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# Gender Disparities in Employment and Aggregate Profitability in the United States

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**ABSTRACT**

We explore the relationships between aggregate profitability and women's growing share of market work in the United States during the 1980s and 1990s. Using decomposition analysis and counterfactuals, we investigate whether the contribution of the declining wage share to the upswing in profitability was aided by the growing incorporation of women into the workforce. Results show that women helped to moderate the decline in the aggregate wage share. The counterfactuals suggest that the reduction in gender pay disparity overwhelmed the negative effect of women's growing share of market work on the wage share. The decline in the wage share was driven primarily by distributional changes within the sectors rather than by changes in the composition of value added. In sectors where wage shares fell, however, women did not restrain the fall, indicating that the aggregate outcome was the net result of distinct sectoral trends in women's employment.

**Keywords:** Feminization; Gender Inequality; Functional Distribution; Profitability
**JEL Classifications:** B51, B54, J16, E25

## INTRODUCTION

Gender relations can play a constitutive role in determining the key variables influencing the pace and rhythm of capitalist accumulation. Feminist economists have long recognized the effects of competition between male and female workers on the average level of wages: "Capitalists have indeed used women as unskilled, underpaid labor to undercut male workers, yet this is only a case of the chickens coming home to roost—a case of men's cooptation by and support for patriarchal society, with its hierarchy among men, being turned back on themselves with a vengeance" (Hartmann 1979). However, the effects of such competition on the functional distribution of income or how the accumulation process itself may set the limits to such competition are questions that have not been given sufficient attention. Macrodynamic models that take gender relations explicitly into account are of recent vintage, but they suggest that secular feminization of market work might boost profitability and growth in high-income countries (e.g., Erturk and Çağatay 1995; Erturk and Darity 2000).

A significant strand of the empirical work on the overall dynamics of accumulation in advanced capitalist nations focuses on dissecting the trends in aggregate profitability (Duménil and Lévy 1992; Brenner 1998; Zacharias 2002). However, most of the empirical work on developed capitalist nations does not address the potential effects of gender disparity in pay or the growing feminization of employment on aggregate profitability. Our main purpose is to make a modest attempt to tackle this much-neglected question in the context of the upward swing in profitability in the United States during the 1980s and 1990s.

Recent work has analyzed the contribution of different factors to the rise in the profitability. For example, Edward Wolff (2003) has suggested that the shift in power relations in favor of the capitalist class and structural change as reflected in the growing share of labor intensive sectors in total employment were the main factors behind the profits boom. Duménil and Lévy (2002) also found evidence supporting the existence of the upswing in profitability utilizing a variety of measures of profitability and assessed the relative importance of technological change and distributional shifts. We begin by briefly recapitulating this familiar ground and showing by means of decomposition

analysis that the profits boom was underwritten to a substantial degree by a shift in the functional distribution of national income in favor of capital.

We then turn to examine how the changing functional distribution of income was shaped by the increased integration of women into paid employment at both the aggregate and sectoral levels. Recent work by Kade Finoff and Arjun Jayadev (2006) finds a strong negative correlation between the feminization of the labor force and the labor share of national income in the OECD countries between 1975 and 2000. However, our work differs from their work in two significant ways. First, rather than regression analysis, we use a decomposition methodology to separate the effects of the trends in women's employment and wages on the labor share and, in turn, on the general rate of profits. Second, we disaggregate the economy into seven sectors and examine the influence of structural change and distributional shifts within sectors on the movement of the aggregate wage share.

By its very nature, decomposition analysis of the type conducted in this paper (and in other studies of aggregate profitability cited earlier) is descriptive. It does not allow for any direct inference about the causal mechanisms that might have generated the observed outcome. However, the decomposition analysis can shed light on the factual implications of a causal mechanism. Consider, for purely illustrative purposes, a potential casual explanation of the rising profitability of the manufacturing sector sketched as follows. The bargaining power of labor was weakened as a result of the threat of foreign competition; consequently, manufacturing workers could not secure wage gains that kept pace with productivity gains, leading to an increase in the profit-wage ratio of the manufacturing sector. In turn, the rise in the profit-wage ratio contributed to the rising profitability. Now, a decomposition of the manufacturing profit rate can only provide a clue as to whether the last step of the causal story (i.e., its observable implication about the effect of a rising profit-wage ratio on the profit rate) was borne out by the data. It cannot tell us about the validity of the postulated causal mechanism (i.e., foreign competition weakening the bargaining power of labor).[1]

[1] While the empirical validity of the observable implication of a causal mechanism is not the sole criterion by which a theoretical hypothesis is judged in normal scientific practice, it is definitely an important consideration. Regression models are also open to similar caveats regarding causality.

The focus of the present paper is on the effect of feminization on profitability. Using a classical model of prices of production, it is trivial to show that the comparative static effect of a rising share of lower-paid workers in total employment would be an increase in the long-run profit rate because of its direct effect on lowering the average wage.[2] As already noted above, recent macrodynamic models that explicitly incorporate gender relations have also arrived at a similar conclusion. Decomposition analysis can provide some indication regarding the operation of these effects in the profits boom of the 1980s and 1990s.

## TRENDS IN PROFITABILITY

The economy-wide average profit rate, measured empirically as the ratio of profits to the value of capital stock, is a concise measure that combines information on the functional distribution of national income and technology:

$$\begin{aligned} r &= \frac{Y - W}{K} \\ &= (1-\omega)\left(\frac{Y_r}{K_r}\right)\left(\frac{p_y}{p_k}\right), \end{aligned} \tag{1}$$

where $Y$ is the amount of value-added, $W$ is the wage bill, and $K$ is the value of capital stock (all magnitudes are measured on a nominal, per annum basis, with the exception of the capital stock that reflects year-end values). The profit rate varies inversely with the ratio of the wage bill to value-added or wage share ($\omega$). On the other hand, it varies positively with the real output-capital ratio and the ratio of the price index of net output to the price index of capital stock. The first term in the second line of Equation (1) reflects the functional distribution of income, while the second is a joint indicator of the technology in use and the rate of capacity utilization. Typically, historical accounts of capitalist dynamics in the classical/Marxian tradition treat technology and distribution as

[2] The lower average wage could also have indirect effects on the rate of profit via changes in the methods of production employed and relative prices. These indirect effects of the growth in female labor supply, though worthy of study, are probably much harder to quantify than the direct effect on the average wage.

the fundamental variables that determine the long-run trajectory of the profit rate, with the full recognition that the variables in question have reciprocal relations with one another (Duménil and Lévy 1990).[3]

There have been recurrent debates about "the" appropriate empirical measure of profit rate (Mueller 1990; Shaikh 1999). In our analysis we employed two of the most widely used measures—gross and net profit rates. Both had the same measure of capital stock—current-cost, net stock of fixed capital. The difference between the two is in the measure of profits: gross profits are the difference between the GDP and employee compensation of private industries and net profits exclude depreciation and indirect taxes (net of subsidies) from gross profits. The results of our analysis were pretty much the same for both measures; therefore we report only the results based on gross profit rates.[4]

Average gross profit rate in the U.S. private sector during the period 1947–2005 is shown in Figure 1. The data suggest that there were two distinct periods of sustained growth in profitability (defined here as a prolonged period of stable or rising annual profit rates). The first phase, occurring toward the end of the so-called "golden age" of U.S. capitalism, lasted from the trough of 1958 to the peak of 1966. The second phase, starting from the depression-like conditions of the early 1980s, lasted from 1982 to 1997.[5] Since 1997, the profit rate has not displayed any sustained movement in either direction.

