Online Appendix for:

Gender Equality and Positive Action: Evidence from UK Universities [1]

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Appendix A: Data description for figure 1

We use an administrative data set that collected and managed by the Higher Education and Statistics Agency (HESA), which records socio-economic information on the entire population of individuals in the higher education sector. The purpose of the data collection is to meet the requirements of the 1992 Further and Higher Education Act and the White Paper 'Higher Education: A new framework'. HESA collects annual data from all the Higher Education Institutes, which includes all publicly and privately funded institutions, and also other organisations that offer Higher Education courses, including those that are not publicly funded. The agency holds all aspects of information of these institutes such as students, staff and graduates, finance and estates, academic department and course and public engagement and commercial enterprise (HESA, n.d.). We use only the information of HESA data that includes all the academic professionals.

Our main sample consists of full-time academics in permanent contracts in 24 Russell group universities in selected departments. Russell Group is an association of 24 self-selected public research universities (Russell Group 2018) regarded as the most prestigious research

[1] All statistics in this paper follow a level of aggregation to maintain anonymity of individuals and ensures no personal data or personal sensitive data are identifiable. We follow Higher Education Statistic Agency (HESA) standard rounding methodology to comply with HESA agreement. This implies that (1) All number of individuals are rounded to nearest multiple of 5, (2) Percentages based on fewer than 22.5 individuals are suppressed, (3) Averages based on 7 or fewer individuals are suppressed.

universities in the UK. These are: University of Birmingham, University of Bristol, University of Cambridge, Cardiff University, Durham University, University of Edinburgh, University of Exeter, University of Glasgow, Imperial College London, King's College London, University of Leeds, University of Liverpool, London School of Economics, University of Manchester, Newcastle University, University of Nottingham, University of Oxford, Queen Mary University of London, Queen's University Belfast, University of Sheffield, University of Southampton, University College London, University of Warwick and University of York.

We select departments that are comparable to the US evidence presented in Lundberg & Stearns (2018). The selected hard Science departments are, 'chemistry', 'civil engineering', 'electrical, electronics and computer science', (aggregated as 'Chem/Engineering'), 'bioscience, 'earth, marine and environmental sciences' (identifies as 'Bio/EarthSci'), 'Mathematics', 'IT, Systems sciences & computer software engineering' and 'physics' (aggregated as 'maths/physics/CompSci') and 'psycology and behavioural science'. The selected social science departments are 'economics', 'political science' and 'sociology'.

HESA data do not indicate the department or the school the individuals belong to, hence we use the cost centres as a proxy to departments. Cost centres are defined groups used by university finance departments to allocate budgets. All hard sciences mentioned above have their own cost centre in HESA, therefore we assume that individuals belonging to these cost centre must be from their corresponding department.

Social science departments are grouped under a common cost centre 'Social Studies' until 2012, and as separate cost centres after that. In order to identify the social science department of an individual between 2004-2012 we use information about the main academic discipline in addition to the cost centre. Main academic discipline is a variable in HESA that captures the main area of study, and we use it alongside cost centre information to assign

individuals with a department. For example an individual is assigned to a sociology department if he or she is employed under ‘Social Studies’ cost centre with a main academic discipline as “sociology”. Table A.1 shows the numbers underlying Figure 1. We see a jump in sociology and a drop in economics after re-classification of cost centres (year 2013 onwards). No such jump/drop is observed among hard science departments, suggesting that the jump in social sciences department is likely to be due to our department imputation method.

