TECHNICAL APPENDIX AND REFERENCES FOR $10.50 MINIMUM WAGE PETITION

Jeannette Wicks-Lim and Robert Pollin
Political Economy Research Institute (PERI)
University of Massachusetts-Amherst
June 20, 2013

In the following, we provide documentation and references for all of the evidence cited in the petition "Economists in Support of a $10.50 Minimum Wage."

1. 1968 real value of the minimum wage

The real value of 1968 minimum wage determined by using Bureau of Labor Statistics (BLS) Consumer Price Index for All Urban Consumers (CPI-U), All Items.

2. Labor productivity growth

Labor productivity over time is measured by the BLS Labor Productivity and Costs program (LPC). The specific index used here is for the Business Sector. The index value in 1968 is 47.45 and 111.417 for 2013, indicating a 135 percent increase in productivity (111.417/47.45).

3. Number of affected workers.

We estimate that about 45 million workers would receive some form of raise from minimum wage hike of this size. These workers includes three groups: (1) workers who currently earn between $7.25—the regular minimum wage today—and $10.50; (2) workers who earn more than the proposed minimum wage of $10.50 who would receive "ripple-effect" raises; and (3) tipped workers who currently earn between $2.13—the tipped minimum wage today—and $7.35 (70 percent of $10.50).

We estimated the figures for the first two groups directly from the 2012 Current Population Survey (CPS) data produced by the Labor Department's Bureau of Labor Statistics. This household survey is the standard source of labor market data set for labor economists studying the U.S. workforce and forms the basis for the official, national unemployment rate. We specifically use the "outgoing rotation group" data file that has particularly high quality data on wages. The data file we used was prepared by the Center for Economic and Policy Research (CEPR). CEPR provides such data files free to the public at their website: www.cepr.net.

The first group includes workers who earn between $7.25 and $10.50. We expect that these workers will receive mandated raises to get them at least up to $10.50. We estimate that 22.7 percent of the U.S. civilian non-institutionalized workforce earned between $7.25 and $10.50 in 2012.

The second group includes workers who earn more than the new minimum wage but also get "ripple effect" raises. These are the raises that employers give workers at their own discretion (i.e., they are not mandated) in order to maintain the same wage hierarchy before and after the minimum wage hike. These raises are also referred to as "spillover" effects.

Estimating the number of workers who would get ripple effect raises is necessarily a more speculative exercise since such raises are not legally required. We estimate the number of workers who would receive ripple effects using the results of a study by one of us (Wicks-Lim, ch. 11 in Pollin et al. 2008). That study looks at the impact of minimum wage hikes, from 1983 to 2002, on wages across the wage distribution. The basic finding is that ripple effect raises tend to be fairly concentrated at the bottom of the wage distribution, causing the low end to compress. Specifically,

based on the experience of minimum wage hike of about 8 percent, on average, ripple effect raises extended only up to wages between 25 percent and 30 percent higher than the minimum prior to the hike.

In order to apply these findings to the current proposal, we break up the proposed 44.8-percent minimum wage hike into a series of three steps that resemble more closely the size of past increases (e.g., the three steps of the last federal minimum wage hike): three consecutive 13.1-percent increases (1.131^3 = 1.448). This is important to do since the mandated 44.8-percent raise extends past the upper limit of ripple effects (again, to wages between 25 and 30 percent higher than the minimum prior to the hike) found from past, smaller, minimum wage hikes.

Therefore, if the minimum wage rose in three equal steps, it would rise from $7.25 to $8.20 to $9.27, and finally to $10.50. We can then apply the upper-limit for ripple effects on the last step of this three-step increase. That is, we approximate that raising the wage floor from $9.27 to $10.50 would cause ripple effect raises up to 30 percent higher than the $9.27 minimum, or $12.00. Thus, the ripple effect raises for the cumulative 44.8-percent minimum wage can be expected to extend up workers earning $12.00. The percent of workers earning between $10.50 and $12.00, again based on the 2012 CPS, is 7.6 percent.

In sum, we estimate that the proportion of workers who would receive raises from increasing the minimum rate from $7.25 to $10.50 would add up to about 30.3 percent.

