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Folbre, N, Gautham, L orcid.org/0000-0001-9098-7272 and Smith, K (2023) Gender Inequality, Bargaining, and Pay in Care Services in the United States. Industrial and Labor Relations Review, 76 (1). pp. 86-111. ISSN 0019-7939

https://doi.org/10.1177/00197939221091157

Gender Inequality, Bargaining, and Pay in Care Services in the U.S.

Abstract

The authors argue that paid providers of care services in the U.S. (in health, education, and social service industries) are less able than providers of business services to capture value-added or to extract rents because limited consumer sovereignty, incomplete information regarding quality, and large positive externalities reduce their relative market power. In addition, many care jobs enforce normative responsibility for others and require specific skills that limit cross-industry mobility. Analysis of Current Population Survey data for 2014-2019 reveals significant pay penalties in care services relative to business services, controlling for factors such as gender, education, occupation, and public/private employment. Women's concentration in care services explains a significant proportion of the gender wage gap and raises the possibility of significant potential benefits from industry-level bargaining strategies.

Because gender differences in education and labor market experience have diminished in recent years, patterns of industrial and occupational segregation now explain much of the difference between women's and men's earnings in the U.S. (Blau and Kahn 2017). The positive impact of movement into professional and managerial occupations on women's earnings has been counterbalanced by their concentration in traditionally female-dominated industries such as health, education, and social services, which we term "paid care services." Care occupations—heavily concentrated in care industries--typically pay less than others, even controlling for gender, education, experience, and other relevant factors.

The possibility that job characteristics influence compensation echoes early research on comparable worth and conforms with persistent earnings differences across industries and firms. Care jobs have typically been defined in terms of occupations or occupation/industry overlaps, with an emphasis on distinctive aspects of the labor process. Unlike previous researchers, we focus on industry-specific factors, explaining

why firms and workers in care services have less potential to capture value-added than those in business services, another subset of the service sector.

As noted by Kenneth Arrow (2008), public provision of care services is a response to limited consumer sovereignty, incomplete information regarding service quality, and positive social externalities. These characteristics are likely to affect the nexus between pay and productivity in both public and private establishments. Many occupations in care industries select for intrinsic motivation, encourage responsibility for consumer/client outcomes, and require specific skills, licensing, and experience—factors that limit cross-industry mobility and reduce worker bargaining power.

Emphasis on industry-level effects does not vitiate the impact of other factors. Many workers find great satisfaction in being paid to care for others but would nonetheless prefer to be more generously rewarded. Caring preferences are costly partly because the characteristics of services they help motivate make it difficult for workers to demonstrate their specific value to consumers who enjoy significant but diffuse benefits. In business services, by contrast, both firms and workers can clearly demonstrate dollar value and are often able to directly increase prices or command bonuses.

Care Work and Wage Determination

Empirical research documents pay penalties in care jobs in the U.S. and the U.K., controlling for a variety of personal and job characteristics (England, Budig and Folbre 2002; Barron and West 2013; Hirsch and Manzella 2011; Hodges, Budig and England 2018; Pietrykowski 2017). Although these penalties are apparent for both genders, women are disproportionately affected via their concentration in care jobs, as noted by advocates of pay equity (England 1992; Barth et al. 2016).

Attention to industry characteristics complements other research on earnings differences unrelated to occupation or other skill measures (Card et al. 2018). Many high-level employees in financial services capture rents in the form of wage premia, earning significantly more than would be predicted based on their education and other individual characteristics (Bivens and Mishel 2013; Philippon and Reshef 2009). The relatively low earnings of high-level employees in care services mirror this phenomenon.

Institutional arrangements and market imperfections mediate the effects of both skills and preferences. Imperfect competition implies that wages are partially determined by bargaining power (Manning 2003; Taylor 2007). High market share delivers extra profits, or rents, that workers in high-end occupations may partially capture (Nickell 1999; Card et al. 2018). Differences in labor supply elasticity allow employers to influence gender and racial wage gaps (Stelzner and Bahn 2021; Manning 2003). Both public schools and hospitals in the U.S. exercise significant wage-setting power (Falch 2001; Random and Sims 2010; Staiger, Spetz, and Phibbs 2010). By contrast, firms providing business services often face the threat that high-level employees will change jobs, taking valuable contacts and information with them (Godechot 2017).

No sectors of the U.S. economy conform exactly to the textbook abstraction of impersonal exchange in competitive markets with perfect information, and licensing regulations influence the ability of many occupational groups to capture rents (Kleiner and Krueger 2013; Weeden and Grusky 2014). However, workers in care service industries have less ability to capture rents than those in business service industries because they have less direct bargaining power and because their employers are less able to capture firm-level rents that could potentially be shared.

Caring preferences and normative obligations. Caring preferences are linked to cultural norms of femininity that shape labor and marriage markets and women are more likely than men to say they value relationships with others (Badgett and Folbre 2003; Fortin 2008; Folbre 2012). Some "people skills" probably work to the advantage of women's future employment and earnings (Deming 2017; Borghans et al. 2014). However, a subset of these skills (such as empathy) are not financially advantageous. When workers identify with their employers' mission, they are willing to provide more effort for less pay (Francois 2000, 2003; Besley and Ghatak 2005). Depending on market structure and the elasticity of demand, firms, consumers, or both may benefit (Frank 2010).

Financial services firms successfully opposed a Fiduciary Rule proposed by the Obama administration in 2010 that would have strengthened requirements that financial advisors prioritize the best interest of their clients (Byrd 2020). By contrast, health care providers, educators, and social workers who violate a "duty to care" are subject to strict legal, managerial, and cultural sanctions. While satisfaction with caring (or "donative') preferences can be interpreted as a compensating differential, such satisfaction is neither directly observable nor necessarily experienced by the marginal worker (Jones 2015). In any case, caring preferences that reduce workers' willingness to press for higher wages reduce their collective bargaining power. Such preferences are related to, but distinct from those that may affect the earnings differential between employees in for-profit and non-profit firms, which is relatively modest and possibly over-stated by the cumulative effect of differences in work hours (Johnston and Johnston 2021; Hirsch, Macpherson, and Preston 2018); Ruhm and Borkoski 2003).

Incomplete information. Care provision is especially difficult to standardize. Health and social services are often tailored to specific needs, and their effectiveness depends on the motivation and cooperation of those served. Teacher productivity is influenced by the characteristics of students. Heterogeneity and joint production make it difficult to measure individual value-added. In contrast to business services, care services typically yield returns that cannot be easily denominated in dollar terms.

