all academics at junior levels are initially employed on temporary contracts. Consequently, North American academics who do not achieve the required standard of performance are not offered tenured positions and have their temporary contracts suspended, whereas in Ireland such academics are likely to remain employed in the system.

14. The funds to some technically-oriented third-level colleges are administered by the Department of Education along lines very similar to those operated by the HEA.

15. Most employees have a three year probationary period; however, it is highly exceptional that after such a period an individual would not be made permanent. Effectively the only basis for dismissal is gross moral turpitude.

A further contrast between the two systems is that in Ireland the rigid hierarchical structure within most departments means that an outstanding academic may not be promoted within a small department because there is simply no slot available, whereas in North America the number of senior posts is never fixed in this way. Thus in Ireland actual promotion beyond the initial employment level may depend as much on the hierarchical structure within a particular department as on performance. While there is occasionally some bargaining by individuals for promotion on the basis of job offers from other institutions, a practice which is very common in North America, this is very limited in Ireland because of the HEA rule on the balance between senior and junior posts and because of fixed salary scales.¹⁶

(iii) *The Structure of Academic Salary Scales*

Since the mid-1960s, the salary scales in third-level colleges have been related to salary scales within the Irish civil service. These salary scales, which are bargained centrally by civil service management and all of the unions involved (including academics), are applied with minimal changes to the third-level colleges. As a result, irrespective of the different conditions which apply in labour markets associated with different academic disciplines, the salary scales on offer are identical.¹⁷ Furthermore, since these salary scales are automatically incremental over a twelve to fifteen year period, there is an upward momentum in an individual's salary, independently of demand or supply considerations. Finally, there is an absolute upper limit on professorial salaries which, at least officially, is identical across all disciplines. Consequently, even if someone of considerable merit gains salary increments early, eventually the incremental salary structure will reduce his or her relative position. Again this contrasts with the North American system where there is a wider distribution of salaries, because increments are rarely automatic and the top salary of a professor is usually negotiable.

(iv) *Employment Equality in Ireland*

Until very recently, the prevailing view in Irish society was that married women would not normally participate in the labour force. Limited participation of married women occurred before and after child-rearing, if at all. While this viewpoint was obviously strongly influenced by social, cultural and religious values, it was also influenced by two important economic factors: (a) the tax system discriminated and still discriminates in favour of women

16. In effect, the limitations set on the colleges typically prohibit their making counter offers.

17. Different market conditions reflect themselves in the size of non-salary income rather than salary income, as those in disciplines in which there is high demand are likely to enjoy additional income opportunities.

who engage in "home duties" and (b) women in public service employment before 1973 were forced to resign from the civil service *on marriage* and married women, unless widowed, were ineligible for civil service employment. While this latter legislation did not apply *de jure* in universities, *de facto* prior to 1970 many women resigned either upon marriage or the birth of their first child. Consequently, almost the only women to have university careers with the probability of reaching senior positions within their colleges were a small group of single women. As we shall see below, this undoubtedly has had a major effect on the cohort structure of females within the university system.¹⁸

IV THE IRISH DATA SAMPLE

The sample used in this study consists of a sub-group of respondents to a survey questionnaire circulated to academics in third-level colleges in Ireland. The sample included all female academics and an equal number of male academics, who were chosen on a systematic basis to match all of the females by college and discipline as far as possible.¹⁹ The response rate to the survey,²⁰ which was administered by post in October 1985, with follow-up by telephone in November and December, was 53 and 56 per cent for the 599 males and 599 females surveyed respectively. Analysis of the respondents suggests that they are an unbiased sample of the total population.²¹ Only data from the colleges which are research-oriented were used in the study, the size of our sub-group was 311 respondents – 144 males and 167 females.²²

The questionnaire sought information which would determine whether the relative positions of Irish male and female academics in terms of salary differences could be fully explained by the various factors discussed above; in other words, to what extent does the Irish sample support the evidence of sex discrimination found in the US studies cited in Section II. In terms of seniority and salary, the position of women relative to men is clear from Table 4.1; while the share of female employment is rising, women are still outnumbered by males six to one and are consistently more strongly represented in the lower ranks and salary grades. However, this outcome must be interpreted in the context of the fact that (a) women are more strongly represented in the

18. As noted by one of the referees, all of the institutional factors mentioned in this section "should add up to less of an unexplained earnings gap in Ireland. Yet the results are comparable to the US".

