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ABSTRACT

With malls, franchise strips and big-box retailers increasingly dotting the landscape, there is concern that middle-class jobs in manufacturing in the U.S. are being replaced by minimum wage jobs in retail. Retail jobs have spread, while manufacturing jobs have shrunk in number. In this paper, we characterize the wages that have accompanied the growth in retail. We show that wage rates in the retail sector rise markedly with firm size and with establishment size. These increases are halved when we control for worker fixed effects, suggesting that there is sorting of better workers into larger firms. Also, higher ability workers get promoted to the position of manager, which is associated with higher pay. We conclude that the growth in modern retail, characterized by larger chains of larger establishments with more levels of hierarchy, is raising wage rates relative to traditional mom-and-pop retail stores.

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Abstract: With malls, franchise strips and big-box retailers increasingly dotting the landscape, there is concern that middle-class jobs in manufacturing in the U.S. are being replaced by minimum wage jobs in retail. Retail jobs have spread, while manufacturing jobs have shrunk in number. In this paper, we characterize the wages that have accompanied the growth in retail. We show that wage rates in the retail sector rise markedly with firm size and with establishment size. These increases are halved when we control for worker fixed effects, suggesting that there is sorting of better workers into larger firms. Also, higher ability workers get promoted to the position of manager, which is associated with higher pay. We conclude that the growth in modern retail, characterized by larger chains of larger establishments with more levels of hierarchy, is raising wage rates relative to traditional mom-and-pop retail stores.

With malls and franchise strips increasingly dotting the landscape, there is an image that the U.S. labor market is one in which middle-class jobs in manufacturing are being replaced by minimum wage jobs in the retail sector.[1] There is no question that retail jobs have spread. The contrast between manufacturing and the retail sector is illustrated in Figure 1. This figure shows that employment in the retail sector considerably exceeds that in manufacturing, and that it has grown significantly over time, while employment in manufacturing has shrunk.

The goal of this paper is to examine the wages that accompany the spread of retail in the economy. In particular, does retail trade pay only minimum wages, as some policy discussions, and the intensity of competition in that sector, suggest that it might? Or, are there higher wages for workers? Are the productivity gains associated with modern retail firms – as defined below – accompanied by higher or still lower pay?

These questions are especially important because the retail sector is likely to continue to flourish. Much of the economic activity in retail relates to non-tradable goods, so jobs here are likely to stay. As in manufacturing, there is room in retail for substitution of computers for people; but, contrary to manufacturing, overall growth in the sector so far is swamping that

[1] More generally, Autor, Katz, and Kearney (2006 and 2008) and Autor and Dorn (2013) find evidence of polarization in the labor market, with middle income jobs becoming rarer while lower-paid and higher-paid jobs are both growing in numbers.

substitution. There is some substitution in retail also from brick and mortar to the Internet, such that some of the retail jobs are in distribution centers rather than stores. However, when talking about all retail trade, including, for example, gas stations, automobile dealers, and grocery stores, the Internet still stands at less than five percent of retail sales.[2]

The segment of retail that is growing most is what we refer to as modern retail. We define modern retail firms as those that have successfully developed as regional or national chains in the last few decades. Following Milgrom and Roberts (1990), modern retail firms are perhaps better described as those that have undertaken product and/or process innovations.[3] For example, Wal-Mart is known for process innovations – for developing relationships with suppliers and computerizing all elements of its supply chain. Many big retail firms have followed Wal-Mart's lead. Starbucks is known for product innovations – for making specialty coffee a common retail good in the United States, and then exporting this concept globally. Many large retail and service firms combine product and process innovations along with organizational innovations.

There is ample evidence that the retail sector has become more concentrated, with increasing numbers of large firms or chains that comprise modern retail. Foster, Haltiwanger and Krizan (2006) report that the four-firm concentration ratio grew from 5.2% to 6.8% from 1987 to 1992. According to the most recent economic census, this ratio had reached 12.3% by 2007. Using data from the Economic Censuses and the Longitudinal Business Database (LBD), Jarmin, Klimek, and Miranda (2009) also show that there has been an increase in firm and establishment size in retail (see also Basker, Klimek, and Pham, 2012).

[2] See http://www.census.gov/econ/estats/ for the latest statistics on this, which as of this writing, was for 2011. Note that the five percent above refers to the proportion of sales in Retail Trade (NAICS 44-45) only.

[3] In other words, we refer to Modern Retail as the retail equivalent of Modern Manufacturing, which Milgrom and Roberts (1990) define based on a system of product and process innovations in manufacturing that is accompanied by a set of complementary organizational practices, like lean manufacturing.

These increases in firm and establishment size may be promising developments for the wage levels of employees in retail, for three reasons. First, there may be an increase in wages as firms grow in size. Research has provided strong evidence of positive firm-size effects on wages in the economy as a whole, after controlling for work conditions and worker quality.[4] Second, there may be an increase in wages for larger establishments. Many big box chain stores are large establishments compared to the more traditional mom-and-pop store. Third, relative to traditional mom-and-pop stores, there is more room for promotion to supervisor or manager in large firms, and with such promotions come the promise of higher wages. Firm size, establishment size, and promotion are the determinants of wage levels that are considered in this paper.

We model wage levels using data from the 1996 to 2013 Current Population Survey (CPS) and the National Longitudinal Survey of Youth (NLSY) from 1986 to 2010. The CPS data provide the large sample size needed to model wage levels as a function of firm size. The NLSY data provide the longitudinal platform to model the determinants of wages and to estimate establishment size effects.

At the end of the analysis, wages in the retail sector are compared to wages in manufacturing. The reasons for this comparison are twofold. First, the presence of high-paying jobs in other sectors, including manufacturing, is often attributed to the presence of rents that are then shared with labor. The retail sector, in contrast, is typically viewed as very competitive, leaving little scope for such rent sharing. Second, there is an emphasis on "good jobs" in manufacturing in the public discourse, with the implication that policies should be put in place to

[4] See Brown and Medoff (1998), Oi and Idson (1999), Fox (2009), and Pedace (2010). Bayard and Troske (1999) analyze a cross section of data in the retail industry from 1990 and find no firm-size effects on wages using a linear model of firm size. They do find establishment size effects.

try to restore the predominance of manufacturing in the economy. It is, therefore, natural to ask how much retail differs from manufacturing, or, if there are any similarities.

The results are as follows:

1. Wage rates in the retail sector rise markedly with firm size and with establishment size. Holding constant a set of standard control variables, pay is 15 percent higher in large firms (1000+ workers) compared to small (less than ten workers) for the high school educated. For those with some college education or a degree, pay is 25 percent higher in large than small firms. Across establishments, pay is 26 percent higher for large establishments (500+ workers) versus small (less than ten workers) for those with high school education, and 36 percent higher for those with some or more college education.
2. When we control for unobserved worker quality, firm and establishment size premia decline markedly. Adding worker fixed effects to wage regressions, when a worker moves from a small firm to a large firm, his pay rises by 11 percent for the high school educated and 9 percent for those with some college education or college degree. When a worker moves from a small establishment to a large one, pay rises by 19 percent for high school educated and by 28 percent for those with some college education.
3. Taken together, these regression results imply that higher quality workers are sorted into large firms and large establishments, but that working in larger firms or establishments yields additional increases in pay.
4. Higher quality workers are also sorted into managerial positions. Comparing pay across workers of different ability levels, managers earn more than 23 percent more than non-managers if they are high school educated, and 20 percent if they have some college education or more (using CPS data). Holding constant worker ability via worker fixed

effects, promotion to a management job increases pay by 8 and 7 percent for these two educational groups. Moreover, the proportion of individuals that are promoted to manager is high, at 28 percent, in retail.

These pay increases with firm size and establishment size and with managerial occupation are treatment of the treated effects – these are the pay increases that would be received conditional on obtaining a job at a large firm or establishment or as a manager. That is, the estimated wage return to promotion is conditional on being promoted to manager, which may require special skills, like organizational skills or people management skills.

In sum, the increasing firm size and establishment size that are a hallmark of modern retail are accompanied by increasing wages and opportunities for promotion for many workers. While retail pay is considerably below that in manufacturing, pay in retail is above that found in service jobs, as defined by Autor and Dorn (2013). The results below contradict the image of the retail sector as one comprised of the lowest paying jobs in the economy.

I. The Rise of Modern Retail

The growth of the retail sector has been accompanied by growth in modern retail chains. Over the last several decades, the growth in firm size in the retail sector has been pronounced. Foster, Haltiwanger and Krizan (2006) and Jarmin, Klimek, and Miranda (2009) document the growth of large chains and rise of modern retail. Modern retail calls to mind chains like Wal-Mart and Home Depot, but the trend towards large-scale retail firms predates these. Jarmin, Klimek, and Miranda (2009, p. 237) point out that single-location retail firms accounted for 70.4 percent of sales in 1948, but only 39 percent by 1997. Similarly, over this time period the market share of sales accounted for by firms with more than 100 establishments rose from 12.3 percent to 36.9 percent (p. 238). Using data from a 1971 Census Bureau report and information

they compiled from the Longitudinal Business Database, they show that retail establishments operated by multiple-establishment retail chains accounted for only 20.2 percent of all establishments in 1963, but reached 35 percent by 2000. As a result of the growth of chains, employment at single-location retailers grew by 2 million between 1976 and 2000, but employment at chains grew by 8 million.

One source of rising demand for retail chains has been the rise of women in the work force (Pashigan and Bowen, 1994). Women's increasing income and resulting time constraints have led to an increase in the demand for branded products, because brands convey information that otherwise takes time to assess. Nationally recognized brands save shopping and search time.

The growth of retail chains has been accompanied by growth in retail establishment size as well. Between 1958 and 2000, the average retail establishment went from about six to more than fourteen workers (Jarmin, Klimek, and Miranda, 2009, page 240 and Figure 6.4). This growth in establishment size has been especially pronounced in chains. From 1976 to 2000, small mom-and-pop stores grew from 5 to 7 employees per store. In the same period, local chain stores increased their number of employees from 9 to 15, regional chains from 12 to 15, and national chains from 15 to 25 (Jarmin, Klimek, and Miranda, 2005). Holmes (2001) argues that this tendency is the result of the important investments in technologies, such as barcodes and related inventory management techniques, that retail chains can make. Similarly, Basker, Klimek, and Pham (2012) discuss how the breadth of products sold in the typical store of a chain store has increased with the number of establishments in the chains. They explain this as the interaction between technological advances and associated scale and scope economies, along with consumer desire for one-stop shopping.