Standard efficiency wage models explain why employers may offer a higher than market-clearing wage to motivate greater effort (Stiglitz 1975). These models assume that employers can assess the effect of effort on the value of output. This assumption is violated in care services where quality is variable and difficult to measure. As a result, signals of intrinsic motivation become important as means of reducing monitoring costs. The resulting dynamic reverses the logic of efficiency wages – willingness to work for lower pay is sometimes interpreted as a signal of quality, providing a rationale for keeping wages low (Heyes 2005).

Rewards for measurable dimensions of performance often divert effort away from goals more difficult to assess (Holmstrom and Milgrom 1994). Many professional care occupations are sites of struggle over this issue. Educators tend to be critical of pay-for-performance policies or school ratings that rely heavily on standardized tests, because they value unstandardized capabilities. Payoffs to specialization among physicians are shaped by information problems as well as politically brokered reimbursement rates set by Medicare and Medicaid. Performance is easier to measure when diagnosis and treatment plans are clear, as in many surgical procedures. In 2021, as in previous years,

the average annual income of orthopedists and plastic surgeons was more than twice as high as the average for practitioners of family medicine or specialists in infectious disease (Medscape 2021). Research suggests that a small subset of physician specialists is able to extract occupational rents (Laugesen 2016). Most nurses are at the opposite extreme: because bedside care is highly variable and involves close personal interaction, hospitals seldom bill for specific nursing services, instead they simply charge a daily fee (Welton et al. 2006).

Performance-based pay incentives are less common in care services than business services. Analysis of the 2013 National Compensation Survey reported that 36% of workers in information and 32% in financial services received performance pay, compared to 12% in education and health services. Occupational differences are salient: 28% of workers in management, business, and financial occupations received performance pay, relative to 19% in professional and related services and 10% in service occupations (Gittleman and Pierce 2013b: R7).

Limited consumer sovereignty. Incomplete information reduces consumer sovereignty. Appropriate expertise regarding care services is difficult to acquire, and comparison shopping is often impractical. The complex, heterogeneous and person-specific dimensions of care provision limit the usefulness of standardized quality ratings for institutions such as hospitals and nursing homes (Price 2016; Mukamel et al. 2016; Konetzka et al. 2015; Austin et al. 2015).

Education, health, and social services all involve extensive third-party payments by government or insurance companies. Bureaucratic regulations impede flexibility. Choices are literally out of reach of many consumers, including young children, the

seriously ill, and those suffering from dementia or other cognitive limitations. Wherever consumer sovereignty is limited, profit-maximization tempts employers to provide low-quality services, encouraging low-wage, high-turnover labor regimes (Deming, Goldin and Katz 2012; Cabin et al. 2014; Barron and West 2017).

Positive social externalities. Divergences between private and social benefits seldom enter discussion of earnings inequality, yet they make it difficult for care providers to directly capture the value they create. Even in the private for-profit sector, care provision contributes to human and social capabilities with positive spillover effects. The present value of care services that contribute to the development of long-run human capabilities is difficult to estimate, much less capture. Imagine doctors or nurses charging patients on the basis of estimated increases in life expectancy, or educators charging students on the basis of estimated increases in lifetime earnings. Such calculations could never be precise, but one recent empirical analysis of teacher quality based on standardized test scores alone found that replacing a teacher in the bottom 5% with one of average quality would increase the present value of students' lifetime income by more than $250,000, far more than any teacher earns in a year (Chetty, Friedman and Rockoff 2014).

In principle, care workers should be rewarded for social, as well as private value added. However, social value is difficult to pin down, and voters are often reluctant to pay for services they are unlikely to personally utilize. Conventional measures of the value created in education and health care are (like measures of public sector output) based only on the cost of purchased inputs (Abraham and Mackie 2005). In theory, the output of education includes the cumulative value of increased lifetime earnings, increased productivity in unpaid family care, and greater contributions to the polity.

Likewise, the output of health care and human services includes the value of improved health and increased life expectancy. Workers' ability to capture a portion of these positive spillovers is quite limited.

Limited inter-industry mobility. Women's family responsibilities and status as secondary earners discourage them from changing jobs (Manning 2003; Webber 2016). The ease with which workers can change jobs affects their bargaining power. Costly professional credentials and industry-specific experience can also limit worker mobility, especially in higher-paid occupations. While occupational licensing can restrict entry in ways that increase occupational rents, it can also work the other way, discouraging inter-industry mobility. Managerial experience may also be industry-specific, for reasons related to cultural norms as well as skill demands.

Hypotheses and Data Analysis

These considerations suggest that the narrowing effect of increases in women's representation in professional and managerial occupations on the gender earnings gap has been counterbalanced by their concentration in care services. Our empirical research builds on previous analysis of occupation-linked pay penalties, focusing on the implications of employment in care services relative to business services. As we will show, employees in these two industry categories are similar in terms of average educational attainment and professional/managerial status, which sharply distinguish them from other industries. Care services are shaped by "duty to care," a normative and legal constraint that is far less binding in business services, with their weaker fiduciary rules. Finally, as aforementioned, previous research suggests that high-level employees in business services are particularly well-positioned to capture a portion of firm-level rents.

Our empirical strategy tests three specific hypotheses with descriptive import.

H1. Regardless of their gender, employees in care services earn significantly less than comparable employees in business services, with women experiencing an industry penalty on top of a gender penalty in earnings.

H2. Interactions between industry and occupation show that both suffer pay penalties, but industry effects are significant even for professionals and managers not in care occupations.

H3. The high level of employed women's concentration in care services helps explain a substantial portion of the gender earnings gap.

Our analysis of Current Population Survey (CPS) data from the 2014-2019 Outgoing Rotation Groups (ORG) shows that the level of median earnings is lower, and the distribution of earnings more compressed, in care services compared to business services. We supplement our multivariate analysis of pay penalties by industry and occupation with longitudinal analysis using fixed effects, controlling for unobserved differences among individuals and revealing less inter-industry mobility among professionals, in particular. A decomposition of the gender earnings gap based on these results estimates the impact of women's concentration in care services.

Methodological Issues. Although specifications used in previous research on "care penalties" vary somewhat, paid care jobs are typically defined as occupations characterized by concern for the well-being of others and personal contact with patients, students, or clients within care service industries (health, education, and social services) that develop human capabilities (England, Budig and Folbre 2002; Budig and Misra

2010; Duffy, Albelda and Hammonds 2013; Hodges, Budig and England 2018). By these criteria, a nurse employed in a health care industry is included, but a nurse in a manufacturing industry is not; managers and others in non-care occupations are not included, regardless of industry.

