

Accurately portraying the gender earnings gap

The issue of the gender wage gap has recently had a dominant presence in national media. It has been observed that the Bureau of Labor Statistics shows a 23% wage gap between women and men, and certain individuals interpret that to mean that women are discriminated against in the workplace, only earning “77 cents for every dollar that a man earns.” Both this inference and the size of the wage gap are being used to drive US and international political discussion and policy. However, this talking point is misleading and must be either revised or abandoned altogether. Research suggests that most, if not all, of the gender wage gap is a result of individual choice rather than gender discrimination. This can be seen in statistical analysis of measurable data, exploration of factors that don’t lend themselves well to statistical analysis, the role of choice in both of the above, and the interplay of choice and the growth trend of the wage gap. In short, if due attention is given to the data behind the raw wage gap, it is shown to be a highly inflated and misleading figure around which to discuss social and policy change.

In the first place, the 23% wage gap figure is what is referred to as the “unadjusted differential” - the statistician’s equivalent of the phrase “apples-to-oranges.” Much like iron ore, this figure is raw material and not useful unless the extraneous is smelted away. A significant majority (over 70%) of the unadjusted differential has been proven to be such extraneous matter: hours worked, education, experience, profession, and results of individual choice (Bertrand, Goldin, & Katz, 2010, Abstract). As Biggs and Perry (2014) put it:

While the BLS reports that full-time female workers earned 81% of full-time males, that is very different than saying that women earned 81% of what men earned for doing the same jobs, while working the same hours, with the same level of risk, with the same

educational background and the same years of continuous, uninterrupted work experience.

Put more succinctly: “It would be unfair to measure gender discrimination by the ratios of average earnings unadjusted for the many differences in worker skills and characteristics known to affect earnings” (Olson, 2013, p. 189). What factors, then, are not included in the unadjusted differential that are known to affect earnings?

The unadjusted differential doesn’t account for hours worked. Women are nearly three times as likely as men to work a part-time week (O’Neill, 2012), with roughly two-thirds of all part-time employees being female (Bertrand et al, 2010, p. 8). Between 20% and 33% of employed women work part-time, compared with 5% to 8% of men (CONSAD Research Corporation, 2009, p. 24). Within ten years after graduating from college, only 62% of women are employed full-time and year-round (Bertrand et al, 2010, p. 8). This compounds with the fact that, hours worked being equal, part-time positions are generally paid less per hour than full-time positions (CONSAD, 2009, p. 1). Men are also more likely to work overtime and, among those who do work overtime, work more overtime hours than their female counterparts (CONSAD, 2009, p. 17). Such overtime earnings introduce nonlinearity into the earnings equation; a man who works forty-five hours may be only be working five hours more than his forty hours-per-week female counterpart, but those five hours are paid at 150% of their shared hourly rate. In other words, the raw differential must be adjusted to accommodate the differences in full-time versus part-time employment.

Moreover, the “full-time” category contains significant ambiguities. The official definition of full-time employment is thirty-five or more hours per week. However, there is a

significant difference in potential for earnings and productivity even between thirty-five and forty hours per week. Even within the bounds of the definition of full-time, men work significantly more than women, as touched on in the preceding paragraph. The Bureau of Labor statistics (2014) found that, among full-time employees in 2013, men worked an average of 8.3 hours a day while women worked 7.7 hours per day - in other words, full-time female employees worked 93% as much as their male counterparts. This is consistent with the findings of the American Association of University Women (2012), which show that, one year after college, full-time working women work only 96% of hours of their male peers (p. 2). Men are nearly twice as likely as women to work more than 40 hours a week (Kochhar, 2013), and women almost twice as likely to work only 35 to 39 hours per week (Holland, 2014). In a study of the work habits of male and female full-time pharmacists, the American Pharmacists Association found that men worked 44.1 hours per week while women worked 37.2 hours on average (Hymowitz, 2011). Additionally, the definition of full-time fails to incorporate roles such as teachers - and industry composed primarily of women - where the primary job only fills nine months of the year (Kessler, 2014).