Productivity growth in the retail sector has been enhanced markedly by the growth of chains. Foster, Haltiwanger, and Krizan (2006) show that the net entry of establishments accounts for most of the productivity growth in the retail sector over time, and that this net entry is driven by chain stores. Productivity gains in modern retail are due to investments in information technologies that lead to lower inventories, more frequent deliveries, and larger stores (Jarmin, Klimek, and Miranda, 2009; Holmes, 2001). Given these mechanisms for productivity growth, one would expect that large chains would have the greatest productivity gains from information technologies. And indeed they do (Doms, Jarmin, and Klimek, 2004). The retail sector has contributed to overall productivity growth in the economy over the last 50 years. Jorgenson, Ho and Samuels (2011) state that when they order industries by contributions to value added and productivity, wholesale and retail trade are heading the list.[5]

As the numbers above indicate, mom-and-pop stores (which we equate to single-location stores) have not become extinct with the growth of large chains. On the contrary, large numbers of these stores continue to offer a variety of products, including many specialty products. While these are stores where productivity is unlikely to grow much due to information technologies, workers may be more highly skilled as they sell these speciality products.

How does the growth in productivity in modern chains affect labor demand in the retail sector? Autor, Levy, and Murnane (2003) show that within industries, non-routine analytic and non-routine interactive tasks exhibited strong growth in employment throughout the 1970s to 1990s. In contrast, routine cognitive and routine manual tasks have experienced declines. How might these overall trends apply to retail trade? Autor and Dorn (2013) cite cashiers as an occupation ranked high on the Routine Task Index, suggesting that employment of cashiers is

[5] Conversely, Haskel and Sadun (2011) show that regulation in the U.K. retail sector has led to smaller shops and a total factor productivity slowdown.

reduced due to the substitution of capital for routine tasks. Basker (2012) examines the effect of the introduction of scanners in grocery stores. Much of retail trade has adopted bar code scanners that raise productivity. Smart cash registers, using pictures, also substitute for labor in the fast food and restaurant industries. So there has been some substitution of capital for labor. Autor, Levy, and Murnane show that the industries that invest in information technologies – which would include scanners and cash registers – have lower demand for labor performing routine work. Retail contains a mixture of routine and non-routine work according to their definitions. And the evidence from Basker (2012) suggests that scanners did increase productivity in the supermarket industry by reducing payroll. However, the job growth in retail overall implies that the increased demand for retail output has more than outpaced any reduction in labor demand arising from increased reliance on technology.

II. Wages in Retail: Evidence from Case Studies

Before turning to the analysis of wages using survey data, it is valuable to look to case study evidence on pay in some well-known firms. Table 1 summarizes data from Glassdoor on pay at Wal-Mart, Starbucks, Whole Foods, and Costco.[6] These cases demonstrate that not all retail work is low paying. In these firms, on average, even cashier pay is above the current federal minimum wage. But what is most pronounced is the increase in pay for workers who become managers. According to these data, an entry level cashier in a Wal-Mart store earns $8.48 per hour, but a Supervisor earns $14.38 per hour. Turning to jobs that are salaried, pay rises: a Shift Manager earns $62,837 and a Store Manager earns $92,462. Wal-Mart is at the mid-point of our set of cases. Starbucks pays less; its establishments are smaller. The high-end grocery and big-box stores, of Whole Foods and Costco, pay higher wages. While these are but a few examples, they illustrate well some of the overall patterns revealed in the analyses below.

[6] Glassdoor.com is a website where people voluntarily enter their wages and jobs. The site then publishes averages.

These patterns are also evident at the bottom of Table 1, where mean wages using Current Population Survey data are displayed.

III. Data Sets

The retail sector that is the focus of this study is the one that the "man on the street" or the press would consider retail. It combines two broad industries per the North American Industry Classification System (NAICS), namely the Retail Trade and the Accommodations and Food Services – respectively 15 million workers and 12 million workers according to the BLS by the end of our data period – as well as some segments of the Automotive and Repair Services industry, the Arts, Entertainment and Recreation industry, and the Personal Services sector. See Appendix A for details. We combine these, and refer to the combination as the Retail sector, because the notion of the labor market being dominated by low paying jobs relates to the growth in the combination of all these sectors. This broad definition also aligns better with the SIC (Standard Industrial Classification) definition of the retail sector which was used by the Census Bureau until 1997, which included in particular "Eating and Drinking Places."

Data from the 1996 to 2013 March Supplement of the Current Population Survey (CPS) are used to model retail and manufacturing wage levels and employment. The CPS measures firm size by asking respondents to state how many people work at all locations of their employer. Yearly income, occupation, industry, and firm size all refer to the respondent's longest job in the previous year, and thus 2012 income is the most current available (reported in the 2013 survey). The sample begins with the 1996 survey because there was a major change in sampling frame for the CPS in 1996. For the OLS regressions below, our CPS sample for retail includes 234,667 observations, or individual-years, covering 194,581 unique individuals ages 18 to 64 (see Table 2). For manufacturing, the same database yields a sample of 179,550 individual-years, for

139,499 unique individuals in the same age range. The subsample of individuals that we can track over two time periods, and where the individual remains in retail or in manufacturing for the two years, is relatively small compared to the overall sample, with 40,086 individuals in retail and 40,051 individuals in manufacturing.[7] There are many reasons for this relatively low match rate. First, only half the observations for the first and last year in the data (1996 and 2013) can be matched within our data as the other half match with out-of-sample observations. For the other years, due to factors such as migration, mortality, non-responses, etc., the maximum matching rate is estimated to be about 70% (see Madrian and Lefgren, 1999). Moreover, for our purposes, we restrict the sample to those individuals who are within the right age range in both years, work full time in both years, and are in retail or manufacturing in both years.

The definitions of all the variables used, along with descriptive statistics calculated with relevant sampling weights, are show in Table 2.

Data from the National Longitudinal Survey of Youth (NLSY) are used to complement the CPS data. The data from the NLSY follows a panel of respondents who were 14 to 22 in 1979 when the panel began, extending to 2010. In 1986, the NLSY began asking respondents about the size of the establishment in which they work. Using the panel nature of the data, the effects of establishment size can be modelled with controls for worker fixed effects. Therefore, the regressions below use data on respondents aged 21 to 53 from 1986 through to 2010, with odd-numbered years skipped after 1994 because the survey was not conducted in those years. There is oversampling of the economically disadvantaged in this database, and our regression results below reflect this fact. There are 17,914 individual-year observations in the retail sector and 19,029 individual-years in manufacturing, for a total of 4,904 and 4,218 individuals,

[7] Matching is done as prescribed in the Census Department's "How To Link CPS Public Use Data Files," available at: http://www.census.gov/cps/files/How%20To%20Link%20CPS%20Public%20Use%20Files.pdf.

respectively. Due to attrition in the sample, and movements in and out of the labor force, and in and out of the retail and manufacturing sectors, we observe an average of three to four years of data for each person in each sector. The means of the variables of interest, calculated with appropriate sampling weights to represent population estimates, as well as all variable definitions, also are shown in Table 2.

The descriptive statistics in Table 2 and the regressions below use only the data on full-time workers, or those working 35 or more hours per week, the standard definition used by the Bureau of Labor Statistics. The retail sector is one that comprises a large number of part-time workers. In the CPS data, in retail, 70 percent of employees are full time, with 61 percent of women and 78 percent of men working full time. In manufacturing, the comparable numbers are much larger, at 95 percent for all employees, and 91 percent and 97 percent for women and men employees respectively. Our goal is to model pay for those whose primary job is in retail, and who dedicate most of their time to that job. Nonetheless, for comparison purposes, we show in Table A1, in the appendix, the same information as in Table 2, but for samples that include part-time workers. Though not shown, when we add part-time workers to our regressions below, some magnitudes differ but conclusions are unaffected.[8]

IV. Some Simple Statistics

There are some surprises in the mean wages and characteristics of workers that one garners from the descriptive statistics in Table 2 (and Table A1). First, retail is not comprised only of less educated workers. In the CPS data, only 52 percent of fulltime workers in retail have a high school education or less, with the vast majority of those having completed high school. For those with more than a high school degree, 31 percent have some college, and 17 percent have a college education or more. The level of education of workers in both retail and

[8] An appendix showing results when part-time workers are included in all our analyses is available upon request.

manufacturing has gone up over time. Though not shown in the table, the data show that in retail, the average years of education rose modestly from 12.6 to 13 between 1996 and 2013, while in manufacturing, years of education went from the same 12.7 to 13.4 on average over this period. The proportion of individuals with more than a high-school education (i.e. more than 12 years of education) increased from 43 percent to 51 percent in small retail firms (499 or fewer employees) and from 46 to 56 percent in large retail firms (500 or more employees).

Second, there is a very large number of managers: 28 percent of full-time retail workers self report that they are managers, as compared to 19 percent in manufacturing.[9] Note that 18 percent of the full-time labor force in retail are first-line supervisors who are managing shifts of workers. In other words, in retail, 64 percent (.180/.288) of all managers (as we define managers) are first-line supervisors. Thus what we traditionally think of as managers (more senior than first-line supervisors) are 10 percent of the full-time workforce. We have been very careful to include the first-line supervisors, erring on the side of having too many managers. For example, a "chef" in a restaurant is designated a manager because a large percent of his time is spent managing others. Combining these first-line supervisors with managers from headquarters, the percent manager gets quite high. If we look at the entire retail workforce, including part-time workers, the percent manager in retail falls to 22 percent, while it is virtually unchanged in manufacturing, at 18 instead of 19 percent (see Table A1, in the Appendix).