Note that though this 44.8-percent minimum wage increase is large relative to the average past minimum wage increases, it actually closely resembles the size of the typical minimum hike relative to the wage distribution of the low-wage retail industry.

Wicks-Lim (2008) found that minimum wage hikes compress the wage distribution among retail workers more dramatically than is the case for the overall workforce. This is because even while the mandated raises from a typical minimum wage affected a much higher proportion of retail workers (about 25 percent) compared to the total workforce (less than 10 percent), the ripple effects do not extend any further relative to the original minimum wage rate (i.e., to wages about 30 percent higher than the minimum wage prior to the increase) than was the case for the overall workforce. As a result, many more retail workers are squeezed into a much narrower wage range.

The ripple effects from the proposed 44.8-percent minimum wage hike that we estimated above will produce this same type of effect on the wage distribution. As we saw above, we expect the mandated raises to go to just under a quarter of the workforce (similar to the retail industry's 25 percent). And, we assume that the ripple effect raises do not extend any further from the minimum wage prior to the increase then what we observed from past minimum wage hikes. As a result, our ripple effect estimates suggest that the minimum wage hike would strongly compress the wage distribution at the low end.

Finally there is a third group of workers who would get raises from the increase in the "tipped minimum wage." These are workers who traditionally receive a substantial portion of the wages in tips, as documented by Allegretto and Filion (2011). These occupations include: massage therapists, bartenders, waitstaff, gaming services workers, barbers, hairdressers and cosmetologists, and other personal appearance workers. We assume that all those with wages below the proposed subminimum wage ($7.35) will rise to that new level.

We assume that these tipped workers do not receive ripple effect raises for the following two reasons. First, tipped workers receive the majority of the earnings through tips—not their base wage rate—so that the ups and downs of their tips largely determine their actual pay rate. Their base pay

rate (the "tipped minimum wage") has been falling relative to the regular rate since 1991 so that today it is equal to less than one-third the regular rate. Up until the 1990s, the tipped minimum wage varied between 50 and 60 percent of the regular rate. The base pay rate, therefore, among tipped workers likely plays a modest role in the workplace dynamics affected by firms' wage hierarchies. Second, among tipped workers there exists a distinct spike around the base pay rate of $2.13, and then a drop off in the number of workers between the tipped minimum wage and the regular minimum rate. This suggests that employers basically pay their tipped workers the tipped minimum with little variation from that. In other words, there are relatively few tipped workers who work at wages above the tipped minimum (and below the regular rate) that would be likely candidates for ripple effect raises.

Based on the CPS, tipped workers, earning between $2.13 and $7.35, adds another 0.9 percent of the workforce that would get raises.

Thus, the total proportion of workers expected to receive raises from the proposed minimum wage hike equals: 22.7 percent (directly affected workers) plus 7.6 percent (workers receiving ripple effects) plus 0.9 percent (tipped workers receiving raises in the tipped minimum wage), for a total of 31.2 percent.

To get the overall number of affected workers for 2013, we apply this proportion of 31.2 percent to the most recent BLS estimate of the workforce based on the CPS. In its News Release for May 2013, the BLS reported that 144 million workers held jobs today, so 31 percent of 144 million workers is 45 million.

4. Demographic characteristics.

The demographic characteristics for this 31.2 percent of workers are estimated from the 2012 CPS.

The estimated number of years in the labor force is based on a standard labor economics (Mincer 1974) definition of "potential labor force experience": Age – Years of schooling – 6.

5. Evidence of employment effects from the professional literature.

Debate among economists around the question of whether minimum wages negatively affect employment peaked during the mid-1990s. At that time, in 1995, David Card and Alan Krueger published their now classic book, *Myth and Measurement: The New Economics of the Minimum Wage*, on the topic in which they consistently found that minimum wage increases did not lower employment by any discernible amount and, if anything, appeared to slightly raise employment. These findings sparked a well-known debate between Card and Krueger and two other economists--David Neumark and William Wascher--who challenged the Card/Krueger findings. Neumark and Wascher's own findings (e.g. Neumark and Wascher 2000) on the minimum wage-employment question, however, find either no significant employment effects or only small negative effects. Economist Richard Freeman of Harvard University summarized the state of the debate after this critical exchange saying, "The debate is over whether modest minimum wage increases have "no" employment, modest positive effects, or small negative effects. It is *not* about whether or not there are large negative effects (1995, p. 833; emphasis in original)."

