



Answers to Questions for the Record Following a Hearing on the Minimum Wage Conducted by the Senate Committee on Health, Education, Labor, and Pensions

*On March 12, 2014, the Senate Committee on Health, Education, Labor, and Pensions convened a hearing at which Douglas W. Elmendorf, Director of the Congressional Budget Office, testified about CBO's report *The Effects of a Minimum-Wage Increase on Employment and Family Income* (February 2014), www.cbo.gov/publication/44995. Some Members of the Committee submitted further questions for the record, and this document provides CBO's answers.*

Chairman Tom Harkin

Question. In your estimation, do the benefits of raising the minimum wage outweigh the costs?

Answer. Whether the overall benefits of increasing the minimum wage outweigh the costs is a question for policymakers to decide. The Congressional Budget Office's report did point out, however, that the benefits and costs would be different for different groups of people. Most low-wage workers would receive higher pay that would increase their family's income, and some of those families would see their income rise above the federal poverty threshold. But some jobs for low-wage workers would probably be eliminated, and the income of most of the workers who became jobless would fall substantially. Other people would be affected differently. For example, a few higher-wage workers would owe their jobs and increased earnings to the heightened demand for goods and services that would result from a minimum-wage increase. In addition, business owners would see reductions in real (inflation-adjusted) income, as would consumers, who would face higher prices as a result of the minimum-wage increase.

Question. CBO states that it weighted certain studies differently when creating its range of estimates for possible employment effects. Please explain CBO's methodology in detail. How did CBO determine the weights? Which specific studies were weighted and by how much? If the weights were changed, how would that affect the resulting estimates?

Answer. CBO reviewed a wide variety of studies that used various methodologies and data sources to assess the effects of increasing the minimum wage on employment. (The studies are listed in Appendix B of *The Effects of a Minimum-Wage Increase on Employment and Family Income* and in the literature reviews cited in that appendix.) One common approach in those studies was to compare employment rates among states that had different minimum wages

but otherwise similar labor markets; such analyses plausibly isolate the effects of minimum wages from the effects of national economic changes, such as fluctuations in the business cycle. Recent examples of those studies include Addison, Blackburn, and Cotti (2013); Neumark, Salas, and Wascher (2013); Allegretto, Dube, and Reich (2011); Dube, Lester, and Reich (2010); and Sabia (2009). Earlier examples include Card and Krueger (1994), Card (1992), and Neumark and Wascher (1992). CBO also reviewed studies that used different approaches, such as trying to isolate the employment effects of minimum-wage increases by comparing the national employment rate in years when the minimum wage was high to the rate in years when the minimum wage was low. Brown, Gilroy, and Kohen (1982) review many of those studies, and Williams and Mills (2001) and Solon (1990) have applied that approach more recently. However, CBO put the most weight on the studies of state-by-state differences, judging those studies to have estimated more accurately the effects of minimum wages on employment.

Because the studies' estimates varied widely, giving more or less weight to particular studies would lead to somewhat different conclusions. To reflect the resulting uncertainty, CBO developed a range of elasticities for both minimum-wage increases considered in the report. (The report called those increases the \$9.00 option and the \$10.10 option. An elasticity is the percentage change in employment induced by a percentage change in the minimum wage.) For the elasticity of teenage employment with respect to the change in the minimum wage under the \$9.00 option, the range was from zero to -0.15, with a central estimate of -0.075. In CBO's assessment, there was about a two-thirds chance that the actual response would lie within that range. For the elasticity of teenage employment under the \$10.10 option, the range was from a very slight negative number to -0.20, with a central estimate of -0.10.

Question. The CBO report did not address some of the many positive effects of a raise that can actually reduce labor costs—including reduced turnover (and its associated costs for hiring, recruiting, and training), increased efficiency and productivity, improved morale, and better customer service. In fact, many businesses have already raised their wages above the minimum because they know they will achieve these results. Why did CBO not discuss these effects in its narrative, which are supported by economic research? Do you agree that raising wages can help businesses reduce labor costs in these ways—which can, in turn, help pay for a raise?