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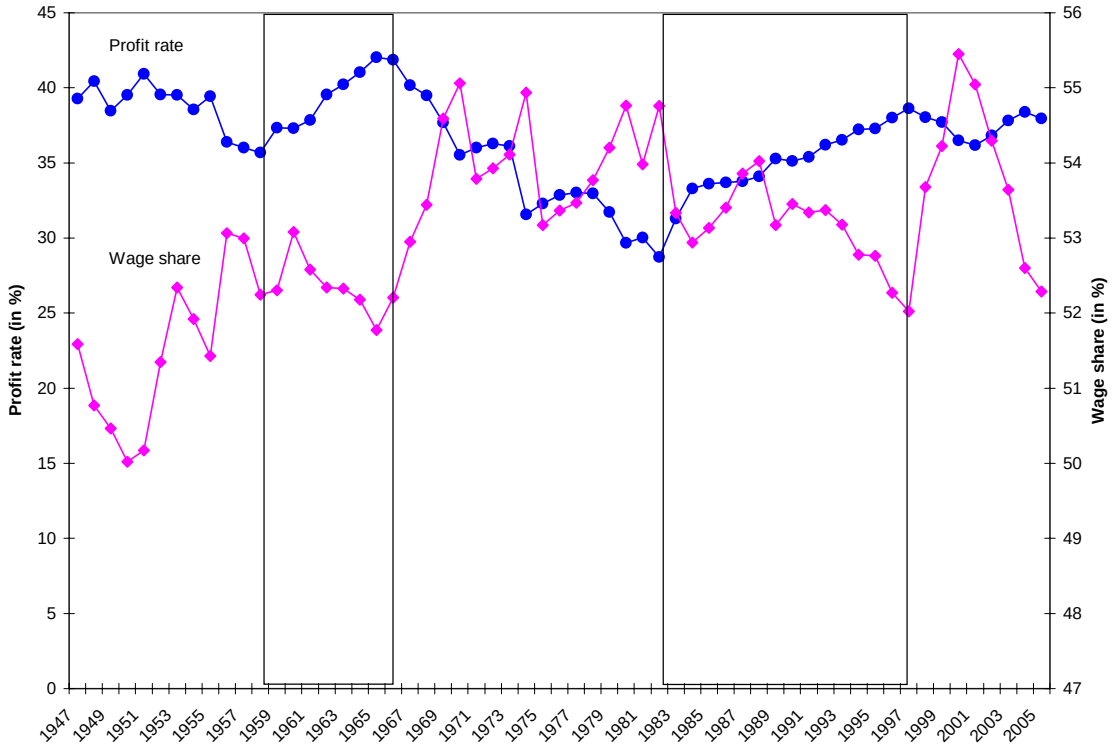
[3] The rate of capacity utilization is considered in this tradition as the main determinant of the cyclical fluctuations in the profit rate (Shaikh 1999).

[4] The data on value-added and employee compensation was taken from the "industry" section of the website of the Bureau of Economic Analysis (BEA), U.S. Department of Commerce (http://www.bea.gov/industry/index.htm). Gross value-added in private industries is the "gross product originating" definition of the BEA. The data on capital stock was downloaded from the "fixed assets" section by the BEA website (http://www.bea.gov/national/FA2004/index.asp). Capital stock refers to "the current-cost net stock of private nonresidential fixed assets" definition by the BEA.

[5] The periodization of the upswings in the profit rate was performed by examining the smoothed profit rate series (the smoothing was done using the standard Hodrick-Prescott filter). Visual inspection of the filtered series suggested that a sustained upward movement in the profit rate begins from the first year of the chosen period and ends in the last year of the period. For example, 1982 is the year from which the filtered profit rate in every year is higher than the profit rate of the previous year and 1997 is the last year for which this observation is true. Since the latter period (1982–1997) is the focus of this paper, we also conducted a Chow test to examine whether the two chosen years could be considered as breakpoints in the profit rate series stretching from 1947 to 2002. The results of the Chow test confirmed the results from the visual inspection. The *F*-values for 1982 and 1997 were, respectively, 34.38 (0.0001) and 6.38 (0.003) (numbers in parentheses indicate the p-values). Our periodization also generally accords with what followed in similar studies cited in the paper (Wolff 2003; Dumenil and Levy 2002).

**Figure 1. Gross Profit Rate (left scale) and the Wage Share (right scale), 1947–2005 (in percent)**




Utilizing the standard decomposition technique (e.g., Wolff 2003) we can resolve the change in the profit rate between any two years into the contributions made by the profit share ($\pi \equiv 1-\omega$), real output-capital ratio, and the ratio of the price index of output to that of capital stock.[6] The results from the decomposition analysis indicate that the main driving factor behind the rise in profitability in both periods was the rising real output-capital ratio (Table 1).[7] However, a stark difference between the two periods emerges once we examine the behavior of the profit share. During the "golden age" its

[6] Consider the equation $x = yz$. The standard decomposition resolves the change in $x$ between two periods (say 0 and 1) into the weighted sum of changes in the right-hand side variables according to the following equation: $x^1 - x^0 = \overline{z}(y^1 - y^0) + \overline{y}(z^1 - z^0)$, where the bar over a variable indicates that it is the average of the values corresponding to the two periods.

[7] The BEA does not publish a series for the price deflator of net capital stock. We derived an implicit deflator by converting the current dollar series into a chained-dollar series using the quantity index for net capital stock (available from the BEA, Table 4.2) and then calculating the ratio of the current dollar series to the chained-dollar series. Such a procedure is justified because the percent change in the chained-dollar values will be identical to the percent change in the quantity index. The chain-type price index of value-added was taken from the "industry" section of the website of the Bureau of Economic Analysis (BEA), U.S. Department of Commerce (http://www.bea.gov/industry/index.htm).

contribution to the 6.17 percentage point increase in the gross profit rate was a mere 0.03 percentage point (less than one percent of the total increase in the profit rate). In contrast, its contribution to the increase of 9.92 percentage points in the gross profit rate during the recent phase of rising profitability—the "leaden age"— was a substantial 1.97 percentage points (about 20 percent of the total increase in the profit rate).

**Table 1. Decomposition of the Change in Gross Profit Rate (in percentage points)**

| | **"Golden Age" 1958–1966** | **"Leaden Age" 1982–1997** |
|---|---|---|
| Actual change in gross profit rate | 6.17 | 9.92 |
| Contribution of: | | |
| Change in profit share ($\pi \equiv 1-\omega$) | 0.03 | 1.97 |
| Change in real output-capital ratio ($Y_r/K_r$) | 5.80 | 5.39 |
| Change in relative price of output ($p_y/p_k$) | 0.34 | 2.56 |

The accounting separation made between the profit share and output-capital ratio in the decomposition analysis does not imply a causal separation. In fact, they may reflect two interrelated aspects of the same underlying process: a rise in profitability may take place because growth occurs predominantly in labor-intensive activities (which generally have lower output-capital ratios) characterized by labor relations weighed heavily in favor of capital (larger shares of contingent and part-time workers, low levels of unionization, etc.) that help in keeping wage growth below productivity growth. As noted in the introduction, decomposition analysis cannot tell us whether such a process indeed generated the observed outcomes, yet it does provide some quantitative indication of the relative impact of the characteristics of the underlying accumulation process on the two variables that govern the profit rate; it turns out that the main variable responsible for the changes in the profit rate during both periods was the real output-capital ratio rather than profit share.[8]

[8] The decomposition of the determinants of the profit rate into wage share and output-capital ratio is not a causal separation also because these variables are not independent of each other. Any significant change in the output-capital ratio due to technological change can be expected to have an effect on the wage share via

However, the huge difference in the contribution made by the profit share to the surge in profitability between the two periods is a confirmation that a fundamental shift had occurred in the social and political arrangements governing the distribution of productivity gains between capital and labor between the two periods, apparently in favor of capital, as discussed by several scholars (e.g., Marglin and Schor 1991; Gordon 1996). Among the various factors that distinguish the golden and the leaden ages, an important difference is the much higher participation rate of women in market work in the leaden age. Given that the relative wage of women is lower, was the increased role of women in market work related to the considerable deterioration that took place in the wage share (or alternatively, the increase in the profit share)? As we pointed out in the introduction, theoretical models generally predict that, other things remaining the same, the greater incorporation of women into market work will lower the wage share and boost profitability. However, "other things" that affect the wage share did *not* remain the same during the period under consideration and this makes empirically disentangling the effect of the changes in gendered macroeconomic variables—women's overall average wage and employment—from that of other factors quite a difficult proposition.[9]

Regression analysis with the macroeconomic series is not a feasible option since the number of years in the period under study is quite small. A feasible alternative is an extension of the standard decomposition methodology and this is the route that we take below. While this is not a substitute for a full-fledged causal analysis, we believe that it can yield some insights into the quantitative significance of the gendered macroeconomic variables on rising profitability during the leaden age.

## WOMEN'S EMPLOYMENT AND FUNCTIONAL DISTRIBUTION

The growth in women's participation in market work—a persistent feature of American economic life since World War II—continued also during the period under study here.

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its effect on labor productivity, while substantial changes in the real wage can influence the kind of methods of production that are employed (as well as the relative prices) and hence have an impact on the output-capital ratio.

[9] We borrow the term "gendered macroeconomic variables" from Nilufer Cagatay, Diane Elson, and Caren Grown (1995). In a sense, the approach taken in this paper can be viewed as an empirical implementation of the "gendered macroeconomic variable method" that they discussed.