This debate has resurfaced more recently with a series of studies that find no employment effects from minimum wage increases (e.g., Dube, Lester, and Reich 2010 and Allegretto, Dube, and Reich 2011). These studies take advantage of the rich set of labor market data resulting from the growing number of states that adopt varying state minimum wage levels that, in turn, allow more rigorous statistical tests of the link between changes in minimum wage rates and employment. In particular,

these recent studies use innovative econometric techniques that more carefully account for the many other changes that may be occurring in the low-wage labor market simultaneously with minimum wage changes, allowing them to more cleanly identify how minimum wages impact employment. Moreover, Dube and his colleagues are able to show how their empirical tests find no employment effect on the same data from which older techniques--such as those used by Neumark and Wascher (2007)--would produce evidence of a negative effect.

The debate continues, however, into 2013 with two more publications, one on each side of the debate: Neumark, Salas, and Wascher (Jan, 2013; revised May 2013) negatively critiquing the newer research strategies, showing evidence of negative employment effects for teenagers within the range of past findings. In response, a June 2013 paper by Allegretto, Dube, Reich and Zipperer carefully supports the techniques used in Dube, Lester and Reich (2010) and Allegretto, Dube and Reich (2011), and reaffirm those results. In our view, this recent set of papers can basically be described as extensions of the same debate that Freeman characterized well with his summary statement nearly two decades ago. In other words, the debate continues to be over whether minimum wage increases have modest or no effects, "*not* about whether or not there are large negative effects."

6. Estimate of the increase in business costs due to minimum wage hikes

Our estimate that business costs for fast food restaurants would rise an amount equal to 2.7 percent of sales revenue is extrapolated from the findings of five separate studies.

In Table A1 below we present these five studies, along with the size of the minimum wage hike analyzed, and the accompanying estimate of the business cost increase relative to sales revenue figure.

We use the numbers in Table A1 to produce a scatterplot (see Figure A1) with the size of the minimum wage increase on the x-axis, and the size of the business cost increase to sales on the y-axis. We find that the curve with the following equation best fits the data points (with an R2 of 0.73):

$$y = 0.0454 \, x^{0.6363}$$

We use this equation to extrapolate that the business cost increase relative to sales figure given a 44.8-percent minimum wage hike would be 2.7 percent ($0.0454 \times 0.448^{0.6363} = 0.027$). Therefore, a price increase sufficient to cover half of this rise in costs would amount to a 1.35% (2.7%/2). For a $4.00 Big Mac, a 1.35% increase equals about 5 cents.

References

Aaronson, Daniel, Eric French and James MacDonald. 2004 (revised August 2007). "The Minimum Wage, Restaurant Prices, and Labor Market Structure," Federal Reserve Bank of Chicago Working Paper 2004-21.

Allegretto, Sylvia and Kai Filion. 2011. "Waiting For Change: The $2.13 Federal Subminimum Wage," EPI & CWED Briefing Paper, February 23.

Allegretto, Sylvia, Arindrajit Dube, Michael Reich. 2011. "Do Minimum Wages Really Reduce Teen Employment" Accounting for Heterogeneity and Selectivity in State Panel Data," Industrial Relations 50(2): 205-40.

Allegretto, Sylvia, Arindrajit Dube, Michael Reich, and Ben Zipperer. 2013 (June). "Credible Research Designs for Minimum Wage Studies." Working Paper Series, Institute for Research on Labor and Employment, UC Berkeley.

Card, David and Alan Krueger. 1995. *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton, New Jersey: Princeton University Press.

Dube, Arindrajit, T. William Lester, and Michael Reich. 2010. "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties." *Review of Economics and Statistics*, 92(4): 945-64.

Freeman, Richard. 1995. "What will a 10%...50%...100% Increase in the Minimum Wage Do?" *Industrial Labor Relations Review*. 48(4): 830-834.