The unadjusted differential must be adjusted to allow for the reality that women work fewer hours than men on aggregate. The Bureau of Labor Statistics recognizes this, and provides statistics on median weekly wages rather than annual wages. When adjusting no other factors than comparing weekly wages rather than annual wages, the earnings gap is lowered to 18% (Bureau of Labor Statistics, 2013b, p. 2). However, even weekly wages don't accommodate the wide variance in hours worked per week. When the gender wage comparison is adjusted from weekly wages to hourly wages, the earnings gap shrinks to 14% (Bureau of Labor Statistics,

2013a, p. 6). Also of note is that, when hourly wages are compared solely amongst part-time employees, the wage gap inverts, with women earning between 4% and 19% *more* than their male counterparts (Kochhar, 2013).

Clearly, a more granular comparison of wages to hours worked provides a more useful differential than the 23% figure. However, hours worked is not the only statistically measurable factor in a human capital analysis. Education and industry choice play a significant role in understanding the unadjusted wage differential (CONSAD, 2009, p. 35). Men are more likely than women to major in fields which typically lead to higher-paying jobs (AAUW, 2012, p. 1); nine out of ten of the most remunerative college majors are overwhelmingly male while nine out of ten of the least remunerative majors are overwhelmingly female (Carnevale, Melton, & Strohl, 2011, p. 17). Moreover, as the American Association of University Women (2002) stated:

Although the choice of major is related to occupation, the relationship is not strict. For example, male engineering majors are more likely than their female counterparts to work as engineers after graduation (p. 2).

In other words, even having studied the same highly-compensated discipline, women are less likely than men to enter that highly-compensated industry after graduation. And, if they do, they are more likely to accept clerical or other low-paid occupations (American Association of University Women, 2007, p. 2).

This trend in choice of studied discipline is predictably mirrored in choice of industry worked. Some industries are more highly-compensated than others, and women are more concentrated in low-paying industries than are men (CONSAD, 2009, p. 6). The American Association of University Women (2007) found that “women are more likely than men to work

in the nonprofit and local government sectors, where wages are typically lower than in the for-profit and federal government sectors” (p. 2). Men are more likely to be in salary-protected roles such as union positions (Caiazza, 2007, p. 1). Men also comprise the vast majority of those employed in roles which carry a heavy premium to offset working conditions. For example, all of the top ten most dangerous jobs (Greenhouse, 2010) are overwhelmingly male.

In fact, the more detailed a comparison is made *within* an industry - at the occupational level - the more the unadjusted differential is explained (Levine, 2001, p. 10). As Hymowitz (2011) put it:

Among “physicians and surgeons,” for example, women make only 64.2 percent of what men make. Outrageous, right? Not if you consider that there are dozens of specialties in medicine: some, like cardiac surgery, require years of extra training, grueling hours, and life-and-death procedures; others, like pediatrics, are less demanding and consequently less highly rewarded. Only 16 percent of surgeons, but a full 50 percent of pediatricians, are women.

According to the CONSAD Research Corporation (2009), when wages are calculated by categories “which essentially consist of detailed occupations within individual establishments, the pay of men and women who work in the same category is almost equal” (p. 6). In fact, while some industries have men earning more than women, others put women’s earnings above men’s (CONSAD, 2009, p. 10).

It is clear that hours worked, education, and industry choice have major effects on the unadjusted wage differential. As these are all largely measurable factors, statisticians are able to perform regression analyses and come up with an adjusted differential which is significantly

lower than the 23% wage gap figure. This adjusted gap changes from study to study, depending on which measurable factors are incorporated into the regression and the manner in which they are incorporated. Some sources arrive at a 5% gap (Joint Economic Committee, 2010, p. 70; O'Neill, 2012) and one study arrived at a high of 12% (AAUW, 2007, p. 3). However, the most common adjusted differentials are between 6% and 7% (JEC, 2010, p. 88; AAUW, 2012, p. 1; CONSAD, 2009, p. 1). This adjusted differential is frequently referred to as the “unexplained gap.”