Between 1982 and 1997, the employment-population ratio for women surged by nearly 10 percentage points (from 47.7 to 56.8 percent) while that for men rose modestly by 2.3 percentage points (from 69.0 to 71.3 percent). The change in the ratio for women was not dramatic compared to the trends in the previous years, but it was so for men. During the 15-year period that ended in 1982 (1967 to 1982), the employment-population ratio increased by about 9 percentage points for women (from 39.0 to 47.7 percent), while for men it fell precipitously by about 9 percentage points (from 78.0 to 69.0 percent).[10]

Some analysts have argued that women have been pulled into market work in order to maintain family living standards in response to the decline in men's earnings during the 1980s and 1990s. While most scholars recognize that the trend in men's earnings did contribute to increased labor supply of (married) women, the extent of this contribution is generally considered to be small relative to other relevant factors. For example, Heidi Hartmann (2000) argues that in addition to the social and educational forces that have changed women's expectations concerning their economic lives, it is more likely that women have increasingly entered market work in response to increase in the wages. These insights echo Francine Blau (1998), who argues that increases in education, which likely result from the increased prospects for women to have continuous attachments to the labor force, contributed to increasing labor force participation among women through its impact on wages. Additional explanations for women's increased participation in market work include demographic changes, such as decreases in fertility rates, declines in marriage rates, increases in rates of divorce, and the shifts in the U.S. economy from manufacturing to services (Goldin 1990; Blau 1998; Figart and Hartmann 2000).[11]

In addition to women's involvement in market work, the extent of the gender pay disparity will also have an influence on the wage share. For any given increase in women's share of total market work, the potential reduction in the wage share will

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[10] The employment-population ratios referred to in this paragraph pertain to individuals who are 16 years and older. They are based on annual household surveys and can be accessed at: http://www.bls.gov/webapps/legacy/cpsatab1.htm

[11] Focusing specifically on the labor supply behavior of married women, Francine Blau and Lawrence Kahn (2005) found that the elasticity with respect to husband's earnings was small and falling even prior to the 1980s, and that the decline continued in the later years [see also Blundell and MaCurdy (1999) for related analyses and references].

depend upon how much less women are paid, on the average, relative to men. A broad measure of gender pay disparity—the ratio of women's mean earnings to men—showed an improvement of about 6 percentage points between 1982 and 1997 (from 61 to 67 percent). Similar to the trends in the employment-population ratio discussed above, the decline in gender pay disparity during this period was not much different from that observed for the prior 15-year period. Compared to 1967, the relative wage of women was also 6 percentage points higher in 1982 (55 versus 61 percent).[12]

Explanations for the improvement in the relative earnings position of women during the 1980s and 1990s range from reductions in the human capital gap between men and women in terms of both education and labor force experience, to the decline in unionization (which hurt men more than women), to structural changes that have favored economic sectors (such as services) that employ relatively more women. In addition, gender segregation—by occupation, industry, establishment size, and type of employment contract—while persistent, has also decreased somewhat over time. For example, women are more likely than in the past to be employed in traditionally male and higher paying jobs, such as managerial and professional positions (Blau and Kahn 1997, 2000; Hartmann 2000).[13] These factors aside, it is important to note that the narrowing of the wage gap, while reflecting absolute improvement in women's wages, has resulted to a large degree from the decline or stagnation in men's wages over time. The Institute for Women's Policy Research calculates that this accounts for nearly three-fourths of the narrowing of the gap (Hartmann 2000). In spite of the improvements in women's relative wage, a sizable gap still remains between male and female earnings.[14]

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[12] The relative wage reported here pertains to full-time, year-round workers. They are based on annual household surveys conducted by the U.S. Census Bureau and can be accessed at: http://www.census.gov/hhes/www/income/histinc/p39ar.html

[13] It is relevant to ask what effect the rise in overall wage inequality had on the gender wage gap over the period. One would expect that since women have tended to have less marketable skills than men, the factors that have aggravated wage inequality—technological change and international competition—would have a negative impact on the gender wage gap. Blau and Kahn (1997) found that over the 1980s the impact of rising inequality and greater returns to skill, while significant, was more than offset by improvements in women's measurable qualifications and either a reduction in gender discrimination or an improvement in women's unmeasured labor market skills.

[14] Stephen Rose and Heidi Hartmann (2004) looked at a number of alternative measures of earnings disparity in contrast to the conventional measure that considers only full-time, year-round workers in a given year. They utilized the longitudinal data available from the Panel Study of Income Dynamics to develop their measures and found that the conventional measure may significantly understate the size of the

The standard decomposition of the wage share does not explicitly take into account the changes in women's market work or wages. Instead, the change in the wage share is resolved into two terms: labor required per unit of net output (the reciprocal of labor productivity) and real wage. While real wages and labor productivity are highly correlated over long periods of time, heterodox economists generally hold that there is no automatic link between productivity growth and real wage growth. Changes in the wage share may then be understood as shaped by the variations in the extent to which social and political arrangements facilitate workers in capturing some of the gains in labor productivity in the form of higher wages (e.g., Lipietz 2001).[15]

For our purposes here, it is necessary to separate the male and female real wages. In order to capture the effects of the growing involvement of women in market work, it is also necessary to differentiate by gender the ratio of net output to labor. While these ratios are not susceptible to technological determination in a manner the average labor productivity is, changes in them may nevertheless be interpreted as reflecting a structural aspect of the accumulation process—the changing division of market work between men and women. Our extension of the standard decomposition represents these variables explicitly:

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gender wage gap. For example, they found that the gender gap in average annual earnings over the 1983 to 1998 period ranged widely from about 62.1 percent to 36 percent, depending on the population for which the earnings were computed. The former figure measured the gender gap in annual earnings calculated over all prime-age workers with reported earnings for *at least one* year between 1983 and 1998 whereas the latter measured the gap computed over all full-time, full-year workers with earnings reported *each* year over the period. Much of the discrepancy between these measures is due to the fact that women are traditionally less likely to hold full-time, full-year jobs and have continuous work histories. In addition, there is persistent segmentation of the labor market by sex in which women are more likely to earn less than their male counterparts both within and across traditionally female and male job types.

[15] In contrast, in standard marginalist theory, there is not much room for social and political factors to intervene in shaping how effective the workers are in capturing productivity gains because there are strict limits within which the wage share can vary. For example, if the aggregate production function is assumed to be Cobb-Douglas (i.e., $Y = AK^{1-\alpha}L^{\alpha}$) then it is easy to show that under the normal assumptions of perfect competition and homogenous factors of production ($K$ and $L$ represent, respectively, capital and labor) the equilibrium wage share will be equal to the elasticity of output with respect to labor ($\alpha$). With more general production functions, the constraint on the wage share is still technologically determined (e.g., Bentolia and Saint-Paul 2003).

$$\begin{aligned}\omega &= w^m \frac{L^m}{Y} + w^f \frac{L^f}{Y} \\ &= \left(\frac{w^m}{p_Y}\right)\left(\frac{L^m}{Y_r}\right) + \left(\frac{w^f}{p_Y}\right)\left(\frac{L^f}{Y_r}\right) \\ &= w_r^m \lambda^m + w_r^f \lambda^f\end{aligned} \tag{2}$$

In the above equation, $w^m$ and $w^f$ are, respectively, the male and female nominal average hourly wage rates; $L^m$ and $L^f$ are the male and female hours worked; $Y_r$ is the real gross value-added; $\lambda^m$ and $\lambda^f$ are the male and female labor ratios (female and male labor hours per dollar of real GDP). Real variables, i.e., variables deflated with the price deflator for gross value-added ( $p_y$ ), are subscripted with the letter "*r.*" In an accounting sense, the contribution made by women or men to the change in the wage share would depend on the discrepancy between their wage growth and the fall in their labor ratio. In effect, we are taking the changes in the gender labor ratios and compensation rates as given, and estimating their impacts on the aggregate wage share.

While the decomposition of the wage share based on Equation (2) does not necessarily imply causation, it should be noted that the results derived from it are not tautological. Thus, as discussed above, we know from the relevant data that during the period under study the wage share fell, women's share of market work grew, and that gender pay disparity declined. The conjunction of these facts does not logically imply that the negative effect on the wage share stemming from the growth in women's market work must have overwhelmed the positive effect due to the reduction in pay disparity. An inspection of the equation would show that, logically, the wage share could have fallen even if the net effect of the trends in women's market work and wage on the wage share was positive. This outcome could have emerged solely as a result of the trends in men's real wage and labor ratio. Therefore, we believe that the decomposition can help disentangle the quantitative effects of these different factors on the wage share during the period under study.

The variables required to calculate the wage share as shown in Equation (2) are not available directly from the national income and product accounts (NIPA). Although the NIPA is rich in information, it contains no breakdown of employee compensation or

employment by sex. Thus, it is not possible to compute from the NIPA how much of the employee compensation is paid for women or how many of the aggregate hours of market work is performed by women.

Our strategy to disaggregate the NIPA amounts of employee compensation and hours of work by sex was to estimate the male and female components of each of these variables from the Annual Demographic Supplement (ADS) of the Current Population Survey (the March CPS).[16] This estimation process consisted of two steps based on the assumption that the shares of women and men in wages and hours worked observed in the ADS holds for the NIPA aggregates.