19. Within each category, the males were chosen randomly from college calendar lists.

20. The survey, described as a survey of career patterns in third-level education was undertaken by The Economic and Social Research Institute on behalf of the Higher Education Authority. See Higher Education Authority (1987), Appendix 5, page 52, Table C.

21. The questionnaire is too long to reproduce here but is available from the authors on request. There was no apparent non-response bias.

22. The sample used in this paper covers all of the universities and a subset of the third-level colleges.

younger age cohorts and (b) women are more strongly represented in the Arts and Humanities faculties which have grown relatively more slowly than the science and engineering faculties in the past decade.

Table 4.1: *The Representation of Women in University Employment by Rank, 1975/76 and 1984/85*

Grade	1975/76		1984/85	
	Males as % of Total	Females as % of Total	Males as % of Total	Females as % of Total
Professor	95.5	4.5	98.0	2.0
Associate Professor	93.5	6.5	95.0	5.0
Senior Lecturer	97.0	3.0	93.0	7.0
College Lecturer	88.5	11.5	77.0	23.0
Assistant Lecturer (Other)	74.0	26.0	66.0	34.0
Total	89.5	10.5	85.5	14.5

Source: Derived from data presented on page 16 of the HEA Report on *Women Academics in Ireland*.

Note: The percentages relate to all males and females employed by the universities in 1975/76 and 1984/85, respectively. The data used in the analysis in this paper include personnel employed in some colleges which are not included in the university category but which are research oriented. It is to be expected that the percentages would be very similar to those shown in this table.

The survey sought information on current income and on a range of variables all of which might be expected to have some bearing on current salary.²³ These variables included strictly academic variables, such as department, qualifications, publications and years of teaching experience; career variables, such as college committee memberships, memberships of professional bodies, and breaks in career paths for non-academic reasons; and personal variables such as age, sex, occupation of spouse if married, and number of children. From these data, specific variables were derived and are used in the regression analysis in the next section to attempt to explain the salaries of male and female academics.

23. The survey questionnaire actually requested data on current income rather than current salary, though it seems likely that most respondents would have stated their current salary in answer to this question. However, to the extent that there is a systematic and significant non-salary component present in the case of certain departments (e.g., business and professional departments), and that this was included in the income figure, the use of income rather than salary data will tend to increase the significant coefficients of the departmental proxy variables.

V REGRESSION ANALYSIS

The actual variables used to estimate the determinants of salary, as measured by current income, were.

- (1) Department, measured by a set of dummy variables indicating an individual's membership of a department in
 - (i) Business and Economics
 - (ii) Science and Technology
 - (iii) Medicine, Dentistry, Law and Architecture.The Arts and Humanities faculty is used as the reference category.
- (2) Qualifications, measured by a binary variable indicating whether or not an individual had (1) or had not (0) a Ph.D.
- (3) Research output, measured by a binary variable indicating whether or not an individual's publication record was equal to or above (1) or below (0), the median publication record of all academics. The measure of publications used was an index based on a 4:1 ratio for full-length books relative to academic articles and 2:1 for single relative to joint publications. Unfortunately the data available did not allow us to make any adjustment for quality, nor to distinguish between monographs and textbooks.
- (4) Teaching experience, measured by summing the total number of years an individual spent in full-time and part-time teaching.
- (5) Administrative/committee experience, measured by the number of memberships of professional bodies and non-elected college committees in the previous five years.
- (6) Career breaks for child care measured by a binary variable, indicating that the individual had spent six months or more engaged in full-time child care [1: break for child care; 0: no break].
- (7) Age, measured by the individual's actual age.
- (8) Sex, measured by a binary variable [1: female; 0: male] in equations estimated for both groups together.
- (9) Children, measured by the total number of an individual's children.
- (10) Occupation of spouse, measured by a binary variable with an academic spouse (1) and other (0).