While it is clear that the 23% unadjusted differential should not be cited as evidence of gender discrimination, many claim that this 7% “unexplained gap” should be; that, if it is “unexplainable” by data, then it must be due to discrimination. However, this assertion is “too simplistic” (Council of Economic Advisors, 1998), given that “unexplained” is not synonymous with “unexplainable.” As Olson (2013) stated, “it would make more sense to refer to explained and unexplained variance without the addition of the word ‘discrimination’” (p. 189). The adjusted differential is neither confirmation of nor refutation of gender-based discrimination (JEC, 2010, p. 88). Instead, it is confirmation of the limits of measurable knowledge - that some things are functionally immeasurable in a way that can be used in a regression (Levine, 2001, p. 6) and that some factors are so closely correlated that “their individual coefficients cannot be accurately estimated” (Olson, 2013, p. 188).

In other words: some nondiscriminatory factors don't lend themselves well to statistical analysis, but nevertheless undoubtedly have an effect on income. That is what the majority of the 7% adjusted differential represents. There are many, equally-plausible explanations for the

adjusted differential that can be explored, such as perceived effort, non-wage compensation, career interruptions, and negotiation practices.

Though the topic of comparative hours worked was explored earlier, there are more subtle implications to gender-based trends in time put in at the office. In a work culture that emphasizes “face time,” effort is frequently perceived through net hours at work. Those who don’t put as many hours in are penalized and those who put in hours on the job are rewarded (Furchtgott-Roth, 2007). Hymowitz (2011) observed that “wage growth is heavily dependent on perceived effort expended. Promotions may go to people who are devoted to the job, who rearrange schedules to deal with immediate crises at work, who seem focused almost entirely on work.” This equation of hours to effort is most pronounced in high-level and high-paying roles (Weissmann, 2012). Compounding this effect is that many highly-compensated professions compensate those who spend longer hours at the office disproportionately to those who spend fewer. For example, a lawyer who works 80 hours a week at a big corporate law firm is paid more than double one who works 40 hours a week as an in-house counsel at a small business (Goldin, 2014, p. 1106). This is corroborated by data that shows that, while men and women equally share the workforce in labor, professional, and management positions, the ratio of female participation sharply drops to the mid-teens in the more time-intensive roles of executive, board member, and CEO (US Women in Business, 2014). Goldin (2014) even goes so far as to say that “the gender gap in pay would be considerably reduced and might vanish altogether if firms did not have an incentive to disproportionately reward individuals who labored long hours and worked particular hours” (p. 1091).

Not only is the relationship between hours worked and perceived effort a major contribution to the 7% adjusted differential, but the interplay between total compensation and industry plays a significant factor in explaining the gap. CONSAD (2009) concluded that "any measure of earnings that excludes fringe benefits may produce misleading results as to the existence, magnitude, consequence, and source of market discrimination" and then observes that few studies go this far (pp. 13-14). Studies show that women value non-wage benefits more than men do (CONSAD, 2009, p. 2) and "family-friendly" fringe benefits such as flexible hours, shorter work weeks, and proximity to home occur more frequently in female-dominated professions (CONSAD, 2009, p. 13). For example, while the role of librarian - a predominantly female profession - offers lower wage returns to work experience, the profession penalizes "home time" less. Furthermore, a year of part-time work had no future effect on a librarian's full-time salary while a year of part-time work lowered the later full-time salary of an MBA - a predominantly male discipline - by \$3,710. In short, if total compensation were depicted as a pie chart, women frequently make the tradeoff of a smaller "wages" piece for a larger "benefits" piece. There is evidence that this might be because women are less motivated by money than men (Farrell, 2006) and prefer noncompetitive payment schemes (AAUW, 2007, p. 31). Whatever the reason, very few comparisons of the gender wage gap take total compensation into account, effectively comparing the size of a piece of the compensation pies without comparing the size of the pies themselves. Indeed, CONSAD (2009) found that, "when earnings were measured by the index of total compensation, they differed statistically significantly between genders in only one occupational category" (p. 14).