TABLE A1 – AVERAGE FEMALE REPRESENTATION ACROSS DISCIPLINE BY PROFESSOR AND NON-PROFESSOR

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	**Math/Physics/Comp Sci**	**Bio/Earth Sci**	**Chem/ Engineering**	**Psychology**	**Political Science**	**Economics**	**Sociology**
Panel A: Non Professors							
2009	15.67%	31.25%	14.29%	42.34%	30.95%	28.37%	41.51%
2010	15.87%	31.83%	14.98%	42.72%	30.99%	29.03%	44.23%
2011	15.77%	33.40%	15.13%	41.49%	32.06%	28.64%	45.27%
2012	16.06%	34.39%	15.99%	44.35%	33.58%	29.79%	46.53%
2013	16.03%	34.89%	17.38%	46.65%	34.97%	25.95%	49.49%
2014	15.81%	35.98%	17.64%	47.89%	33.80%	27.27%	50.98%
2015	16.79%	36.34%	18.16%	46.60%	33.24%	27.64%	52.24%
2016	16.96%	36.97%	18.44%	47.33%	33.29%	29.63%	52.65%
Average	16.12%	34.38%	16.50%	44.92%	32.86%	28.29%	47.86%
Growth	1.29%	5.71%	4.15%	4.99%	2.34%	1.26%	11.14%
Panel B: Non Professors							
2009	7.14%	11.55%	5.57%	22.11%	15.92%	9.85%	33.03%
2010	7.18%	12.11%	6.09%	23.81%	17.01%	10.22%	33.96%
2011	7.18%	11.72%	6.74%	26.32%	17.57%	12.56%	36.63%
2012	8.38%	13.91%	7.24%	25.71%	17.95%	13.10%	37.11%
2013	8.19%	14.92%	7.78%	26.09%	16.67%	15.14%	41.74%
2014	9.04%	16.35%	8.58%	25.46%	20.63%	14.03%	40.14%
2015	9.84%	16.30%	9.10%	27.94%	21.37%	14.29%	40.71%
2016	10.62%	18.04%	10.34%	29.13%	23.55%	14.44%	43.28%
Average	8.45%	14.36%	7.68%	25.82%	18.83%	12.95%	38.33%
Growth	3.47%	6.49%	4.76%	7.02%	7.63%	4.59%	10.26%

Source: HESA dataset. Sample: All full time and permanent academics between 2009-2016 in 24 Russell group Universities. Russell group universities are classified as top research-intensive universities in the UK.

TABLE A2 – AVERAGE FEMALE REPRESENTATION ACROSS DISCIPLINE SINCE 2004

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	**Math/Physics/Comp Sci**	**Bio/Earth Sci**	**Chem/ Engineering**	**Psychology**	**Political Science**	**Economics**	**Sociology**
2004	10.02%	17.33%	8.39%	31.88%	22.42%	21.63%	29.33%
2005	10.64%	20.70%	8.71%	32.21%	23.39%	20.91%	32.57%
2006	11.27%	21.80%	9.88%	34.07%	24.11%	20.00%	35.25%
2007	12.09%	23.55%	10.89%	36.34%	25.00%	20.40%	37.54%
2008	13.06%	25.20%	11.72%	38.56%	25.14%	21.90%	37.34%
2009	13.20%	26.39%	11.97%	37.67%	26.64%	22.43%	38.63%
2010	13.46%	27.26%	12.68%	38.33%	27.32%	23.09%	40.76%
2011	13.38%	28.53%	13.04%	37.97%	28.27%	23.49%	42.38%
2012	13.76%	29.43%	13.75%	39.64%	29.21%	24.02%	43.48%
2013	13.66%	29.92%	14.89%	41.54%	29.77%	22.34%	47.33%
2014	13.76%	31.09%	15.29%	42.22%	30.08%	22.88%	47.54%
2015	14.70%	31.29%	15.92%	42.20%	30.11%	23.39%	48.67%
2016	15.05%	32.30%	16.48%	43.33%	30.75%	24.73%	50.10%
Average	12.93%	26.52%	12.59%	38.15%	27.09%	22.40%	40.84%
Growth	5.03%	14.97%	8.09%	11.45%	8.32%	3.10%	20.77%

Source: HESA dataset. Sample: All full time and permanent academics between 2003-2016 in 24 Russell group Universities. Russell group universities are classified as top research-intensive universities in the UK.

Appendix B – Analysis

Appendix B1: Athena SWAN Data Construction

ECU publishes the latest list of charter members on their website. [2] At the time of writing this paper there were 112 higher education institutions who had signed up to the charter. Below we outline the stages of how we constructed the Athena SWAN data set.