Answer. CBO expects that some firms would be able to offset some of the increase in their costs that would result from raising the minimum wage. Higher productivity from employees' working harder to keep their better-paying jobs might be one such offset; another might be the lower cost of filling vacant positions that results from higher wages' attracting more applicants and reducing turnover. Those points are noted on page 7 of *The Effects of a Minimum-Wage Increase on Employment and Family Income*. Also, the extent to which those effects have occurred in the past is reflected in the large research literature on which CBO based its analysis.

Question. The CBO report constructed a confidence interval for the employment effects that ran from just below zero to about 1 million. As described in the report, this confidence interval was roughly 68 percent (or two-thirds in the CBO description). Can you tell us the ranges for a 90 percent confidence interval? A 95 percent confidence interval?

Answer. According to CBO's central estimate, implementing the \$10.10 option would reduce employment by roughly 500,000 workers in the second half of 2016, relative to what would happen under current law. The reduction could be smaller or larger than that, however. As the report explains, there is about a two-thirds chance that the effect of the \$10.10 option would be in the range between a very slight decrease in employment and a decrease of 1.0 million workers; thus, there is a one-third chance that the effect would be either above or below that range. The most important factors contributing to the width of the range are uncertainty about the growth of wages through 2016 (which influences the number of workers who would be affected by the minimum-wage increase, as well as the extent to which the increase would raise their wages); uncertainty about the responsiveness of employment to an increase in wages; and uncertainty about the extent to which an increase in aggregate demand because of higher labor earnings would increase employment. For example, if wage growth under current law was slower than CBO projects, implementing the increase would result in more people with increased wages and a greater reduction in employment than in CBO's central estimate.

In CBO's assessment, there is a 90 percent chance that the effect of the \$10.10 option would be in the range between a small increase in employment and a reduction of somewhat more than 1.0 million workers in the second half of 2016, relative to what would happen under current law. As such a range widens to include increasingly rare potential outcomes, it grows harder to quantify, and CBO has not precisely quantified that wider range. The range corresponding to a 95 percent chance would be wider still, but again CBO has not quantified it. The increase in employment at one end of those wider ranges reflects what would happen if wages grew quickly through 2016, if employment was not very responsive to wage increases, or if higher labor earnings had a particularly strong effect on employment by increasing aggregate demand. The larger reduction in employment at the other end of those wider ranges reflects what would happen if wage growth was slower, if employment was more responsive to a higher minimum wage, or if increased earnings had a smaller effect on aggregate demand than in CBO's central estimate.

Question. The CBO study extrapolates its chosen employment elasticity for teens to adults, even though the research does not support that and even though the CBO has not done so in the past. Past CBO studies have projected potential job losses for teens only, not adults. The main researchers who find that raising the minimum wage affects teen employment, Neumark and Wascher, generally do not find statistically significant employment effects for adults. What has changed in CBO's estimation that it is now assuming job losses for adults? How did CBO reach the conclusion that the effect for adults would be one-third that for teens? What assumptions were made and what methodology was used?

Answer. Some studies have found large elasticities for particular groups of adults, such as high school dropouts or African Americans in their 20s, although most of the adults who would be affected by the \$9.00 and \$10.10 options that CBO studied would not fall into those categories. One study that tracked adults directly affected by a minimum-wage increase regardless of their education, age, or race found that their employment fell when the minimum wage was increased, but by less than teenagers' would have. (See Neumark, Schweitzer, and Wascher [2004], which is cited in Appendix B of *The Effects of a Minimum-Wage Increase on Employment and Family Income*.) An explanation for that lower degree of responsiveness is that employers facing an excess of workers or of job applicants tend to favor

adults over teenagers. Supporting that explanation is research suggesting that encouraging employment among low-wage parents reduces employment among younger, childless adults.

