THE AFFORDABLE CARE ACT, LABOR SUPPLY, AND SOCIAL WELFARE

Jane G. Gravelle and Sean Lowry

This paper converts Congressional Budget Office estimates of the labor supply effects of the Affordable Care Act (ACA) into social welfare effects for each of the major individual provisions of the law. The sum of these negative, individual welfare effects can be reduced, almost to zero, by utilizing alternative assumptions about labor supply elasticities and the ability of individuals to perceive changes in marginal tax rates. Incorporation of previous estimates of the welfare-enhancing aspects of the ACA would likely outweigh the small, negative (and possibly negligible) welfare losses caused by the law's labor supply distortions.

Keywords: Affordable Care Act, health care reform, labor supply, efficiency, welfare

JEL Codes: H20, I13, J20

I. INTRODUCTION

Much attention is being paid to the effects of individual provisions of the Affordable Care Act (ACA), as well as the net effect of the law, on labor supply and growth. While this analysis of the subsidies, taxes, penalties, and other market reforms may contribute to better understanding of potential policy impacts, including revenue effects, this framing is not the appropriate metric for evaluating a policy. Rather, the measure of a policy's gains or losses to the economy is best framed through its social welfare effects, or the total reductions of deadweight losses and inefficiencies throughout the economy.

First, this paper reviews the existing literature on health insurance, labor supply, and welfare. Second, it converts estimates of the effects of various ACA provisions on labor supply from a CBO working paper (Harris and Mok, 2015; hereafter "H&M") into estimates of changes to welfare. Third, the paper questions the magnitudes of labor supply elasticities and the application of these elasticities to the exchange subsidies

Jane G. Gravelle: Congressional Research Service, Washington, DC, USA (jgravelle@crs.loc.gov)

Sean Lowry: Congressional Research Service, Washington, DC, USA (slowry@crs.loc.gov)

and suggests the welfare effects associated with labor supply response to the ACA are likely negligible. Lastly, the paper considers sources of welfare gain from the availability of affordable insurance from the ACA, such as reduction in risk over a lifetime and employment choices.

II. PREVIOUS RESEARCH ON HEALTH INSURANCE AND LABOR SUPPLY

A. Studies Before Implementation of the ACA

Gruber and Madrian (2004) review the literature on the effects of health insurance on labor supply, and job mobility prior to the ACA. Mobility in the job market was generally reduced by the value of employer-sponsored insurance (ESI) plans. The cost of switching to a job without health insurance or self-employment was high (i.e., "job lock"), as insurance in the individual market was expensive and perhaps not available to those in poor health. Gruber and Madrian conclude that previous research has generally not found a statistically significant effect of health insurance on job lock, but the evidence was mixed and in need of reconciliation.

For workers approaching retirement age but not eligible for coverage through a spouse, declining health status with age makes retirement an attractive option, but being in poor health raises the value of ESI and leaving the labor force might be prohibitively expensive. With a declining share of employers offering early retirees continued health coverage, COBRA continuous coverage served as the primary means of bridging the gap between early retirement and Medicare. COBRA is only available for a finite period (generally, 18 months) at costs that are often unaffordable. Gruber and Madrian note that almost every study on this topic has found a significant link between health insurance coverage and retirement decisions.

The labor supply decisions of individuals enrolled in public assistance programs (e.g., Medicaid) could also be affected by health insurance. Generally, the decision to move from welfare to work involved forgoing public health benefits and working at a low-wage job that often did not offer health benefits. Gruber and Madrian find mixed reviews in the literature at the time, with little to no effect on the labor force participation of low-income single mothers but some evidence for an effect on participation in welfare programs.

Health insurance could also discourage secondary earners who are the source of health insurance coverage from leaving the workforce to raise children or for other reasons. Gruber and Madrian's survey finds that individuals (particularly married women) are less likely to be employed when health insurance is available and not attached to one's own employment.

