DOES ONE'S SEX IMPACT PAY – BUSINESS COLLEGES?

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ABSTRACT

Despite significant efforts by the U.S. government to achieve gender equality, gender-based differences in worker compensation persist. Women tend to make less money than their male colleagues in most workplaces. Rather than only considering salary and the sex of the faculty member, this study explores the existence of salary disparities by sex, academic rank, and size of universities within business programs. We discuss the existing trends in-depth and offer some thoughts on the prospects for the future. Findings from our study could inform decision-making and have policy implications for public universities and individual states in the U.S. We base our empirical analysis on data gathered from the faculties in the College of Business of 4-year public universities in one state in the south-central U.S. Controlling for faculty heterogeneity, we use factorial N-way ANOVA for our analysis.

Keywords: pay gap, business faculty, sex, gender equality

INTRODUCTION

Despite significant efforts by the U.S. government to achieve gender equality, sex-based differences in worker compensation persist (Barroso & Brown, 2021). Women tend to make less money than their male colleagues in their corporate jobs and as faculty members (Strittmatter & Wunsch, 2021). The unexplained wage inequalities between women and men have been widely studied for over 50 years using a variety of modeling methodologies to help explain this disparity (Blau & Kahn, 2000; Blau & Kahn, 2017; Goldin & Mitchell, 2017; Olivetti & Petrongolo, 2008; Olivetti & Petrongolo, 2016). Studies show that work establishments are important for creating and maintaining gender equality with differing pay gaps in different settings (Huffman, King, & Reichelt, 2017). Even with the increase in women in academia, male faculty still earn higher salaries than females (Ordway, 2017). In the US, the government is the entity that passes laws to prevent pay disparities based on sex. Hence, one might think that there would not be a pay gap issue when working for a government agency, but there is. While prior studies have focused on pay and sex, we did not limit our study to just these two variables. This study explores the existence of salary disparities by sex, academic rank, and size of universities since we saw that these additional variables might also contribute to salary and might help explain the pay gap between the sexes. We base our empirical analysis on data gathered from the faculty (in the college of business) of all 4-year public universities in one south-central U.S state.

The existing literature on the sex pay gap in the U.S. falls under two main themes. The first focuses on increasing the understanding of existing sex pay gaps while the second focuses on the impact of research methodological choices. We contribute to the first theme by focusing on understanding what factors influence faculty remuneration. We used one dependent variable (salary) and three independent categorical variables (sex, faculty rank, and university size). Controlling for faculty heterogeneity, by keeping our focus solely within business programs, we use factorial N-way ANOVA for our analysis. In this paper, we first present existing related works which drove our research questions in the literature review section. Then we discuss the methodology we use for our analysis, discuss our data selection, and show our findings in the results section. Finally, we summarize our work and give directions for future research in the conclusion section.

LITERATURE REVIEW

Literature

The existence, impact, and measurement of gender pay disparities have been the topic of extensive research for decades (Olivetti & Petrongolo, 2008; Olivetti & Petrongolo, 2016; Strittmatter & Wunsch, 2021). Despite some improvement over the years, studies show that there remains a substantial gap even if a large set of observable characteristics are adjusted for (Blau & Kahn, 2017; Ding, Ohyama, & Agarwal, 2021). Several factors have been found to impact gender pay disparity in work establishments. These include policies aimed at reducing gender inequality in general, especially among lower-wage earners. These studies focused on investigating the pay gap trends over different time intervals, using a variety of analytical models. Although the observed gap is declining, the disparity still exists.

The pay gap further widens for married people and even more for people with children (Goldin & Mitchell, 2017). This is because time-consuming roles are often associated with high wages. However, most individuals find it difficult to combine family life with long hours at work. The impact of marriage and family life on gender wage disparity is especially pronounced in high prestige occupations (Magnusson & Nermo, 2017). This is because such roles often require time-consuming work arrangements; including demands for constant availability, substantial overtime work, and regular business travel. Thus bringing down the pay for married people and especially for married women.

While the existence of gender wage disparity has been well researched for prestigious occupations, there is a need for more granular studies which focus on specific fields. Academia, though prestigious, is also notable for its flexible work schedule with a relatively balanced family and personal life (Crowder & Mouratidou, 2020) as well as having significant control over work travel. Studies however show that even in academia, gender pay disparities persist (AAUW, 2014). A study by Renzulli, Reynodls, Kelly, and Grant (2013) showed institution type and academic rank affect salary interdependently. Further, they found that locations men and women occupy mediate the effect of gender on pay.