In order to estimate elasticities for adults, CBO applied a proportional adjustment to its central estimates and likely ranges of elasticities for teenagers. CBO concluded that the elasticities for adults directly affected by the minimum-wage increases in question were about one-third of the elasticities for directly affected teenagers. CBO also reviewed studies that examined the response of employment to changes in the minimum wage for other groups of workers, such as those in particular industries. The results of those studies were broadly consistent with CBO's findings for teenagers and adults.

CBO's previous estimates of the effects of a minimum-wage increase included effects for both teenagers and adults.¹

Question. The CBO report states that indexing the minimum wage could have greater effects in the long term. The research that I have seen shows no such effects; in fact, studies that look specifically at states that have indexed their minimum wages find no job losses as a result of that policy. What research did CBO use on which to base this assertion?

Answer. The \$10.10 option that CBO examined would index the minimum wage to inflation and would therefore result in a higher minimum wage in the future than if a similar initial increase was not indexed. Because the federal minimum wage has not been previously indexed to inflation, some employers may have refrained from reducing employment in response to minimum-wage increases, realizing that inflation would soon erode the cost of those increases. CBO concluded that the responsiveness of employment to a minimum-wage increase would probably be somewhat greater if that increase was indexed to inflation than if it was not. Supporting that conclusion, some research has found that more employers would replace workers with new equipment if the inflation-adjusted value of the federal minimum wage was permanently increased; see Sorkin (2013), which is cited in Appendix B of *The Effects of a Minimum-Wage Increase on Employment and Family Income*.

Also, Allegretto, Dube, and Reich (2011) show that it is difficult to use data from states to precisely gauge the effect of indexing on elasticity, because only a small number of states have indexed their minimum wages and because many of them did so only recently.

Question. In choosing employment elasticities, CBO said it chose the midpoint, but in fact it only looked at estimates that ranged from zero to -0.15, or -0.075 for teens. But credible studies have also shown positive employment effects. Why did CBO not include positive estimates in its range of estimates? Furthermore, CBO increased the elasticity to -0.1 for the \$10.10 option, based on a number of assumptions, rather than a specific result in economic research. What assumptions did CBO make to increase the elasticity for a higher minimum wage? On which specific economic studies are such assumptions based?

1. See Congressional Budget Office, private-sector mandate statement for S. 277, the Fair Minimum Wage Act of 2001 (May 9, 2001), www.cbo.gov/publication/13043; and private-sector mandate statement for Section 101 (Minimum Wage Provision) of H.R. 3081 (October 18, 1999), www.cbo.gov/publication/11886.

Answer. There is considerable uncertainty about the elasticity of employment with respect to a minimum-wage increase, and CBO developed a range of estimates to reflect that uncertainty. (See the response to the second question above.) For the \$9.00 option, the range was from zero to -0.15, with a central estimate of -0.075; for the \$10.10 option, the range was from a very slight negative number to -0.20, with a central estimate of -0.10. In CBO's assessment, there is about a two-thirds chance that the effect of the options on the employment of teenage workers would lie within those ranges. Some studies, however, have found that increases in the minimum wage raise employment slightly, while others have found much larger negative effects on employment than are reflected in CBO's ranges.

Four main factors led CBO to conclude that employment in the second half of 2016 would be more responsive to the wage increase of the \$10.10 option than to the wage increase of the \$9.00 option. The first factor was that the \$10.10 option was indexed to inflation—so some employers who would not have reduced employment under the \$9.00 option would do so in this case, knowing that inflation would not erode the cost of paying higher wages. Second, the initial increase in the minimum wage would take place two years before the second half of 2016 under the \$10.10 option, but just one year before the second half of 2016 under the \$9.00 option—and employers would be more likely to reduce employment over a longer period after an increase in the minimum wage than over a shorter period. Third, because the cost of paying higher wages would be larger under the \$10.10 option than under the \$9.00 option, CBO expected that more employers would choose to incur the adjustment costs of reducing employment (such as the cost of installing new equipment). Fourth, the \$10.10 option would apply to a larger share of the workforce and cause a correspondingly larger increase in costs, which employers would be likely to absorb more through reductions in employment and less in other ways. Studies that are relevant to those factors are cited in Appendix B of *The Effects of a Minimum-Wage Increase on Employment and Family Income* and in the literature reviews cited in that appendix; they include Sorkin (2013); Allegretto, Dube, and Reich (2011); Dube, Lester, and Reich (2010); Thompson (2009); Sabia (2009); Burkhauser, Couch, and Wittenburg (2000); and Baker, Benjamin, and Stanger (1999).

