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LIVING WAGE POLICIES AND WAL-MART: HOW A HIGHER WAGE STANDARD WOULD IMPACT WAL-MART WORKERS AND SHOPPERS

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INTRODUCTION AND MAIN FINDINGS

In July 2006, the Chicago City Council passed a “Big Box Living Wage Ordinance,” mandating that all retail stores larger than 90,000 square feet and operated by companies making more than \$1 billion a year in revenue pay workers a minimum hourly wage of \$10 per hour. The ordinance was vetoed by Mayor Richard Daley in September 2006, who said the measure would be harmful to the city.

The growth of big box retail is a mixed blessing to local communities. There is strong evidence that jobs created by Wal-Mart in metropolitan areas pay less and are less likely to offer benefits than those they replace. Controlling for differences in geographic location, Wal-Mart workers earn an estimated

12.4 percent less than retail workers as a whole, and 14.5 percent less than workers in large retail in general.¹ Several recent studies have found that the entry of Wal-Mart into a county reduces both average and aggregate earnings of retail workers and reduces the share of retail workers with health coverage on the job. The impact is not only one of substitution of higher wage for lower wage retail jobs, but also a reduction in wages among competitors.² As a result of lower compensation, Wal-Mart workers make greater use of public health and welfare programs compared to retail workers as a whole, transferring costs to taxpayers.³

Big box retail in general, and Wal-Mart in particular, also bring benefits to consumers in the form of lower prices. Studies of Wal-Mart prices find them to be 8 to 27 percent lower for food compared to major supermarkets. Just as competition from Wal-Mart has led competitors to reduce wages, it also leads them to reduce prices.⁴ Basker (2007) cites the results of a Pew Research Center Survey to conclude that poorer consumers disproportionately benefit from Wal-Mart's lower prices.⁵ Furman (2005) makes a similar argument, and further states that Wal-Mart could not raise wages without raising prices which, he argues, would hurt poor and low-income consumers.⁶

To understand how a mandated wage increase would impact poor and low-income families, we need to understand both the size and distribution of any projected increase in consumer prices. We need to understand the economic status of Wal-Mart workers and consumers and how an increase would impact each group. If most Wal-Mart workers came from higher-income families and consumers from low-income families, a mandated wage increase might result in a net transfer away from low-income families. If the opposite is true, it might result in a net transfer to low-income families.

In this study we analyze how a higher wage standard would impact both Wal-Mart workers and consumers, and how those impacts are distributed across income levels. We use a \$10 per hour minimum as the hypothetical wage standard for the analysis.

¹ Arindrajit Dube and Steve Wertheim. "Wal-Mart and Job Quality: What Do We Know and Should We Care?" October, 2005.

² Arindrajit Dube, T. William Lester and Barry Eidlin. "Firm Entry and Wages: Impact of Wal-Mart Growth on Earnings Throughout the Retail Sector." August, 2007; David Neumark, Junfu Zhang and Stephen Ciccarella. "The Effects of Wal-Mart on Local Labor Markets." October 2005.

³ Arindrajit Dube and Ken Jacobs. "Hidden Cost of Wal-Mart Jobs: Use of Safety Net Programs by Wal-Mart Workers in California." August 2004.

⁴ Jerry Hausman and Ephraim Leibtag. "Consumer Benefits from Increased Competition in Shopping Outlets: Measuring the Effect of Wal-Mart." 2005.

⁵ Emek Basker. "The Causes and Consequences of Wal-Mart's Growth." 2007. The Pew Survey found that 53 percent of respondents with annual earnings under \$20,000 reported regularly shopping at Wal-Mart, compared with 33 percent of those with annual incomes above \$50,000. (Pew Research Center 2005). Note that the Pew data does not control for the reasons shoppers gave for frequently shopping at Wal-Mart; it is possible that low-income shoppers shop more regularly at Wal-Mart because they have fewer stores to choose from, or may lack transportation to reach other stores as easily. Consumer data collected by Neilson shows that those surveyed say that their main reason for choosing Wal-Mart was location (34 percent). Twenty-five percent of respondents say their main reason is low prices (Hale 2004).

⁶ Jason Furman. "Wal-Mart: A Progressive Success Story." November 28, 2005.

Main Findings

IMPACT ON WORKERS

Our analysis reveals that establishing a higher minimum wage for large retailers like Wal-Mart would have a significant impact on workers living in poverty or near-poverty. We find that 46.3 percent of the pay increase would go to workers in families with total incomes below 200 percent of the federal poverty level (200 percent FPL). These poor and low-income workers could expect to earn an additional \$1,020 to \$4,640 a year in income for each Wal-Mart employee in the family, before taxes.