Another research (Cha and Weeden 2014) found that overtime work (50 and more work hours per week) and its associated increased wage returns had a significant effect on the gender pay gap. The study found that men were more likely to do overtime work and raise their wages compared to

their female counterparts. The effect of overtime work on gender pay disparity was most pronounced in managerial and professional work environments where working long hours is expected and forms part of the organizational culture. In fact, with the standard workweek being a 40-hour week and faculty reporting working an average of 61 hours per week, this pay gap should also be notable for faculty (Flaherty, 2014). Although faculty are salaried and not hourly employees and thus do not earn overtime for their assigned workload, there are often other opportunities such as teaching an overload or teaching in the summer that does lend itself to salary (overtime) increases. If men tend to work more overtime than women, then we may also see this in academia with men volunteering to work more overtime and thus earning more. As the standard for working long hours was more pronounced in managerial and professional work environments, all faculty whether working as administrators (managers) or in a teaching/research role (professional) should also reflect this pay disparity between men and women in academia.

In the U.S., gender pay disparity has been found to widen with age (more so after 15 to 20 years after school). Within the academic profession, pay increases are primarily tied to tenure-track promotions that are available at scheduled time intervals such as that from Assistant to Associate to Professor. If the pay gap increases with time, then it would also manifest differently at the different ranks. These promotion opportunities are traditionally set at 6-year intervals. To fit this timeline, it would mostly apply to differences between the Assistant Professor to Professor ranks. This could be confounded with the assertion that faculty salaries suffer from inversion and compression (Homer, Hunt, & Runyon, 2020) with newer hires earning more than senior faculty who hold a higher rank and with long time faculty having not received cost of living adjustments in line with inflation yet again in 2021 (Flaherty, 2021). Which is the overriding factor? Where are the largest, if any, of the pay gaps? Are they with newer (more junior in rank) or senior faculty with longer lengths of employment (tied to rank)? This study controls for rank in an attempt to determine which, if any, are the controlling factors in pay disparities.

Just as one's pay can be impacted by the size of their organization, research has shown that the size of a university and the field in which you teach can impact faculty's pay (McCarron, 2021). Whereas McCarron (2021) addresses faculty pay, Keenan (2017) did similar research, but in the corporate arena. Both of these conclude that the smaller the organization one works for, the less one is likely to get paid. McCarron (2021) also postulates that this is driven by the ratio of teaching to research responsibilities. The larger the university, the larger the proportion of research compared to teaching and thus larger salaries at the larger universities. This led us to include a factor to control for the size of the university.

To enter the academic workforce it is desirable to have a terminal degree. Although lecturer positions can be found while only having a Master's Degree, they also pay less than tenure-track positions. Obtaining a terminal degree is a feat that has seen major strides in recent times (Nerad, 2020). The percentage of women who have been awarded doctoral degrees in the US has drastically increased over the years. For example, in the science and engineering fields, women who received their doctoral degrees increased from 13% (1970) to 46% (2018) (Thurgood, Golladay, & Hill, 2006; NSF, 2019) whereas women in business increased from 1.6% to 42.3% during the same period (National, n.d.). In general, women have earned more than 50% of all doctoral degrees in the US since 2006 (Johnson, 2017). Among these women, only a quarter chose to work in the industry rather than academia (NSF, 2019). However, research suggests that

academia has a wider gender pay gap relative to industry (Ding, Ohyama, & Agarwal, 2021). Our study aims to advance knowledge about the observed trend of the gender pay gap in specific academic fields. But which fields, colleges, and universities would provide us with a good control group?

Within universities, pay also is different based on the type of university (Bryant, 2021) being public, private, independent, or religious. Focusing on state (public) universities allows us to eliminate another disparity – public versus private institutions. An examination of the outcomes in pay disparity litigation favors public sector organizations over private with proportionally more cases being found against private than public organizations (Terpstra & Honoree, May 11, 2016). In addition to this litigation disparity, there is also a salary disparity between public and private universities. When focusing on faculty salaries at public versus private nonprofit universities, there is a distinct increase in the pay scales at the private institutions (Characteristics, 2020). Whereas in universities the pay is higher in the private institutions, women in the public sector can earn a significantly higher wage premium than their private sector counterparts (Mukhtarova, Baig, & Hasnain, 2021) which might make up for the observed national lower pay for women. This led us to limit our research to only public institutions to control for these differences.