In the first step, we calculated hours worked per year for each worker as the product of usual weekly hours and weeks worked per year. Aggregating across all workers, we were able to calculate the total hours worked and the gender composition of employment. We divided the NIPA estimate of hours worked into male and female hours using the proportion calculated from the ADS.

In the second step, we constructed a compensation variable for each worker that corresponds most closely to the NIPA concept of employee compensation. The latter is the sum of wages and salaries, employer contributions for social insurance,[17] and other labor income.[18] In order to approximate this concept, we augmented the wages and salaries received by each worker with the imputed amounts for payroll taxes and employer contributions for health insurance available in the ADS. Aggregating across all workers, we were able to calculate the total "augmented wage bill." Just as in the case of aggregate hours, we split the NIPA estimate of employee compensation into male and female portions using the proportion estimated from the ADS.[19]

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[16] The ADS (also known as the March CPS) is the source of official data on household income. More information about the ADS can be found at: http://www.bls.census.gov/cps/ads/smethdoc.htm. The calculations described in the text were carried out using the public-use version of the ADS microdata. Sample sizes for men range from 45,048 in 1982 to 36,583 in 1997, and for women from 36,942 in 1982 to 33,169 in 1997.

[17] Consists mainly of mandatory payments by employers to the government for Social Security, unemployment insurance, and workers' compensation.

[18] Consists of employer contributions to private group health and life insurance, private pension and profit-sharing plans, private supplemental unemployment insurance, private workers' compensation, and publicly-administered government employee retirement plans.

[19] In both instances, we applied population weights to obtain aggregate estimates.

We recognize that this method has several shortcomings, especially as applied to the compensation data (e.g., topcoding of the ADS data, differences in the concept of wages and salaries, reporting errors in the ADS, etc.). Most importantly, in this context, the main source of discrepancy between the two sources (at least in terms of concept) is the lack of any estimates in the ADS for components of other labor income, except for health insurance, which is the single largest component of the NIPA category of "other labor income."[20] Our inclination is to think that using the ADS proportions to split the NIPA compensation data between the sexes may result in overestimating the share of women in total compensation. This is because women's share in jobs with fringe benefits, such as private pension and profit-sharing plans, is generally lower than men's (e.g., Hardy and Shuey 2000). Unfortunately, there exists no comparable alternative to the March CPS for gender-specific information on the value of fringe benefits at the national level.

**Table 2. Decomposition of the Change in Wage Share, 1982–97 (in percentage points)**

| | |
|---|---|
| Actual change in wage share ($\omega$) | -2.73 |
| Contribution of: | |
| Change in male hourly compensation ($w_r^m$) | 4.03 |
| Change in female hourly compensation ($w_r^f$) | 4.41 |
| Change in male labor ratio ($\lambda^m$) | -8.59 |
| Change in female labor ratio ($\lambda^f$) | -2.59 |

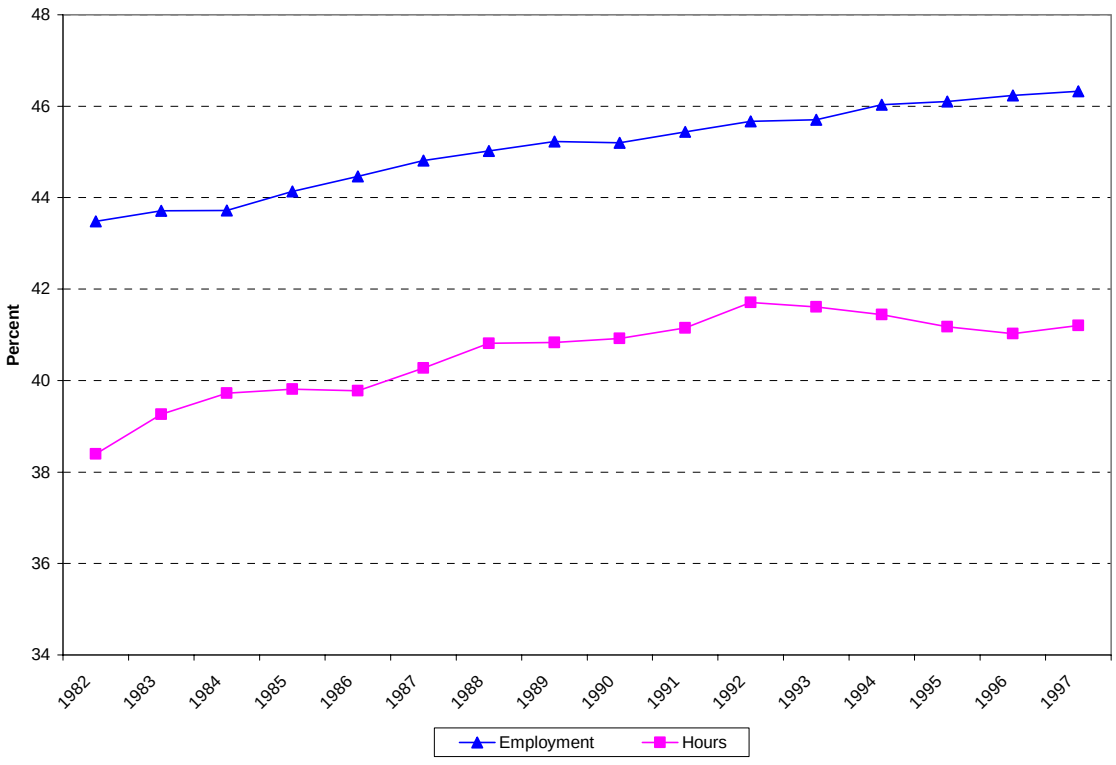
Once these estimates were obtained, we were able to decompose the change in the wage share during the leaden age using Equation (2). The negative contribution to the change in the wage share from men's labor ratio was much larger than the positive contribution stemming from their hourly wage, with the gap between the two exceeding the overall decline in the wage share. For women, the opposite was true; that is, the

[20] Employer contributions for health insurance amounted to about 55 percent of all other labor income in 1997. Pension and profit sharing plans accounted for another 40 percent of other labor income in the same year; however, roughly 60 percent of these were publicly administered retirement plans for government employees. The remaining 10 percent was distributed between workers' compensation, life insurance, and supplemental unemployment insurance.

negative contribution from the change in their labor ratio was outweighed by the positive contribution from the change in hourly compensation. Our results suggest that, in an accounting sense, the decline in the wage share was driven primarily by the unfavorable trend in men's wage relative to their labor ratio. The fall in the wage share could have been exacerbated by the decline in women's labor ratio, but this effect was offset by the growth in women's wage.

The notable growth in the female share of aggregate hours worked and employment reflects the movements in the gender labor ratios (Figure 2). Female share in hours grew sharply during 1982–1992 and then declined somewhat. Interestingly, the share in employment grew steadily throughout the period and was at relatively higher levels than the share in hours throughout the period, suggesting that women, on the average, had jobs that involve relatively fewer hours (e.g., part-time and part-year jobs with "flexible" schedules).

**Figure 2. Share of Women in Total Employment and Hours Worked, 1982–1997 (in percent)**



These trends indicate that at the aggregate level some amount of "substitution" of female for male labor took place during the leaden age. The substitution that occurred at the aggregate level surely must have been the result of a combination of forces that operated at the disaggregated level: loss of employment in male-dominated occupations and industries, replacement of male by female workers in some occupations and industries, and the faster growth of female-dominated occupations and industries.[21] For our purposes here, the interesting question is the impact of the substitution observed at the aggregate level on the wage share.[22]

As noted before, the direct channel of the impact is via the lower relative wage of women and its impact on overall labor costs. Additionally, the growing female share of employment could also be associated with the weakening of labor's bargaining power and hence on lowering the ability of workers to procure wage gains in tandem with productivity growth. While we do not directly test this hypothesis here, it is useful to note some channels of influence. As argued by Stephanie Seguino, women's lower relative wage "may signal weaker bargaining power on the part of female workers, leading to low unit labor costs, and an assumption on the part of employers of the reduced cost of extracting labor effort from female workers and limited resistance to poor working conditions" (Seguino 2000). The fact that a substantial share of female private-sector employees are employed in segments of labor market that historically have seen relatively low degree of collective bargaining also contributes to their lower bargaining power. The greater incidence of part-time and part-year work among women further weakens labor's bargaining power. These difficulties are aggravated by the lack of state support for women workers in the form of public provision of childcare or mandatory maternity and childrearing leave.