Type of occupation has received more research attention than type of industry. For example, Barron and West (2013) single out six caring occupations for analysis using British Household Panel Survey data: childcare worker, doctor, nurse, nursing assistant, schoolteacher, and welfare worker. Another approach to the definition of caring jobs ranks all occupations in terms of a care index based on U.S. Department of Labor job descriptions in the O*Net data base (Hirsch and Manzella 2015). Attention to specific occupations is certainly relevant to analysis of the labor process, but the effect of employment in care industries also merits consideration.

Data and Analysis

The Current Population Survey (CPS) is collected monthly by the U.S. Census Bureau and includes a nationally representative sample of roughly 57,000 households each month. We use 2014-2019 data from the Outgoing Rotation Groups (ORG) supplement downloaded from the Integrated Public Use Microdata Series, Current Population Survey (IPUMS-CPS) (Flood et al. 2020). The ORG contains work and income questions pertaining to current employment, administered to CPS households in their fourth and eighth month in the CPS rotation, to civilians aged 15 or older who are currently employed as wage or salaried workers.

We limit our samples to wage and salary workers between the ages of 18 and 64 who were employed full-time, or 35 or more hours per week, and drop workers for whom

wages were imputed in the CPS, following Bollinger and Hirsch (2006).[1] We pool ORG data from the years 2014-2019 to boost sample size. The ORG questions were administered to households twice, separated by one year: we use IPUMS linking variables to match individuals over time, and delete observations with inconsistencies in the panel person-link relating to age and sex. For workers paid by the hour, we measure hourly wages as the reported hourly wage rate. For workers who are not paid by the hour, we divide weekly earnings by the product of usual hours worked per week to calculate hourly wages. Top-coding is not a significant issue for workers paid by the hour: the top-code is $99.99 and very few workers cross this threshold. However, for workers not paid by the hour, the top-code threshold is $2884.61 for weekly earnings, which are then censored at this value (this affects about 5.2% of the 2019 sample). For weekly earnings above the topcode, we apply topcodes (by year and gender) provided in Macpherson and Hirsch (2021, Table 1), based on the assumption that the right tail of the earnings distributions follows a Pareto distribution. For years prior to 2019, nominal wages were converted to 2019 dollars using the CPI-U series from the BLS.

We replicate results from our primary dataset (the ORG) with the Annual Social and Economic Supplement (ASEC), which is administered to all CPS households in the rotation in March of each year, with questions on employment in the previous year. The ASEC has a slightly higher topcode threshold for wages and swaps incomes rather than censoring them at the topcode threshold; it also allows us to control for firm size. We prefer the ORG as our primary dataset as hourly wages in the ASEC must be computed

[1] The CPS-ORG imputation assigns nonrespondents with the wages of a respondent with "similar" attributes. As industry is not a match attribute, including imputed wages attenuates wage comparisons across industries as well as the contribution of differences in representation across industries to gender wage inequality.

from annual earnings and annual hours worked, resulting in noisier estimates; ASEC also has a smaller sample size and does not include information on union membership/ coverage. Results from both datasets are similar.

Information on employment (class of employment, industry, occupation, union status) is based on the worker's job in the previous week. We control for 11 broad occupations according to the 2010 census classification.[2] We prefer broad controls, since many detailed occupations are specific to either care or business services. For instance, about 42 percent of all employment in care services is concentrated in occupations that are unique to this category, in that less than 5 percent of workers in those occupations are outside it. We also control for care work occupations, a subset of professional and service occupations associated with a wage penalty (for a list of these occupations, see Appendix C).

Other covariates include union coverage (taking the value 1 if the worker was either a member of a union or covered by a collective bargaining agreement), gender, potential experience (age minus years of education minus six) and its square, education (6 dummy variables including less than high school as reference category: high school degree, some college, college degree, master's degree, and Ph.D. or professional degree), region, metropolitan residence, marital status, presence of children, and race and ethnicity (4 dummy variables including white, non-Hispanic (reference), black, non-Hispanic, Other, non-Hispanic, and Hispanic).

Industry Groupings

[2] These are: managerial occupations, business and financial operations, professionals, service occupations, sales occupations, office and administrative support, farming, construction, maintenance, production, and transportation occupations.

We first demonstrate the rationale behind our industry groupings. Tables 1 and 2 show the characteristics of workers in the 14 industries defined by Census headings from the U.S. Census Bureau's 2012 Industry Classification.[3] As previously indicated, care services include educational services and health care and social assistance. We define business services as all industries listed under information; finance, insurance, real estate, rental and leasing; professional, scientific, management, administrative, and waste management services; and public administration.[4] The remaining industries are divided into other services and non-services.

Many business and care service workers have a college degree, a graduate degree, or a terminal (professional/doctoral) degree, and they substantially differ from workers in other industries in both respects (See Table 1). Care service workers are mostly women (68% for education, and 78% for healthcare and social assistance). Among the remaining industries, business services constitute a slightly larger share of female employment than other services, while workers in non-services are mostly men.

<Table 1 about here>

The occupational structures of business and care services are also similar (See Table 2). The share of the three top occupations (managers, professionals, and business occupations) ranges between 47% to 84% in each of the detailed industries constituting care and business services; by contrast, it never rises above 32% for other services and non-service industries. Union coverage is about twice as high among workers in care

[3] https://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html

[4] Detailed codes are listed in Appendices A and B. We include public administration under business services because its managerial and professional tasks are similar, and we include a control variable for public employment, which we believe has effects similar to, but also distinct from, employment in care services.

services as in business services (24 percent vs. 12 percent). Workers covered by unions are overwhelmingly in the public sector in both care and business services (See Table S1) and are also more likely to be in care work occupations.

<Table 2 about here>

Taken together, care services and business services constitute more than half of all full-time workers in 2014-2019, and about 66% of full-time female employment. Over the last forty years, both the share of female employment in care services and the share of male employment in business services has grown rapidly with significant declines for both women and men in non-services (see Figure 1).

<Figure 1 about here>

Wage Differences in Care Services and Business Services

Comparison of worker characteristics and wages between care services and business services reveals both similarities and differences. Both sets of workers resemble each other in terms of age, marital status, children, race, and ethnicity, but care workers have higher average levels of education than their counterparts in business services and might therefore be expected to have higher earnings (See Table 3). However, as Figure 2 demonstrates, both men and women in business services earn more than women in care services at every percentile of the hourly wage distribution. This business service premium increases along the wage distribution: women (men) in the 25th percentile in business services have hourly wages that are about 10 (12) percent higher than women (men) in care services at the same percentile; the corresponding differences for women

(men) at the 85th percentile is 20 (27) percent. The male premium rises steadily across each percentile, while the female premium rises primarily at the higher end.[5]

<Figure 2 about here>

These cross-industry differences partly reflect divergent occupational structures. Managers, earning more on average than professionals, represent a larger share of employment in business services, and both managers and professionals in care services earn lower median wages (See Table 4). Managers constitute about 16 percent of employment in business services, but only 9 percent in care services, and earn about 18 percent more, on average, in business services. Professionals in care services earn 26 percent more than in business services. One consequence of these differences is greater pay compression in care services relative to business services. (Workers in care services do not work fewer hours, on average, than those in business services, largely because our sample is restricted to full-time employees; for more details, see Table S5).