From 112 universities, we first obtain the date when the university signed the charter as well as the date of first accreditation by going through the awards booklets. Booklets are published from 2011 onwards for every round of accreditation, and thus this information is limited to universities that got accredited for the first time or renewed their accreditation during this period. These booklets contain the list of universities that received Athena SWAN accreditation and when these universities first signed the charter. The booklets also feature additional information about the accreditation process such as content submitted by winners and good practice examples highlighted by accreditation panels. [3]

For 95 universities of 112 we found the year they signed the charter and the year they first got accredited using the booklets, for those universities who got accredited for the first time or renewed the accreditation between 2011-2017. In the case of first accreditation, for example, university of West Scotland received their first accreditation in 2015 and we found the year they signed the charter (2011) using the November 2015 booklet. In the case of renewal, we also find the information about the year they signed the charter and year they first got accredited on the award booklet corresponding to their respective renewal round. For example, University of Southampton renewed their accreditation in 2012, and we found the

[2] https://www.ecu.ac.uk/equality-charters/athena-swan/athena-swan-members/
[3] The booklets can be found at the webpage: https://www.ecu.ac.uk/equality-charters/athena-swan/athena-swan-members/

year they signed the charter (2005) and the year they got first accredited (2006) from the November 2012 booklet.

There were 17 universities for which we could not find the year they signed the charter using the booklets. These universities either never got accredited, or got accredited before 2011 and never renewed. We contacted these universities directly and through email/call correspondence, and checked their websites directly. We obtained information of when they signed the charter for 10 universities (7 directly and 3 using online information). Making the total of 105 universities with confirmed signature year. These 10 universities signed the charter after 2011, therefore if any were to receive an accreditation, it would have been captured in the award booklets. Therefore, we can confirm that these 10 universities did not received an accreditation between 2011 and 2016.

7 universities did not respond to our correspondence, and we were unable to find the year they signed the charter. We eliminated them from the sample since we cannot establish the year of signature. These 7 universities make up only 6.3% of our sample of universities. This leaves us with 105 universities.

Of these 105 we have 10 universities that signed the charter in 2015 or later, which we excluded from our sample. That leaves us with 95 universities.

Of these 95, there were 4 universities that did not include non-STEMM department which are eliminated from the sample. This leaves us with 91 universities that have signed the charter. This leaves us with 91 universities.

We further observe an additional 8 universities of the 91 universities that have signed and never received an accreditation in the period 2011-2017, or never renewed in the period

2011-2017. These 8 universities all signed the charter post 2010, and thus we can rule out that they got accredited before 2010. We can thus confirm that they never received an accreditation.

TABLE B1.1— NUMBER OF UNIVERSITIES SIGNED AND GOT ACCREDITED OVER THE YEARS

	(1)	(2)	(3)	(4)
Year	**No. of Universities signed the charter each year**	**Cumulative No. of Universities signed the charter**	**No. of accreditations per year**	**Cumulative No. of Accreditations**
2005	20	20	0	0
2006	2	22	12	12
2007	4	26	1	13
2008	6	32	3	16
2009	9	41	7	23
2010	6	47	5	28
2011	15	62	1	29
2012	18	80	11	40
2013	5	85	16	56
2014	6	91	10	66
2015	N/A	N/A	11	77
2016	N/A	N/A	6	83
Total	91		83	

Notes: Source: Self constructed Athena SWAN dataset.

Appendix B2- Construction of Main Variables in HESA data set

Table B2.1 presents the constructions of the rest of the variables used in Equation (1). Promotion probability relies in the professor market. After 2012 HESA data did not record a professor marker, but instead the highest occupational level, with the following categories: senior management, head of school/ senior functional head, professors, function head, senior lecturer/reader, lecturer/senior lecturer/senior research fellow, lecturer/research fellow/teaching fellow and research assistant/teaching assistant that is related to academics. After 2012 we assume that an individual is a professor if the occupational category is professor or if they were identified as professors in the professor marker prior 2012. Comparisons of the proportion of professors over time suggest this variable is reliable.

TABLE B2.1— DEFINITIONS OF KEY VARIABLES

Name	Definition
Treatment Variables	
Athena Marker	Dummy variable taking value 1 if the institution has ever had an Athena SWAN accreditation and 0 otherwise.
Main Dependent Variables	
Female	Dummy variable. =1 if female.
Salary	Real log salary converted to year 2016 prices using the 2016 CPI using the nominal salary variable in HESA.[4]
Promotion	Dummy variable taking value 1 if promoted to a professor level and 0 otherwise.
Inflow	Dummy variable taking value 1 in year *t* for individual *i* if at year t the university of individual *i* was different to the university of individual *i* in year *t-1*.
Personal Characteristics	
Age	Age in number of years
Disability Flag	Dummy Variable. = 1 if the individual is disabled
Education	Categorical Variable recording the highest level of qualification. Classified into 6 categories.
UK Citizen	Dummy variable. =1 if UK citizen
Ethnicity	Categorical variable recording ethnic origins of the individual. Classified into White, Black, Asia and other
Employment Characteristics	
Years in current tenure	Continuous variable showing the number of years in the current tenure
Institution	Categorical variable for university
Professor Marker	Dummy Variable. =1 if professor.
Senior Management Indicator	A dummy variable =1 if senior management post holder
Mode of Employment	Categorical Variable taking values: 1 - full time, 2- Full-time, term-time only, 3- Part-time, 4-Part-time, term-time only
Terms of Employment	Categorical Variable taking values 1 for open-ended/permanent contracts and 2 for fixed-term contracts
Academic Employment Function	Categorical Variable taking values: 1- Teaching only, 2- Research only, 3 Teaching and Research