Finally, it should be noted that the questionnaire requested individuals to identify income ranges rather than give a precise income figure. The mean of

each range was used in the regression analysis and the range extended well beyond the top range of the salary scale at the time.²⁴

On the basis of our discussion in Sections II and III, we would expect qualifications, research output, teaching experience and administrative experience all to exert a positive influence on salary, while career breaks would have a negative effect. Furthermore, given that salary scales are incremental and that all staff appointed prior to 1980 are entitled to children's allowances, we would expect the coefficients of both the age and children variables to be positive.²⁵ We might also expect the growing departments (science and technology) and those facing a competitive environment (business and economics and the professions) to have a positive impact on salary relative to the arts and humanities departments. Finally, the impact on salary of sex remains to be determined by the data, as does the impact of spouse's occupation (since the data set relates to several institutions and joint-offers are almost unknown).²⁶

The regression results are presented in Tables 5.1 to 5.4. Table 5.1 presents the aggregate results for both salary and its logarithm regressed on all of the variables listed above. In the literature, this simple regression, with a binary variable for sex, is used as the first check on whether the data suggest some form of discrimination, which may be implicit or explicit, against female academics. Both equations are significant at the 1 per cent level, and the signs of the main variables are as expected with research output, teaching experience, membership of college committees and age all having a positive significant impact on salary. By contrast, the qualification and memberships-of-professional-bodies variables are insignificant. Also significant are career breaks, with the expected negative sign, and children with the expected positive sign. The coefficients for the departments operating in a competitive market environment, viz., economics, business and professional departments, are large and significantly positive, while the coefficient on science and technology is smaller and significant only at the 10 per cent level. Finally, sex turns out to be significant at the 1 per cent level, having a negative impact on salary. In fact, looking at the data in Table 5.1, where the regression coefficients with salary as the dependent variable may be interpreted as the amounts which particular variables add to or subtract from the intercept income, we can see that being a female cost over IR.£800 in 1985 or over 9 per cent of average

24. The maximum range given was IR.£37-40,000, and the maximum of the professorial scale at the time was less than IR.£30,000. In fact, the maximum income level declared was IR.£30,000 which suggests that individuals may have given data on salary only rather than on total income earned.

25. We might expect the impact of children to be large if we expect that people work harder to support children or small if we believe that children divert parents' attention from their careers.

26. This is included in several of the US studies because of the increasing importance of joint appointments, as academic couples maximize joint career prospects rather than the prospects of one member of the couple.

gross salary. This is equivalent to over 46 per cent of the mean difference between male and female salaries.

Table 5.1: *Multiple Regression of Salary and Log Salary on all Independent Variables for Males and Females*

<i>Dependent Variable</i>		<i>Salary</i>		<i>Log Salary</i>	
<i>Independent Variables</i>		<i>Means</i>	<i>Regr. Coef.</i>	<i>Regr. Coef.</i>	
Department					
(i)	Business & Economics	0.096	2.174***	0.115**	
(ii)	Science & Technology	0.251	0.814*	0.044*	
(iii)	Professions	0.164	1.192**	0.040	
Qualifications (Ph.D. = 1)		0.543	0.472	0.026	
Research Output (\geq Median = 1)		0.508	0.986**	0.053**	
Teaching Experience		15.433	0.198***	0.010***	
Administrative Experience					
(i)	College Committees	1.399	0.525***	0.025***	
(ii)	Professional Bodies	2.678	0.143	0.006	
Career Break (Child Care = 1)		0.061	-1.881**	-0.096**	
Age		43.061	0.095***	0.005***	
Sex (Female = 1)		0.537	-1.823***	-0.089***	
Children		1.688	0.349***	0.018***	
Occupation of Spouse (Academic = 1)		0.106	-0.612	-0.027	
Constant			10.080***	2.435***	
R ²			0.572	0.556	
F			30.543***	28.654***	
N = 311					

* Significant at 10 per cent level

** Significant at 5 per cent level

***Significant at 1 per cent level

Table 5.2 examines the equations for males and females taken separately. The first point to note is that several of the variables which are significant in the combined equation are no longer significant in the equations for males and females taken separately. In particular, children are significantly positive in the male equation, whereas they are not in the female equation, and research is significant in the male equation (albeit only at the 10 per cent level) but not in the female equation. Secondly, we see that no males have taken career breaks to engage in full-time child care for six months or more and the effect

on women who have taken such breaks is large, negative and significant at the 10 per cent level. The cost to women of taking career breaks for child-care purposes is IR£1,500, almost 9 per cent of the mean income of academic females. Thirdly, as might be expected from a casual glance at the coefficients in the two equations, on the basis of a global Chow test on both slopes and intercept, we can reject the hypothesis that there is no difference between the coefficients of the male and female equations at the 1 per cent level of significance. This implies that, since the intercepts in the two equations are not significantly different, that the male and female sub-samples should not in fact be combined.