As Table 5 shows, inequality at both the bottom half and top half of the wage distribution is greater in business services (wages at the top are measured at the 85th percentile instead of the more conventional 90th percentile measure because of the top-coding problems highlighted earlier). Overall wage inequality (as measured by the ratio of wages at the 85th percentile against wages at the 10th percentile) is about 22 percent higher in business services compared to care services.

<Table 4 about here>
<Table 5 about here>

[5] The ASEC, which has a higher threshold for top-coding (or rather top-swapping) wages, confirms the presence of a business service premium across all wage percentiles, for both women and men (Appendix Figure S1); 1.4% and 0.8% of full-time workers in business services and care services, respectively, have wages that are top-swapped in the ASEC; the figures for men in business services and care services are 2.0% and 2.1%.

Cross-sectional Regressions

We estimate an ordinary least squares regression (OLS) to capture the effect of working in care services on wages, after controlling for occupation and human capital characteristics, based on the following equation:

$$w_i = \beta D_i + \boldsymbol{X}_i'\boldsymbol{\gamma} + \varepsilon_i$$

where the subscript *i* refers to an individual, w_i denotes the natural logarithm of hourly wages, D_i is a dummy for being employed in care services, X_i is a vector of controls which includes broad occupation (11 groups), public sector, union coverage, years of potential experience and its square, education, region, living in a metropolitan area, being married, having a child, gender (interacted with marriage and children), race and ethnicity, and year. ε_i captures the associated error term. We estimate the model using OLS for all full-time workers, and then separately by gender. Specification 1 (in Table 6) reports the coefficient on care services for the entire sample. Employment in care services is associated with 21 log point (19%) reduction in hourly wages overall (relative to employment in business services, which is the reference category), with a 16 log point (15%) reduction for women and a 29 log point (25%) reduction for men.

Specification 2 adds a control for a care work occupation (reference: managers), and Specification 3 aggregates occupations into five broad groups: managers, business and financial occupations, professionals (excluding care work occupations), care work occupations, and other occupations (a residual category), and interacts these occupations with care service employment. Controlling for care work occupations reduces the wage penalty associated with care service employment (to 17 log points (16%) overall, and 14 log points (13%) for women and 22 log points (20%) for men), while care work

occupations are associated with wage reductions of 24 log points (21%) for women and 30 log points (26%) for men (with reference to managerial occupations). Within occupations, the largest penalties associated with care service employment are among managerial, business and financial, and professional occupations, while the penalty among other occupations is smaller (Table 6, specification 3): professionals in care services earn about 30 log points (26%) less compared to professionals in business services, while the corresponding figures for managers and business occupations are 27 log points (24%) and 19 log points (17%), respectively. The wage difference between business services and care services for workers in other occupations is about 14 log points (13%). Estimates from the ASEC (shown in Table S4 in the Online Appendix) are nearly identical.[6]

In order to better assess the effects of unionization, we split the sample into unionized and non-unionized groups. The wage penalty associated with care services is not lower in the unionized group compared to the non-unionized group, but the penalty associated with care occupations is considerably lower in the unionized group (15 compared to 27 log points) (See Table S2).

<Table 6 about here>

Fixed-effects regressions

Wage regressions with individual fixed effects help address the concern that our results are driven by unobserved worker heterogeneity or worker-sorting into industries.

[6] The occupational category of physicians and surgeons (3 percent of care services in our sample) are a likely exception to other care workers, in that they have a greater ability to capture rents; we may also be underestimating their earnings, both because of top coding in the CPS and because their business income is not included in the ORG measure of wages. We address these concerns by replicating our main results in the Online Appendix, a) excluding physicians and surgeons (Tables S7 and S8); and (b) including business income from the ASEC in our measure of hourly earnings (Table S9). Our findings remain robust.

However, job changes that involve switching may be determined in part by wage offers and are therefore endogenous.[7] The following analysis is identical to above but excludes individuals who were observed only once or had inconsistencies in the panel person-link relating to age and gender; we also drop individuals who were not in care services or business services in some period.

Two caveats apply: The average characteristics of switchers suggest that they differ from stayers (Table 7). For example, those switching out of business services into care services earn considerably less, to begin with, than those who stay in business services, are less likely to belong to managerial or business and financial occupations, and are more likely to be in the public sector; women and men switching out of care services and into business services are less likely to have an advanced degree (master's or terminal degree) compared to those who stay, and are also less likely to belong to professional occupations. Workers switching from care services to business services average considerably larger wage increases than workers switching from business services to care services: those switching out of care services experience a 12-13 percent wage increase compared to a 5-6 percent increase among those moving in the reverse direction. Switchers from care services have lower wages than their counterparts in business services but enjoy the largest increase from switching.

<Table 7 about here>

[7] A more technical concern is that identification is based on people who switch industries during a 12-month period, which means that the fixed effects are estimated from a small sample of only about 1,550 women and 700 men. Measurement error (as highlighted in Kambourov and Manovskii 2008) may lead to potentially severe attenuation bias in our estimates of care service employment. Further, top-coding of earnings, noted earlier, is particularly large for male business service workers.

Our estimates in Table 6 suggest that care service employment is associated with larger wage reductions among high-wage occupations such as managers and professionals. However, job mobility among these occupations is somewhat limited. For instance, professionals are underrepresented among switchers compared to stayers, likely due to job specific skills and high returns to occupational tenure. We re-estimate the OLS penalty associated with care service employment (following the specifications in Table 6) separately for industry stayers and industry switchers in the initial period: our results (shown in Table S6 in the Online Appendix) record much smaller care service penalties among the switchers in contrast to stayers.

Table 8 shows our estimates of the following log wage regression controlling for individual fixed effects:

$$w_i = \beta D_i + \alpha_i + \boldsymbol{X}_i{}'\boldsymbol{\gamma} + \varepsilon_i$$

where D_i is a dummy for being employed in care services, α_i is the individual fixed effect, and X_i includes controls such as occupation, union coverage, public sector employment, marital status and children (interacted with gender), and time trends (interacted with education and potential experience). Our estimates suggest that care service employment is associated with a 3 log point (3%) reduction in wages. While the estimates for within-occupation regressions are noisy, they suggest larger wage penalties associated with care service employment among managerial occupations (a 5 log point (5%) reduction in wages) and, among men, professional occupations (a 5 log point (5%) reduction in wages).