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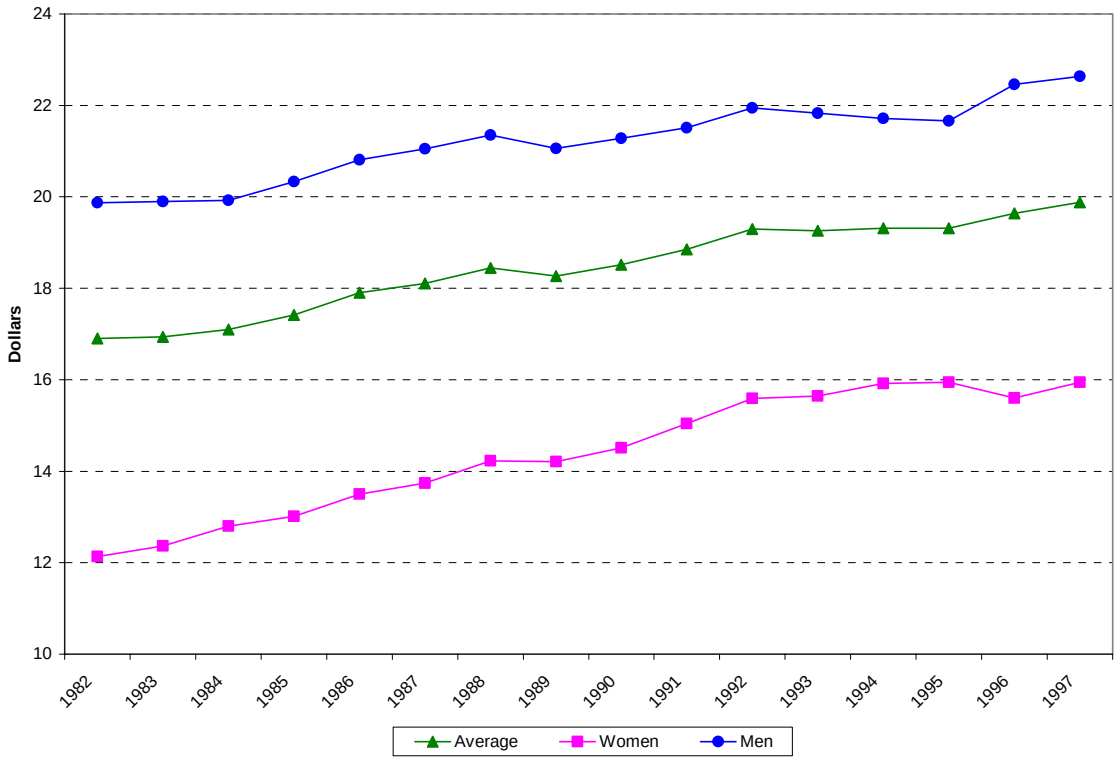
[21] A full investigation of the relative importance of these processes in shaping the substitution observed at the aggregate level, as well as their relation to the processes of globalization and structural and technological changes, is a task that is well beyond the scope of this paper.

[22] The increase in women's share of market work also reflects the growth of, and women's employment in, sectors producing market substitutes for products of household production (e.g., childcare and adult care, prepared foods, etc.). The effect of the latter on the aggregate wage share and profitability would depend on the institutional arrangements under which these substitutes are provided (e.g., public provisioning of childcare in the Scandinavian countries versus the predominantly private provisioning in the United States) and their conditions of production (e.g., the labor intensity of the activities, the presence of collective bargaining, etc.).

While the growing share of women in market work could have the direct and indirect effects discussed above, changes in gender pay disparity also affects the changes in the wage share. While the gap between female and male hourly compensation rates was still sizeable at the end of the period under study here, it did shrink during the period as a result of the various factors that were discussed at the beginning of this section. At the aggregate level, two factors emerge as central to this process in terms of mediating the effects on the wage share (see Figure 3). First, the narrowing of the gender compensation differential took place in an environment of stagnant or slowly growing male hourly compensation. Second, the decline was not occurring at a rate sufficient to push overall compensation growth to match or exceed the productivity gains attained during the period. Thus, the rise in gender pay parity could not prevent a decline in the wage share and did not pose a threat to the overall increase in profitability.

**Figure 3. Average Real Hourly Compensation, 1982–1997 (in 1996 dollars)**



These considerations can be better illustrated by constructing two sets of counterfactual wage shares and profit rates. While the decomposition results are based on a comparison between the starting and ending years of the period under study, the counterfactuals can shed light on the year-to-year changes in the wage share and profit rate due to the changes in gender pay disparity and female share in total hours of employment. To construct the counterfactuals, it is helpful to express the wage share [see Equation (2)] explicitly as a function of the latter:

$$\omega = w_r^m \lambda \left[(1-s) + \delta s\right], \tag{3}$$

where $\lambda = L/Y_r$ is the average labor requirement (the reciprocal of labor productivity), $s = L_f / L$ is the female share in total hours of market work, and $\delta = w_f / w_m$ is the ratio of female to male hourly compensation. The equation clearly implies that, holding everything else constant, the difference between the impact of an infinitesimal change in the female share in market work and a similar change in pay disparity will depend on the difference between the value of the pay gap $(\delta - 1)$ and the female share in market work, at which the change is evaluated.[23]

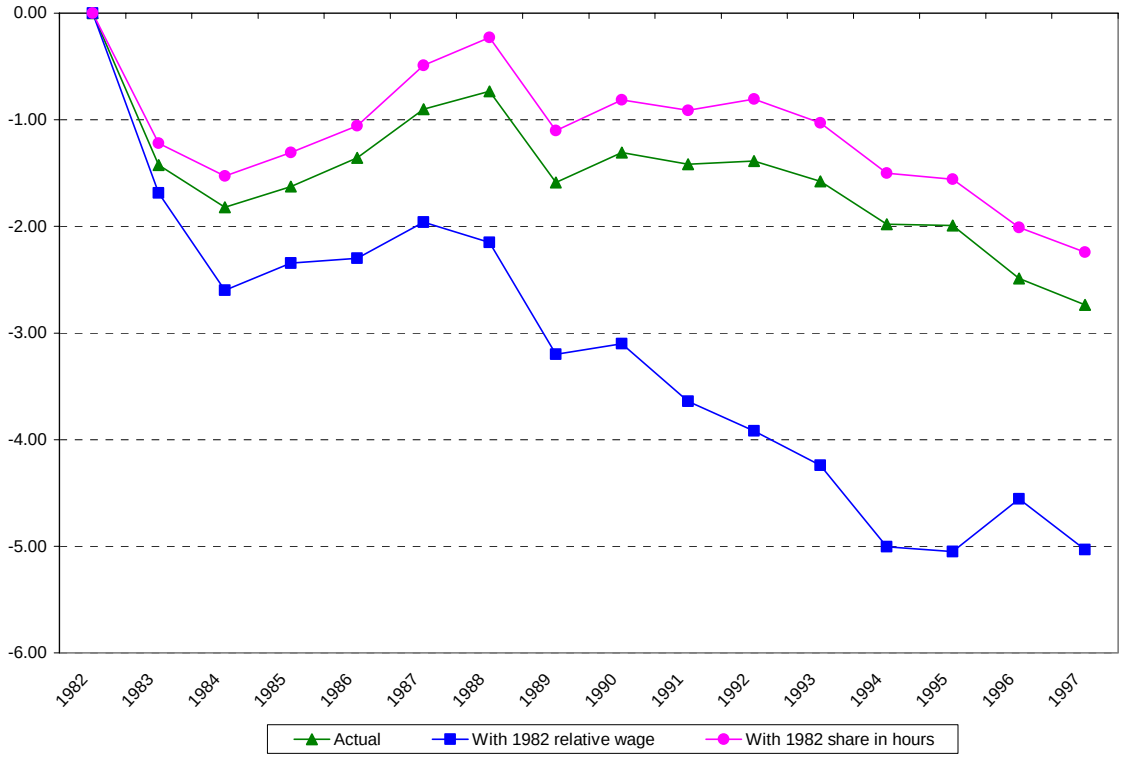
In the first counterfactual, we held the pay disparity $(\delta)$ at its 1982 level and estimated the wage share and profit rate in each year utilizing the actual annual values for the other variables $(w_r^m, \lambda, s, \text{and } \nu)$. Similarly, the second counterfactual was constructed by holding women's share in hours of market work $(s)$ at its 1982 level and allowing other variables $(w_r^m, \lambda, \delta, \text{ and } \nu)$ to take their actual annual values. Even though women's share of employment grew and gender disparity fell during the period under consideration, these counterfactuals are meaningful to consider because, theoretically, a rising share of female employment need not imply a fall in the gender pay gap. Such an outcome would be inevitable if the trend in women's relative wage was only a function of the forces of (relative) supply and demand. However, as discussed earlier in this section,

[23] This is because the partial derivatives of the wage share with respect to the female share of employment and wage disparity are, respectively, $\omega_s = w_r^m \lambda (\delta - 1)$ and $\omega_\delta = w_r^m \lambda s$ .