Third, the distribution of employment by firm size and establishment size is quite dispersed. Large firms employ a large number of people: similar to manufacturing, where large firms account for 44 percent of employment, 41 percent of fulltime employment in retail is in

[9] Abraham and Spletzer (2007) show that the percent manager reported in the CPS is considerably higher than that reported by a survey of firms in the BLS OES (Occupational Employment Statistics) data for 1996-2004. Some of the difference can be explained by how "managers" are coded in the OES, but even after correcting manager definitions in the OES, a significant and unexplained discrepancy remains. The NLSY does not contain information allowing us to identify first-line supervisors separately from managers before 2002.

firms with more than a thousand employees. But mom-and-pop firms and establishments are still prevalent in retail: Firms with less than ten employees account for 18 percent of employment and those with less than 100 employ 45 percent of the retail labor force, i.e. they account for as many employees in this sector as large firms do. Moreover, establishments with less than 10 employees are 32 percent of employment in this sector.[10]

Another feature of retail, not displayed in Table 2, is that the number of people employed by large retail firms and large retail establishments has grown over time. Those employed in large firms (of 500+ employees) grew from 42 percent to 47 percent in the retail sector, and those in large establishments (50 or more employees) grew from 33 to 52 percent. In contrast to retail, in manufacturing, there was no change, or even perhaps a slight decrease, in the percent employed by large firms, and also no change in the percent working in large establishments.[11]

Retail is noteworthy also because it provides substantial employment for women. From the CPS data, only 30 percent of manufacturing workers were women during the period of our data; in retail, even among those working full time, this figure was 44 percent. Thus, the decline in the number of jobs in manufacturing shown in Figure 1 pertains more to men as they predominantly occupy these jobs. Moreover, larger firms in retail employ a greater share of women workers. Fifty percent of employees in firms with 500 or more employees are women, whereas for firms with fewer than 500 employees, this proportion is only 39 percent. Both of

[10] We used the Census of Retail in 2007 to check some of these numbers, based on self-reports, against those reported by firms in the Census. Using the definition of retail from the Census, i.e. NAICS 44-45, and restricting our sample to year 2007 data, our breakdown of employees on the payroll by firm size is: Size<10, 14.3 percent for the CPS, 10.8 in Census; Size10-99, 21.2 percent in the CPS, 20.2 percent in the Census; Size100-499, 9.6 and 8.0; Size500-999, 4.6 and 2.4; Size1000+, 50.3 versus 58.6. With this definition of retail, the breakdown of employees by establishment size in 2007 is: Estab<10, 22.0 percent for the NLSY versus 18.1 percent in Census; Estab10-49, 25.9 percent for the NLSY, 33.5 percent for Census, Estab 50-99, 17.1 percent for the NLSY and 14.8 percent for the Census, and for Estab100+, we have 35.1 percent versus 33.6 percent in Census.

[11] An alternative way to show the same data pattern is to note that the average firm size in retail in the CPS data has grown steadily from 639 employees in 1995 to 725 in 2012. In manufacturing, in contrast, the average size was 797 in 1995 and 799 by 2012, having grown a bit in the late 90s but shrunk through most of the 00s only to bounce back in the last few years. To compute these averages, firm size is measured as the midpoint of each range shown in Table 2, with those in firm size 1000+ given a size of 1500.

these proportions, moreover, have remained basically the same over the whole period covered by our data. In manufacturing, this proportion is 30 percent on average over the period of our data for both smaller and larger firms. As for differences across establishment size categories in retail, they are less pronounced: 46 percent of employees of larger retail establishments (≥ 150 employees) are women, compared to 42 percent in smaller establishments.

The data in Table 1 above suggest considerable variance of pay in retail, variance that is often unacknowledged in popular discourse about wages in the sector. Figure 2 shows this variance using the CPS and total wages and salaries for the previous year for those that work full time. In 2010 dollars, 34 percent of non-managers earned less than $20,000 annually, but at the high end of the spectrum, 13 percent of non-managers earned $50,000 or more.[12] For managers in retail, the pay is higher, not surprisingly, but also even more dispersed: 13 percent earn $20,000 or less, while 33 percent earn more than $50,000.

Retail wage rates are compared to wages for two alternative sets of jobs, those in manufacturing, and those in service occupations. In the CPS data, retail workers earn 68 percent ($16.64 / 24.33) of what manufacturing workers earn. Regressions below explore differences in retail and manufacturing in the wage premia for firm size and for management status.

The second comparison of interest is the mean wages in retail relative to service occupations. As defined by Autor and Dorn (2013), a service occupation is one that offers personal services, such as a gardener, housekeeper, or nanny.[13] Do retail jobs pay as little as service occupations? There are two reasons to ask this question. The first is that service jobs are considered to be the typical job encountered by low-skill workers. The second reason service

[12] For the figures, we do not weight the data. As a result, there are 5 additional observations in this sample, i.e. there are 5 observations in the retail sample that receive weights of zero per the CPS. Also, for Figure 2, we include only workers who indicate that they worked most of the year, defined as 40 weeks or more in the prior year.

[13] Note that this is a discussion of service occupations (e.g. nannies, gardeners, cosmetologists, etc.) found mostly in the personal services sector. See the Appendix for a list of occupations included in this group.

occupations are of interest is that they have been growing in numbers while middle income occupations – such as those in manufacturing – decline. Service occupations are rarely computerized, and so the quantity of these jobs and their pay has risen over time while middle-income routine work has been squeezed out due to computerization (Autor and Dorn, 2013).[14] Using CPS data, we find that service occupations paid $13.97 and $11.15 for men and women respectively, while retail occupations paid $16.28 and $12.79, respectively. Thus, retail jobs pay 16.5 percent (men) to 14.7 percent (women) more than service jobs do.

In sum, when we think of retail, we should think of a growth sector with some computerization that pays 16.5 percent more for men and 14.7 percent more for women than jobs in service occupations. In other words, wage rates in retail are sandwiched between those in manufacturing and those in service occupations.

V. Wage Regressions

The rise of modern retail firms brings to mind images of hamburger flippers and sales people earning minimum wages in impersonal stores at the expense of traditional retail jobs in mom-and-pop restaurants and shops. However, there are at least two features of modern retail firms that, in our view, should alter this image. First, modern retail firms are big. As described above, retail chains are typically either regional in nature – suggesting mid-size firms – or national or even international in scope – suggesting very large firms. In our data, 41 percent of full-time workers in retail work in firms of more than 1000 workers (Table 2). If wages rise with firm size on average, the growth in large firms will improve retail wages. Second, because modern retail firms are bigger, they have more layers of management. More managers earning

[14] Autor and Dorn (2013) provide little information regarding where retail jobs fall in the spectrum of wage polarization because their analysis aggregates retail jobs with clerical jobs.

pay that exceeds entry level pay improves retail wages as a whole. Both these effects are found in the wage data. The relevant evidence is contained in the subsections below.

A series of wage regressions are estimated to identify the wage returns to firm size, establishment size, and managerial status. These regressions are:

$$(1)\ \ln Wage_{it} = \gamma Size_{it} + \eta Manager_{it} + \mathbf{X_{it}}\,\boldsymbol{\beta} + \alpha_i + \varepsilon_{it}$$

where Size is a categorical measure of firm size (for CPS) or establishment size (for NLSY), Manager is a dummy variable for managerial occupation, including first-line supervisors, **X** is a vector of control variables that includes education, experience, and dummy variables for married, Black, and for living in an urban area. Because the CPS data do not include a measure of work experience, experience is calculated as age minus education minus six. Since women are more likely to be out of the labor force for periods of time, this measure is likely to overestimate the experience of women more than that of men. For the NLSY data, our measure of experience is the cumulative number of years as calculated from reported weeks per year times average hours per week in the data. Thus our measure of experience in the NLSY does not overestimate the work experience of women while that in the CPS will tend to do so.

The regressions are estimated with and without worker fixed effects, α_i. The aim of the regressions is as follows. The first set of regressions are OLS, with standard control variables listed above. The goal is to estimate treatment effects – of moving to big firms or managerial jobs – with some standard controls for worker quality. Because workers who are better educated are more likely to be hired by large firms and more likely to become managers, it is important to control for worker characteristics - observed and unobserved - when estimating these effects. The second set of regressions thus control for worker fixed effects. These regressions hold constant unobserved worker ability, α_i, that can produce omitted variable bias in OLS estimates

of the incremental returns to firm size. If the OLS coefficients on firm size exceed the fixed effects coefficients, the difference measures the degree to which there is sorting of good workers to large firms or managerial positions based on workers' unobserved characteristics.

The coefficients on Size and on Manager are estimating treatment of the treated effects, not average treatment effects. In other words, there are additional relationships that would pick up the sorting of workers into the Size and Manager categories. For example, for the size effects, big firms or big stores may have a larger queue of workers from which to choose and may be more careful in their selection of workers, or they may be less likely to choose workers who might be considered risky, or they may hire based on personal referrals. Alternatively, workers with certain character traits (e.g., those who like to interact with more colleagues, or who are more risk averse) may be attracted to, and seek jobs in, larger firms or establishments. In either case, the coefficient on Size in (1) represents the treatment of the treated because it captures the effect of Size on the wages of the workers who are hired by big firms or big establishments. Whether the treatment of the treated effect would be larger or smaller than the average treatment effect depends on this sorting of workers to firms. Similarly, and perhaps more realistically, there is a set of variables that would cause workers to be promoted to manager. Those promoted may be better organized, have better people skills, or instill trust in others. The coefficient on Manager in (1) is the treatment of the treated because it represents the effect of Manager on the wages of workers who are selected to be managers because they have these traits. There is no data on which to estimate average treatment effects because movement to large firms or to managerial occupations is never imposed randomly on workers.

A. The Effects of Firm Size

There is an abiding interest in whether the retail sector provides "good jobs" for those

who are less educated. Therefore, a natural question to ask is, how do the less educated fare in retail? Do the less educated earn more at large firms or as managers, or is all the increase in earnings power from moving to larger retail chains conferred on better educated retail workers? Table 3 answers these questions using CPS data from 1996 to 2012. In Table 3, we show results first for the largest sample available in the CPS for two educational groups, those with high school or less (column 1), and those with some college or more (column 2). We do this so we can assess how well those with low education fare in retail. We then show OLS (columns 3 and 4) and then fixed effects results (columns 5 and 6) for the sample of individuals for which we have repeat observations so we can compare the OLS and fixed effects results on the same sample.

Large retail firms pay more than small firms in the retail sector if an employee has a high-school or less education, but they pay considerably more for those with some college education or more. From Table 3, for the high school educated, a firm with 100 to 499 workers pays 20.9 percent more than a small firm with less than 10 workers. Note that this is not a manager effect, as we control directly for manager status. For the worker with some college education or more, the larger firm pays 30.1 percent more.

Pay does not rise linearly with firm size. There is an immediate bump up in pay when moving from small (less than 10) to slightly larger (10 through 99) and then to mid-size firms (100-499). The best-paid jobs are those in firms with 100-499 workers across both education levels although the next size up involves wages that are not statistically lower. These high-paying firms may be regional chains, and/or chains comprised of unionized stores.