Ranking Member Lamar Alexander

Question. The Congressional Budget Office report said that raising the minimum wage to \$10.10 will only lift above the Federal poverty threshold, 2 percent of individuals currently living in families under the threshold. Based on this finding, do you think raising the minimum wage is an effective tool to combat poverty?

Answer. Whether raising the minimum wage is an effective tool to combat poverty is a question for policymakers to decide. CBO's report did point out, however, that a minimum-wage increase would add to the resources of most families of low-wage workers regardless of those families' income. According to CBO's estimates, in 2016, when the \$10.10 option would be fully implemented, about one-fifth of the increased earnings would accrue to families whose income was below the federal poverty threshold; about one-half would accrue to families whose income was between one and three times the threshold; and the remainder would accrue to families whose income was more than three times the threshold.

Question. The CBO compared the effects of raising the minimum wage to the Earned Income Tax Credit (EITC). Specifically the report found that an increase in the minimum

wage would go to many workers who are in families whose income was more than three times the Federal poverty threshold, in contrast to the EITC which would almost entirely go to lower-income families. I believe this is a more sensible, targeted approach to assisting those families below the poverty threshold. Do you think expanding the EITC is a better approach?

Answer. Whether expanding the EITC is preferable to raising the minimum wage is a question for policymakers to decide. CBO's report did point out, however, that achieving any given increase in the resources of lower-income families would require a greater shift of resources in the economy if done by increasing the minimum wage than if done by increasing the EITC. Another difference between the two approaches is that increasing the EITC would constitute a cost for the federal government, whereas raising the minimum wage would have only a small net effect on the federal budget. In 2007, CBO estimated and compared two costs: the cost to employers of a change in the minimum wage that increased the income of poor families by a given amount, and the cost to the federal government of a change in the EITC that increased the income of poor families by roughly the same amount.² The former was much larger than the latter.

Question. Can you elaborate on what sort of jobs would be lost if we raise the minimum wage to \$10.10? Will this negatively affect low-wage jobs, or high-wage jobs more?

Answer. In CBO's assessment, there is about a two-thirds chance that the effect of the \$10.10 option would be in the range between a very slight reduction in employment and a reduction of 1.0 million workers. That increase in the minimum wage would reduce the employment of low-wage workers in two ways. First, it would raise the cost of low-wage workers, relative to other inputs that employers use, such as higher-wage workers; that would tend to reduce employment among low-wage workers but increase it among the higher-wage workers. Second, the higher cost of producing goods and services would lead employers to hire fewer low-wage workers *and* fewer higher-wage workers; however, that effect would be offset, at least in part, by an increase in employment stemming from the heightened demand for goods and services. On balance, CBO expects that the employment of low-wage workers would decline but that the employment of other workers would not change significantly.

Question. CBO's February 2014 baseline report predicted that Obamacare will reduce the total number of hours Americans work by the equivalent of 2.3 million full-time jobs in 2021. I'm told that's because the CBO thinks people will stop working instead of participating in the workforce and grow our economy. Can you tell me what kinds of other effects having 2.3 million fewer people in our workforce will have on our economy?

Answer. In CBO's assessment, the changes in benefits and taxes under the Affordable Care Act (ACA) will result in workers' choosing to supply less labor. CBO estimates that the total number of hours worked from 2017 to 2024, on net, will consequently be about 1.5 percent to 2.0 percent lower than it would have been otherwise.³ That estimate translates into a reduction of about 2.3 million full-time-equivalent workers in 2021.