Noted: We use Terms of Employment, Mode of Employment and Academic Employment Function for our sample selection only, and do not include them in our regressions.

[4] Refer: https://www.ons.gov.uk/economy/inflationandpriceindices, for UK CPI Index.

TABLE B2.2—SUMMARY STATISTICS OF MAIN DEPENDENT VARIABLES STEMM BY GENDER

	Men					Women				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Observations	Mean	SD	Min	Max	Observations	Mean	SD	Min	Max
Panel A: Professor										
Salary (£ 2016 prices)	55,524	£82,158	19123	£23,207	£323828	11,424	£77,733	16703	£10,479	£245,955
Inflow of Academics	55,524	1.1%	0.102	0	1	11,424	1.51%	0.122	0	1
Panel B: Non Professors										
Salary (£ 2016 prices)	121,939	£53,432	12189	£11,843	£182,006	64,806	£50,940	10750	£13,945	£170,621
Inflow of Academics	121,939	1.4%	0.118	0	1	64,806	1.57	0.124	0	1
Panel C:Promotions	177,463	1.8%	0.133	0	1	76,230	1.44	0.119	0	1

Notes: Source HESA dataset. Sample consists of full time permeant academics employed under teaching and research contracts over a period of 8 years (2009-2016) in 91 universities.

TABLE B2.3— SUMMARY STATISTICS OF MAIN DEPENDENT VARIABLES NON-STEMM BY GENDER

	Men					Women				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Observations	Mean	SD	Min	Max	Observations	Mean	SD	Min	Max
Panel A: Professor										
Salary (£ 2016 prices)	28,167	£79,836	19906	£12,906	£383,600	10,300	£74,688	14477	£26,073	£241,262
Inflow of Academics	28,167	1.8%	0.132	0	1	10,300	2.3%	0.150	0	1
Panel B: Non Professors										
Salary (£ 2016 prices)	85,182	£50,433	9498	£14,844	£265,511	68,161	£48,847	8417	£19,220	£199,969
Inflow of Academics	85,182	1.8%	0.132	0	1	68,161	2.0%	0.124	0	1
Panel C: Promotions	113,349	1.5%	0.122	0	1	78,461	1.3%	0.111	0	1

Notes: Source HESA dataset. Sample consists of full time permeant academics employed under teaching and research contracts over a period of 8 years (2009-2016) in 91 universities.

Appendix C: UK Pay SPINE System

Individuals and universities negotiate the wages of professorial staff on a one-to-one basis. Pay for non-professorial staff is determined by a multi-employer bargaining process undertaken by the Joint Negotiating Committee for Higher Education Staff (JNCHES). This is a sector-wide collective bargaining agreement, identified as the framework agreement for the modernisation of pay structure. The framework agreement builds a common pay structure known as the pay spine system to fit a diverse range of institutions. The focus of the agreement is to introduce a pay structure that addresses equal pay for equal value, promote staff retention and rewards staff for their contribution to the national university pension scheme. The agreement is negotiated between the main university unions and the employers and became affective in August 2006. If a university agrees to the framework and does not comply, the trade unions may take industrial action. As of 2018, 147 universities have implemented this pay spine structure.[5] 3 out of the 91 universities in our sample have either opted out or have not agreed to the SPINE system in our sample of universities, and an additional 4 universities do not participate for all staff. The pay spine system is only applicable to posts below professorial level.