Closely tied with both the issue of perceived effort and “family friendly” benefits is another significant element in the unadjusted differential: career interruptions. It is no surprise that leave taken from a career, for whatever reason, is associated with reduced income and that such interruptions occur more frequently with women than with men (CONSAD, 2009, p. 9). This is, of course, highly correlated with childbirth. Women are two times more likely as men to take leave for child care and, among those who any took leave, women stayed out more than three months longer than men (AAUW, 2007, p. 26). As previously explored, such gaps would seriously affect the perception of effort expended for the company. Additionally, those who anticipate having children in the near future would most likely gravitate to more female-dominated industries which trade high wages for more “family friendly” benefits. Typically, male-dominated industries do not enable shorter or more flexible work schedules (CONSAD, 2009, p. 13), made evident by the fact that the decrease in earnings for men who return to work after an interruption of at least one year is greater and longer-lasting than the decrease in earnings for their female counterparts (CONSAD, 2009, p. 9). This interplay between hours spent at work, the trading off of wages for benefits, and career interruptions (such as child-rearing) creates a complex alchemy which can largely explain the adjusted differential.

The final element that we will consider here, though there are several more worth exploring, has been repeatedly observed in behavioral experimentation: the tendency of men to negotiate more than women. As established above, women avoid negotiation (AAUW, 2012, p. 3), preferring noncompetitive (Goldin, 2014, p. 1094) payment schemes while men “prefer environments where the rules of wage determination are ambiguous” (Liebbrandt & List, 2012, p. 1). In such environments, men are eight times more likely than women to ask for increased

compensation. Even at the beginning of the career, male graduates are four times more likely to negotiate for higher wages (Vedantam, 2007), negotiating an average salary 7% greater than their non-negotiating counterparts (AAUW, 2007, p. 31). Men are even more likely to negotiate for non-wage advantages, such as assignments that will eventually lead to greater professional opportunity (Vedantam, 2007).

To be fair, gender discrimination probably plays a role in the adjusted differential in tandem with these and other difficult-to-measure factors. As the American Association of University Women (2012) states, “discrimination is impossible to measure directly, and many who discriminate—both men and women—may not be aware that they are doing so. For all of these reasons, it is likely that at least part of the unexplained gap results from discrimination” (p. 3). However, those that assert that the entirety of the adjusted differential is indicative of gender discrimination - that the elements mentioned above have little to no impact on the gap - are on logically tenuous grounds; if one of the plausible (but difficult-to-measure) factors is a possible culprit for the whole gap, than any other is as well. CONSAD (2009) wrote:

It can confidently be concluded that, collectively, those factors [not due to discrimination] account for a major portion and, possibly, almost all of the raw gender wage gap. (p. 15)

As a result, it is not possible now, and doubtless will never be possible, to determine reliably whether any portion of the observed gender wage gap is not attributable to factors that compensate women and men differently on socially acceptable bases, and hence can confidently be attributed to overt discrimination against women. (p. 36)

In other words, little to none of the original, unadjusted 27% differential can be attributed to discrimination.

Instead, the difference in earnings - both adjusted and unadjusted - can be concluded to be almost entirely the result of the aggregate choices made by individual men and women (CONSAD, p. 15). According to CONSAD:

This study leads to the unambiguous conclusion that the differences in the compensation of men and women are the result of a multitude of factors and that the raw wage gap should not be used as the basis to justify corrective action. Indeed, there may be nothing to correct. The differences in raw wages may be almost entirely the result of the individual choices being made by both male and female workers. (p. 2)

Choice affects outcome. Women who choose to have children early in their career choose to earn less for a time than those who delay childbearing (National Women's Law Center, 2014). Those who eschew childbearing completely will earn even more (Batchelder, Ellwood, & Wilde, 2010, p. 12). Women who choose never to marry have an adjusted differential of only 4% less than men's earnings (Holland, 2014). Women between the ages twenty-two and thirty who completely forgo both marriage and childbearing earn an average of 8% *more* than their male counterparts (Luscombe, 2010; O'Neill, 2012). The choice of college major effects earning potential. For example, over the past decade the percentage of women earning engineering (National Center for Education Research, 2012b) and computer science (National Center for Education Research, 2012a) degrees has significantly *decreased* as women choose other alternatives. Women are choosing to work fewer hours than men - a Pew Research survey (2007) demonstrated that 79% of working mothers would prefer to work part-time or not at all, while

only 12% of working fathers said the same. It is clear that most, if not all, of the significant determinants of income (and, thus, the wage differential) are the result of choice.