<Table 8 about here>

While these cross-sectional and fixed effects estimates provide no causal evidence, they reveal disadvantages for workers in care services relative to business services, with implications for the overall gender wage gap.

Care Service Employment and the Gender Wage Gap

We decompose the gender wage gap, defined as the average difference in male and female log hourly wages (Δ_w), as follows

$$\Delta_w = \left[\overline{\boldsymbol{X}}_f - \overline{\boldsymbol{X}}_m\right]' \boldsymbol{\gamma}^* + \overline{\boldsymbol{X}}_f' [\boldsymbol{\gamma}_f - \boldsymbol{\gamma}^*] + \overline{\boldsymbol{X}}_m' [\boldsymbol{\gamma}^* - \boldsymbol{\gamma}_m]$$

where Δ_w denotes the average difference in female and male daily wages, *f* and *m* denote female and male workers respectively, $\overline{\boldsymbol{X}_i}$ denotes the vector of mean characteristics – including care service employment of workers of gender i, $\boldsymbol{\gamma}_i$ the coefficient vector associated with $\boldsymbol{X}_i$, and $\boldsymbol{\gamma}^*$ is the vector of OLS coefficients from the pooled regression that includes both women and men. The first term on the right-hand side represents the "explained" or "composition" effect, while the last two terms represent the "unexplained" or "wage structure" effects. As we focus on the effect of differences in representation across sectors on the overall gender pay gap, we do not perform a detailed decomposition of the latter. We also group most of the variables to facilitate interpretation: broad occupations, a care work occupation dummy, six education categories, dummy variables for marriage and children, race, Hispanic ethnicity, region and year.

The total gender gap in log hourly wages among full-time workers in business services and care services is 26 log points (Table 9). Of this, 11 log points (or 42% of the difference) can be attributed to compositional differences in observed characteristics (when weighted by coefficients from the pooled regression). Care service employment is higher among women than among men (59% among women versus 29% among men):

this overrepresentation of women in care services – combined with the wage penalty associated with care service employment seen in Table 5 – contributes to a sizeable portion of the mean gender wage gap: 5 log points, or about 19% of the total difference in hourly wages. Occupation contributes 2 log points to the mean gender wage gap, or about 8% of the total difference. Our results support earlier findings that occupation and industry are main drivers of the gender wage gap (Blau and Kahn 2017).

<Table 9 about here>

Limitations. These results do not establish a causal relationship between the features of care services and lower pay. The cross-sectional estimates of earnings omit some important variables including unobservable worker preferences, years of on-the-job experience, and employer contributions to health insurance and pensions; the fixed effects estimates also suffer from measurement and endogeneity limitations. Other factors, such as market power or prevalence of sub-contracting, could also account for the differences we observe.

A more serious limitation of our comparative analysis is its reliance on a novel definition of two subsectors of the larger service sector, care services and business services. The heterogeneity of standard industrial codes means that all such aggregative exercises create somewhat arbitrary boundaries. Our analysis demonstrates the potential value of disaggregating the service sector and invites further efforts to specify its sub-categories.

Conclusion

Limited consumer sovereignty, incomplete information regarding quality, and large positive externalities likely reduce the average ability of care service employees to

capture value-added or extract economic rents relative to business service employees. The marginal social products of care services almost certainly exceed the revenues they generate. Our cross-section and fixed effects estimates of data from the Current Population Survey support the hypothesis that employment in care services is associated with lower earnings for both women and men compared to business services. The decomposition exercise based on these estimates verifies that women's concentration in care services contributes significantly to the gender earnings gap.

Our results also illustrate the interaction between working in a care service industry (related to the type of services provided) and working in a care occupation (related to personal preferences, credentials, and occupational bargaining power). Analysis of interactions shows that industry effects can exacerbate occupation effects but also exert an independent influence. High wages for specialty physicians and others with occupational bargaining power are counterbalanced by the relatively low earnings of lower-level managers and professionals who play an important role in the delivery of care services.

This analysis points to the possible benefits of sectoral/industrial bargaining policies. Moving more women into business services would reduce the gender pay gap, but not necessarily reduce care services wage penalties, which affect men as well as women. In New Zealand, strategic community-union coalitions around issues of pay equity won significant, publicly funded wage increases for frontline elder care workers in 2017 (Charlesworth and Heap 2020). In the U.S., the Biden administration's Build Back Better plan proposed administrative wage increases for many childcare and eldercare employees. Despite occupational differences, workers in health, education, and social

services are all engaged in processes that require effective collaboration with those they care for. Both care providers and care recipients could gain from the development of political alliances that could bargain more effectively for “high-road” employment strategies.

Tables and Figures

Table 1. Gender and Education of Workers by Detailed Industry.

Industry	Share of total employ-ment	*Percent*			
		Female	At least college degree	At least a graduate degree	Professional/ doctoral degree
Business Services	0.27	0.44	0.54	0.18	0.05
Information	0.02	0.37	0.57	0.16	0.02
Finance, insurance, real estate, rental leasing	0.07	0.54	0.53	0.13	0.02
Professional, scientific, management, and administrative, and waste management services	0.12	0.40	0.55	0.20	0.06
Public administration	0.06	0.44	0.52	0.20	0.06
Care Services	0.24	0.73	0.58	0.30	0.08
Educational services	0.10	0.68	0.77	0.46	0.09
Health care and social assistance	0.14	0.78	0.45	0.18	0.07
Other Services	0.27	0.39	0.24	0.05	0.01
Wholesale trade	0.03	0.29	0.32	0.06	0.01
Retail trade	0.09	0.43	0.23	0.04	0.01
Transportation, warehousing and utilities	0.06	0.23	0.23	0.05	0.01
Arts, entertainment, recreation, accommodation and food services	0.07	0.46	0.21	0.03	0.00
Other services	0.03	0.43	0.32	0.12	0.02
Non-service Industries	0.23	0.21	0.25	0.07	0.01
Agriculture, forestry, fishing, hunting and mining	0.02	0.18	0.19	0.05	0.01
Construction	0.06	0.09	0.14	0.02	0.00
Manufacturing	0.13	0.28	0.30	0.09	0.02