Refining our research to the public institutions still left many variables to be controlled for. We next examined the influence of minorities. Much research has been done to examine the pay gaps of minorities and alludes to this issue being based on discrimination (Sha, 2019). It is commonly known that both women and minorities earn less than others (Patten, 2016), and in many areas of employment women are the minority sex. But what if we consider an organization where women are not in the minority or majority? Despite the extensive study about existing pay gaps in the U.S., little is known about the impact in disciplines where women are not considered a minority such as in a business college where the ratio is close to even with men making up 52% of the business faculty (Zippia business, n.d.). We argue that, if one of the contributing factors to reducing the wage gap is the proportion of women in the workforce and this proportion gap has been narrowing (Gender, n.d.), then there should be a reduced pay gap in organizations where the percentage of men and women are similar. Our study is intended to help fill this knowledge gap in the existing literature and control for women being in the minority by restricting our research to business college faculty.

Even with refining our research to only public universities and business colleges, there is still a disparity of pay among the different disciplines (McCarron, 2021; Wilson 2018) based on one's department and rank. Within the US, some research suggests that women faculty members generally make less money than their male counterparts (Agarwal & Ohyama, 2013). On the other hand, some research has shown that women who are full professors sometimes earn more than their male counterparts (Chettri, 2021). However, the existence of controlling for other variables was not evident in that research. This leaves us with conflicting research results when considering faculty sex and rank, but consistent trends when considering the university size and limiting the research to business programs in public universities.

Research Questions Derived from Literature

Although it is common knowledge that women in the US make less than men, we wanted to understand more about how this may apply in a university setting when we control for other factors. Is it the person's sex that determines the difference, is it some other factor, or is it a combination of some factors? The prior discussion led us to want to investigate this in a field where there is a fairly equal balance of men and women to avoid the potential bias of women or men being in the minority. This led us to focus our study solely on business colleges/schools.
Our first research question asked whether sex was a determining factor in pay. But we did not want to short-change this study by not controlling for other factors we believed would influence faculty pay. Referring to the discussion we posed in the literature review, we built on this first research question with two more.

Faculty receive pay increases tied to their rank and lecturers earn less than tenure-track faculty. This meant we had to control for faculty rank. But it is also a common belief that the newer faculty are being hired at higher salaries than those already established at a university. As tenure-track faculty apply for promotions in specified time intervals (often 6-year periods), then those with higher rank will have been teaching longer (in general). The answer to this research question would lead us to understand if rank (time teaching) influences pay with the higher ranks earning more or the newly hired earning more (inversion and compression).
The last research question we addressed was related to the type of university. The larger universities tend to require more research from the faculty whereas the smaller universities require more teaching. As research brings in money to the university we believe those teaching at the larger universities might also make more money than those at smaller universities.

Using these three research questions, we add more insight and explain some of the salary disparities with business college faculty that are often attributed to sex discrimination.

METHODOLOGY

In this section, we outline the methodological process of our study. We begin by discussing the data source, the variables, and then the examined relationships in the study. We further discuss the variables we controlled for and the analytical methods considered.

Data

Data were obtained from all but one four-year public university in one state in the south-central of the United States. This state publicly provides the incomes of all faculty as a result of a Freedom of Information (FOIA) request from a local newspaper thus providing census (100%) level data. This data came from the 2018 fiscal year (Arkansas, 2018). That information was cross-checked with all university websites to match faculty information. Where information on salary as well as demographic information about the faculty were both available, these were entered into our data set.

We collected information on sex, rank, university, and the department/college from the universities' websites and cross-checked with other social media such as LinkedIn. The most debatable data might be concerning the individual's sex. We intentionally did not use gender. We began this classification by cross-checking and classifying common first names, uses of sex pronoun terminology from websites, and a visual of the person's image from multiple websites to determine their sex. Many common names such as Bob, George, Henry, Sally, Annette, and Henrietta were clear classification criteria. However, we sought out additional clarifications on names such as Pat, Pu, Shannon, Carol, and Kelli. Our first source was the universities' websites. If the university had a photo of the faculty member, that was used. If not, we attempted to find them on social media. The most often used source was LinkedIn or Google. Some faculty were not able to be identified via these methods either due to a photo not being found or many photos of different people with the same name living in the same area and thus not identifiable. Our final source used in determining the faculties' sex was in print. Often there were articles about the faculty member earning an award, their hiring, their promotion, or article publication. In many of these sources, pronouns were used to address the faculty member as his or her work. Using all of these sources combined, the result was that none were of a questionable categorization allowing us to make a binary determination of the sex (male/female) for all the faculty in our dataset.