IMPACT ON CONSUMERS

Even if Wal-Mart were to pass 100 percent of the wage increase on to consumers, the average impact on a Wal-Mart shopper would be quite small: 0.9 percent of prices, well below Wal-Mart's estimated savings to consumers. This works out to \$0.36 per shopping trip, or \$9.70 per year, for the average consumer who spends approximately \$1,088 per year at Wal-Mart. This is the most extreme estimate, as portions of the raise could be absorbed through other mechanisms, including increased productivity or lower profit-margins.

Wal-Mart shoppers are disproportionately middle and lower income, although the customers who spend the most at the store are somewhat less likely to come from poor and low-income families. These high spending shoppers, who spend on average \$9,866 a year at Wal-Mart, would bear a somewhat larger impact of the pay increase. They would pay an additional \$87.98 a year, or \$1.47 per shopping trip. We estimate that 3.4 percent of Wal-Mart shoppers are both low income and in this high spending group.

We find that 29.3 percent of the total price increase would be borne by consumers in families below 200 percent FPL. In comparison, 46.3 percent of the benefits would go to workers in families below 200 percent FPL.

In summary, we find that a Big Box Ordinance or similar legislation that raises wages would provide significant, concentrated benefits to workers, almost half of them in poor or near-poor families, while the costs would be dispersed in small amounts among many consumers across the income spectrum. In net, a wage increase for Wal-Mart workers represents a transfer of income to poor and low-income families. Low-income Wal-Mart workers would see a raise of \$1,020 to \$4,640 per year, while the average Wal-Mart shopper would spend an additional \$9.70 per year. Both the benefits to workers and the costs to consumers would be smaller in higher wage states and metropolitan areas.

IMPACT ON WORKERS

What if Wal-Mart put in place a \$10 per hour minimum wage for all its hourly employees in the U.S.? How much would it cost Wal-Mart, and how much of the increase would benefit workers in poor and low-income families?

In order to calculate the cost of a wage increase for Wal-Mart, we use detailed data on Wal-Mart workers' starting wages and average pay in 2001 for 156 job titles from Richard Drogin's analysis of Wal-Mart payroll data. Wages are adjusted to 2006 dollars using average annual wages reported by

Wal-Mart. Although much of the variation in wages within the Wal-Mart workforce is captured by the job-based wage distribution, each job category has workers earning at different levels. To capture this added variation within job titles, we use household level wage data from the March 2006 Current Population Survey (CPS), and assumptions based on existing estimates in the literature on within-company and between-company components of wage variance. We also use the March CPS to estimate the family income of Wal-Mart workers by statistically profiling them based on their wage levels, gender, full-time status and industry of work. For a full description of the methodology, see Appendix A. The key finding of this report—that a higher wage standard at Wal-Mart represents a progressive income redistribution even accounting for effects on consumers—is quite robust to a plausible range of assumptions we use in our analysis.

Based on the distribution of wages for the Wal-Mart workforce, we estimate that a \$10 minimum wage would increase Wal-Mart's total payroll for hourly workers by 9.3 percent (Table 1). With a total hourly payroll of 25.6 billion for the company in 2006, this comes to \$2.38 billion per year. About 46.3 percent of this increase would go to workers with family incomes below 200 percent FPL (Table 2).

Table 1. Increase necessary for a \$10 minimum wage for Wal-Mart hourly employees (using starting wages or \$7.25/hour)

Increase in Wal-Mart's hourly payroll as percent of total hourly payroll	9.3 percent
Increase in hourly payroll as dollar annual amount	\$2.38 billion

Source: Authors' analysis based on data from Drogin 2003, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement.

Table 2. Percentage of payroll increase going to workers in poor and low-income families

Below 200% FPL	46.3%
Over 200% FPL	53.7%
<i>Total</i>	<i>100%</i>

Source: Authors' analysis based on data from Drogin 2003, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement.

What would the raise to \$10 per hour look like for the Wal-Mart workforce? Wal-Mart notes that its average hourly wage is \$10.11. However, not all employees earn the average. In fact, payroll data from 2001 suggests that there is a good deal of variation in hourly wages by gender, race and job title. As shown in Table 3, adjusted for current income, workers currently earning below \$8 an hour would receive a 30 percent wage increase on average, depending on the number of hours worked. Those earning between \$8 and \$10 an hour would receive an 11 percent wage average increase. In dollar amounts, the wage increase to \$10 per hour would result in \$2,310 to \$4,640 average annual pay increases for workers with wages below \$8 an hour, and \$1,020 to \$1,960 average pay increase for workers with wages between \$8 and \$10 an hour. (The range reflects the difference between full and part-time workers). The post-tax increase would be lower for some workers that qualify for the Earned Income Tax Credit, depending on the precise family income level.