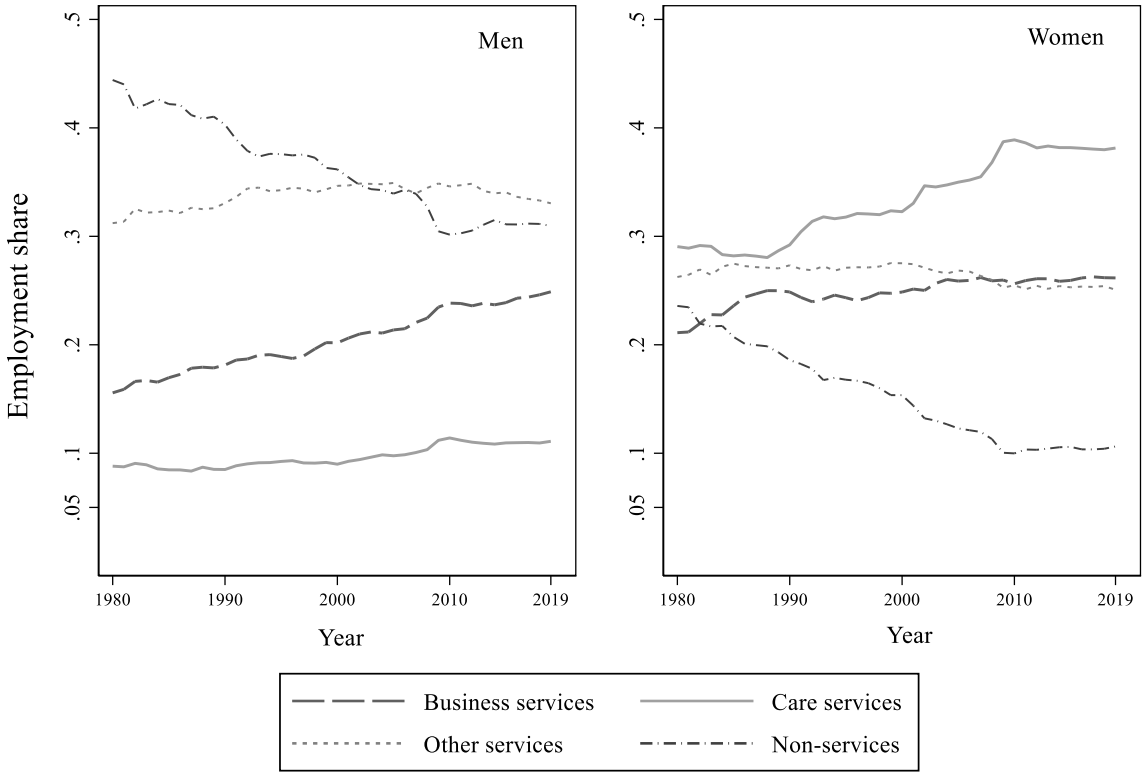
Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). Includes all wage and salary workers, ages 18-64; excludes part-time (usual hours worked per week less than 35 hours) and allocated or missing wages (N= 468,255).

Table 2. Other Characteristics of Workers and Firms by Detailed Industry.

Industry	*Percent*				
	Managers	Business occupations	Professionals	Public	Union coverage
Business Services	0.16	0.13	0.27	0.24	0.12
Information	0.17	0.05	0.39	0.05	0.12
Finance, insurance, real estate, rental and leasing	0.22	0.23	0.11	0.03	0.03
Professional, scientific, and management, and administrative, and waste management services	0.15	0.11	0.35	0.03	0.04
Public administration	0.11	0.09	0.27	1.00	0.38
Care Services	0.09	0.02	0.58	0.35	0.24
Educational services	0.10	0.02	0.70	0.70	0.41
Health care and social assistance	0.09	0.02	0.49	0.10	0.11
Other Services	0.10	0.03	0.07	0.04	0.09
Wholesale trade	0.10	0.05	0.05	0.00	0.05
Retail trade	0.05	0.03	0.07	0.00	0.06
Transportation, warehousing and utilities	0.09	0.03	0.06	0.19	0.28
Arts, entertainment, recreation, accommodation and food services	0.17	0.02	0.04	0.04	0.06
Other services	0.11	0.04	0.17	0.01	0.05
Non-service Industries	0.12	0.04	0.12	0.03	0.13
Agriculture, forestry, fishing, hunting and mining	0.11	0.03	0.09	0.03	0.04
Construction	0.12	0.02	0.03	0.05	0.18
Manufacturing	0.12	0.04	0.16	0.01	0.11

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). Includes all wage and salary workers, ages 18-64; excludes part-time (usual hours worked per week less than 35 hours) and allocated or missing wages (N= 468,255). Data on firm size is obtained from the 2014-2019 ASEC following the same restrictions and variable definitions (N=261,683).

Figure 1. Employment Trends, 1980-2019.



Notes: Data are from CPS 1980-2019. Full-time wage and salary workers between the ages of 18 and 64 included. Industry categories are modified so as to use harmonized 1990 census industry codes.

Table 3. Characteristics of Workers in Business Services and Care Services.

Characteristics	Business Services		Care Services	
	Women	Men	Women	Men
Share of employment	0.41	0.71	0.59	0.29
Age	41.3	40.7	41.6	41.7
Education				
Less than high school	0.02	0.04	0.02	0.02
High school degree	0.17	0.16	0.14	0.12
Some college	0.29	0.24	0.28	0.20
College degree	0.35	0.37	0.29	0.28
Master's degree	0.12	0.14	0.22	0.23
PhD/Professional degree	0.04	0.05	0.05	0.15
Family	0.53	0.63	0.58	0.64
Married				
Children	0.48	0.48	0.53	0.48
Race and ethnicity				
White, not Hispanic	0.65	0.67	0.67	0.67
Black, not Hispanic	0.12	0.09	0.13	0.12
Other, not Hispanic	0.09	0.10	0.07	0.10
Hispanic	0.13	0.15	0.13	0.12
N	58045	68863	84078	29499

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). Restricted to workers in business services or care services.

*Figure 2***.** Percent Difference in Hourly Wages Between Business Services and Care services, by Wage Percentile.

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). All wage and salary workers, ages 18-64; excludes part-time (usual hours worked per week less than 35 hours) and allocated or missing wages. Top-coding affects men and women differently, by industry. About 2% of all full-time workers in care services have their wages top-coded, compared to 5% among workers in business services. This discrepancy is even greater for male workers: 11% of men in business services have top-coded weekly earnings compared to only 7% in care services. For male workers in business services, measure of percentile wages for the 89th and 90th percentile are therefore not reliable: for this reason, the graph terminates for male workers at the 88th percentile, and for female workers at the 91st percentile.