We wanted to eliminate any faculty not teaching full time and who had a primary position as an administrator as we felt that might skew the results. We went about trimming our data set by using multiple sources to confirm which employees fit the category of full-time faculty. Faculty rank and position is a good indicator to help determine the full-time faculty, but faculty rank was not listed in the data set we initially obtained. What was listed was a title. Some of these titles identified the employee as an administrator such as VP Enrollment Management. If a person was an administrator and not a faculty member, they were removed from the dataset. We then went to the specific university to determine the faculty members' rank. As different universities' websites are not laid out in the same manner, this was often challenging. A few faculty members whose rank was not clear were verified from other websites – most often their non-university individual web pages or LinkedIn. Faculty who were teaching as adjuncts and not full-time were eliminated from the dataset. The last portion of faculty eliminated were those who were also administrators. These faculty are often 12-month employees and not 9-month employees and sometimes receive a paid stipend for their administrative roles. Had we kept these faculty members in the data, it could have skewed the results as they would have higher pay than a similar rank faculty member at the same university on a 9-month salary and not in an administrative position.

Classifying the university each faculty member belonged to was easy as it was in the dataset. All 4-year public universities in the state were represented in this dataset except one. This one was in the smallest sized category which had four other colleges represented. Its location was physically near other similar-sized colleges. We did not foresee any bias to the analysis by not including data from this one college.

To control for differences in salary from one college to the next, this study wanted to focus on only those faculty who reside in business colleges. To do that, we had to filter the original dataset to include any departments that might not be in a business college and then cross-check it with each university. Some programs such as economics are normally part of a traditional business college. However other classifications such as accounting could be part of the universities' administrative

component or within a business college. Other classifications such as information systems could be housed in a business college or a science, technology, engineering, and math (STEM) college. To ensure we only included faculty from business colleges, every department that could feasibly be in a business college was considered and cross-checked with the universities' websites. Departments such as history were not considered. We also chose not to differentiate between different departments within the business college. We know that pay differs between departments (Wilson, 2018) and this has already been researched and established.

Variables

When considering the plethora of research and conclusions showing that male faculty earn more than women, that women full professors earn more than men, and that faculty earn more at larger institutions, we knew that we needed to control or account for these differences. To better understand our population, we began with the appropriate analysis of the data for descriptive statistics.