Table 5.2: *Multiple Regression of Salary and Log Salary on all Independent Variables for Males and Females Separately*

<i>Dependent Variable</i>	<i>Women (N=167)</i>			<i>Men (N=144)</i>		
		<i>Salary</i>	<i>Log Salary</i>		<i>Salary</i>	<i>Log Salary</i>
<i>Independent Variables</i>	<i>Means</i>	<i>Regr. Coef.</i>	<i>Regr. Coef.</i>	<i>Means</i>	<i>Regr. Coef.</i>	<i>Regr. Coef.</i>
Department						
(i) Business & Economics	0.090	1.760**	0.099**	0.104	2.051	0.106*
(ii) Science & Technology	0.251	1.026*	0.057*	0.250	0.369	0.019
(iii) Professions	0.180	0.038	-0.015	0.146	2.479***	0.105**
Qualifications						
(Ph.D. = 1)	0.497	0.471	0.022	0.597	0.549	0.035
Research Output						
(≥ Median = 1)	0.371	0.671	0.036	0.667	1.223	0.067*
Teaching Experience	14.133	0.219***	0.011***	16.942	0.139**	0.006*
Administrative Experience						
(i) Non-Elected						
Committees	1.138	0.544***	0.027***	1.701	0.521***	0.025***
(ii) Professional Bodies	2.587	0.111	0.006	2.785	0.111	0.004
Career Break						
(Child Care = 1)	0.114	-1.506*	-0.080*	0.000	-	-
Age	41.695	0.095***	0.006***	44.646	0.107**	0.006**
Children	1.078	0.005	0.000	2.396	0.590***	0.032***
Occupation of Spouse						
(Academic = 1)	0.126	-1.342*	-0.057	0.083	1.081	0.045
Constant		8.752***	2.350***		9.631***	2.429***
R ²		0.519	0.499		0.528	0.520
F		13.827***	12.781***		13.398***	13.021***

* Significant at 10 per cent level

** Significant at 5 per cent level

*** Significant at 1 per cent level

An alternative method of comparing males and females is given in Table 5.3 which summarises the extent of the salary differentials by computing actual and estimated wage gaps under the male and female "reward structures". (Mean values of the independent variables for females are combined with the regression coefficients from the equations for males and vice versa.) Under the male "reward" system the mean female salary would be IR£1,860 higher, whilst the mean male salary would be IR£2,307 lower if males were being rewarded on the same basis as females. Thus, while the actual gap between mean salaries is IR£4,014 (equivalent to almost 20 per cent of the average male salary), the gap would reduce to IR£1,706 if males were subjected to the same "reward" structure as females and IR£2,154 if females benefited from the same "reward" system as males.

Table 5.3: *Actual and Estimated Wage Gaps Under Male and Female Reward Structures*

	<i>Female</i>	<i>Male</i>	
	<i>Average Income</i>	<i>Average Income</i>	<i>Difference</i>
Female Reward Structure	£17,299	£19,005	£1,706
Male Reward Structure	£19,159	£21,313	£2,154

Finally, in computing Table 5.4, we divided the data set into two parts, based on the time period in which people were employed as academics. The purpose of this analysis is to see if the gaps between rewards to males and females *appointed* before and after 1975 are identical.²⁷ This is an attempt to focus on the impact of the increased awareness of equal pay and treatment issues in Ireland in the mid-1970s (following various government and other initiatives on equal pay) on the promotion of women within third-level colleges. This increased awareness also coincided with the granting of permission, referred to above, for female civil servants to stay in full-time employment following marriage – thus symbolising a major change in social attitudes to married women working outside the home.