Table 3. Impact of raises on low-wage Wal-Mart workers*

Category of worker	Total number of workers (estimated)	Average wage (estimated)	Annual income at current wage	Annual income at \$10/hour	Total annual increase	Percentage increase (before taxes)
Part-time, below \$8/hr	137,189	\$7.69	\$7,690	\$10,000	\$2,310	30%
Full-time, below \$8/hr	238,872	\$7.68	\$15,360	\$20,000	\$4,640	30%
Part-time, \$8-10/hr	99,382	\$8.98	\$8,980	\$10,000	\$1,020	11%
Full-time, \$8-10/hr	294,223	\$9.02	\$18,040	\$20,000	\$1,960	11%

*Assumes that full-time is 40 hours per week, and part-time is 20 hours per week for 50 weeks. All numbers are in 2006 dollars.

Source: Authors' analysis based on data from Drogin 2003, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement.

The distributional impacts would be reduced to the degree that firms respond to the mandated increase by hiring more skilled labor. The empirical evidence on similar policies suggests such impacts would be small.⁷

IMPACT ON CONSUMERS

Another important question to address is how a \$10 per hour minimum wage would impact consumer prices charged by Wal-Mart. It is not necessarily the case that Wal-Mart would pass on the total cost of a wage increase to its shoppers through higher prices. Part of the cost could be absorbed through accepting a lower profit margin; leveling or reducing management salaries and bonuses; and through improved labor productivity due to increased effort, lower turnover, and lower absenteeism.⁸ To the degree that Wal-Mart's lower relative wages have led to greater opposition to the company's expansion in urban areas, measures to respond to critics may improve the business climate for the company, opening new markets in urban areas and lessening the time needed to secure necessary zoning changes.

⁷ Michael Reich, Peter Hall and Ken Jacobs. "Living Wage Policies at the San Francisco Airport: Impacts on Workers and Businesses." 2005; David Fairris, David Runsten, Carolina Briones and Jessica Goodheart. "Examining the Evidence: The Impact of the Los Angeles Living Wage Ordinance on Workers and Businesses." 2005.

⁸ A Bank of America analysis estimates that the after tax impact of a \$0.50 per worker wage increase by Wal-Mart would be an increase of \$0.013 earnings per share. David Strasser and Camilo R. Lyon. Bank of America Retailing Report on Wal-Mart Stores, Inc. March 8, 2007. While little research has been done on the impact of reputation on stock price, Communications Consulting Worldwide suggests that in the case of Wal-Mart it could be significant. Pete Engardio, "Beyond the Green Corporation," *BusinessWeek*. January 29, 2007; Jared Bernstein and L. Josh Bivens. "The Wal-Mart debate: A false choice between prices and wages." June 2006.

For the purposes of this paper, however, we examine the outermost case of what would happen if Wal-Mart were to pass the entire cost of the wage increase on to consumers.

As we showed in the previous section, the cost for Wal-Mart of a \$10 per hour wage increase would amount to \$2.38 billion a year in payroll costs, or 9.3 percent of Wal-Mart's current hourly payroll. If we distribute this among all consumers, we find that it amounts to 36 cents per shopping trip, for the average consumer, based on the annual sales and customer figures provided by Wal-Mart for 2006 (Table 4).

Table 4. Annual cost for average shopper

Total cost of raises, wages and benefits	\$2,380,000,000
Total U.S. sales, year ending in Jan 2007	\$266,900,000,000
Sales per day	\$731,232,877
Total U.S. customers per week	127,000,000
Average customers per day	18,142,857
Average sale per customer, per day	\$40.30
Cost of total raises, per day	\$6,520,548
Cost of raise per customer	\$0.36
Raise as % of sale, per customer	0.9%
Annual cost, for average shopper	\$9.70

Source: Authors' analysis based on data from Drogin 2003, Hale 2004, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement. All data is for the U.S. only.

To estimate the impact per shopping trip, we use Wal-Mart's annual U.S. sales data and weekly customer data. We divide sales by 365 and customers by seven to get the average sale per customer per day. We then divide the total annual payroll increase by 365 to get the cost of the wage increase per day.