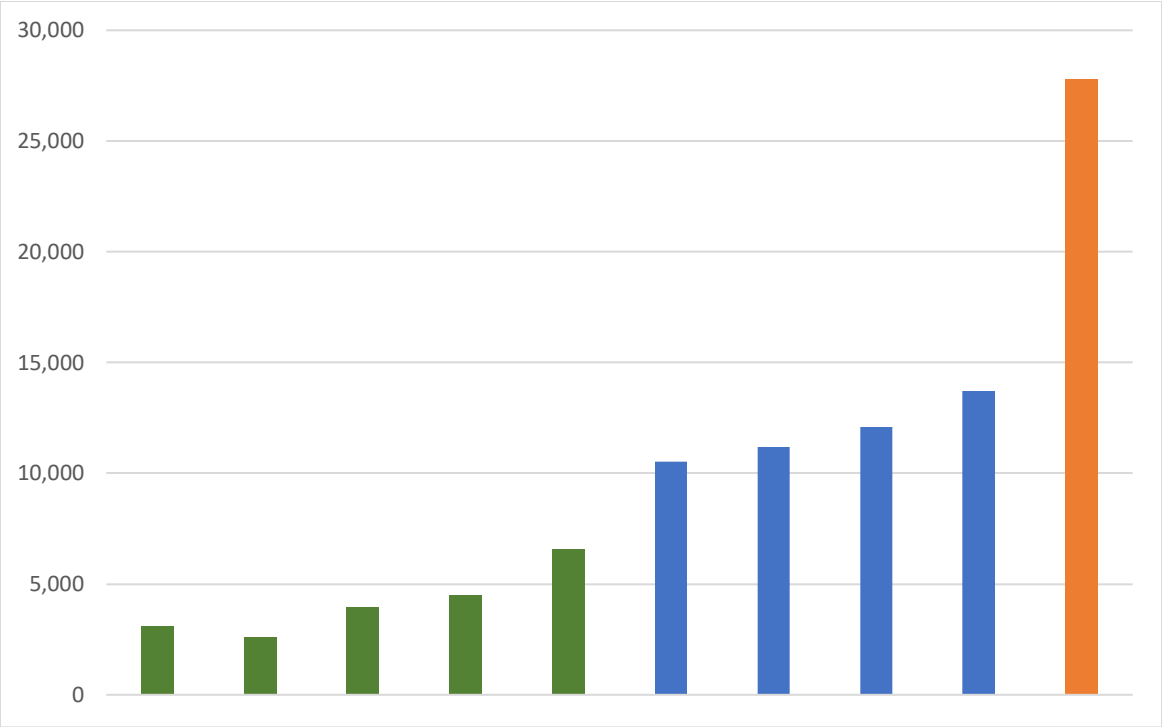
Choosing the analytical tool can be highly debated. While few analysts still use a pencil and calculator, which statistical tool to use is often a decision of familiarity. Although both Statistical Analysis System (SAS) and R (programming language for statistical computing) should obtain the same result, we wanted to use both to satisfy the traditional analyst who might lean towards using Statistical Package for the Social Sciences (SPSS) or SAS as well as the more newly-minted analysts who are experienced in R. We used both SAS and R to analyze the dependent variable (income) while using the hypothesis of interest (sex) and controlling for the other factors (rank and university size). We used "ANOVA" and "lm" functions to apply factorial ANOVA in R. Our main hypothesis is that in a college where the traditional proportion of male/female is more balanced (such as in business schools), we should see an income spread like that in the rest of the United States. But as previously stated other research has concluded both that women can make more and that women make less than men. We feel this is due to some confounding variables such as rank and university size, so these factors were controlled for.

To adequately control for this, we only included faculty that were full-time and not in an administrative role. We also used rank as a control variable. The concern we had was that there has been a trend with salary compression where the recently hired (more likely to be Assistant Professors) are being hired at salaries larger than those who have been at the university for longer periods (Associate Professors and Professors). But regardless of pay being higher at higher ranks or if compression overrides and pay is higher at new hires, controlling for rank should show us which direction the larger pay scales lie.

We also realized that larger universities tend towards being more research-focused with higher salaries and, although they may not be classified by Carnegie as a Tier 1 or a Tier 2 research university, they do tend to pay more and have a smaller teaching load than smaller four-year universities. Thus, to classify the universities we considered the total student population of each of the colleges (CollegeSimply, n.d.). As seen in Figure 1, we saw a clear delineation at the 10,000 and 20,000 student population levels and thus classified the universities by size where 1 is the largest and 3 is the smaller universities. This grouping also matched grouping universities by the Southern Regional Educational Board categories by grouping the Four-Year 1 university, the Four-

Year 2 and 3 universities, and then all of the Four-Year 4 and below universities (Southern, n.d.). As the Carnegie classifications have recently changed to have multiple groupings from the former R1, R2, R3 classifications, we chose to not use these criteria (The Carnegie, n.d.).

Figure 1. Student Population by University.



Methods

Since we were missing one university in the state and since we were interested in applicability outside the one state under study, we chose not to simply report the data, but use statistical measures for inferences. We used measures of central tendency to compare our data by breaking out the income with our factors (sex, rank, and size). This initial exploratory analysis allowed us to understand the relationships and representativeness of the data. Before continuing our analysis, we wanted to ensure our data was representative of our expected population and to understand if there were any gaps or under-represented categories.

We then used N-way analysis of variance (ANOVA) to test for differences as this allows us to study the influence of multiple independent variables on a single dependent variable. We had a numerical (interval) dependent variable and three categorical (ordinal and nominal) independent variables. Since we were studying salary (dependent variable) and wanted to control for sex, rank, and university size, this was the most appropriate statistical method. Factorial ANOVA (UCLA, n.d.) specifically allows us to test and partition this data using the Type I, II, and III sum of squares (SS) (Gottingen, n.d.). We had no missing data (empty cells) so Type IV SS was not necessary as this is the same as Type II when there are no empty cells.