The proposed system identified as the pay spine system introduces 51 pay spine points. Each 51 spine point is matched to a salary amount with 3% difference between the proceeding spine point.[6] For example, spine point 1 is matched with a salary of £10,250 and spine point 2 is matched with a salary £10,558, making the different of 3% between the two (UCU, 2013). Every year the spine point salaries are updated depending on the general pay

[5] Refer: https://www.ucu.org.uk/article/9611/List-of-institutions-included-in-the-ballot for a full list of universities.
[6] Refer: https://www.ucu.org.uk/he_singlepayspine, for full list of spine points and their respective salary since 2014/2015 academic year.

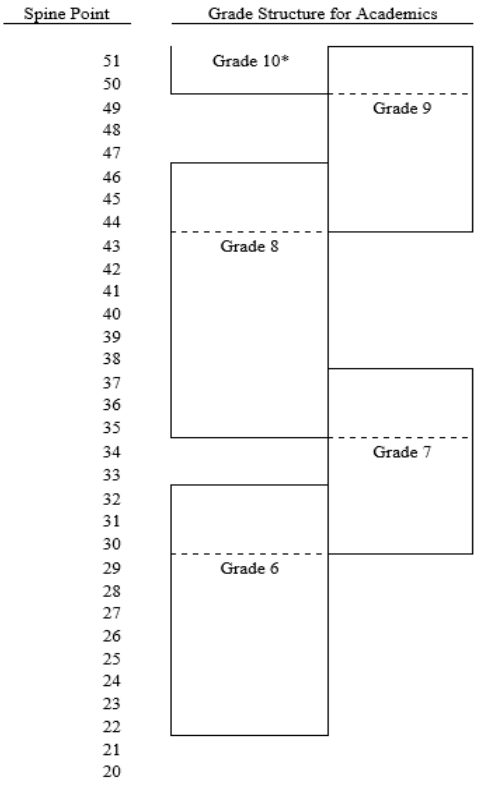
reward, which is typically negotiated every year between the trade unions (University and College Union, UNISON – the public service union, Unite the Union and GMB- Britain's General Union) and the Universities and Colleges Employer Association (UCEA). There is no set criteria for the pay reward negotiation, and since 2009 the pay reward was below inflation, which was heavily criticised.[7] Over the past, couple of years the salaries in the pay spine points have increased by 1.6% in 2016/2017, 1.1% in 2017/2018, and 2% for 2018/2019 (still under negotiation).

Spine points are matched with university employment grade on a many-to-one basis. Figure C1 provides a recommended match between the university grade and pay spine system for academics by JNCHES in 2004. For example, according to the guidance, 'grade 6' refers to a post that involve in assisting teaching/research activity (UCU, (2013)). This corresponds to a salary scale of £19,068 (spine point 22) - £25,626 (spine point 32) under 2003/2004 spine point system. Every year the post holder moves up the spine point system until they reach the spine point 29 (a salary of £23,395)- this the maximum annual automatic increment. However, the same post holder can achieve a spine point 30-32 (identified as contribution point) in some instances, such as a performance related increments. These contribution increments criteria is subjective and is at the discretion of the pay evaluator. All grade consist of a maximum automatic increment threshold (depicted by the dash line) and the contribution (above the dash line and below the solid line) as shown in Figure C1. This proposed structure is a mere guidance and universities can deviate from this structure and implement their own as long as it is agreed with the union. However, the grade system varies across different universities. For example Royal Holloway University of London; consist of 10-tier grade

[7] Refer: https://www.ucu.org.uk/media/9412/Pay--equality-matters---leaflet/pdf/ucu_pay-equality-matters_leaflet_jun18.pdf for a criticism on pay reward.

system while Queen Mary University of London consists of only 7-tier grade system.[8] Given the heterogeneous nature of the grade system, it is difficult to compare grade system and pay across universities. Each university matches their idiosyncratic grade classification to university titles in a different way. For example, Assistant professor at Queen Mary University London starts at Grade 5 and associate professor is a grade 7. In Royal Holloway however, assistant professor starts at Grade 8 and asocial professor at grade 9.

Figure C1: Recommended Pay spine system and grade structure by JNCHES



Notes: Source- UCU (2003). *represent the minimum only. The dotted line represents the maximum pay spine point achieved based on annual automatic increment. The difference between the dotted line and the ceiling point for a particular grade is the contribution pay.