the reduction gender pay disparity was driven to a large extent by other factors such as declining gender segregation and improvements in women's educational attainment.[24]

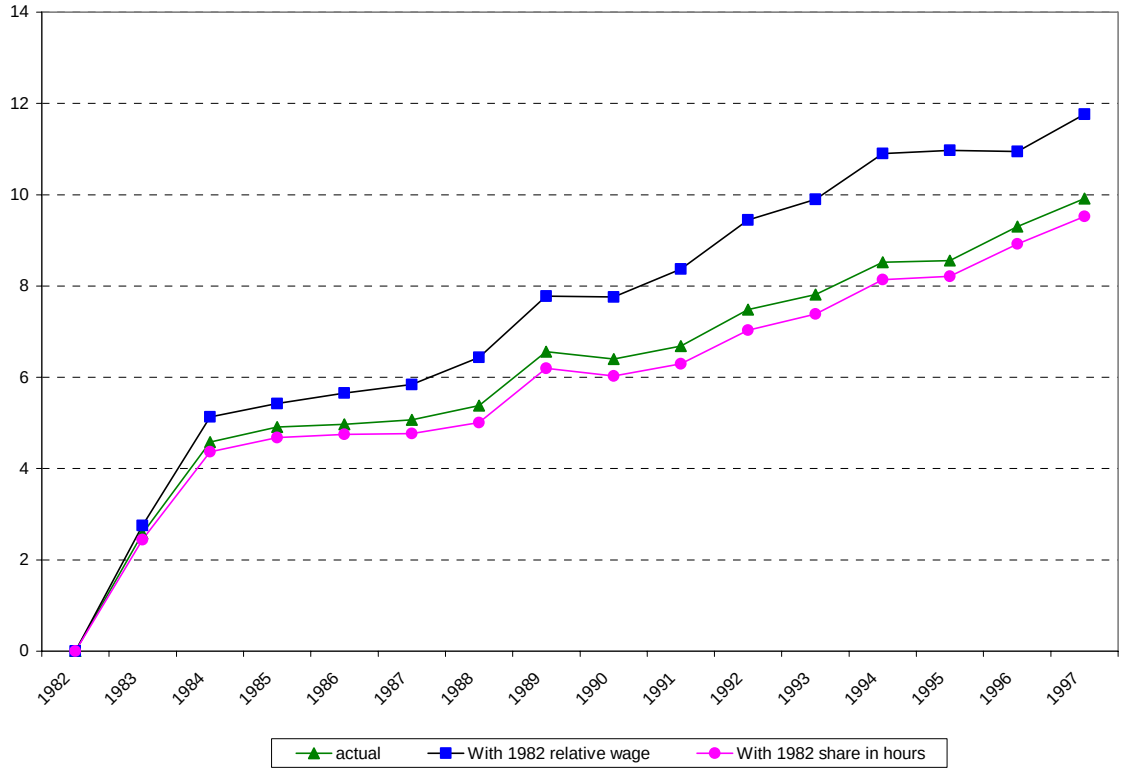
The results of the calculations are displayed in Figures 4 and 5. Since the actual and counterfactual series will have the same values in 1982, we have shown the values for the other years as deviations from the 1982 levels to highlight the potentially divergent behavior of the different series.

**Figure 4. Counterfactual and Actual Wage Shares, 1982–1997 (in percent)**




[24] For example, if the degree of gender segmentation of labor had remained unchanged, the growing share of women in employment would occur mostly in the bottom rungs of the wage distribution. Other things remaining the same, such a process can indeed result in a rising rather than falling gender pay gap.

**Figure 5. Counterfactual and Actual Gross Profit Rates, 1982–1997 (in percent)**




If the relative wage of women had remained at its 1982 level, the decline in the wage share over the period 1982–1997 would have been much bigger than what was actually observed (a fall of 5 as against 3 percentage points); correspondingly, the increase in the profit rate would have been much higher than what was actually observed (a rise of 12 versus 10 percentage points). Conversely, if women's share of market work had remained at its 1982 level, the fall in the wage share would have been somewhat smaller than actual (2 versus 3 points) and the increase in profit rate would also have been smaller (9.5 as compared to 10 points). In reality, as discussed above, women's share in total hours did rise and the gender pay differential narrowed, thus resulting in actual wage share and profit rate series that lie between the two counterfactuals. However, the difference in the extent to which the two counterfactual series of changes diverge from the actual series of changes suggests that the narrowing of the gender pay

disparity played a significant role in ameliorating the decline in the wage share and the associated increase in profitability.

Our finding that, in an accounting sense, women contributed to offsetting the loss in wage share during 1982 is apparently inconsistent with Finoff and Jayadev (2006) who found a negative correlation between wage share and female share of the labor force for a panel of OECD countries over the period 1970–2000. While they controlled for a number of factors (such as per capita GDP, unionization, etc.) in their regression analysis, our result is derived from decomposition analysis using data for a very specific period for a single country. These differences in data and methods might account for the different findings; yet, it is notable that Jayadev and Finnoff did not control for the differences in the gender pay disparity among countries in their regression models.

## DISTRIBUTIONAL SHIFTS AND COMPOSITIONAL SHIFTS

We now turn to examine two issues that are relevant to our findings at the aggregate level. First, the fall in the aggregate wage share could have come about primarily as a result of a shift in the composition of aggregate output in favor of sectors with low wage shares. In such a scenario, the distributional shift that we observed at the aggregate level would appear to be considerably different in its macroeconomic significance from an alternative scenario in which the decline in wage share was primarily due to changes in the social and political environment in which employees were not able secure wage gains in tandem with productivity growth. The second issue relates to the moderating effect that women's employment had on the fall in the aggregate wage share because the contribution from women's rising wage outweighed the contribution from their falling labor ratio. If similar effects could be found in sectors where the wage share fell, we can confirm the existence of palpable sectoral analogs for the observed aggregate outcome. In its absence, the aggregate outcome would confirm the old macroeconomic maxim that the whole is different from the sum of the parts.

Since the aggregate wage share is the weighted sum of sectoral wage shares, we can address the first issue by decomposing the following equation (using the same technique as described before, see Note 6):

$$\omega = \sum \kappa_i = \sum \omega_i \gamma_i , \tag{4}$$

where $\kappa_i$ is the $i^{th}$ sector's contribution to the aggregate wage share and $\omega_i$ and $\gamma_i$ are, respectively, the $i^{th}$ sector's wage share and share in total nominal value-added, $Y_i/Y$. We separated the private sector into seven broad sectors.[25] While a case for greater disaggregation can be made, we believe that the interesting issue in our context is the impact of the decline of the manufacturing sector and the rise of service-producing sectors (trade, finance, etc.) on the variables of interest.

**Table 3. Decomposition of the Change in the Aggregate Wage Share by Sector, 1982–1997 (in percentage points)**

| Sector | Total contribution of the sector to the change in aggregate wage share ($\kappa_i$) | Contribution of the change in the sector's: | |
|---|---|---|---|
| | | Wage share ($\omega_i$) | Share in Value-added ($\gamma_i$) |
| Agriculture, extractive, and construction | -1.18 | 0.93 | -2.11 |
| Durable good manufacturing | -3.35 | -1.51 | -1.85 |
| Nondurable good manufacturing | -1.76 | -0.85 | -0.92 |
| Transportation and public utilities | -1.48 | -0.95 | -0.53 |
| Wholesale and retail trade | -0.81 | -0.68 | -0.13 |
| Finance, insurance, and real estate | 1.03 | 0.15 | 0.88 |
| Services | 4.85 | 0.46 | 4.40 |
| **All private industries** | -2.71 | -2.45 | -0.26 |

[25] The data for the value-added and employee compensation for the individual sectors were also drawn from the BEA, as discussed in Note 4. A minor point to note regarding the sectoral disaggregation is that the sum of value-added of the individual sectors will be different from the aggregate value-added because of the very small amount of "statistical discrepancy," the amount of value-added that could not be allocated across sectors. As a result, the aggregate wage share reported in this section differs slightly from that reported earlier.

The results of the decomposition are shown in Table 3. Structural change (as reflected in changing values of $\gamma_i$) contributed to only about 10 percent of the decline in the aggregate wage share between 1982 and 1997. Much more important to the decline at the aggregate level were the falling sectoral wage shares over the period, suggesting that the changing conditions governing the distribution of productivity gains between employees and employers were the principal factor. The contribution of the change in sectoral wage shares was about 90 percent (or 2.45 of the total 2.71 percentage points) of the decline in the aggregate wage share over the period. Thus, while employment shifts during the period had a major positive effect on aggregate profitability via their effect on the organic composition of capital (Wolff 2003), their effect on profitability via the wage share appears to be rather small. Service-producing sectors that grew in relative importance contributed positively to the aggregate wage share via their own rising wage shares, indicating that the decline at the aggregate level happened in spite of, rather than because of, structural change.