The initial analysis using the measures of central tendency confirmed we had unbalanced data as we expected. This led us to consider the interaction effects and if there were impacts from these. Type I SS lets us know if men or women get paid more. We already know that different studies have concluded both. But, knowing that the different ranks get paid differently and our data was unbalanced at these ranks, we knew we needed to control for that imbalance (Cooper, 2011). We also hypothesized that people at larger universities get paid more and that was also unbalanced and needed to be controlled for. Thus, although we conducted Type I SS, we were not as concerned with that result. We include it in our results to help explain why some analyses might be reporting differences in male/female salary where other research is not. We do note that if there are no interaction effects, then we should rely on Type II over Type III as it will be more powerful. On the other hand, if there are significant interactions, then the main interactions should not be further analyzed.

RESULTS

In this section, we share the results from our methods detailed above. We begin with a descriptive analysis of the data and then provide the sum of squares (SS) full factorial N-way ANOVA while controlling for sex, rank, and university size.

The Data

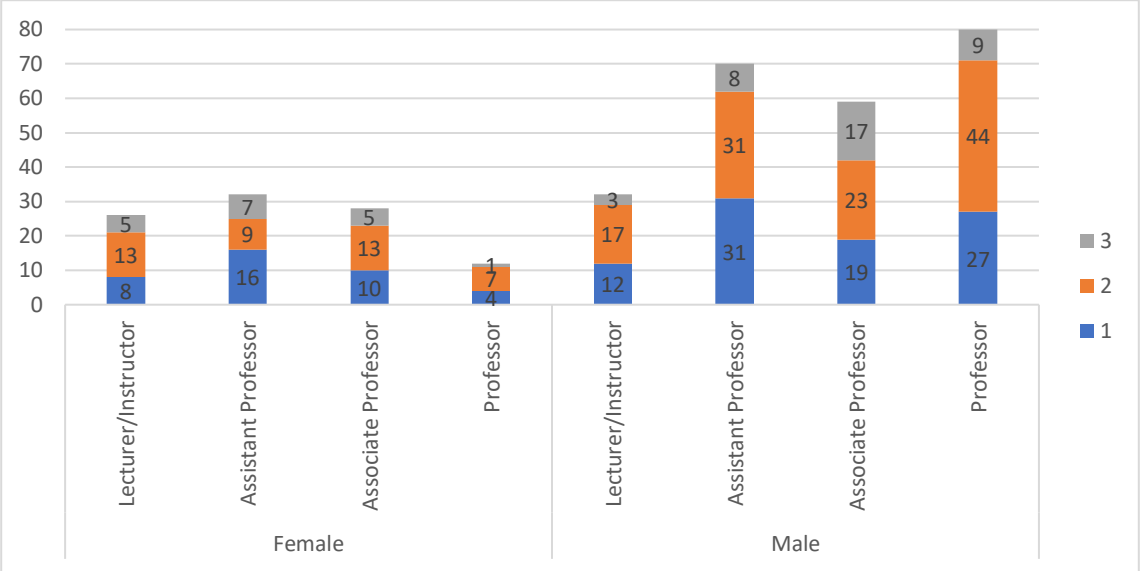
There were 339 faculty members in business colleges in this study. Out of that, 98 were women and 241 were men. Whereas men make up approximately 52 % of the business colleges nationally (Zippia business, n.d.), this data showed men being 71% of the data set. This is contrary to what we expected to see. When we explored the proportion of sex by the different colleges, we found that a similar proportion held with men being 70, 73, and 67% of the population at level 1, level 2, and level 3 colleges. This is only one of the imbalance cases that led us away from using Type I SS.

Typically, university faculty pay is tied to rank (Kelly and Grant, 2012). If men and women are to have equal pay, they should have similar ranks at their universities. The lowest-paid are the non-tenure-track rank of lecturer/instructor where women comprise 45% of the faculty (a higher proportion than any other rank). As we consider the tenure-track ranks women comprise about the same except at the highest rank from 31% of Assistants and 32% of Associates to only 13% of Professors. Because there are fewer and fewer women as the ranks (pay) progress, we would expect to see women making less money than men. If we had only considered this construct, we might associate the pay differences to rank. Doing this would rely on SS Type I results but recognizing the imbalance leads us to not use SS Type I.