Higher pay in larger firms might arise if larger firms hire workers who are more skilled. Regression results support this hypothesis. Introducing worker fixed effects in Columns 5 and 6

shows that the returns to firm size fall considerably when controlling for worker's unobserved ability—firm size effects are about one-half to one-third as big, depending on the education group. Recall that in the CPS data, identification of firm size effects in fixed effects regressions comes from only a one-year change in wages as workers move between firms. Still, in all instances, a comparison of the OLS results (in columns 3 and 4, which use the same sample as the fixed effects regressions) to the fixed effects results (in columns 5 and 6) suggests that there is a sorting of better workers to larger, better-paying firms.[15] Workers selected by large firms may differ in some unobserved ways from those who are not.[16] The subset of those selected by large firms benefit from higher pay.

Why do larger firms pay higher wages than small? Pay premia in larger firms have long been a puzzle in economics, just as it has been a stable result across data sets and time periods.[17] Part of the story is that big firms are hiring higher quality workers; the fixed effects results show this. But a sizeable wage premia remains after controlling for worker fixed effects. It may be that big firms are offering compensating differentials for more onerous work, such as more nighttime hours in big stores than in mom-and-pop stores. We do not have data on nighttime hours to test those possibilities. But we compare workers in businesses that sell merchandise to workers in the restaurant sector, where the latter are especially likely to have to work nights, and find very similar patterns of firm and establishment size wage premia. The fact that we find these

[15] Wage growth regressions validate this finding, but also confirm that firm size and promotion effects remain after we control for unobserved worker ability. For example, using the CPS data, wage growth regressions indicate that moving from a firm with fewer than 10 workers to a larger one is associated with an increase of 7.2 percent in wages for the high-school educated, and 8.3 percent for those with some college education or more when we control for changes in Manager, Education, Experience, Married, and Urban. Similarly, a movement to manager is associated with an increase in pay of 8.2 percent for those with a high-school degree or less, and 6.6 percent for those with some college education or more.

[16] Fox (2009) shows that the firm size wage premium increases with the level of worker responsibility on the job, where responsibility means advancing in the job to supervise others. This could imply that large firms will look for workers who can shoulder more responsibility.

[17] See footnotes 4 and 16 above.

wage premia even in narrowly defined sectors, such as within the restaurant industry, moreover suggests that wage premia are not due to inter-industry differences. It may be that workers in large stores work harder. This could be due to efficiency wages – that offering higher wages will induce higher effort. We checked to see if the firm size effect has changed over the 17 years of our data, and it has not. The puzzle largely remains. The most likely explanation in our view is that employees in larger firms are more productive on average – due to technology investments, intangible assets such as brands, increased coordination, and so on, and that they are compensated for their increased productivity or simply able to share in the increased returns generated by these technologies and intangible assets.

B. The Effects of Establishment Size

Major retail chains are typically larger firms; they are also typically, though not always, comprised of larger establishments. As described above, big box stores have more employees per store than the typical mom-and-pop stores. Of course, the correlation between firm size and establishment size is far from perfect – many big chains, like fast-food and other restaurant chains, have fewer employees per store than would a standard grocery store or a traditional department store.[18] But if large stores are becoming more common, as described in section I above, the question is, do larger establishments pay higher wages like larger firms do?

Wage levels rise markedly with establishment size according to the NLSY data (Table 4), across both educational levels. Working in a store with 500+ employees pays 26 percent more for high-school educated and 36 percent more for those with some college education (including those with a college degree or more), relative to working in a store with less than 10 employees.

[18] We are unable to assess this correlation in our data since the CPS includes information on firm size only, and the NLSY includes information on establishment size only.

For both education levels, the effect of store size rises steadily as we move from stores with less than 10 employees through to the larger size stores.

Here as well, some portion of the wage gain as store size increases is a return to workers' unobserved ability. When worker fixed effects are introduced in the regressions, the gains to store size remain, but for those with a high-school or less education, they fall twenty-some to thirty-some percent across establishment sizes. For those with more education, we see such a reduction only in the largest establishments. The NLSY data has three to four observations per person on average in retail, from which to estimate the store size effects while controlling for worker fixed effects.

Why do larger establishments pay higher wages than small ones? The potential explanations are the same as those for the firm size effects discussed above. Yet again, we find no time-series changes in premia. We also find no difference in premia for rural versus urban markets. The latter result is especially interesting as establishments in rural areas are those that would be most likely to benefit from market – specifically monopsony – power in their local labor markets, which would suggest lower wage premia in rural markets. But we find no evidence of such differences. We also find sizable establishment size effects within the restaurant sector and within merchandise retailing. Thus inter-industry differences do not seem to be the source of the establishment size differences that give rise to the wage premia. Again, it may simply be that employees in larger retail establishments are more productive – due to selection or the productivity benefits of larger establishments – than those in smaller establishments, on average.

C. Promotions

One of the key features of modern retail firms is that promotion to managerial positions

provide opportunities for pay increases. Darden Restaurants states that "More than half of our restaurant managers are promoted from hourly positions,.., and nearly 100 percent of general managers and managing partners are internal pomotions."[19]

Managers in retail in the CPS and NLSY data are predominately lower-level supervisors. In selecting the occupational codes to define managers, we purposely selected managerial occupations to include those who are first-line supervisors (see Appendix). The majority of the managers in the data are therefore low level, not high-level management. Recall that from Table 2, 64 percent of the people who are managers in the CPS data are, indeed, first-line supervisors.[20]

It is, however, true that well-educated workers are much more likely to be managers. The percent manager rises from 22 percent for high-school educated or less to 35.5 percent for those with some college or more (CPS data, full-time workers). Note that by running wage regressions within educational group, we control for the degree to which the wage gains for managers are due to sorting by educational group.

The effect of becoming a manager on wages in retail can be estimated in both the CPS data and the NLSY data. The regression results show that manager effects on wages are sizable in the two data sets. Wage rates are 22.6 and 15.3 percent higher for high school educated managers, all else constant, in the CPS and NLSY data (Tables 3 and 4). The gains are similar for the workers with some college or more – at 19.5 and 16.1 percent respectively. Because managers are better educated, when education is dropped from the regression (not shown), the estimated returns to being a manager become larger.

Managers who work in large stores earn more than those who work in small stores. While not displayed in Table 3, we estimate regressions with interactions between the Manager

[19] Jennings (2013). Darden is the owner of eight restaurant brands, including Olive Garden and Red Lobster.
[20] The NLSY does not include codes to identify supervisors separately from managers prior to 2002.

dummy variable and store size.[21] For the high school educated, a manager in a small store (Size <10) earns 12.6 percent more than a non-manager. But managers in all bigger stores earn wage premia that are about twice that. For example, a high-school educated manager in a store of Size 100-499 earns 28.2 percent more than a non-manager. Results are comparable for the college educated.

A sizable portion of the wage increase that accompanies a promotion to a managerial position is a return to ability. In worker fixed-effects regressions with the CPS data, movement into management raises wages by only 8.3 percent and 6.5 percent for each education group (Table 3). Similarly, in the NLSY fixed effects regressions, the movement into management increases wages by 10 percent and 8 percent, respectively, for the two education groups (Table 4). These pay premia for managerial skills are treatment of the treated results. Managers' pay may reflect unobserved skills – like organizational skills or people skills – that are rewarded with higher pay when a worker is promoted to manager status.

D. Worker Sorting

Taken together, the wage regressions above show that there is sorting of higher quality workers into big firms, big establishments and managerial occupations. Looking across the numerous regressions in Tables 3 and 4, the wage gains for firm size and for establishment size fall considerably when comparing the OLS estimates of these effects to the worker fixed effects estimates (in Table 3 for the CPS data and in Table 4 for the NLSY data). Nonetheless, working in a larger firm, and/or a larger establishment, and getting promoted to a managerial position still benefits the individual worker beyond what is necessary to compensate for unobserved ability.

[21] Results from these regressions are available upon request.

E. Gender Gap

Women represent almost half of the full-time labor force in retail (Table 2). This might lead to an expectation that the retail gender wage gap would be low, and that women would be promoted to managerial positions with greater frequency in this sector. Holding constant firm size and all other variables, wages are 25 and 21 percent lower for women in the CPS data, for high school educated and those with some college or more (Table 3). The gender wage gap is the same in the NLSY data (Table 4).

These regressions do not control for the detailed occupations of women and men. Women may be cashiers and men forklift operators. However, if we estimate the wage regressions within a major occupational category – that of cashiers – in the CPS data the pay received by women remains 17 and 20 percent lower, respectively for the two education levels, all else constant in the regression (not shown). Nevertheless, these regressions do not tell us that firms are paying differential amounts for like workers. The mean values of Table 1 show that if women choose to work at Starbucks and men choose to work at Costco, men will make considerably more than women.[22]

We delve deeper into the pay differences for men and women by estimating wage regressions by gender. In OLS, the gains to firm size and managerial status are similar for men and women (Table 5). The gains to establishment size are greater for women than men (Table

[22] Neumark (1996) conducted an audit study of restaurant hiring. In that study, he sent women and men with identical resumes to high priced restaurants that pay higher wages than average restaurants. He found that women are less likely to be interviewed and less likely to be hired than men. There is some evidence that it was due to customer discrimination. The implication is that high-paying restaurants are less likely to hire women than men: women are more likely to work in low-paying restaurants. Neumark's study is now twenty years old and did not measure whether women are less likely to apply to work at higher paying restaurants. Still, in a more recent similar study aimed at science recruiting, Moss-Racusin et al (2012) found that identical resumes for men and women graduate students applying for lab manager positions received different salary and mentoring offers.

6).[23] Combined with results on the wage gap, these results imply that base pay is lower for women than men, the rate at which pay grows with firm size or managerial promotion is similar across the two genders, but women benefit particularly from working in larger establishments.[24]

As before, much of the wage premia with rising firm size is a return to ability for both women and men. When worker fixed effects are added to the regressions, the returns to firm size drop (columns 5 and 6, Table 5). There is less sorting of high-ability women and men across establishments of different sizes: the fixed effects results (columns 3 and 4, Table 6) show wage premia for big establishments that are pronounced, and statistically significantly greater for women than men.