2. See Congressional Budget Office, *Response to a Request by Senator Grassley About the Effects of Increasing the Federal Minimum Wage Versus Expanding the Earned Income Tax Credit* (attachment to a letter to the Honorable Charles E. Grassley, January 9, 2007), www.cbo.gov/publication/18281.

3. See Congressional Budget Office, *The Budget and Economic Outlook: 2014 to 2024* (February 2014), Appendix C, www.cbo.gov/publication/45010.

In particular, CBO estimates that the availability of subsidies for health insurance under the ACA will reduce some people's incentive to work. Because the subsidies decline as income rises (and increase as income falls), work will be relatively less attractive, so some people will choose to work less or not at all. Also, the subsidies increase people's available resources, thereby allowing the recipients to maintain the same standard of living while working less. CBO has not assessed how the people who choose to work less would spend that time instead.

Because the reduction in labor supply will be concentrated among lower-wage workers, the reduction in aggregate compensation (wages, salaries, and fringe benefits) and the impact on the overall economy will be smaller, in percentage terms, than the reduction in hours worked. CBO estimates that aggregate compensation over the 2017–2024 period will be roughly 1 percent lower than it would have been in the absence of the ACA. CBO has not examined other ways that the reduction in employment might affect the economy.

Senator Lisa Murkowski

Question. In our current environment, I believe it is more important than ever that Congress understand how proposed labor policies will impact the economy moving forward. While I understand that this is one of those issues where you will find a study to support any side of the argument, could you share your response to some of the criticisms received by the report (i.e., that your report overstates the costs of raising the minimum wage or that you use the wrong methodology, or that you improperly discount bias in other studies)? I'm particularly concerned about criticism that your report just picks the middle number (500,000) of your estimate of the potential impacts of raising the minimum wage to \$10.10 per hour.

Answer. The Congressional Budget Office's estimates of the change in employment that would result from increasing the minimum wage have been criticized by some people as being too small and by others as being too large. In conducting its analysis, CBO carefully reviewed a large body of empirical research. CBO then constructed ranges for key parameters on the basis of that research. Finally, CBO calculated its central estimates of the effects of minimum-wage increases by using values for those parameters that were at or near the midpoints of the ranges.

To reflect the considerable uncertainty in estimating the effects on employment of the two minimum-wage increases under consideration, CBO also reported ranges within which, in the agency's assessment, there was about a two-thirds chance that the actual effects would lie. CBO produced those ranges by analyzing various sources of uncertainty. The three most important were the growth of wages through 2016, the responsiveness of employment to changes in wages, and the extent to which an increase in aggregate demand because of higher labor earnings would increase employment. (For more detail, see the answer to Chairman Harkin's fourth question above.) CBO concluded that two further sources of uncertainty—sampling variability in the Current Population Survey and the level of state minimum wages in 2016—were relatively insignificant. CBO then generated simulations of effects on employment that incorporated the likelihood that wage growth would be higher or lower by a certain amount, that responsiveness would be larger or smaller to a certain extent, and so forth. CBO used the results of those simulations to form a range for each policy option's effect on employment.

Question. In your report, you explain who benefits most from an increase in the minimum wage. You draw a distinction between low-wage earners vs. low-income earners. What is the difference between these groups and why should this matter?

Answer. CBO assessed the effect of increasing the minimum wage on low-wage workers and also on low-income families. The agency expects that increasing the minimum wage would affect most low-wage workers—defined in CBO’s report as those who are projected, under current law, to be paid less than \$11.50 per hour in the second half of 2016. Not all low-wage workers live in low-income families, however. In 2016, if current law does not change, about one-fifth of low-wage workers will live in families whose income is below the poverty threshold, about one-half will live in families whose income is between one and three times the threshold, and the remainder will live in families whose income is more than three times the poverty threshold, according to CBO’s projections. Thus, most of the additional wages would accrue to families with fairly low income, but a substantial portion would also be received by low-wage workers in higher-income families.