[8]Refer: https://intranet.royalholloway.ac.uk/staff/assets/docs/pdf/human-resources/rhul-single-pay-spine-01.08.2018.pdf for full classification of pay grade and spine point at Royal Holloway, University of London. And refer: http://hr.qmul.ac.uk/workqm/paygradingrewards/pay/scales/ for full classification of the pay grade at Queen Mary University of London.

Appendix D: Additional Tables in Results

TABLE D1: FEMALE REPRESENTATION AND ATHENA SWAN ACCREDITATION

	STEMM		Non-STEMM	
	Professor	Below Professor Level	Professor	Below Professor Level
Athena (d)	0.123	0.244	0.951	-0.853***
	(0.00473)	(0.00287)	(0.00677)	(0.00324)
Observations	66,948	186,745	38,467	153,343
Individuals	13,790	42,205	8,720	35,340
Universities	91	91	91	91
Years	8	8	8	8

Notes: Sample: Full time permanent academics on teaching and research contracts observed over a period of 8 years from 2009-2016. Standard errors in parentheses clustered by individual. Linear probability model estimates are shown in all columns, divided between Science, Technology, Engineering, Mathematics, and Medicine (STEMM) disciplines and other disciplines (Non-STEMM) and further by professors and non-professors. The main dependent variable in all columns is female dummy, variable taking value 1 if the individual is a female. Variable of interest is Athena SWAN accreditation variable, a dummy variable taking value 1 once the institution receives an accreditation. All estimates are controlled for individual level characteristics (age, age square, ethnicity, education, years in current tenure, senior post holder, disability, nationality), time trends, university fixed effects and time and university interactions. The coefficient indicate the average probability of the individual being a female in an Athena Accredited university. For example for STEMM junior staff, we can interpret the coefficient as 0.7 percentage point increase in the female representation in Athena Accredited University. ***p<0.1, **0<0.05 * p <.01.

Appendix E: Identification and Falsification Tests.

Our main results assumes that prior to Athena SWAN accreditation the trends in salaries of women relative to men are the same between universities with and without Athena SWAN accreditation. To that extend, we estimate equation (1), with full set of time dummies going from four years before and four years after initial Athena SWAN accreditation. In particular:

$$(1) \qquad Y_{iji} = \alpha + \sum_{t=4}^{-4} \lambda_t D_{tj} + X_{iji}\gamma + \eta_j + \delta_t + \gamma_j t + \varepsilon_{tj}$$

where D_{tj} is a vector of time dummies four years before and four years after Athena SWAN accreditation. Y_{iji} is the real log salary (using 2016 as the base year) for individual *i* in university *j* and year *t*. We also control the specification for socio-demographic characteristics(X_{it}), university fixed effects (η_j), time trends (δ_t) and university-specific time trends $(\gamma_j t)$. Note that, since universities are accredited at different points in time, we standardised the years before and after accreditation. For example D_{0j} corresponds to 2012 for some universities *j* while, 2010 for another. In the absence of pre-existing trends, we should expect to see no difference in pay inequality over the years prior accreditation. Table E2 shows the results of our main specification using a fixed effect estimate for men and women professor and non-professors. These results are also graphically presented by Figure E1. Whereas we observe that prior to Athena SWAN accreditation the differences between men and women's wages were statistically significant, after Athena SWAN accreditation they are less so. This result suggests that men and women's wages converge after Athena SWAN accreditation.