F. Education and Experience

While the popular press suggests that all retail jobs are low skilled, the estimated returns to education in our regressions indicate otherwise. Tables 5 and 6 show the rate of return to years of education, by gender. Without controlling for unobserved ability, the return to education is 8.1 percent and 7.4 percent per year of education for women and men according to the CPS data (columns 1 and 2 of Table 5), or 8.3 and 7.0 if we reduce the sample to be comparable to that used in the fixed effects regressions. Similarly, the return to education is 5.8 and 5.4 percent for women and men in the NLSY data (columns 1 and 2 of Table 6). These effects are again much smaller when we control for worker unobserved ability via fixed effects. However, such estimation relies on very limited data, namely increases in education between two years in the CPS data, and increases in education that occur almost exclusively in the early years

[23] We also pool the samples for men and women to do t-tests of whether there are significant differences for the genders. In the CPS data, women earn 5 percent more than men in the Size1000+ size, and in the NLSY data, women earn significantly more than men across all the size categories relative to small establishments.

[24] When we look at all workers, part-time and full-time, the regressions are very similar to those for full-time. The returns to firm size and establishment size are slightly lower for all workers. These results are available upon request.

of the NLSY data. Note that the more educated also have bigger returns to firm size than the less educated: in Table 3, the returns to firm size for the some college or more is about 50 percent greater than that of the high school educated, and the differences are statistically significant.

Pay also rises with experience in the labor market. In the CPS data, the OLS gains to experience are greater for men than women most likely because our measure of experience does not control for women's time out of the labor force (Table 5). In the NLSY, where we can measure experience based on reported hours and weeks of work over time, the effects of experience are greater, and no longer statistically different for men and women.

G. Manufacturing

A comparison of the structure of pay in retail to that in manufacturing is warranted because manufacturing often serves as the example of "good jobs" in the economy. Therefore, it makes sense to see whether the structure of pay in retail diverges from that in manufacturing. Clearly, the difference in mean wages is pronounced in Table 2.[25] To understand how the structure of pay differs, we show manufacturing wage regressions in Tables 7 and 8 that are directly comparable to those in Tables 5 and 6.[26]

There is a steep gradient in pay with firm size in manufacturing, so that workers in the largest firms earn 34 to 40 percent more than those in the smallest (Table 7, OLS results using CPS data). Comparing manufacturing to retail, the returns to firm size are more pronounced in manufacturing, pay increases due to promotion to manager are somewhat greater, and the returns

[25] We expect that compensation differences would be more pronounced if we could incorporate data on fringe benefits. Unfortunately, such data are unavailable.

[26] An additional regression documents the manufacturing to retail wage differential. We examine a sample of 2,804 workers in the CPS data who move from manufacturing to retail. When making this move, wages fall by 8.3%, when we control for Firm size, Education, Experience, Manager, Married, and Urban. Some of this wage drop however may reflect the lower tenure associated with a job change. On the other hand, a change from retail to manufacturing - 2747 individuals in the CPS make such a move - is associated with a 12.2 percent increase in pay, suggesting that the differences are at least to some extent reflecting the different pay scale in the two industries.

to education are somewhat higher.[27] Holding worker effects fixed, however, we find greater returns to promotion in retail than in manufacturing. The gains to establishment size, per Table 8, also are smaller in manufacturing plants than in retail stores. But since base pay is smaller in retail, those working in large retail stores do not catch up to those working in large manufacturing plants (more on this below).

As in retail, the pay gradients with firm size or establishment size also are dramatically lower when controlling for individual ability (columns 5 and 6 of Table 7 and columns 3 and 4 of Table 8). Those who are more able are more likely to work in large firms, large establishments, and as managers. Interestingly, while fixed effects regressions can only be estimated with some confidence for male workers in manufacturing, the within-worker gains to firm size are somewhat smaller in manufacturing than in retail. In other words, the sorting of high-ability workers into large firms accounts for even more of the large gains in wages that are associated with firm size in manufacturing than in retail.

To summarize, retail jobs and manufacturing jobs share a similar structure of pay. In both, there are gains to firm size, to managerial promotion, to education, to experience, and to ability. While outside the scope of this paper, we would speculate that well-paid manufacturing jobs tend to be higher skilled, entail more physically onerous working conditions, and be unionized.[28]

VI. Further Implications

The preceeding regressions are aimed at estimating the impact of firm size on a worker's wages holding constant the worker's ability. Ability is held constant first via the inclusion of

[27] These differences are statistically significant when we pool the retail and manufacturing sectors.

[28] It is less clear whether retail trade jobs also have onerous working conditions due to standing and work schedules that may be out of the control of the employee. At the same time, retail jobs may also be preferred by workers for the possibility of non-standard schedules.

standard control variables – education and experience – and then with worker fixed effects.

It is now revealing to turn back to the raw data to further illuminate the debate on whether large firms pay higher wages and why. Table 9 displays mean wages by firm size and managerial status for retail and manufacturing. The pay differentials across firm sizes are more extreme in the raw data than in the wage regressions. When we do not control for worker quality, bigger firms hire more able workers and thus wage differentials are large with firm size.

The displayed wage levels inform a policy debate on where the United States should put its resources if we are aiming to increase middle class jobs. In ongoing policy discussions, it is suggested that resources should go into bringing outsourced manufacturing jobs back to the U.S., or to improving the training that workers need for today's manufacturing jobs. Table 9 makes clear that there is an alternative to policies aimed at building up manufacturing. That alternative is to prepare workers to be managers in modern retail firms. A manager in the retail sector makes more per hour than an operative in manufacturing, and the need for managers in retail is greater than in manufacturing, as indicated by the higher proportions of managers in all size firms. Managers in retail are more highly skilled than operatives in manufacturing: managers have some college education and likely have unobserved personal skills, such as people-management skills or organizational skills. But expending resources on education to increase preparation for managerial jobs in the retail sector could be a viable alternative to expending resources on education for manufacturing work, because wages are higher for managers in retail than they are for non-managers in manufacturing. From Tables 2 and 9, retail firms employ a larger proportion of managers than manufacturing firms do. Also, large firms, who need managers, have been growing fast in the retail sector.

VII. Conclusion

Over the last forty years, modern retail firms, those with the modern products and processes that support large chains, have become a large segment of the retail sector. Using worker-level panel data on wage rates, we show that the spread of these chains has been accompanied by higher wages. Large chains and large establishments pay considerably more than small mom-and-pop establishments. Moreover, large firms and large establishments give access to managerial ranks and hierarchy, and managers, most of whom are first-line supervisors, are a large fraction of the retail labor force, and earn about 20 percent more than other workers. A good part of these wage gains are returns to ability – large firms and large establishments hire and promote the more able.[29] The retail sector pays considerably less than manufacturing, but as the manufacturing sector has declined over time, the growth of modern retail chains has increased retail wages and provided more promotion opportunities, particularly for the more able worker.

[29] Holzer, Lane, Rosenblum and Andersson (2011) use employee-employer matched data on individual workers for 1992 to 2003 to show that retail "now provides good jobs to many workers in the fourth and fifth quintiles of skills who obtain jobs in higher quintiles of firm quality." In their work, worker skills are measured as individual fixed effects and firm quality is measured using firm fixed effects.

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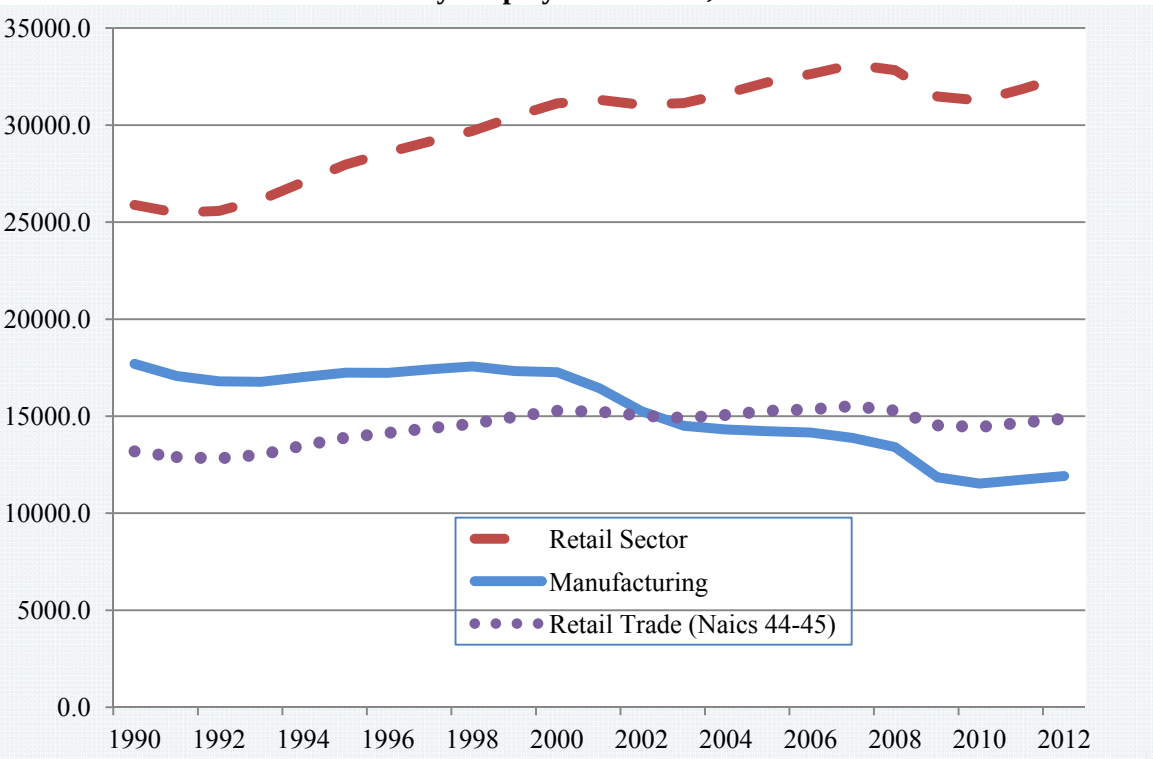
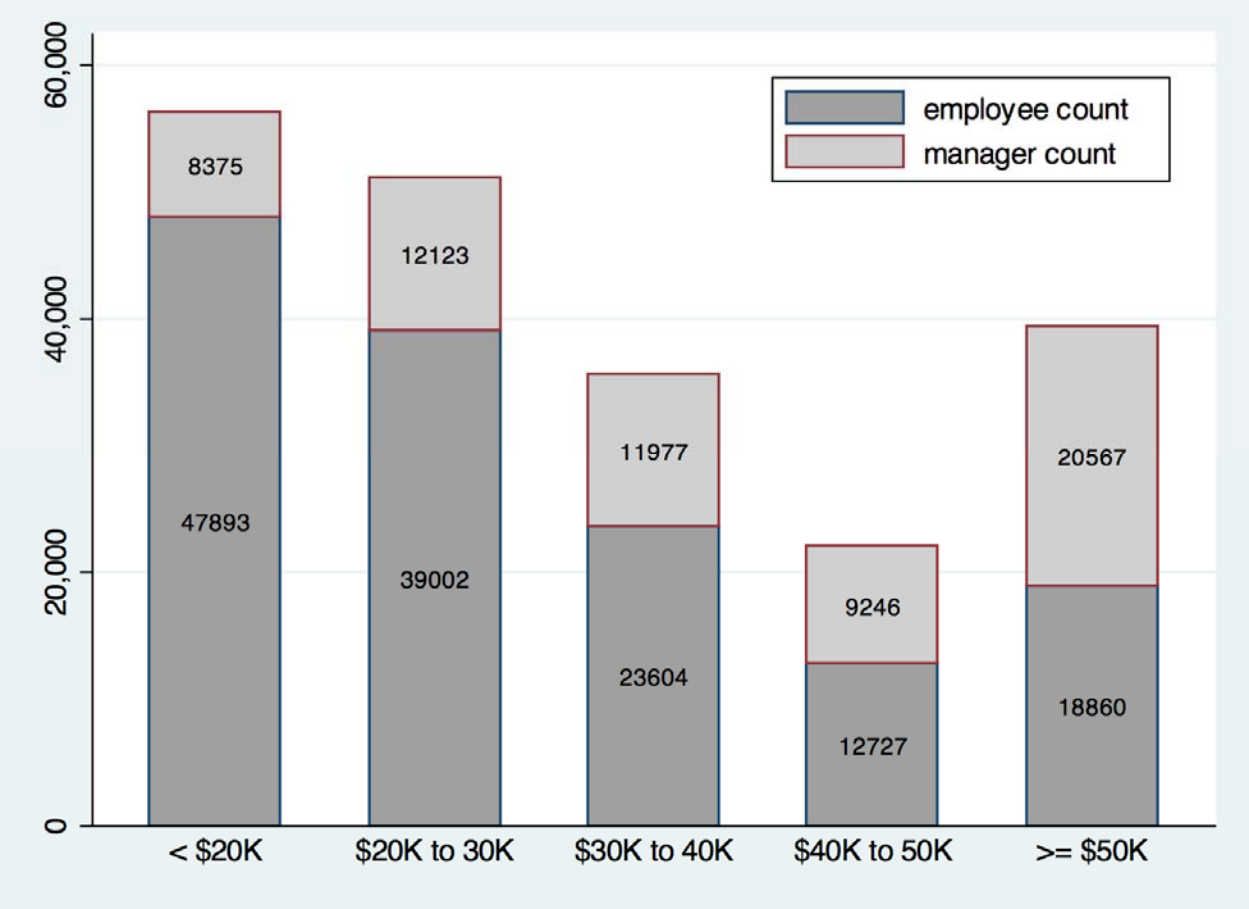
Figure 1
Yearly Employment Levels, in thousands