Hirsch, Barry T., Bruce E. Kaufman, and Tetyana Zelenska. 2011. "Minimum Wage Channels of Adjustment," W. J. Usery Workplace Research Group Paper Series Working Paper 2011-11-1, November.

Mincer, Jacob. 1974. *Schooling, Experience, and Earnings*. Cambridge, MA: National Bureau of Economic Research.

Neumark, David and William Wascher. 2000. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry: Comment." *American Economic Review*, 90(5): 1362-96.

Neumark, David, J. M. Ian Salas, William Wascher. 2013 (January, revised May). "Revisiting the Minimum Wage-Employment Debate: Throwing Out the Baby with the Bathwater?" NBER Working Paper #18681.

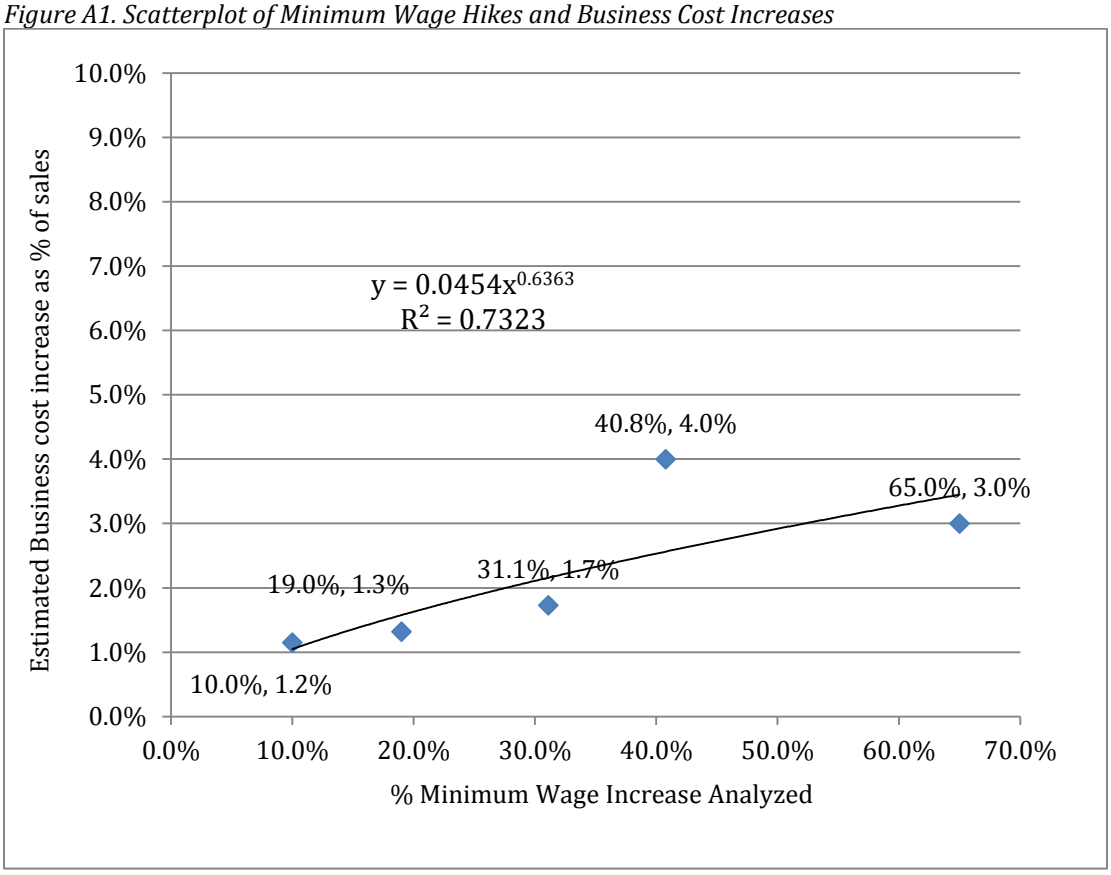
Wicks-Lim, Jeannette. 2008. "Mandated Wage Floors and the Wage Structure," in *A Measure of Fairness: The Economics of Living Wages and Minimum Wages in the United States*, by Robert Pollin, Mark Brenner, Jeannette Wicks-Lim, and Stephanie Luce. Ithaca, NY and London: Cornell University Press.