Using Wal-Mart's figures on U.S. sales and customers, we find that the average customer spends \$40.30 per shopping trip, and makes 27 shopping trips per year, spending \$1,088 annually at the store (Table 4). The 36 cent increase amounts to a 0.9 percent increase in prices. For the average shopper, this would result in a price increase of \$9.70 a year.⁹

However, we are not only concerned with the average Wal-Mart shopper, but also with the low-income Wal-Mart shopper, and in particular, those low-income consumers who frequently shop at the store. How would these low-income shoppers fare if Wal-Mart were to increase its prices to recoup the costs of a wage increase?

⁹Todd Hale, "Understanding the Wal-Mart Shopper." 2004.

The Nielsen Company provides a breakdown of Wal-Mart shoppers by household income using its Homescan Consumer Panel. The panel consists of a sample of 40,000 randomly selected households who use in-home scanning devices to record where they shop, what they buy, what they spend, and whether or not they used a coupon or took advantage of a store deal in their purchase of a product. Of the total households in the sample, 34,000 made at least one shopping trip to Wal-Mart during the year.¹⁰

The Nielsen Company analysis shows that Wal-Mart shoppers are distributed across household income brackets, but disproportionately middle and lower income (Table 5). However, the distribution of top shoppers—the top 6.25 percent of shoppers who account for more than one-third of Wal-Mart sales—is skewed away from lower-income households. For example, while 18 percent of all Wal-Mart shoppers come from households with annual incomes of \$70,000 or more, 23 percent of the top shoppers come from this bracket. In fact, almost half of Wal-Mart's top shoppers come from households earning \$50,000 or more in annual income.¹¹ Data from the Current Population Survey allows us to estimate the share of shoppers in these household brackets who are in families below 200 percent FPL.¹²

Table 5. Wal-Mart shoppers by household income

Annual Household Income	All Wal-Mart Shoppers	Top tier of Wal-Mart shoppers	Wal-Mart shoppers below 200% FPL
\$70,000 or more	18%	23%	0.9%
\$50,000 to \$69,999	17%	23%	1.9%
\$40,000 to \$49,999	13%	14%	6.8%
\$30,000 to \$39,999	15%	15%	21.0%
\$20,000 to \$29,999	19%	17%	54.9%
Below \$20,000	19%	9%	93.4%
All shoppers	100%	100%	32.7%

Source: Hale 2004 and March 2004 Current Population Survey. Percentages may not add up due to rounding.

Note: FPL status depends on family size, which explains how a household earning \$70,000 or more could still be below 200 percent FPL.

¹⁰ Ibid.

¹¹ We compared the Nielsen data to other sources to check for consistency. Mediamark Research conducts a face-to-face, in-home survey of 26,000 consumers a year. Their 2004 data found a greater share of Wal-Mart shoppers from higher-income households than the Nielsen data. For example, Mediamark data shows 49.7 percent of all Wal-Mart shoppers have a household income of \$50,000 or more (compared to 35 percent in the Nielsen data). Mediamark finds that 28 percent of households have income of \$75,000 or more, while Nielsen finds 18 percent of \$70,000 or more. (Mediamark also finds 15.4 percent of shoppers from households with \$100,000 or more in annual income; Nielsen does not provide this data). The Pew Research Center data also finds shoppers more skewed to higher-income households than does the Nielsen data. The Pew data (2005) is more recent than the Nielsen data, but finds 27 percent of shoppers from households with \$75,000 or more in annual income, and a total of 46 percent with household income of \$50,000 or more. This suggests that it is unlikely that Nielsen Company undercounts low-income shoppers.

¹² To find the percentage living in poverty, we use the March 2004 Current Population Survey ASEC (Table 6). In order to make overall consumers more representative of Wal-Mart consumers, the sample was re-weighted to make each state's percentage of U.S. households equal to each state's percentage of U.S. Wal-Mart stores. The 2004 March CPS data reflects information for the previous year, which corresponds to the Nielsen Company data, which is from 2003.

The top 6.25 percent of shoppers account for 35 percent of total Wal-Mart sales. The second 6.25 percent of shoppers account for 19 percent of sales. The remaining tiers—87.5 percent—contribute 46 percent of sales (Table 6). We weight shoppers by their share of total Wal-Mart sales, to find the impact of the raises on low-income shoppers.