Source: Bureau of Labor Statistics, Table B-1. Employees on nonfarm payrolls by industry sector and selected industry detail

Note: "Retail Sector" includes retail trade, accommodations and food services, and minor sectors classified under arts, entertainment, and recreation, and under personal services (*see Appendix A*).

Figure 2
Number of Employees and Managers by Annual Income, in 2010 dollars (CPS)



Note: Counts are based on responses in CPS about total wages and salaries earned in the previous year. Current wages and salaries data converted to constant 2010 dollars using the CPI published by the US Bureau of Labor Statistics.

Table 1: Information on Compensation in Specific Retail Chains, from Glassdoor© and Comparable Data from CPS for 2012 (in current dollars)

	Position Title	Type	Average Compensation	Sample Size
Wal-Mart				
	Cashier	Hourly	$8.48	262
	Stocker, Overnight	Hourly	$9.64	140
	Sales Associate	Hourly	$8.86	413
	Associate, Customer Service	Hourly	$9.13	65
	Zone Supervisor	Hourly	$14.38	46
	Assistant Manager	Yearly	$43,916.00	342
	Manager, Shift	Yearly	$62,837.00	80
	Manager, Store	Yearly	$92,462.00	75
Starbucks				
	Barista	Hourly	$8.80	1107
	Lead Barista	Hourly	$9.52	39
	Shift Supervisor	Hourly	$11.02	577
	Assistant Manager	Yearly	$33,634.00	31
	Manager, Store	Yearly	$44,632.00	331
	Manager, District	Yearly	$75,775.00	42
Whole Foods				
	Cashier	Hourly	$10.31	98
	Team Member	Hourly	$10.90	75
	Associate, Customer Service	Hourly	$10.37	31
	Associate, Team Leader	Hourly	$17.57	20
	Team Leader	Hourly	$22.65	23
	Manager, Department	Yearly	$53,722.00	2
	Manager, Store	Yearly	$69,620.00	2
Costco				
	Sales Assistant	Hourly	$11.59	14
	Cashier, Front End	Hourly	$11.86	77
	Stocker	Hourly	$12.85	48
	Supervisor	Yearly	$54,160.00	10
	Assistant Manager, Department	Yearly	$77,250.00	4
	Manager, Department	Yearly	$67,167.00	6
	Manager, Front End	Yearly	$65,583.00	6
	Manager, General	Yearly	$109,000.00	3
Current Population Survey 2012 Data, for Retail				
	Cashiers, full and part-time	Hourly	$11.22	1998
	Supervisor	Yearly	$43,142	2529
	Manager (excl. supervisor)	Yearly	$66,802	1241

Data for Glassdoor.com are from anonymous submissions, which we downloaded on October 21, 2013. We used all available data for each company and position, and the data pertain to both 2012 and 2013. Small sample sizes are attributable to the voluntary basis of wage submissions. CPS data are for 2012, the last full sample year available. If we restrict to only full-time cashiers, the mean hourly wage is slightly lower, at $11.01.

Table 2: Variable Definitions and Descriptive Statistics

Variable Name	Retail		Manufacturing		Variable Definition
	CPS Mean (S.D.)	NLSY Mean (S.D.)	CPS Mean (S.D.)	NLSY Mean (S.D.)	
Hourly Wage	16.641 (19.911)	16.177 (37.912)	24.334 (25.494)	21.383 (38.819)	Hourly Wage Rate in 2010 Dollars
Size < 10	0.182		0.054		Firm Size, less than 10 employees
Size 10 - 99	0.268		0.218		Firm Size, 10 to 99 employees
Size 100 - 499	0.098		0.211		Firm Size, 100 to 499 employees
Size 500-999	0.039		0.079		Firm Size, 500 to 999 employees
Size 1000 +	0.413		0.438		Firm Size, more than 1000 employees
Size 0 - 9		0.323		0.100	Estab. Size, less than 10 employees
Size10 - 49		0.183		0.086	Estab. Size, 10 to 99 employees
Size 50 - 149		0.148		0.094	Estab. Size, 100 to 499 employees
Size 150 - 499		0.283		0.433	Estab. Size, 500 to 999 employees
Size 500 +		0.064		0.288	Estab. Size, more than 1000 employees
Manager	0.283	0.282	0.187	0.143	Manager (includes supervisors)†
Supervisor	0.181		0.059		Supervisors only†
Education	12.710 (2.365)	12.754 (2.005)	12.934 (2.719)	12.908 (2.235)	Years of Education
High school or less	0.524	0.624	0.519	0.636	High School Degree or Less
Some_college	0.310	0.231	0.255	0.167	Some College, but not a 4-year degree
College_more	0.166	0.145	0.226	0.197	College 4-year Degree or more
Experience	18.184 (12.291)	12.460 (7.679)	22.280 (11.523)	14.185 (8.177)	Years of Work Experience††
Hours/week	42.922 (7.757)	39.537 (1.345)	43.210 (6.537)	39.875 (0.702)	Hours Worked per Week
Age	36.891 (12.152)	33.497 (7.274)	41.213 (11.270)	34.011 (7.246)	Age
Married	0.463	0.517	0.619	0.622	Married Status Indicator Variable
Black	0.117	0.138	0.105	0.115	Black Indicator Variable
Urban	0.706	0.774	0.635	0.688	Urban Indicator Variable†††
Female	0.440	0.427	0.302	0.312	Female Indicator Variable
N obs.	234,667	17,914	179,550	19,029	
N individuals	194,581	4,904	139,499	4,218	

All descriptive statistics calculated using weights. See online code for details.

† See Appendix A for codes used to define Manager and Supervisor in both the CPS and NLSY. We do not report the proportion supervisor for the NLSY because the occupational codes in that survey do not allow us to identify supervisors separately from managers prior to 2002.

†† In the CPS, we have limited information on work experience, and construct this variable using Age minus 6 minus Education. In the NLSY, we compute this variable as the cumulative weeks of work and hours per week worked reported for the individual in question over time, which we report in number of years equivalent.

††† In the CPS data, this is constructed from information about the statistical area of residence where we code "Central city" and "Balance of MSA" as urban. For the NLSY, we rely on the urban/rural indicator variable that is in the data directly.