Family income differs from wages in that it includes labor earnings, capital and business income, other private sources of income, and cash transfers from the government. (As measured in CBO’s report and as used in the official calculations of poverty, family income does not include noncash government transfers, nor does it reflect the taxes that people pay or the tax credits that they receive.) Family income also differs from wages in including the income of all family members, not just the wages of one person.

Question. Can you explain how increasing the minimum wage actually reduces the workforce? How did you arrive at this estimate?

Answer. According to conventional economic analysis, increasing the minimum wage reduces employment in two ways. First, higher wages increase the cost to employers of producing goods and services. The employers pass some of those increased costs on to consumers in the form of higher prices, and those higher prices, in turn, lead the consumers to purchase fewer of the goods and services. The employers consequently produce fewer goods and services, so they hire fewer workers. That is known as a scale effect, and it reduces employment among both low-wage workers and higher-wage workers. Second, a minimum-wage increase raises the cost of low-wage workers, relative to other inputs that employers use to produce goods and services, such as machines, technology, and more productive higher-wage workers. Some employers respond by reducing their use of low-wage workers and shifting toward those other inputs. That is known as a substitution effect, and it reduces employment among low-wage workers but increases it among higher-wage workers.

However, conventional economic analysis might not apply in certain circumstances. For example, when a firm is hiring more workers and needs to boost pay for existing workers doing the same work—to match what it needs to pay to recruit the new workers—hiring a new worker costs the company not only that new worker’s wages but also the additional wages paid to retain other workers. Under those circumstances, which arise more often when finding a new job is time-consuming and costly for workers, increasing the minimum wage means that businesses have to pay the existing workers more, whether or not a new employee was hired; as a result, it lowers the additional cost of hiring a new employee, leading to increased employment. There is a wide range of views among economists about the merits of the conventional analysis and of this alternative.

CBO's central estimate that the \$10.10 option would reduce employment by roughly 500,000 workers was based on four main factors: the number of low-wage workers directly affected by the option; the responsiveness of the employment of low-wage workers to increases in minimum wages; the change in the wages of directly affected workers; and the increase in demand for goods and services caused by the option. To calculate the total effect on employment, CBO multiplied estimates of the first three factors together for teenagers; did the same for adults; added the results; and then added an amount to account for the fourth factor.

Question. I read another report CBO recently produced on the estimated economic impacts of the Affordable Care Act (ACA). In that report, you estimated that the ACA will cause a reduction of approximately 2.4 million jobs in the workforce. Reading the reports together, am I correct in that if the \$10.10 per hour minimum wage proposal is adopted, our economy stands to lose nearly 3 million jobs from these two policies combined? If this is not correct, please explain.

Answer. Although the employment effects of increasing the minimum wage are separate from the employment effects of the ACA, CBO's estimates should not be added to one another, because they use different measures and apply to different years.

CBO's analysis of proposals to increase the minimum wage found that the \$10.10 option would reduce total employment by about 500,000 workers during an average week in the second half of 2016, when the option would be fully implemented. Because some workers have part-time jobs, that effect on employment would probably translate into a smaller impact on the number of full-time-equivalent workers, but CBO did not estimate the effect in those terms. Moreover, CBO did not analyze how the option would change the number of hours worked by people who remained employed—which would likewise affect full-time-equivalent employment.

CBO's analysis of the ACA's employment effects focused on a different period: 2017 through 2024. It also used a different measure of employment: full-time-equivalent workers. CBO estimated that the number of full-time-equivalent workers would be about 2.0 million lower in 2017 under the ACA than it would have been otherwise. The effect in earlier years would be smaller, but CBO did not generate a numerical estimate for those years.

Because of the different time periods and employment measures used in the two analyses, generating a figure for their combined impact would be difficult. However, that combined impact in 2017 would be somewhat larger than the reduction of 2.0 million full-time-equivalent workers estimated for the ACA by itself.