Table 6. Share of wage increases paid by low-income shoppers

	Share of total Wal-Mart sales <i>(column 1)</i>	Share of cost of wage increase <i>(column 2 = column 1 * total cost of raises)</i>	Share of increase borne by shoppers <200% FPL <i>(column 3 = col 2 * share of segment <200% FPL)</i>	Percentage of wage increase borne by shoppers <200% FPL <i>(column 4 = column 3 / column 2)</i>
All 16 tiers of shoppers	100.0%	\$2,380,000,000	\$698,073,700	29.3%
Top tier (6.25% of all shoppers)	34.7%	\$825,860,000	\$185,694,621	22.5%
Second tier (6.25% of all shoppers)	18.9%	\$449,820,000	\$142,444,499	31.7%
Remaining tiers (87.5% of all shoppers)	46.4%	\$1,104,320,000	\$369,934,579	33.5%

Source: Authors’ analysis of data from Hale (2004) and the March 2004 Current Population Survey.

Overall, 32.7 percent of all Wal-Mart shoppers are in families with incomes below 200 percent FPL. If we weight these shoppers by their share of sales, we find that shoppers below 200 percent FPL would bear 29.3 percent of the wage increase (see Table 6). By comparison, 27.7 percent of the entire adult population is below 200 percent FPL.¹³

The two top groups, which make up 12.5 percent of all Wal-Mart shoppers, shop, on average, just over once a week at the store. We estimate that 27.1 percent of them are in families below 200 percent FPL. That means that 3.4 percent of all Wal-Mart shoppers are in poor and low-income families and are in the top two tiers of Wal-Mart shoppers.

To estimate the impact of a complete pass-through of higher wages on high-spending, low-income shoppers, we calculate the proportion of sales that the top two segments of low-income shoppers spend at Wal-Mart, to get their average spending per shopping trip. We find that frequent shoppers living at less than 200 percent FPL spend \$36.8 billion a year at Wal-Mart, and would be responsible for approximately \$328 million of the wage increase. This amounts to approximately \$1.47 per shopping trip. Top tier shoppers average between 57 and 60 shopping trips a year, and spend approximately \$164 per trip, or \$9,866 per year. The \$1.47 price increase would amount to an increase of \$87.98 a year, or approximately \$7.33 per month.¹⁴

¹³ Current Population Survey, Annual Social and Economic Supplement (2006).

¹⁴ For a family of four living at 200 percent of the federal poverty level, this price increase would amount to 0.2 percent of their gross annual income. This assumes a family of two adults and two children. The 2006 preliminary weighted average poverty threshold, as defined by the Census Bureau, is \$41,260 for a family of this size.

CONCLUSION

Should policy makers consider supporting legislation that would raise wages at Wal-Mart? Should they be concerned that low-income shoppers will bear the cost if Wal-Mart is required to increase its minimum wage to \$10 an hour?

Our data suggests that a \$10 per hour minimum wage standard at Wal-Mart would be effective in aiding lower-income families. If Wal-Mart increased its minimum wage to \$10 per hour, 46.3 percent of the income gain would accrue to workers with wages below 200 percent FPL. These low-wage workers could expect to earn an additional \$1,020 to \$4,640 a year in income.

If Wal-Mart passed on 100 percent of the wage increase to consumers through price increases, which is unlikely, the impact for the average Wal-Mart shopper would be \$9.70 a year (Table 7). We estimate that 29.3 percent of the impact of the price increase would be borne by shoppers with incomes below 200 percent FPL. Frequent, low-income shoppers, who account for 3.4 percent of all Wal-Mart shoppers, might see larger costs, up to \$87.98 a year. In higher wage labor markets the impacts would be lower for both workers and consumers.

Table 7. Impact of Wal-Mart raises on workers and shoppers

Workers:	
Percent of wage increase going to workers < 200% of FPL	46.3%
Estimated increase in annual earnings for low-wage workers (before taxes)	\$1,020 to \$4,640
Shoppers:	
Percent of wage increase borne by shoppers < 200% of FPL	29.3%
Estimated additional annual cost to average low-income shopper	\$9.70
Percent of all Wal-Mart shoppers who shop frequently & are low-income	3.4%
Estimated additional annual cost to frequent/low-income shoppers	\$87.98

Source: Authors' analysis based on data from Hale (2004) and the March 2004 Current Population Survey.