Table 3: Retail Trade by Education (CPS); Dependent Variable: Log Wage

	OLS High School or Less	OLS Some College +	OLS High School or Less	OLS Some College +	Fixed Effects High School or Less	Fixed Effects Some College +
Size 10-99	0.126***	0.190***	0.134***	0.206***	0.065***	0.071***
	(0.007)	(0.009)	(0.012)	(0.015)	(0.018)	(0.025)
Size 100-499	0.209***	0.301***	0.222***	0.322***	0.092***	0.104***
	(0.009)	(0.010)	(0.015)	(0.018)	(0.021)	(0.028)
Size 500-999	0.207***	0.271***	0.210***	0.278***	0.092***	0.070**
	(0.011)	(0.013)	(0.019)	(0.021)	(0.025)	(0.032)
Size 1000+	0.152***	0.253***	0.153***	0.280***	0.075***	0.105***
	(0.006)	(0.008)	(0.011)	(0.014)	(0.020)	(0.026)
Manager	0.226***	0.195***	0.209***	0.158***	0.083***	0.065***
	(0.005)	(0.005)	(0.008)	(0.009)	(0.015)	(0.017)
Education	0.052***	0.093***	0.053***	0.086***	0.020**	0.015
	(0.001)	(0.002)	(0.002)	(0.003)	(0.008)	(0.018)
Experience	0.280***	0.356***	0.226***	0.317***	0.187**	0.371***
	(0.006)	(0.008)	(0.013)	(0.016)	(0.079)	(0.105)
Experience^2	-0.041***	-0.066***	-0.031***	-0.059***	-0.033**	-0.061***
	(0.001)	(0.002)	(0.003)	(0.004)	(0.016)	(0.022)
Female	-0.252***	-0.211***	-0.266***	-0.197***		
	(0.004)	(0.005)	(0.008)	(0.009)		
Married	0.115***	0.153***	0.116***	0.157***	0.038	0.023
	(0.005)	(0.005)	(0.008)	(0.010)	(0.032)	(0.039)
Black	-0.105***	-0.095***	-0.122***	-0.118***		
	(0.007)	(0.008)	(0.013)	(0.017)		
Urban	0.087***	0.144***	0.087***	0.147***	-0.529*	0.037
	(0.005)	(0.005)	(0.008)	(0.010)	(0.317)	(0.153)
Constant	1.298***	0.618***	1.398***	0.793***	2.089***	1.747***
	(0.017)	(0.028)	(0.033)	(0.054)	(0.259)	(0.313)
Total Obs	125,115	109,552	39,856	35,276	39,856	35,276
Nb Individuals	105,187	91,409	19,928	17,638	19,928	17,638
Adjusted R^2	0.162	0.219	0.165	0.194	0.445	0.516

Notes: All regressions include year fixed effects, and use CPS March Supplement weights. Clustered standard errors, at the individual level, in parentheses. * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The educational categories are high school or less and some college or more. The first two columns show results for the larger sample available in the CPS. Columns 3 and 4 show results for the reduced sample corresponding to that used in the fixed effects regressions in Columns 5 and 6. Note that the sample sizes in columns 3 and 4, or in columns 5 and 6, do not sum to the number of matched individuals described in the text. This is because a number of the matched individuals switch education category between the two years we observe them.

Table 4: Retail Trade by Education (NLSY); Dependent Variable: Log Wage

	OLS High School or Less	OLS Some College +	Fixed Effects High School or Less	Fixed Effects Some College +
Estab 10-49	0.111***	0.054	0.086***	0.100***
	(0.020)	(0.036)	(0.019)	(0.029)
Estab 50-149	0.214***	0.130***	0.139***	0.170***
	(0.024)	(0.043)	(0.023)	(0.039)
Estab 150-499	0.247***	0.180***	0.188***	0.189***
	(0.030)	(0.046)	(0.033)	(0.040)
Estab 500+	0.259***	0.357***	0.194***	0.277***
	(0.028)	(0.065)	(0.036)	(0.046)
Manager	0.153***	0.161***	0.100***	0.084***
	(0.021)	(0.028)	(0.018)	(0.021)
Education	0.017***	0.070***	-0.009	0.020
	(0.007)	(0.012)	(0.025)	(0.021)
Experience	0.494***	0.470***	0.404***	0.642***
	(0.041)	(0.071)	(0.082)	(0.158)
Experience^2	-0.067***	-0.041*	-0.052***	-0.076***
	(0.012)	(0.023)	(0.016)	(0.029)
Married	0.066***	0.090***	-0.025	0.085***
	(0.017)	(0.027)	(0.020)	(0.031)
Black	-0.118***	-0.122***		
	(0.018)	(0.033)		
Female	-0.243***	-0.200***		
	(0.021)	(0.033)		
Urban	0.101***	0.107***	0.032	-0.046
	(0.020)	(0.034)	(0.029)	(0.032)
Constant	1.799***	1.097***	2.151***	1.798***
	(0.078)	(0.180)	(0.284)	(0.308)
Total Obs	11,776	6,138	11,776	6,138
Nb Individuals	3,323	1,694	3,323	1,694
Adjusted R^2	0.267	0.257	0.573	0.593

Notes: All regressions include year fixed effects, and use NLSY weights. Clustered standard errors in parentheses. The educational categories are high school or less and some college or more.
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 5: Retail Trade by Gender (CPS); Dependent Variable: Log Wage

	OLS female	OLS Male	OLS female	OLS male	Fixed Effects female	Fixed Effects male
Size 10-99	0.163***	0.146***	0.168***	0.160***	0.034	0.083***
	(0.008)	(0.007)	(0.015)	(0.012)	(0.021)	(0.018)
Size 100-499	0.259***	0.243***	0.266***	0.265***	0.088***	0.104***
	(0.010)	(0.009)	(0.017)	(0.014)	(0.026)	(0.021)
Size 500-999	0.254***	0.224***	0.230***	0.249***	0.051*	0.098***
	(0.012)	(0.011)	(0.020)	(0.019)	(0.029)	(0.026)
Size 1000+	0.225***	0.178***	0.236***	0.194***	0.083***	0.082***
	(0.008)	(0.007)	(0.013)	(0.011)	(0.023)	(0.020)
Manager	0.216***	0.204***	0.178***	0.189***	0.081***	0.079***
	(0.005)	(0.005)	(0.009)	(0.008)	(0.015)	(0.016)
Education	0.081***	0.074***	0.083***	0.070***	0.030***	0.023***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.008)	(0.008)
Experience	0.254***	0.341***	0.183***	0.294***	0.262***	0.148*
	(0.007)	(0.007)	(0.014)	(0.013)	(0.089)	(0.079)
Experience^2	-0.040***	-0.054***	-0.028***	-0.046***	-0.040**	-0.029*
	(0.002)	(0.002)	(0.003)	(0.003)	(0.017)	(0.015)
Married	0.066***	0.191***	0.060***	0.195***	0.020	0.056
	(0.005)	(0.005)	(0.009)	(0.008)	(0.031)	(0.035)
Black	-0.091***	-0.135***	-0.111***	-0.145***		
	(0.007)	(0.008)	(0.014)	(0.015)		
Urban	0.154***	0.097***	0.159***	0.092***	-0.471	-0.045
	(0.005)	(0.005)	(0.009)	(0.008)	(0.439)	(0.128)
Constant	0.673***	0.965***	0.806***	1.086***	1.713***	1.926***
	(0.021)	(0.017)	(0.039)	(0.033)	(0.338)	(0.174)
Total Obs	105,976	128,691	34,644	45,528	34,644	45,528
Nb Individuals	88,654	105,927	17,322	22,764	17,322	22,764
Adjusted R^2	0.169	0.225	0.173	0.210	0.468	0.506

Notes: All regressions include year fixed effects, and use CPS March Supplement weights. Clustered standard errors, at the individual level, in parentheses. * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The first two columns show results for the larger sample available in the CPS. Columns 3 and 4 show results for the reduced sample corresponding to that used in the fixed effects regressions in Columns 5 and 6.

Table 6: Retail Trade by Gender (NLSY); Dependent Variable: Log Wage

	OLS female	OLS male	Fixed Effects female	Fixed Effects male
Estab 10-49	0.147***	0.041*	0.103***	0.073***
	(0.027)	(0.024)	(0.027)	(0.019)
Estab 50-149	0.253***	0.120***	0.180***	0.113***
	(0.030)	(0.030)	(0.031)	(0.026)
Estab 150-499	0.297***	0.159***	0.210***	0.155***
	(0.034)	(0.037)	(0.037)	(0.034)
Estab 500+	0.434***	0.230***	0.274***	0.183***
	(0.055)	(0.051)	(0.037)	(0.046)
Manager	0.206***	0.123***	0.143***	0.059***
	(0.025)	(0.023)	(0.022)	(0.018)
Education	0.058***	0.054***	-0.012	0.025*
	(0.007)	(0.006)	(0.026)	(0.014)
Experience	0.396***	0.480***	0.445***	0.576***
	(0.059)	(0.052)	(0.113)	(0.102)
Experience^2	-0.035	-0.064***	-0.054**	-0.065***
	(0.022)	(0.016)	(0.026)	(0.019)
Married	-0.009	0.150***	-0.008	0.051**
	(0.020)	(0.021)	(0.025)	(0.023)
Black	-0.092***	-0.158***		
	(0.023)	(0.022)		
Urban	0.113***	0.099***	0.021	-0.024
	(0.023)	(0.025)	(0.036)	(0.027)
Constant	1.076***	1.385***	2.092***	1.836***
	(0.096)	(0.084)	(0.325)	(0.186)
Total Obs	7,963	9,951	7,963	9,951
Nb Individuals	2,356	2,548	2,356	2,548
Adjusted R^2	0.257	0.238	0.550	0.584

Notes: All regressions include year fixed effects, and use NLSY weights. Clustered standard errors in parentheses.
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 7: Manufacturing by Gender (CPS); Dependent Variable: Log Wage

	OLS female	OLS male	OLS female	OLS male	Fixed Effects female	Fixed Effects male
Size 10-99	0.119***	0.140***	0.052*	0.144***	-0.026	0.027
	(0.017)	(0.011)	(0.028)	(0.019)	(0.034)	(0.027)
Size 100-499	0.206***	0.212***	0.134***	0.203***	0.023	0.063**
	(0.017)	(0.011)	(0.028)	(0.018)	(0.034)	(0.027)
Size 500-999	0.288***	0.259***	0.200***	0.254***	0.058	0.072***
	(0.018)	(0.012)	(0.029)	(0.020)	(0.036)	(0.028)
Size 1000+	0.414***	0.378***	0.347***	0.365***	0.071**	0.099***
	(0.016)	(0.011)	(0.028)	(0.018)	(0.035)	(0.027)
Manager	0.282***	0.246***	0.250***	0.229***	0.040**	0.060***
	(0.008)	(0.005)	(0.011)	(0.007)	(0.017)	(0.013)
Education	0.092***	0.095***	0.093***	0.093***	0.047***	0.022***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.013)	(0.008)
Experience	0.171***	0.252***	0.124***	0.204***	0.325**	0.313***
	(0.010)	(0.007)	(0.016)	(0.011)	(0.131)	(0.084)
Experience^2	-0.022***	-0.032***	-0.016***	-0.024***	-0.024	-0.043***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.020)	(0.013)
Married	0.047***	0.162***	0.026***	0.151***	0.041	0.001
	(0.006)	(0.004)	(0.008)	(0.007)	(0.035)	(0.025)
Black	-0.128***	-0.173***	-0.137***	-0.161***		
	(0.009)	(0.007)	(0.013)	(0.011)		
Urban	0.153***	0.130***	0.152***	0.133***	0.181	-0.016
	(0.006)	(0.004)	(0.008)	(0.006)	(0.256)	(0.079)
Constant	0.830***	0.933***	1.035***	1.059***	1.272***	2.156***
	(0.026)	(0.017)	(0.044)	(0.028)	(0.367)	(0.198)
Total Obs	55,046	124,504	23,404	56,698	23,404	56,698
Nb Individuals	43,344	96,155	11,702	28,349	11,702	28,349
Adjusted R^2	0.322	0.358	0.357	0.351	0.636	0.611

Notes: All regressions include year fixed effects, and use CPS March Supplement weights. Clustered standard errors, at the individual level, in parentheses. * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The first two columns show results for the larger sample available in the CPS. Columns 3 and 4 show results for the reduced sample corresponding to that used in the fixed effects regressions in Columns 5 and 6.