We now turn to the second issue raised at the beginning of this section, namely whether the moderating effect that women had on the falling aggregate wage share could be found at the level of the individual sectors where wage shares fell. We addressed this issue by decomposing the sectoral wage shares using the same procedure that we used for the aggregate wage share.[26] The results are shown in Table 4.[27] We have also shown the contribution (the sum of the contributions of labor ratio and hourly compensation) of men and women to the change in sectoral wage shares in Figure 6.

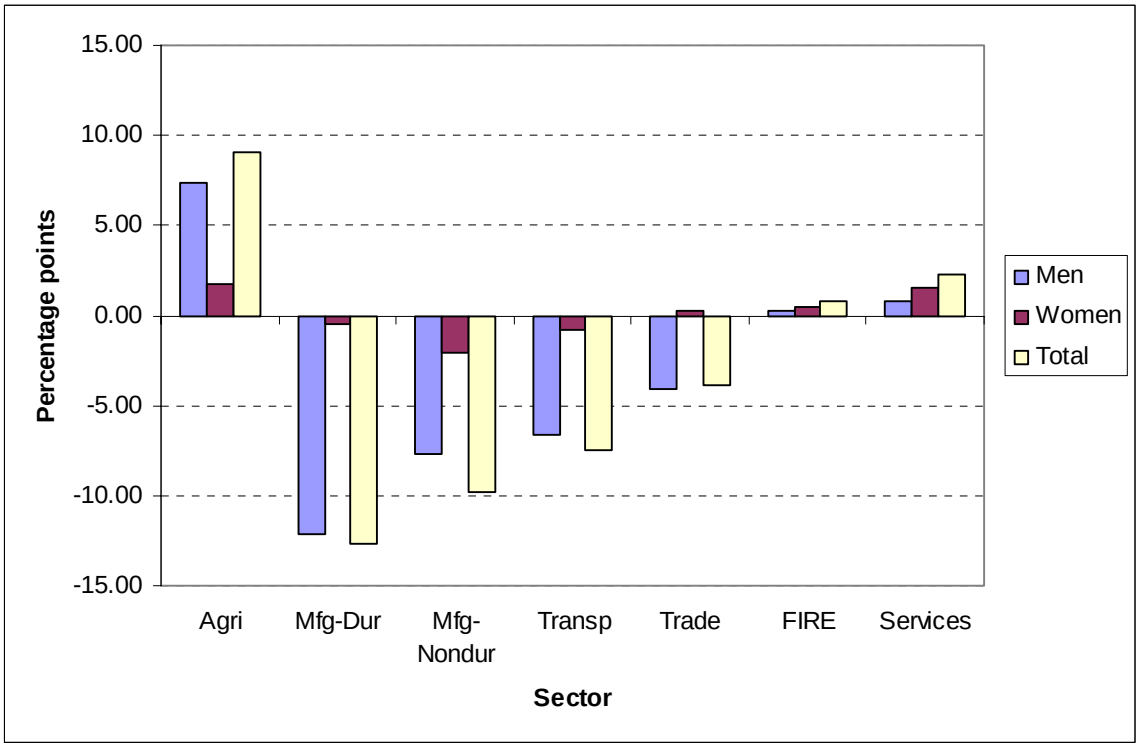
[26] As we pointed out in the context of the discussion of the decomposition of the aggregate wage share, we are not suggesting that the relationships examined by the decompositions are necessarily causal. We are taking the changes in the sectoral labor ratios and compensation rates as given and then estimating the impacts of these factors on the wage share. However, following the same logic as in the instance of aggregate decomposition, this does not mean that the results from the decomposition are purely tautological.

[27] The sectoral hourly compensation rates and labor ratios by gender were estimated by utilizing the ADS in conjunction with the national accounts. Details about the calculations are available from the authors upon request.

**Table 4. Decomposition of the Change in Sectoral Wages Shares, 1982–1997 (in percentage points)**

| Sector | Contribution to the change in wage share from change in: | | | | Actual change in wage share |
|---|---|---|---|---|---|
| | Real hourly compensation | | Labor ratios | | |
| | Male | Female | Male | Female | |
| Agriculture, extractive, and construction | 14.59 | 2.34 | -7.22 | -0.59 | 9.12 |
| Durable goods manufacturing | 28.07 | 8.11 | -40.25 | -8.60 | -12.68 |
| Nondurable goods manufacturing | 3.25 | 3.69 | -10.93 | -5.79 | -9.76 |
| Transportation and public utilities | 3.42 | 2.12 | -10.05 | -2.93 | -7.44 |
| Wholesale and retail trade | 10.54 | 8.10 | -14.63 | -7.89 | -3.87 |
| Finance, insurance, and real estate | 2.62 | 1.46 | -2.31 | -0.97 | 0.80 |
| Services | -1.25 | 0.33 | 2.06 | 1.19 | 2.33 |

**Figure 6. Contribution to the Total Change in Wage Share between 1982 and 1997 by Men and Women, by Sector (in percentage points)**

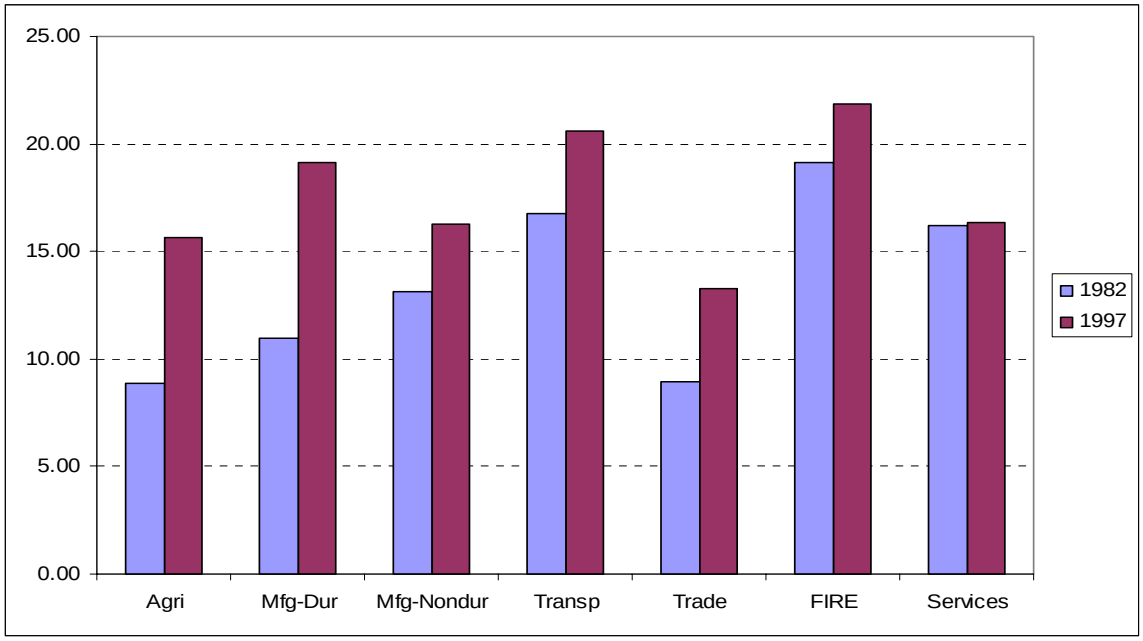



**Key**: *Agri*: Agriculture, mining, and construction; *Mfg-Dur*: Durable goods manufacturing; *Mfg-Nondur*: Nondurable goods manufacturing; *Transp*: Transportation, communication, and public utilities; *Trade*: Wholesale and retail trade; *FIRE*: Fire, insurance, and real estate.

In each of the sectors where a decline in the wage share occurred—manufacturing (durable and nondurable goods), transportation, and trade—the decline was driven primarily by the unfavorable trend in men's wages relative to their labor ratio. Unlike at the aggregate level, women contributed (in an accounting sense) to an exacerbation of the decline in the wage share in these sectors, i.e., growth in their wage did not offset the decline in their labor ratio. However, the contribution made by women to the fall in the sectoral wage share was much smaller than men, as can be seen clearly by a comparison of the heights of the bars in Figure 6. The trade sector constituted a minor exception in the sense that women contributed positively, though a very small amount, to the change in the wage share.