Pollin, Robert and Mark Brenner. 2008. "Santa Fe Citywide Living Wage Ordinance," in *A Measure of Fairness: The Economics of Living Wages and Minimum Wages in the United States*, by Robert Pollin, Mark Brenner, Jeannette Wicks-Lim, and Stephanie Luce. Ithaca, NY and London: Cornell University Press.

Pollin, Robert and Jeannette Wicks-Lim. 2006*. Economic Analysis of the Arizona Minimum Wage Proposal.* Amherst, MA and Washington, DC: Political Economy Research Institute and Center for American Progress.

Pollin, Robert, Mark Brenner and Jeannette Wicks-Lim. 2004*. Economic Analysis of the Florida Minimum Wage Proposal.* Amherst, MA and Washington, DC: Political Economy Research Institute and Center for American Progress.

Figure A1. Scatterplot of Minimum Wage Hikes and Business Cost Increases



Source: See Table A1.

Note: For the minimum wage hike figure based on the Aaronson et al. study (2007), we used the average of the two minimum hikes studied (i.e., average of 12% and 8%) in the scatterplot.

Table A1. Estimated Business Cost Increases from Minimum Wage Increases

Study	Minimum Wage Hike Analyzed	Estimate of Business Cost Increase Relative to Sales for Fast Food Restaurants
Economic Analysis of the Florida Minimum Wage Proposal, by Robert Pollin, Mark Brenner and Jeannette Wicks-Lim (Amherst, MA and Washington, DC: Political Economy Research Institute and Center for American Progress, 2004).	Proposal to raise state minimum wage 19.4% from $5.15 to $6.15 in 2004	1.32% (see page 29)
Economic Analysis of the Arizona Minimum Wage Proposal, by Robert Pollin and Jeannette Wicks-Lim (Amherst, MA and Washington, DC: Political Economy Research Institute and Center for American Progress, 2006)	Proposal to raise state minimum wage 31.1% from $5.15 to $6.75 in 2006	1.73% (see page 26)
"Santa Fe Citywide Living Wage Ordinance," by Robert Pollin and Mark Brenner, Ch. 5 in *A Measure of Fairness: The Economics of Living Wages and Minimum Wages in the United States*, by Pollin et al. (Ithaca, NY and London: Cornell University Press, 2008)	Proposal to raise citywide minimum wage 65%, from $5.15 to $8.50	3.0% (see page 83)
"The Minimum Wage, Restaurant Prices, and Labor Market Structure," by Daniel Aaronson, Eric French, and James MacDonald, Federal Reserve Bank of Chicago Working Paper 2004-21 (revised August 3, 2007)	2-step federal minimum wage increase over 1996 to 1997, each step examined: from $4.25 to $4.75 (12%) and $4.75 to $5.15 (8.4%)	1.15% (see page 16)
"Minimum Wage Channels of Adjustment," by Barry T. Hirsch, Bruce E. Kaufman, and Tetyana Zelenska, W. J. Usery Workplace Research Group Paper Series Working Paper 2011-11-1, November, 2011	3-step federal minimum wage increase over 2007 to 2009, from $5.15 to $7.25 (40.8%)	4.0%* (see pages 22-23)

* Hirsch et al. (2011) estimate that mandated wage raises from the 40.8% minimum wage hike amount to 3.9% of business costs, and all labor cost increases that occurred over the 2007-2009 period (including ripple effect raises and payroll tax increases, but also regular performance raises unrelated to the minimum wage hike) amount to 5.7% of business costs. They do not distinguish how much of the 5.7% can be attributed to the minimum wage hikes alone. We therefore take the average between the two figures since the former (3.9%) represents an underestimate, and the latter (5.7%) represents an overestimate. This average of 4.8% is then adjusted downward to 4.0% since, as the authors' note (p. 23), that the cost increases relative to sales will be smaller than when compared to business costs alone.