Finally, we should consider the impact of a mandated wage increase on the economic viability of big box retailers. Some analysts suggest that Wal-Mart could not just raise wages, and prices, given that they operate in a competitive environment. However, the Big Box Ordinance would require all large retailers to operate under the same standards. Steve Hoch of the Wharton Business School argues that the proposed Chicago Big Box Ordinance is unlikely to have a negative impact on retailers or Chicago: "The standard argument by the retailer is that they can't afford to do it, but if everybody has to, then the playing field is level." His argument is born out by recent research on the economic impacts of minimum wage and living wage ordinances.

In conclusion, big box living wage laws provide a means of capturing the positive benefits to consumers of the big box retail model, while mitigating the negative impacts on workers.

Appendix A:

Payroll data and distribution of wage increase by poverty status

In order to estimate the effect of a \$10 per hour minimum wage we need to estimate the distribution of wages for Wal-Mart's hourly workers. We use the Drogin¹⁶ data set as the basis for this estimate and the Current Population Survey (CPS) to understand the poverty status of the Wal-Mart workers.

ESTIMATING 2006 PAYROLL FROM THE DROGIN DATA

The Drogin data contains the average pay in 2001 for 156 different job titles by gender and full-time/part-time hourly workers employed at the end of 2001. This results in 502 different “job categories” based on title, gender and full/part-time status. We increase the number of workers in each job category so that the total number of hourly employees equal 1,371,830¹⁷ and 75 percent of are full-time while 25 percent are part-time.¹⁸ The average wage for each job category is “aged” to 2006 levels by a common growth rate. This rate was chosen to be such that the average wages for full-time hourly workers in the data set equal Wal-Mart's self-reported average wage for full-time hourly workers in 2006.¹⁹ We also know the *starting* wages (in 1998) of job categories with at least 1,000 employees (appendix 11a of the Drogin data). To bring these wages up to 2006 levels, we use three pieces of information: 1) from 1998 to 1999, we use the CPI to inflate wages as no other source is available; 2) from 1999 to 2001, we use the growth in average wages of hourly workers to inflate the starting wages; and 3) from 2001 to 2006, we use the 2006 wages of full-time hourly workers to estimate the growth in starting wages-analogous to the way in which we estimate the growth in average wages. For job categories where starting wages are not available we use \$7.25—the scheduled federal minimum wage.

The average and starting wages by job categories provide a rich description of pay-setting within Wal-Mart. However, to estimate the cost increase from a \$10/hour floor, we need to also have the wage distributions *within* each job category. We know the average wage in each of these jobs, but we also need to something about the variance in wages within these detailed categories. Unfortunately, the Drogin Data does not contain information about within-job variance in wages. To remedy this, we use a multi-step process that involves: 1) estimating the overall variance in wages for large general merchandisers using the CPS; 2) making an assumption about how much of this variance represents *within-Wal-Mart* variance in wages; 3) backing out how much *within-job within-Wal-Mart* variance must exist to produce the overall *within-Wal-Mart* wage variance.

We first use the March 2006 CPS to estimate the standard deviation in wages for workers of general merchandise retailers with more than 1,000 employees, which is found to be 40.39. Wal-Mart employees now make-up 71 percent of such workers.²⁰ We assume that the standard deviation of

¹⁶ Richard Drogin. "Statistical Analysis of Gender Patterns in Wal-Mart Workforce." February 2003.

¹⁷ From www.walmartfacts.com December 2006.

¹⁸ Kris Hudson. "Wal-Mart Investors Fret Over Cost." October 25, 2005.

¹⁹ From the website http://www.walmartfacts.com/FactSheets/8292006_Economic_Benefits.pdf, the average, full-time hourly Wal-Mart employees earned \$10.11/hour in 2006. In 2001 the average earnings for full-time hourly employees in the Drogin data was \$9.10/hour. Thus the wages for all job titles for each gender and for full and part-time workers was increased by $10.11 \div 9.10$, or 11.1 percent.

²⁰ Dube and Wortheim (2005) estimate that Wal-Mart constitutes 55% of all general merchandise workers and 71% of large general merchandise workers.

wages for Wal-Mart would be some fraction of the standard deviation of national wages in the industry. We set this fraction at 30 percent of the variance (or 55 percent of the standard deviation). Since Wal-Mart's wages are over 20 percent lower than other large general merchandisers, a sizeable portion of the variance in wages of large general merchandise workers reflects between-firm differences. For this reason, within-Wal-Mart wage variance is unlikely to be the source of the majority of the overall variance. However, as we show below in a set of robustness exercises, assuming a fraction much larger (say 80 percent of overall wage variance is within Wal-Mart) does very little to the results; the intuition for this is that most of the variation in wages is already being captured by mean and starting wages of detailed job-based categories. Overall, then, our assumption is that the overall variance in wages for Wal-Mart workers is $0.3 \times 40.39 = 12.11$.