TABLE E1-PAY AND ATHENA SWAN ACCREDITATION (STEMM) – IDENTIFICATION CHECK FOR PRE-EXISTING TRENDS

	Men		Women		Women-Men	
	(1)	(2)	(3)	(4)	(5)	(6)
	Professor	Non-Professors	Professor	Non-Professors	Professor	Non-Professors
Year (*t*-4)	3.43***	-2.41***	2.16***	-3.24***	-1.27*	-0.83***
	(0.00363)	(0.000823)	(0.00617)	(0.000975)	P<0.1	P<0.01
Year (*t*-3)	2.24***	-3.96***	0.70	-4.84***	-1.54**	-0.88***
	(0.00362)	(0.000962)	(0.00623)	(0.00116)	P<0.05	P<0.01
Year (*t*-2)	0.75**	-5.13***	-0.80	-6.06***	-1.56**	-0.93***
	(0.00323)	(0.00109)	(0.00602)	(0.00135)	P<0.05	P<0.01
Year (*t*-1)	0.06	-5.54***	-1.00*	-6.26***	-1.06*	-0.72***
	(0.00294)	(0.00117)	(0.00574)	(0.00158)	P< 0.1	P<0.01
Year (*t*)	0.40	-4.55***	-0.47	-5.23***	-0.87*	-0.68***
	(0.00268)	(0.00132)	(0.00558)	(0.00182)	P<0.1	P<0.01
Year (*t*+1)	-0.66**	-3.63***	-0.57	-4.17***	0.10	-0.54
	(0.00294)	(0.00137)	(0.00603)	(0.00202)	[0.89]	P<0.01
Year (*t*+2)	-0.51***	-2.91***	-0.3	-3.16***	0.21	-0.25
	(0.00194)	(0.00130)	(0.00446)	(0.00195)	[0.66]	[0.27]
Year (*t*+3)	0.54***	-1.01***	0.98**	-1.09***	0.44	-0.08
	(0.00159)	(0.00120)	(0.00384)	(0.00189)	[0.26]	[0.71]
Year (*t*+4)	0.08	-1.00***	0.20	-1.02***	0.11	-0.03
	(0.00112)	(0.000948)	(0.00282)	(0.00151)	[0.68]	[0.88]
R- Squared	0.129	0.243	0.209	0.255		
Observations	54,268	114,168	11,126	59,683		
Individuals	10,945	25,160	2,525	14,130		

Notes: Sample: Full time permanent academics on teaching and research contracts observed over a period of 8 years from 2009-2016 in 91 universities. Standard errors in parentheses () clustered by individual level. [] denoted the p-value. All coefficients are multiplied by 100. Fixed effect regression estimates are used in all estimates. Dependent variable for gender pay-gap specification is log salaries in 2016 prices. Last two column shows the difference between male and female coefficients among professors and non-professors. ***p<0.1, **0<0.05 * p <.01.

FIGURE E1-PAY AND ATHENA SWAN ACCREDITATION (STEMM) – IDENTIFICATION CHECK FOR PRE-EXISTING TRENDS

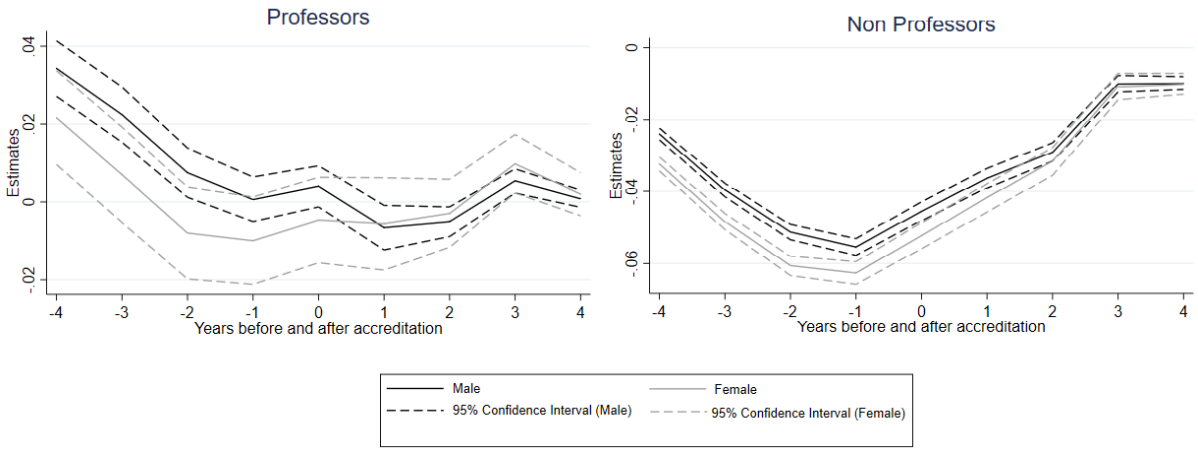


FIGURE E1: PAY AND ATHENA SWAN ACCREDITATION (STEMM) – IDENTIFICATION CHECK FOR PRE- EXISTING TRENDS

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Table E2 below shows that similarly to the case of our STEMM sample in Table 1, there are decreases in the wages of faculty professors, and increases in the wages of non-professorial staff in non-STEMM disciplines. However, unlike the results in Table 1, the differences between men and women are not statistically significant. Unlike results in Table 4 for the STEMM sample, we find that there is no differential effect on promotion probabilities after Athena SWAN accreditation. Female professors and male non-professors experience a higher probability of moving to an Athena SWAN accredited university; however differences are not statistically significant for professors but weakly significant for non-professors with more probability of employment for male non-professors. We find no effect of Athena SWAN accreditation on the promotion probabilities of either men or women in non-STEMM disciplines.