Some might push back, contending that, despite the choices which contribute to the gender wage gap explored above, the gap is still largely a result of discrimination. This stance purports that the existence cultural norms which affect women's choices are a form of discrimination. However, a cursory examination into this reasoning quickly discredits the assertion. Social norms and legal policies which encourage certain behavior without limiting choice cannot reasonably be called discrimination. If that were the case, then the US government openly discriminates against renters and unmarried individuals as neither receives the same tax benefits as homeowners and married couples, respectively. Similarly, a social norm which encourages a man to spend more time at work in order to earn a promotion in order to earn more money to provide for his family (and thus increase the wage differential) would be considered discriminatory against men. Clearly, a situation in which a choice is offered but not taken cannot be reasonably referred to as discrimination.

The purpose of this paper is not to assert whether or not the choices that women as a whole are making are the ones that *should* be made. That is an issue of individual conviction, unique to everyone. And such fundamental individual convictions are difficult, if not unethical, to legislate. What should be, and has been, legislated are methods which prevent the limiting of women's choices (Post and Courier, 2009). We have provided equality of opportunity, of choice; equality of outcome only occurs when all parties take advantage of the same opportunities in the same way at the same time.

The relationship between choice and outcome becomes clear when examining the trend of the unadjusted pay differential over the past several decades. While the adjusted pay differential has remained relatively constant since 1988 (JEC, 2010, p. 89), the unadjusted differential has followed an asymptotic curve. In the 1980s, the gap closed by 9.7 percentage points, then by 3.1 points in the 1990s, and then by only 1.7 points during the 2000s (Institute for Women's Policy Research, 2014, p. 2). Given the trend, there is a possibility that, as the pay gap approaches the apparent asymptote, the convergence of gender incomes will not continue indefinitely (Blau & Kahn, 1996, p. 843). Some believe that this trend is evidence of some kind of resilient core of remaining gender discrimination. However, as has already been explored, this is an irresponsible logical leap. If we keep in mind that the unmoving, adjusted differential represents difficult-to-measure, inter-correlated factors while the shrinking, unadjusted differential represents concrete, measurable factors, it becomes clear that the shrinking differential is a result of a change in women's decision-making (CONSAD, 2009, p. 8). And, if the shrinking of the differential is a result of women's choices, it is not inconsistent to assert that the asymptote- the flattening of the differential over time - is also a result of choice.

The combination of decades of legislation which has provided more options to women and those women choosing among the wider variety of options has contributed to the significant shrinking of the unadjusted differential. However, there are limits to legislation. After all, one cannot legislate that someone is freer than "free." There comes a point at which legislation can go no further as it hands the reins over to individual choice; it reaches its limit and the continued creation of anti-discrimination policy becomes "a task that is, at least, daunting and, more likely, unachievable" (CONSAD, 2009, p. 36). As Furchtgott-Roth (2007) contends:

The choice of more time at home and less money rather than more money and more time at the office is a perfectly valid choice for individuals and it's not something that we need to criticize or fix with government policy. (2007)

Or, put another way:

Unless women stop getting married and having children, and start abandoning careers in childhood education for naval architecture, this huge gap in wages will almost certainly persist. (Kessler, 2014)

At this point, additional anti-discrimination policy based on outcomes rather than choices would be the tail wagging the dog.

Instead of focusing on misleading statistics, the national conversation should focus around the choices available to women and the genders make the trade-offs that they do (Rosin, 2013). Research shows that most, if not all, of the gender wage differential is the result of individual choice rather than discrimination. The majority of the unadjusted differential is explainable through statistical analysis, with the remaining adjusted differential largely understandable in terms of individual preference. Legislation has gone as far as it can, with the onus of closing (or not closing) the wage differential on the interplay between individual choice and cultural norms. If one does wish to address the idea of discrimination as a cause of the gender wage differential, the popular unadjusted differential of 23% should not be used. The real figure at play in the question of discrimination lies in the adjusted differential - somewhere between 0% and 7%. Given the real figures, it could be contended that there are much more pressing gender issues than the wage gap that we could be spending our limited time, money, energy, and attention on.

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