If the overall variance in Wal-Mart wages is 12.11, and the variance in wages by job category is 2.16, then the *within-job* residual variance is by definition $12.11 - 2.16 = 9.95$. We further assume that the wages within each category are distributed lognormally, left censored at the starting wage for each job category. In other words, we estimate 502 separate lognormal distributions for the 502 different job categories, each of which has a separate means and a common variance parameter.

Wages in the lognormal distribution below the starting wage are set to the starting wage amount. These job-based wage distributions are used to estimate how many workers are in various hourly wage intervals. (As we report in the section on robustness checks, we also fit more parsimonious model, with fewer job categories; our final results are very similar.)

Using these assumptions, we arrive at the following total wages and wage distribution for Wal-Mart workers:

- \$23.77 billion — hourly wages for 2006
- \$1.82 billion — payroll tax of 6.2% for FICA, 1.45% for Medicare
- \$25.59 billion — total wages and payroll tax for 2006

Table A1. Constructed 2006 distribution of wages for Wal-Mart hourly workers

Wage level	Percent of hourly workers at wage level in 2006
\$7.25	2.4%
\$7.26—\$8.00	25.0%
\$8.01—\$10.00	28.7%
Above \$10.00	43.9%

Source: Authors' analysis based on data from Drogin 2003, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement.

DETERMINING THE PORTION OF THE INCREASE GOING WORKERS BELOW OR NEAR THE FEDERAL POVERTY LEVEL FROM THE MARCH CURRENT POPULATION SURVEY

To arrive at estimates about the poverty levels of Wal-Mart workers, we estimate the likelihood of being poor or near poor by wage categories as well as demographic information using the Current Population Survey. Fundamentally, we assume that the poverty status of workers at Wal-Mart will be the same as workers at general merchandise retailers with more than 1,000 employees, *conditional on wages, gender and full/part-time status*. Using wage categories of \$7.25-\$8, \$8-\$9 and \$9-\$10, we determine the percentage of workers below 200 percent FPL for each wage category. The Wal-Mart job categories are based on gender full/part-time status so we compute different percentages for females working part-time, females working full-time, males working part-time and males working full-time. We apply these percentages to the Wal-Mart wage data to determine which portions of a hypothetical wage increase (of \$10/hour minimum) would go to workers in the different poverty levels.

Due to the small number of workers in general merchandise big box retail in the March CPS we use two techniques to improve our estimate of the workers below 200 percent FPL. First, we combine the March CPS over four years, from 2004 to 2007, adjusting wages by the CPI so that workers’ earnings are in 2006 dollars. Next, we statistically estimate the fraction of general merchandise workers below 200 percent FPL by using linear regression. We predict whether a worker is below 200 percent FPL by four categorical variables: wage level (\$7.25-\$8, \$8-\$9, \$9-\$10, above \$10), gender, part-time/full-time status and a binary variable to indicate an individual works for a large general merchandise

Table A2. Poverty status of workers at different wage levels for full-time males, full-time females, part-time males and part-time females*

	Full-time Males	Full-time Females	Part-time Males	Part-time Females
Wages between \$7.25 and \$8/hr				
Below 200% FPL	47.8%	48.3%	41.2%	41.7%
200% FPL and above	52.2%	51.7%	58.8%	58.3%
Wages between \$8 and \$9				
Below 200% FPL	45.2%	45.7%	38.6%	39.1%
200% FPL and above	54.8%	54.3%	61.4%	60.9%
Wages between \$9 and \$10				
Below 200% FPL	39.9%	40.5%	33.3%	33.9%
200% FPL and above	60.1%	59.5%	66.7%	66.1%

*All results are “smoothed” by regressing poverty category on wage level, part/full-time status, gender and an indicator variable for general merchandise big box retail workers.

Source: Authors’ analysis based on data March Current Population Survey, Annual Social and Economic Supplement.

employer. This model is estimated using the CPS sample of all retail workers earning less than \$12 per hour. This model is then used to predict the probability of large (employers with 1,000 or more employees) general merchandise workers of being below 200 percent FPL based on wage level (see table A2 on previous page).

To check for the robustness of this statistical model, we repeat the regression with three of the four dependent variables interacting with the indicator variable for large general merchandise workers. This makes very little change in our final results; the fraction of the wage increase going to workers below 200 percent FPL changes from 46.3 percent to 45.1 percent.