When we consider a holistic view of all three factors (sex, university size, and rank), we begin to see a different pattern emerging with more men in the tenure-track and tenured ranks and especially at the highest tenured rank, as seen in Figure 2. Whereas the proportion of female/male lecturers is roughly the same, there are more than twice as many men as Assistant and Associate professors. But the significantly disparate rank was that of Professor where there were more than six times as many men than women. If as we postulate, the larger the university, the more they pay, then we need to look more granularly at the disparities. There may be six times as many men than women

Professors, but there are nine times as many at the largest-sized school. It is these irregularities that we study in this research.

Figure 2. Demographics.



Linear Regression and Interaction

To determine if we should rely on SS Type II or Type III we ran a Linear Regression (LR) using full-factorial model effects and backward elimination. All variables and interactions were eliminated except the interaction term rank * size. These results inform us that we should use SS Type III for our analysis.

Table 1. Parameter Estimates

Parameter	DF	Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	104015	9509	10.94	<.0001
CleanedRank*Size Assistant Professor 1	1	35067	10473	3.35	0.0009
CleanedRank*Size Assistant Professor 2	1	-4937	10632	-0.46	0.6427
CleanedRank*Size Assistant Professor 3	1	-25748	12277	-2.1	0.0367
CleanedRank*Size Associate Professor 1	1	60104	11028	5.45	<.0001
CleanedRank*Size Associate Professor 2	1	4318	10750	0.4	0.6882
CleanedRank*Size Associate Professor 3	1	-15351	11469	-1.34	0.1817
CleanedRank*Size Lecturer/Instructor 1	1	-48429	11647	-4.16	<.0001
CleanedRank*Size Lecturer/Instructor 2	1	-35932	10981	-3.27	0.0012
CleanedRank*Size Lecturer/Instructor 3	1	-49379	14265	-3.46	0.0006
CleanedRank*Size Professor 1	1	108955	10937	9.96	<.0001
CleanedRank*Size Professor 2	1	13535	10400	1.3	0.194
CleanedRank*Size Professor 3	0	0	.	.	.

Sum of Squares (SS)

The preliminary study of our descriptive data raised many questions as to if our control variables would produce statistical differences and lend more to the understanding of pay differences. As our excitement arose, we began our more in-depth analysis. We began our SS analysis with our dependent variable (income), our hypothesized variable (sex), and controlling for faculty rank and size of the university. We ran both SS Type I, II, and III. We show the results for Type I. Then we follow with the results for Type II and III which were the same with very slight differences in significance level.

As part of the SS n-way ANOVA, we also looked at Tukey-Kramer to test differences. For sex, it showed no statistical difference when using the 1-way, 2-way, or a full factorial model. For faculty rank, we found significant differences at the 0.01 and smaller for all pay scales for all modeling methods with non-tenure-track being the lowest, then Assistant, Associate, and finally Professor being paid the most. This is a contradiction of the salary compression theory that new hires are paid more than current faculty leading us to conclude that faculty are paid more at the higher ranks. With more men in our dataset at the higher ranks, if we had not controlled for rank, we would conclude that men get paid more rather than acknowledging that people get paid more when they are in the higher ranks.

We also found significance for the size of the university at 0.007 and smaller for all modeling methods with the larger universities paying more and the smaller universities paying less as we hypothesized. As there are more men in the larger universities, had we not controlled for the university size, we might also have concluded that men get paid more than women rather than understanding that it is the size of the university driving the pay differences.
Using an SS Type I with all models, we see that the individual control variables were all significant as were some interaction effects. But this only tells us that there are significant differences for each of these variables. The cause might be the other control variables and that is where SS Type II and III help clarify it for us.

Table 2. Sum of Squares Type I

	Pr > F		
Source	**1-way**	**2-way**	**Full**
Sex	<0.0001	<0.0001	<0.0001
Size	<0.0001	<0.0001	<0.0001
Rank	<0.0001	<0.0001	<0.0001
Sex*Size		0.0010	0.0005
Sex*Rank		0.2479	0.4427
Size*Rank		<.0001	<0.0001
Sex*Size*Rank			0.7076

Although the significance was slightly worse with Type III, both the Type II and the Type III resulted in the same conclusions. Since we know that there is an interaction effect with size * rank, using SS Type III is the appropriate method. There is a difference in pay, but it is due to the size of the university and the rank of the faculty members. In the table, the results show that in any combination of variables when sex is included, the results are always larger than 0.0001 causing

us to reject our hypothesis that sex is a determining factor. When either size or rank is part of the model without sex, the results are significant. This indicates that both the university size and the faculty member's rank as well as combining the information about the university size and the faculty member's rank are determining factors in the faculty members' salary. The results of Type III SS are provided.