Table 4. Employment and Median Wages, by Occupation.

Occupations and Earnings	Business Services	Care Services
Percent comprised of:		
Managers	16%	9%
Business and financial occupations	13%	2%
Professionals	27%	58%
Other occupations	44%	30%
Median hourly wages (2019 dollars)		
Managers	38	31
Business and financial occupations	30	26
Professionals	35	26
Other occupations	19	15

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG).

Table 5. Hourly Wages at the 10th, 50th, and 85th Percentiles by Type of Industry.

Industry/Gender	Wages (2019 dollars)			Wage ratios	
	P10	P50	P85	P50/P10	P85/P50
Business Services	13	27	53	2.08	1.97
Women	13	24	45	1.89	1.91
Men	13	30	60	2.28	2.00
Care Services	12	22	40	1.91	1.82
Women	11	21	38	1.88	1.79
Men	13	25	47	2.00	1.88

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG).

Table 6. Estimated Effects of Employment in Care Services on Log Hourly Wages.

Key Variables	All	Women	Men
Specification 1			
Care services	-0.21***	-0.16***	-0.29***
	(0.00)	(0.00)	(0.00)
Specification 2			
Care services	-0.17***	-0.14***	-0.22***
	(0.00)	(0.00)	(0.01)
Care work occupations	-0.26***	-0.24***	-0.30***
	(0.00)	(0.01)	(0.01)
Specification 3			
Business and financial occupations	-0.16***	-0.14***	-0.17***
	(0.01)	(0.01)	(0.01)
Professional occupations	-0.11***	-0.11***	-0.12***
	(0.01)	(0.01)	(0.01)
Care work occupations	-0.37***	-0.34***	-0.40***
	(0.01)	(0.01)	(0.02)
Other occupations	-0.39***	-0.36***	-0.41***
	(0.00)	(0.01)	(0.01)
Care services*Managers	-0.27***	-0.22***	-0.31***
	(0.01)	(0.01)	(0.01)
Care services*Business and financial occupations	-0.19***	-0.16***	-0.24***
	(0.01)	(0.01)	(0.02)
Care services*Professionals	-0.30***	-0.26***	-0.33***
	(0.01)	(0.01)	(0.01)
Care services*Care work occupations	-0.08***	-0.07***	-0.13***
	(0.01)	(0.01)	(0.02)
Care services*Other occupations	-0.14***	-0.12***	-0.17***
	(0.00)	(0.01)	(0.01)
Observations	240485	142123	98362

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). *Note*: Specification 1 regresses log hourly wages on a dummy for care service employment controlling for broad occupation (11 groups), union coverage, public sector, education, potential experience and its square, marital status, children, gender (interacted with marital status and children), race and ethnicity (4 groups), region (4 groups), metro area, and year. Specification 2 adds a control for care work occupation (reference: managerial occupations). Specification 3 interacts care service employment with 5 broad occupations: managers, business and financial occupations, professionals (excluding care work occupations), care work occupations, and other occupations, and reports the coefficients for each group (reference: managers in business services). Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 7. Characteristics of Industry Stayers and Switchers, by Industry and Gender.

Characteristics	Women				Men			
	Stayer		Switcher		Stayer		Switcher	
	BS	CS	BS	CS	BS	CS	BS	CS
Hourly wages (2019 dollars)	33.35	26.95	27.66	26.76	45.88	35.52	36.82	33.29
Percent change in hourly wages	0.07	0.07	0.05	0.12	0.09	0.06	0.06	0.13
Occupation								
Managers	0.18	0.09	0.13	0.11	0.18	0.13	0.18	0.16
Business and financial occupations	0.17	0.02	0.08	0.06	0.12	0.02	0.06	0.07
Professional occupations	0.25	0.61	0.35	0.45	0.32	0.60	0.36	0.51
Other occupations	0.40	0.28	0.43	0.38	0.39	0.25	0.41	0.26
Member of/covered by union	0.10	0.27	0.16	0.18	0.15	0.29	0.18	0.19
Public sector	0.27	0.37	0.47	0.38	0.27	0.45	0.42	0.34
Years of experience	22.02	21.47	21.53	20.53	20.97	21.35	21.51	20.23
Education								
Less than high school	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01
High school degree	0.17	0.13	0.15	0.15	0.13	0.12	0.15	0.12
Some college	0.28	0.25	0.27	0.30	0.23	0.18	0.25	0.19
College degree	0.35	0.29	0.33	0.33	0.39	0.27	0.32	0.37
Master's degree	0.13	0.25	0.19	0.16	0.16	0.26	0.18	0.20
Professional degree/doctorate	0.05	0.06	0.04	0.05	0.05	0.16	0.09	0.10
Family								
Married	0.58	0.64	0.60	0.52	0.70	0.71	0.66	0.64
Children	0.50	0.57	0.52	0.54	0.54	0.53	0.52	0.48
Race and ethnicity								
White, not Hispanic	0.70	0.71	0.64	0.61	0.71	0.70	0.56	0.65
Black, not Hispanic	0.10	0.11	0.15	0.17	0.07	0.09	0.16	0.10
Other, not Hispanic	0.09	0.06	0.07	0.08	0.10	0.09	0.10	0.10
Hispanic	0.11	0.11	0.14	0.15	0.13	0.11	0.18	0.14
Region								
Northeast	0.17	0.20	0.19	0.17	0.19	0.21	0.21	0.19
Midwest	0.23	0.25	0.22	0.21	0.20	0.24	0.17	0.23
South	0.36	0.35	0.35	0.37	0.35	0.31	0.33	0.33
West	0.24	0.20	0.25	0.25	0.26	0.24	0.29	0.25
Metropolitan area	0.92	0.87	0.90	0.90	0.94	0.90	0.95	0.95
Observations	11014	17007	754	798	13082	6074	357	366

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). All sample means, other than the change in hourly wages, are computed from the first period of observation.

Table 8. Estimated Effects of Care Services on Log Hourly Wages, with Individual Fixed Effects.