In order to make overall workers more representative of Wal-Mart's workforce the sample is re-weighted to make each state's percentage of large general merchandise workers equal each state's percentage of Wal-Mart hourly workers.

In this report we define poor and low-income families as having incomes below 200 percent FPL. Below we show the differences between the amount of the increase borne by shoppers and the amount of the increase going to workers if we increase our poverty grouping to 250 percent FPL (see Table A3). With 200 percent FPL as a cut-off, the percent of the increase borne by low-income shoppers, at 29.3 percent, is roughly 2/3 of the percent of increase going to low-income workers, at 46.3 percent. We see a similar ratio when 250 percent FPL as is used. The share borne by low-income shoppers is 40.9 percent while the share going to low-income workers of 59.3 percent.

Finally, we use the estimated poverty level of Wal-Mart workers to simulate the effects of a \$10/hour minimum pay. As each worker (by job category) is brought up to \$10/hour, the wage increments are multiplied by the odds of that worker being under 200 percent of FPL.

Table A3. Amount of wage increase borne by shoppers and going to workers by poverty status, using both 200% FPL and 250% as cut-offs for poor and low-income

	Amount of the increase borne by shoppers by poverty status	Amount of the increase going to workers by poverty status
Above 200% FPL	70.7%	53.7%
Below 200% FPL	29.3%	46.3%
Above 250% FPL	59.1%	40.7%
Below 250% FPL	40.9%	59.3%

Source: Authors' analysis based on data from Drogin 2003, www.walmartfacts.com and March Current Population Survey, Annual Social and Economic Supplement.

ROBUSTNESS OF COST AND POVERTY ESTIMATES TO DISTRIBUTIONAL ASSUMPTIONS

As discussed earlier, we utilize a number of modeling assumptions to arrive at the poverty levels of Wal-Mart workers currently earning less than \$10/hour. In this section, we report a number of robustness checks to see how sensitive our final estimates are to: 1) assumption about the fraction of wage variance of general merchandise workers that reflects variance of Wal-Mart wages; 2) estimates of the residual wage variance by detailed job categories, as opposed to more aggregate ones.

First, instead of assuming that the standard deviation for Wal-Mart worker wages would equal 30 percent of the variance of wages (of 55 percent of the standard deviation of wages) for workers in general merchandise retail with firm sizes of more than 1,000 people, we choose alternative fractions: 20 percent, 30 percent, 50 percent and 80 percent.

Variance Fraction	20%	30%	50%	80%
Percent increase in hourly payroll	8.6%	9.3%	10.2%	10.9%
Annual increase in hourly payroll (billions)	\$2.20	\$2.38	\$2.60	\$2.79
Percent below 200% FPL	46.0%	46.3%	46.6%	46.8%
Percent above 200% FPL	54.0%	53.7%	53.4%	53.2%

Setting Wal-Mart to 80 percent of the wage standard deviation raises the payroll increase from 9.3 percent to 10.9 percent. But it has very little impact on the fraction of the wage increase going to poor and low-income workers (this amount changes from 46.3 percent to 46.8 percent). Intuitively, the reason this does not make much difference is because the residual variance within jobs plays a small role when between job variance and left-censoring by starting wages by job categories are already incorporated.

Second, we estimate a more “parsimonious” distribution of wages for Wal-Mart workers. We perform the same analysis with all workers in just one job category (using one log-normal distribution). In other words, starting from our finding that overall Wal-Mart variance in wages is $0.3 \times 40.39 = 12.11$, we now simply fit a single log-normal distribution (as opposed to 502 different ones by job categories) with censoring at \$8.02, the weighted average of starting wages for all hourly workers. With one log normal distribution, the percentage increase lowers to 9.0 percent (from 9.3 percent for all 502 job categories). As an “intermediate” form, we also estimate four wage distributions, by part-time/full-time status crossed with gender. In this case, the percentage increase in payroll from the \$10/hour minimum rises to 9.5 percent. Overall, the results suggest that our key points are quite robust to alternative assumptions behind modeling Wal-Mart's wage distribution.

Appendix B: Sales Data and Impact on Shoppers

Data on shoppers' household income comes from Nielsen (Hale 2004). To find the percentage living in poverty, we use the March 2004 Current Population Survey ASEC. In order to make overall consumers more representative of Wal-Mart consumers, the sample is re-weighted to make each state's percentage of U.S. households equal to each state's percentage of U.S. Wal-Mart stores. The 2004 March CPS data reflects information for the previous year, which corresponds to the Nielsen data, which is from 2003.

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