Table 3. Sum of Squares Type III

	Pr > F		
Source	**1-way**	**2-way**	**Full**
Sex	0.4026	0.2478	0.3332
Size	<.0001	<.0001	<.0001
Rank	<.0001	<.0001	<.0001
Sex*Size		0.2173	0.3112
Sex*Rank		0.5134	0.6236
Size*Rank		<.0001	<.0001
Sex*Size*Rank			0.7076

CONCLUSION

This dataset is representative of a significant majority of the faculty in the public universities in one state in the south-central United States. Only one university failed to respond to the FOIA (size 2) and all other universities supplied information on all of their faculty. This may limit the applicability of the results to other states as it analyzes data from one state where none of the universities are in a union and all the universities were public universities.

There are differences in business faculty pay, but it is not because of one's sex. Although preliminary research may lead one to think that women get paid less, when you control for other variables, women are not paid less than men due to their sex alone. Our data was imbalanced and if this is not considered, the SS Type I would lead one to conclude that sex is a determining factor in pay. But this is erroneous as the SS Type I should not be used when the data is imbalanced as our data was with more men being in the higher ranks and at larger universities.

Faculty pay differences are due to the size of the university one teaches at and one's faculty rank. Our LR results showed we had an interaction effect and that SS Type III was the appropriate statistical method. Our ANOVA SS Type III analysis showed that when we controlled for the faculty members' rank and the size of the university they taught at, there was statistically no difference in pay between the sexes. When considering either or both the faculty member's rank and/or university size we showed differences in pay. This shows us that both factors alone as well as the interaction variable influence pay. Getting promoted is often out of one's ability to influence, but one can choose to apply to work at larger universities. If one desires to make more money, this would be a wise consideration.

Although there has been recent evidence published on compression of salaries, this study did not indicate that to be true. We found that whether we looked at rank alone or controlled for sex and/or university size salaries increased for tenure-track over non-tenure-track faculty and also increased

from Assistant to Associate to Professor. If compression exists at some universities, it was not apparent for the public universities in the state studied.

We also found support for our hypothesis that larger universities pay faculty more than smaller universities. When controlling for sex and/or faculty rank the largest universities paid more than the medium-sized universities which paid more than the smallest sized universities. Although this was true for the public universities in this state, it may or may not be true for public universities in other states or private universities.

Future Work

Our data did not contain information on how long the faculty had been working in academia or at their current universities. In this data, the more senior women (Associate and Professors) comprise less than half of those categories compared to their male counterparts (for all but one category). Our data did not allow us to determine if these women had been teaching the same length of time as their male counterparts and simply not applying for promotion, or if they had been teaching as long as their counterparts and were being denied promotion. Future research should consider years of teaching and years of teaching at that institution to determine if women are being denied or choosing not to pursue advancement to Professor – the highest paying rank. This could also conclude that more women are relatively early in their careers and just recently reaching those ranks. If this is true, then we may begin to see more women at these higher-pay echelons soon.
As more women were teaching at the smaller universities, additional research is warranted to determine if this was self-selected or if there is some inherent bias at the larger universities. One may ask the following questions: do women not apply to the larger universities at the same rate as men? Do women not get hired at larger universities at the same rate as men? Do women leave the larger universities at higher rates than men? Do women choose to work at the smaller universities and why? Understanding these questions/decisions/processes could lead to a better understanding of the salary differences.

The dataset studied in this research only considered public universities. The pay scale is known to be larger at private universities and private institutions tend to have more litigation for pay disparities for the sexes. Future studies might want to study private university data to see if controlling for these variables has the same results. However, obtaining data from private universities might be difficult.

As studies have shown that minorities are often paid less than the majority demographic and some disciplines have a significant minority of female or male faculty, future studies should consider faculty from different programs where one sex is more of a minority (either female or male). In business programs, faculty are closely split with 52% of the faculty being men (Zippia business, n.d.). With the faculty being pretty evenly split by sex, this could be why the salaries are not different. However other programs are not as equally split such as engineering where 18.5% of tenure/tenure-track faculty are women (Society, n.d.). In nursing programs, there are 76.8% women faculty (Zippia nursing, n.d.). Analyzing programs with such differences in the percent of the sexes may reveal differences in salary by the sexes.

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