Table 8: Manufacturing by Gender (NLSY); Dependent Variable: Log Wage

	OLS female	OLS male	Fixed Effects female	Fixed Effects male
Estab 10-49	0.020	0.014	-0.005	0.086***
	(0.048)	(0.029)	(0.047)	(0.023)
Estab 50-149	0.040	0.088***	0.039	0.126***
	(0.050)	(0.031)	(0.049)	(0.023)
Estab 150-499	0.061	0.059*	0.096*	0.145***
	(0.048)	(0.031)	(0.049)	(0.025)
Estab 500+	0.214***	0.251***	0.183***	0.213***
	(0.050)	(0.030)	(0.051)	(0.026)
Manager	0.180***	0.172***	0.045*	0.039**
	(0.027)	(0.025)	(0.024)	(0.016)
Education	0.088***	0.092***	0.061**	0.053***
	(0.006)	(0.004)	(0.026)	(0.015)
Experience	0.348***	0.452***	0.523***	0.721***
	(0.043)	(0.040)	(0.094)	(0.072)
Experience^2	-0.040***	-0.048***	-0.068***	-0.089***
	(0.013)	(0.010)	(0.014)	(0.012)
Married	0.037**	0.099***	-0.002	0.028*
	(0.017)	(0.015)	(0.019)	(0.016)
Black	-0.142***	-0.191***		
	(0.023)	(0.019)		
Urban	0.156***	0.074***	0.018	0.001
	(0.020)	(0.017)	(0.018)	(0.016)
Constant	1.030***	1.162***	1.408***	1.579***
	(0.086)	(0.066)	(0.331)	(0.197)
Total Obs	6,423	12,606	6,423	12,606
Nb Individuals	1,589	2,629	1,589	2,629
Adjusted R^2	0.414	0.411	0.666	0.687

Notes: All regressions include year fixed effects, and use NLSY weights. Clustered standard errors in parentheses.
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 9: Average Wages and Percent Managers, Retail and Manufacturing (CPS)

	Retail			Manufacturing		
	Mean Wage		% Manager	Mean Wage		% Manager
	Non-managers	Managers		Non-managers	Managers	
Size < 10	$13.61	$19.43	29.3%	$16.76	$30.24	25.8%
Size 10 - 99	14.21	22.28	25.9	17.14	32.02	19.3
Size 100 - 499	16.34	25.25	28.0	19.17	32.91	16.9
Size 500-999	15.4	23.05	27.9	20.32	34.68	16.9
Size 1000 +	15.1	21.04	29.6	25.9	40.6	18.2

Source: Authors' calculations using CPS data, weighted.

Appendix A

This research applies the label "retail" to industry categories that the "man on the street" would view as retail. Our definition of "retail" thus includes sectors that are outside of "Retail Trade" as defined by these classifications. The NLSY and CPS use industry codes that have changed over time, and were not the same for the two sources in early years. [30]

For the NLSY, we use:

1986-2000	2002	2004-2006	2008-2010†
1970 Census codes for Industry	**2000 Census codes for Industry**	**2000 Census codes for Industry, revised in 2002**	**2000 Census codes for Industry, revised in 2003**
Retail Trade: 607-698	*Retail Trade*: 467-579	*Retail Trade*: 4670-5790	*Retail Trade*: 4670-5790
Automotive and Repair Services: 749-759	*Automotive and Repair Services:* 877-879, 888-889	*Automotive and Repair Services:* 8770-8790, 8880-8890	*Automotive and Repair Services:* 8770-8790, 8880-8890
Entertainment and Recreation Services: 807-809	*Arts, Entertainment, and Recreation*: 858-859	*Arts, Entertainment and Recreation*: 8580-8590	*Arts, Entertainment and Recreation*: 8580-8590
Personal Services: 777-798	*Accommodations and Food Service*: 866-869	*Accommodations and Food Services*: 8660-8690	*Accommodations and Food Services*: 8660-8690
	Other Services: rental services: 708-718, travel arrangement: 767, personal services: 897-907, 909	*Other Services*: rental services: 7080-7180, travel arrangement: 7670, personal services: 8970-9070, 9090	*Other Services*: rental services: 7080-7180, travel arrangement: 7670, personal services: 8970-9070, 9090

†: though the codes were revised in 2003, the groups of codes we use were unaffected relative to the 2002 version.

The label "manufacturing" applies to industry categories related to the preparation and processing of raw materials and commodities for the creation of goods. The manufacturing classifications used in this research for the NLSY are identified as such in the original classifications, namely:

1986-2000	2002	2004-2006	2008-2010
1970 Census codes for Industry	**2000 Census codes for Industry**	**2000 census codes for Industry, revised in 2002**	**2000 Census codes for Industry, revised in 2003**
107-398	107-399	1070-3990	1070-3990

[30] Further details about all these classificationa and the way we use them can be found in the data and code of this paper.

The label "manager" is applied to occupational categories related to the coordination of operations and the supervision of a class of staff and employees. Supervisors are lower level managers. The codes used to define "managers" and "supervisors" in the NLSY data are:

1986-2000	2002	2004-2010
1970 Census codes for Occupations	**2000 Census codes for Occupations**	**2000 census codes for Occupations, revised in 2002**
Managers: 056, 192, 201-245, 312, 801, 802	*Managers*: 001-043 and supervisors, per below	*Managers*: 0010-0430 and supervisors, per below
	Supervisors: 400, 401, 420, 421, 430, 432, 470, 471, 500, 620, 700, 770, 900	*Supervisors*: 4000, 4010, 4200, 4210, 4300, 4320, 4700, 4710, 5000, 6200, 7000, 7700, 9000

The cashiers occupation is identified in the NLSY as follows:

1986-2000	2002	2004-2010
1970 Census codes for Occupations	**2000 Census codes for Occupations**	**2000 census codes for Occupations, revised in 2002**
Cashiers: 310	Cashiers: 472	Cashiers: 4720

For the CPS, we use:

The industry and occupation codes from 2003 onward in the CPS are the same as those shown above for the 2008-2010 NLSY data (i.e. the 2000 Census codes for Industry, revised in 2003, and the 2000 Census codes for Occupations, revised in 2002), and for our purposes, in terms of codes, they have remained the same for all years from 2003 onward. In addition to the above, we define Service Jobs in the CPS data. From 2003 onward, these are the set of occupation codes 4220 – 4250 and 4500 – 4650.

As best we can ascertain, for years prior to 2003, the CPS used its own industry – different from the SIC or Census codes – and occupation codes (with the latter apparently developed based on the BLS 1980 Standard Occupational Classification, but still different from it). The codes are documented in the yearly CPS codebooks. For our purposes, the code ranges are constant over the 1996 to 2002 period:

- Retail industry codes: 580 to 691, 742 to 760, 762 to 780, 782 to 791, 800 to 810
- Manufacturing industry codes: 100 to 392
- Manager occupation codes : 1 to 37, 243, and supervisor codes, per below
- Supervisor occupation codes: 303 to 307, 433, 448, 456, 503, 553 to 558, 613, 628, 803, 823, 828, 843, and 864
- Cashier occupation code: 276
- Service occupation codes: 449-453, 457, 459

Table A1: Descriptive Statistics For the Combination of Full and Part-Time Workers

Variable Name	Retail		Manufacturing	
	CPS Mean (S.D.)	NLSY Mean (S.D.)	CPS Mean (S.D.)	NLSY Mean (S.D.)
Hourly Wage	15.730	15.610	24.378	21.352
	(23.996)	(37.396)	(31.169)	(38.509)
Size < 10	0.184		0.062	
Size 10 - 99	0.265		0.222	
Size 100 - 499	0.089		0.209	
Size 500-999	0.038		0.077	
Size 1000 +	0.424		0.429	
Size 0 - 9		0.335		0.111
Size10 - 49		0.190		0.089
Size 50 - 149		0.146		0.094
Size 150 - 499		0.276		0.424
Size 500 +		0.054		0.281
Manager	0.216	0.226	0.183	0.141
Supervisor	0.139		0.057	
Education	12.657	12.739	12.917	12.918
	(2.235)	(2.003)	(2.716)	(2.245)
High school or less	0.516	0.626	0.519	0.632
Some_college	0.339	0.235	0.257	0.170
College_more	0.144	0.139	0.224	0.199
Experience	16.160	11.389	22.103	13.990
	(12.921)	(7.512)	(11.680)	(8.186)
Hours/week	36.590	35.196	42.238	39.091
	(12.234)	(8.616)	(7.897)	(4.222)
Age	34.807	33.371	41.018	33.962
	(12.855)	(7.267)	(11.442)	(7.231)
Married	0.411	0.531	0.612	0.623
Black	0.116	0.132	0.104	0.114
Urban	0.698	0.776	0.635	0.687
Female	0.503	0.514	0.315	0.327
N obs.	337,389	23,764	188,766	19,859
N individuals	276,061	5,903	146,895	4,426

All descriptive statistics calculated using weights. See online code for details.

† See Appendix A for codes used to define Manager and Supervisor in both the CPS and NLSY. We do not report the proportion supervisor for the NLSY because the occupational codes in that survey do not allow us to identify supervisors separately from managers prior to 2002.

†† In the CPS, we have limited information on work experience, and construct this variable using Age minus 6 minus Education. In the NLSY, we compute this variable as the cumulative weeks of work and hours per week worked reported for the individual in question over time, which we report in number of years equivalent.

††† In the CPS data, this is constructed from information about the statistical area of residence where we code "Central city" and "Balance of MSA" as urban. For the NLSY, we rely on the urban/rural indicator variable that is in the data directly.