Key variables	All	Women	Men
Specification 1			
Care services	-0.03***	-0.03***	-0.03**
	(0.01)	(0.01)	(0.01)
Specification 2			
Care services	-0.03***	-0.03***	-0.03**
	(0.01)	(0.01)	(0.01)
Care work occupations	-0.02***	-0.02	-0.05**
	(0.01)	(0.01)	(0.01)
Specification 3			
Business and financial occupations	-0.02**	-0.01	-0.04**
	(0.01)	(0.01)	(0.01)
Professional occupations	-0.03**	-0.01	-0.04**
	(0.01)	(0.01)	(0.01)
Care work occupations	-0.04**	-0.02	-0.07**
	(0.01)	(0.02)	(0.02)
Other occupations	-0.03***	-0.01	-0.04***
	(0.01)	(0.01)	(0.01)
Care services*Managers	-0.05***	-0.04**	-0.05**
	(0.01)	(0.02)	(0.02)
Care services*Business and financial occupations	-0.03	-0.05**	0.04
	(0.02)	(0.02)	(0.03)
Care services*Professionals	-0.03**	-0.02	-0.05**
	(0.01)	(0.02)	(0.02)
Care services*Care work occupations	-0.02*	-0.03*	-0.02
	(0.01)	(0.01)	(0.03)
Care services*Other occupations	-0.03***	-0.03**	-0.03
	(0.01)	(0.01)	(0.02)
Observations	98904	59146	39758

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). Specification 1 regresses log hourly wages on a dummy for care service employment controlling for broad occupation (11 groups), union coverage, public sector employment, marital status and children (interacted with gender), and year and individual fixed effects. Specification 2 adds a control for care work occupation (reference: managerial occupations). Specification 3 interacts care service employment with 5 broad occupations: managers, business and financial occupations, professionals (excluding care work occupations), care work occupations, and other occupations, and reports the coefficients for each group (reference: managers in business). Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 9. Oaxaca-Blinder Decomposition of the Gender Gap in Log Hourly Wages.

Key variables	Log hourly wages		Percent contribution to male-female difference
	Contribution	Standard error	
Overall			
Men	3.39***	(0.00)	
Women	3.13***	(0.00)	
Difference	0.26***	(0.00)	100%
Explained	0.11***	(0.00)	42%
Care service employment	0.05***	(0.00)	19%
Occupation	0.03***	(0.00)	8%
Union coverage	-0.00***	(0.00)	0%
Public sector	0.00***	(0.00)	0%
Education	0.02***	(0.00)	8%
Potential experience	-0.00	(0.00)	0%
Marriage and children	0.00***	(0.00)	0%
Race and ethnicity	0.00***	(0.00)	0%
Region and year	0.01***	(0.00)	4%
Unexplained	0.15***	(0.00)	58%
N	240485		

Notes: Data are from the 2014-2019 CPS Outgoing Rotation Groups (ORG). Controls include broad occupation, union coverage, public sector, education, potential experience and its square, marital status, children, race and ethnicity, region, metro area, and year. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

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Appendix A. Care Services Industries (Current Population Survey Codes)

7860	Elementary and secondary schools
7870	Colleges and universities
7880	Business, technical, trade schools
7890	Other schools, instruction, educational services
7970	Offices of physicians
7980	Offices of dentists
7990	Offices of chiropractors
8070	Offices of optometrists
8080	Offices of other health practitioners
8090	Outpatient care centers
8170	Home health care services
8180	Other health care services
8190	Hospitals
8270	Nursing care facilities
8290	Residential care facilities, without nursing
8370	Individual and family services
8380	Community food and housing, and emergency
8390	Vocational rehab services
8470	Child day care services

Appendix B. Business Services Industries (Current Population Survey Codes)

6470	Newspaper publishers
6480	Publishing, except newspapers and software
6490	Software publishing
6570	Motion pictures and video industries
6590	Sound recording industries
6670	Radio and television broadcasting and cable
6672	Internet Publishing and Broadcasting
6680	Wired telecommunications carriers
6690	Other telecommunications services
6695	Data processing, hosting, and related services
6770	Libraries and archives
6780	Other information services
6870	Banking and related activities
6880	Savings institutions, including credit unions
6890	Non-depository credit and related activities

6970 Securities, commodities, funds, trusts, and other financial investments
6990 Insurance carriers and related activities
7070 Real estate
7080 Automotive equipment rental and leasing
7170 Video tape and disk rental
7180 Other consumer goods rental
7190 Commercial, industrial, and other intangible assets rental and leasing
7270 Legal services
7280 Accounting, tax preparation, bookkeeping, and payroll services
7290 Architectural, engineering, and related services
7370 Specialized design services
7380 Computer systems design and related services
7390 Management, scientific, and technical consulting services
7460 Scientific research and development services
7470 Advertising and related services
7480 Veterinary services
7490 Other professional, scientific, and technical services
7570 Management of companies and enterprises
7580 Employment services
7590 Business support services
7670 Travel arrangements and reservation services
7680 Investigation and security services
7690 Services to buildings and dwellings
7770 Landscaping services
7780 Other administrative and other support services
7790 Waste management and remediation services
9370 Executive offices and legislative bodies
9380 Public finance activities
9390 Other general government and support
9470 Justice, public order, and safety activities
9480 Administration of human resource programs
9490 Administration of environmental quality and housing programs
9570 Administration of economic programs and space research
9590 National security and international affairs

Appendix C. Care Occupations (Current Population Survey Codes)

1820	Psychologists
2000	Counselors
2010	Social workers
2025	Miscellaneous community and social service specialists
2040	Clergy
2050	Directors, religious activities and education
2060	Religious workers, all other
2200	Post secondary teachers
2300	Preschool and kindergarten teachers
2310	Elementary and middle school teachers
2320	Secondary school teachers
2330	Special education teachers
2340	Other teachers and instructors
2550	Other teachers and instructors
2540	Teacher assistants
3000	Chiropractors
3010	Dentists
3030	Dietitians and nutritionists
3040	Optometrists
3050	Pharmacists
3060	Physicians and surgeons
3110	Physician assistants
3120	Podiatrists
3140	Audiologists
3150	Occupational therapists
3160	Physical therapists
3200	Radiation therapists
3210	Recreational therapists
3220	Respiratory therapists
3230	Speech language pathologists
3245	Therapists, all other
3255	Registered nurses
3256	Nurse anesthetists
3257	Nurse midwife
3258	Nurse practitioner
3310	Dental hygienists
3320	Diagnostic related technologists and technicians

3400 Emergency medical technicians and paramedics
3240 Health practitioner support technologists and technicians
3500 Licensed practical and licensed vocational nurses
3520 Opticians, dispensing
3535 Miscellaneous health technologists and technicians
3540 Other health care practitioners and technical occupations
3600 Nursing, psychiatric and home health aides
3620 Occupational therapist assistants and aides
3620 Physical therapist assistants and aides
3630 Massage therapists
3640 Dental assistants
3645 Medical assistants
3647 Pharmacy aides
3649 Phlebotomists
3655 Miscellaneous health care support, including medical equipment preparers
4600 Childcare workers
4610 Personal and home care aides
4620 Recreation and fitness workers
4640 Residential advisors
4650 Personal care and service workers, all other