27. Strictly speaking, as pointed out by one of the referees, the evidence from the Chow test above suggests that we should not combine males and females in the same equation. However, since the purpose of the test here is to contrast the treatment of males and females appointed prior to and after 1975, we estimate the equation for both males and females taken together, as the simplest method for focusing on the difference, if any, between the two periods.

Table 5.4: *Multiple Regression of Salary on all Independent Variables for Males and Females Appointed Pre- and Post-1975*

<i>Dependent Variable</i>	<i>Salary</i>			
	<i>Pre-1975 (N = 142)</i>		<i>Post-1975 (N = 169)</i>	
<i>Independent Variables</i>	<i>Means</i>	<i>Regr. Coef.</i>	<i>Means</i>	<i>Regr. Coef.</i>
Department				
(i) Business & Economics	0.06	3.128***	0.13	1.344
(iii) Science & Technology	0.25	1.426*	0.25	0.545
(iii) Professions	0.14	3.343***	0.18	-0.276
Qualifications (Ph.D. = 1)	0.58	0.297	0.50	0.510
Research Output (\geq Median = 1)	0.59	0.857	0.44	1.243**
Teaching Experience	19.23	0.178***	12.24	0.143***
Administrative Experience				
(i) Non-Elected Committees	1.54	0.456***	1.28	0.696***
(ii) Professional Bodies	2.80	0.205	2.58	0.102
Career Break (Child Care = 1)	0.08	-1.770	0.05	-2.766**
Age	47.7	0.057	39.15	0.111***
Sex (Female = 1)	0.5	-1.873***	0.57	-1.555***
Children	2.14	0.216	1.31	0.472***
Occupation of Spouse (Academic = 1)	0.11	-0.802	0.11	-0.624
Constant		12.859***		9.524***
R ²		0.506		0.577
F		10.069***		16.276***

* Significant at 10 per cent level

** Significant at 5 per cent level

*** Significant at 1 per cent level

Several comments are noteworthy on Table 5.4. The first is that, even in the post-1975 appointment period, when one might have expected there to have been greater consciousness about the dangers of implicit sex discrimination, the coefficient on the binary variable for sex is still negative and significant at the 1 per cent level. In other words, correcting for all other differences between females and males appointed in the decade 1975-85, there is still a significantly lower payment to females. Secondly, correcting for age, the cost to women of being female is lower for women appointed in the more recent period, suggesting that there has been some reduction in the differential

between male and female salaries.²⁸ Evidence of such a change is also indicated by a global Chow test which rejects the hypothesis that coefficients of the pre- and post-1975 period are jointly identical at the 1 per cent level. These results combined suggest that while there has been some change in the reward system, females continue to be rewarded at a lower rate than males.

VI CONCLUSIONS

The results of our analysis show that, correcting for objectively identifiable human capital and individual differences between male and female academics in Ireland, female academics are paid significantly less than male academics. This result is very consistent with those obtained in similar studies on US data sets, with over 45 per cent of the male/female wage differential apparently attributable to some form of sex discrimination. While the Irish results are broadly similar to US results, there are two notable differences. First, the explanatory power of the Irish equations is generally lower than that found in the US studies cited. This probably reflects, at least in part, the more rigid institutional setting for wage determination in the Irish system, as well as the upper ceiling on salaries which reduces the range of the income variable. Second, the coefficient of the research output variable in the Irish equations is lower in terms of relative size and significance than the coefficients found in the US studies. This may in part reflect the fact that the only research variable which we were able to derive from the data set was very crude, with no correction at all being made for the quality of the publication. It may also reflect the absence of a tenure track, and the more limited returns to research in the Irish academic environment compared with the US.

While the position of women in the Irish academic labour market seems to be improving, both in terms of the numbers employed and the narrowing of the gap between male and female salaries, the evidence presented in this paper suggests that in 1985 female academics were at a significant financial disadvantage when compared with similarly-qualified and similarly-productive male colleagues.

28. Comparison of the female equations for pre- and post-1975 indicates that the women appointed more recently are actually older relative to their years of teaching experience and have had fewer career breaks for childcare reasons, than the women appointed earlier.

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