TABLE E2—PAY, PROMOTION AND MOVEMENT IN/INTO ATHENA SWAN ACCREDITATION (NON-STEMM)

	Men		Women		Women-Men	
	(1) Professor	(2) Non-Professors	(3) Professor	(4) Non-Professors	(5) Professor	(6) Non-Professors
Log Salaries	-1.06***	1.16***	-1.46***	1.21***	-0.40	0.05
	(0.00227)	(0.000885)	(0.00377)	(0.000965)	[0.36]	[0.67]
R- Squared	0.171	0.265	0.246	0.283		
Mean	£79,836	£50,433	£74,688	£48,847		
P(Move)	0.82	0.48*	1.80*	-0.04	0.98	-0.52*
	(0.00565)	(0.00254)	(0.00946)	(0.00291)	[0.37]	P<0.1
R- Squared	0.099	0.068	0.138	0.083		
Mean	1.78%	1.76%	2.29%	1.98%		
P(Promotion)	-0.10		0.04		0.14	
	(0.00184)		(0.00197)		[0.61]	
R- Squared	0.009		0.012			
Mean	1.50%		1.25%			
Observations	28,170	85,180	10,300	68,160		
No. of Individuals	6,245	19,470	2,490	15,910		

Notes: Sample: Full time permanent academics on teaching and research contracts observed over a period of 8 years from 2009-2016 in 91 universities. Standard errors in parentheses () clustered by individual level. [] denotes p-value. All coefficients are multiplied by 100. Last two columns show the difference between female and male coefficients among professors and non-professors, respectively. ***p<0.1, **0<0.05 * p <.01.

Table E3 below shows the estimates of our main specification for STEMM sample using a pooled OLS regression as given below.

$$Y_{ijt} = \alpha + \lambda D_{jt} + \rho(D_{jt} \times F_i) + X_{ijt}\gamma + \eta_j + \delta_t + \gamma_j t + \varepsilon_{ijt}$$

Where Y_{ijt} is log real annual salaries (using 2016 as the base year) for an individual *i* in university *j* and year *t*. Our key regressor is $(D_{jt} \times F_i)$ interaction term taking value 1 if the individual *i* is a female and works in an institution that holds Athena Swan accreditation in year *t*, and 0 otherwise. Any positively significant coefficient indicates an improvement in the pay gap-favouring women in Athena SWAN accredited university. We also control for socio demographic characteristics (X_{ijt}), university dummies (η_j) and a time trend (δ_t) and university specific time trend $(\gamma_j t)$, similar to our main specification in our paper. The results are similar to our main results, with positive significant coefficient in the interaction term (Athena X Female) in the wage estimate among professors and non-professors (columns 1 and 3, respectively), insignificant results in the probability of moving into Athena SWAN accredited universities among professors and non-professors (column 2 and 4, respectively) and in promotion (column 5).

TABLE E3—PAY, PROMOTION AND MOVEMENT IN/INTO ATHENA SWAN ACCREDITATION (STEMM)

	Professors		Non Professors		All
	(1)	(2)	(3)	(4)	(5)
	Log Salaries	P(Move)	Log Salaries	P(Move)	P(Promotion)
Athena Marker	-2.40***	3.06***	0.87***	2.58***	0.31*
	(0.00202)	(0.00259)	(0.000883)	(0.00126)	(0.00172)
Athena Accreditation X Female	1.57***	0.18	0.58***	0.18	-0.10
	(0.00392)	(0.00466)	(0.00139)	(0.00148)	(0.00196)
Observations	66,948	66,948	186,745	186,745	253,693
No. of Individuals	13,790	13,790	42,205	42,205	51,903
R-squared	0.931	0.379	0.957	0.462	0.169

Notes: Sample: Full time permanent academics on teaching and research contracts observed over a period of 8 years from 2009-2016 in 91 universities. Standard errors in parentheses () clustered by individual level. [] denotes p-value. All coefficients are multiplied by 100. Last two columns show the difference between female and male coefficients among professors and non-professors, respectively. ***p<0.1, **0<0.05 * p <.01.