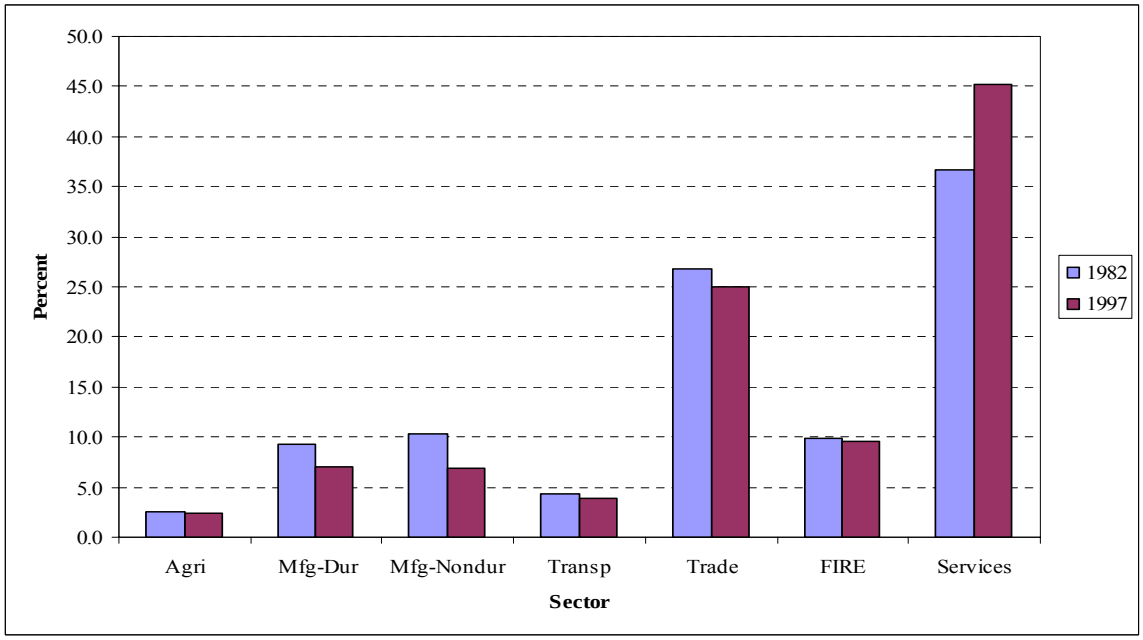
If there were no significant sectoral parallels to the aggregate outcome, how did the aggregate outcome actually come about? This is a question that requires a detailed analysis of sectoral trends, which is a task that falls beyond the scope of this paper. Our preliminary inspection of the data suggests that there were two distinct factors behind the positive contribution from the change in women's wage offsetting the negative contribution from their changing labor ratio at the aggregate level. First, unlike services where there was virtually no growth in female wages, other sectors saw wage gains for women (Figure 7). During this period, the share of services in total female employment rose rapidly from 37 to 45 percent, while the share of all other sectors declined (Figure 8). Since services had higher wages than all the other sectors (with the exception of FIRE) in 1982 and two sectors in 1997, the shift in favor of services contributed to the growth in the female wage rate at the aggregate level. Increasing female wages in all sectors except services, as well as the shift of female labor from sectors with wages lower than services toward the services sector, were responsible for the overall growth in women's average wage.

**Figure 7. Women's Real Hourly Compensation by Sector in 1982 and 1997 (in 1996 dollars)**




**Key**: *Agri*: Agriculture, mining, and construction; *Mfg-Dur*: Durable goods manufacturing; *Mfg-Nondur*: Nondurable goods manufacturing; *Transp*: Transportation, communication, and public utilities; *Trade*: Wholesale and retail trade; *FIRE*: Fire, insurance, and real estate.

**Figure 8. Distribution of Women's Total Hours of Market Work by Sector in 1982 and 1997 (in percent)**




**Key**: *Agri*: Agriculture, mining, and construction; *Mfg-Dur*: Durable goods manufacturing; *Mfg-Nondur*: Nondurable goods manufacturing; *Transp*: Transportation, communication, and public utilities; *Trade*: Wholesale and retail trade; *FIRE*: Fire, insurance, and real estate.

Second, the growth in women's employment in sectors other than services was slower relative to the growth in the respective sectoral GDP, leading to a fall in female labor ratios in these sectors (as shown in Table 4). The combined balance in these sectors between the negative pull from falling labor ratios and the positive push from rising wage for women would have gone in favor of the labor ratios (as it did for men) resulting in a overall negative contribution of women to the aggregate wage share, but this was offset by the rising labor ratio of women in the services sector. The rising labor ratio of women in this sector, coupled with the growth in the share of this sector in aggregate GDP (from 16 to 23 percent), had the effect of restraining the decline in women's labor ratio at the aggregate level.

The service sector was unique among the sectors; it was the only sector to display rising labor ratios for both men and women, indicating that average labor productivity was lower in 1997 than in 1982. It was also the only sector in which the average real wage in 1997 turned out to be lower than in 1982 for men (as reflected in the negative contribution of this component in Table 4) and practically unchanged for women. [28] Therefore, the rise in the wage share of this sector seems to have come about through a perverse process of productivity falling faster than the average wage.[29]

Findings from the sectoral analysis suggest that, at least at the level of disaggregation used here, the aggregate outcome of the changing conditions of women's employment exerting a moderating influence on the falling wage share had no significant sectoral parallels. In particular, this does not appear to be the result of women being increasingly employed in some dynamic sectors where gains from productivity growth are distributed more in favor of employees than employers. On the contrary, the marked shift in the sectoral distribution of women's working hours in favor of the services sector, a sector in which average labor productivity fell, played a significant role in determining the aggregate outcome.

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[28] The characterization of the services sector as a low-wage sector holds only on the average. Several subsectors in it include some of the highest-paid occupations, such as legal and health services.

[29] The decline in the service sector's labor productivity appears to fit its frequent characterization as the culprit in the familiar "cost-disease" model originally proposed by William Baumol (Baumol 1967; Baumol, Bateman, and Wolff 1987). The poor wage trends in the service sector, however, need not be the effect of low productivity in a causal sense, since the availability of a low-wage labor pool can make the less capital-intensive, low-productivity methods of production more profitable to firms (Thurow 2000).

## CONCLUSION

The United States witnessed a sustained rise in the aggregate profit rate during the 1980s and 1990s. Much of the empirical work on the recent rise in profitability has neglected the potential effects of trends in women's employment and wages, though theoretical models indicate that such effects could operate via influencing the functional distribution of national income. The aim of this paper is to make a modest contribution to the study of these potential effects. We extended the standard decomposition technique to assess the contribution of women, in an accounting sense, to the decline in the aggregate wage share between 1982 and 1997. The application required gender-disaggregation of two macroeconomic variables: employee compensation and aggregate hours worked. Our method of circumventing this information gap in the national accounts by utilizing nationally representative household survey data might also prove fruitful in other contexts where specific subgroups of the working population need to be identified in analyzing a macroeconomic problem.

In line with the previous literature, we found that the decline in the share of labor in national income played a much more important role in the profitability boom of the 1980s and 1990s as compared to the profitability boom of the 1950s and 1960s. Our decomposition method allows us to resolve the change in the wage share into changes in real wages and labor ratios (ratio of hours worked to GDP) differentiated by gender. Results from the decomposition suggest that the decline in the wage share during the 1982–1997 period was driven primarily by the unfavorable trend in men's wage relative to their labor ratio. The fall in the wage share could have been exacerbated by the decline in women's labor ratio, but this effect was offset by the growth in women's average wage. We also constructed counterfactual wage shares and profit rates to assess the effects of feminization on yearly changes in these variables. The counterfactuals graphically illustrated that the increasing share of women in hours worked exerted a downward pressure on the wage share because of their lower average wage, but the reduction in the gender wage disparity over time ameliorated this negative effect.

Changes in the sectoral composition of value-added in favor of low wage-share sectors could also result in a decline in the aggregate wage share, but our results indicated

that the overwhelming bulk of the decline during the period 1982–1997 could be attributed to distributional shifts within the goods-producing and trade sectors of the private economy. The decompositions of sectoral wage shares showed that the restraining effect that changes in women's employment had on the fall in the aggregate wage share (because the contribution from women's rising wage outweighed the contribution from their falling labor ratio) constituted a minor exception rather than the rule among the sectors where wage shares fell. We found that, just as at the aggregate level, the principal factor behind the declining wage shares were the unfavorable trends in men's wages and labor ratios. The restraining effect observed at the aggregate level was not a reflection of women becoming increasingly integrated into some dynamic sectors of the economy where the distribution of the productivity gains went in favor of employees. It appears to be the net result of distinct sectoral trends in women's employment and wages, with a marked shift to the services sector—a sector where productivity decline outstripped wage decline during the period—playing an important role.

The macroeconomic effects of gender relations and the impact of macroeconomic conditions on gender relations in the United States are areas that require much further study. To approach this issue from the perspective of trends in aggregate profitability is admittedly only one possible approach. A complementary and fruitful approach would be to examine, as has been done in the case of some developing countries (e.g Seguino 2000, 2006), the interrelationships between feminization, gender inequality, and long-run growth.

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