Most notably, Gruber and Madrian highlight that despite their review of a decade's worth of empirical studies on the links between health insurance and the labor market, the literature had "largely failed" to incorporate labor supply effects into models of aggregate welfare.

B. Studies After Implementation of the ACA

The ACA addressed two characteristics — heterogeneity in plan provisions and higher, if not prohibitively costly, coverage in the individual market — of the health insurance market identified by Gruber and Madrian (2004). The ACA's private insurance market reforms and penalties for not having (or offering, in the case of employers) coverage meeting certain minimum standards of adequacy and affordability reduced the degree of heterogeneity between plans in the insurance market. Although health insurance premiums in the individual market still generally exceed premiums in the group market, refundable premium tax credits, cost-sharing subsidies, and the availability of coverage via insurance exchanges has reduced cost and access barriers to obtaining coverage in the individual market. Additionally, the mere existence of insurance exchanges available to individuals, regardless of their employment status, addresses a major component of theoretical job lock problems.

The ACA's changes have often been depicted in popular media, commonly by anecdote, as being disruptive: employers shifting workers to part-time status to avoid the employer insurance mandate, employers no longer providing health coverage, and more low-income individuals fearing loss of government-subsidized Medicaid benefits if they enter the labor force. Macroeconomic data on the labor force and empirical studies conducted since implementation of the ACA cast doubt on these assertions. Initial analysis indicated little disruption to long-established trends in the distribution of hours in a typical workweek (UC Berkeley Labor Center, 2013; Jorgenson and Baker, 2013; Gravelle and Lowry, 2015). More recent studies confirm there has not been an upward trend in the percentage of workers who are likely to be shifted from full-time to part-time work after implementation of the ACA's employer penalty (Moriya, Selden, and Simon, 2016) or effects on labor force participation (Garrett and Kaestner, 2015). Nor has there been a major decrease in the percentage of firms offering health benefits (Kaiser Family Foundation, 2015).

Official Congressional Budget Office (CBO) estimates have incorporated labor supply effects of the ACA in a number of projections and studies (CBO, 2010, 2014). H&M provide more detailed calculations and data sources explaining how CBO estimates the effects of the ACA on the labor market. H&M estimate that the ACA would result in a 0.86 percent decrease in total labor compensation by 2025, with half of this negative labor supply effect being attributed to subsidies for insurance exchanges. To calculate the labor supply effects of the ACA, H&M calculated the effects of each major provision in the law on marginal and average tax rates, applied a labor supply elasticity, and then adjusted the response based on the size of the affected population.

The remainder of this paper focuses on converting H&M's labor supply estimates into welfare effects. In particular, this paper reflects on the literature review by Gruber and Madrian (2004) and incorporates more recent empirical studies examining the role of health insurance on the labor supply decisions. Despite virtually a decade between Gruber and Madrian's study and the implementation of the ACA, though, research focusing on the welfare effects of health care reform has been limited.

III. CONVERTING EFFECTS ON LABOR SUPPLY TO AGGREGATE WELFARE

We convert H&M's estimates of effects on labor supply, which the authors express as changes in total compensation to labor, into changes to welfare, using standard measures of deadweight loss. H&M estimate a reduction in labor compensation of 0.86 percent (which this paper adjusts to 0.85 percent based on changes to the Cadillac tax that were enacted after the release of the H&M study) and can be translated into a decline of approximately two million full-time jobs. These effects could arise from exit from the labor force or reduction in hours.

Figure 1 provides a diagram of the deadweight loss from changes in marginal tax rates, using linear relationships to simplify the analysis. In calculating the excess burden, the labor supply effects estimated by H&M are used to calculate the triangle ABF, which is the deadweight loss if the provisions were enacted in isolation. This calculation is $t(dL)/2$, where t is the tax rate change (shown as t^* in Figure 1) and dL is the change in labor estimated by H&M. To measure the total deadweight loss (the sum of ABF and BDEF), the approach in this paper calculates the relative areas of ABDEF and

Figure 1
Measuring Deadweight Loss
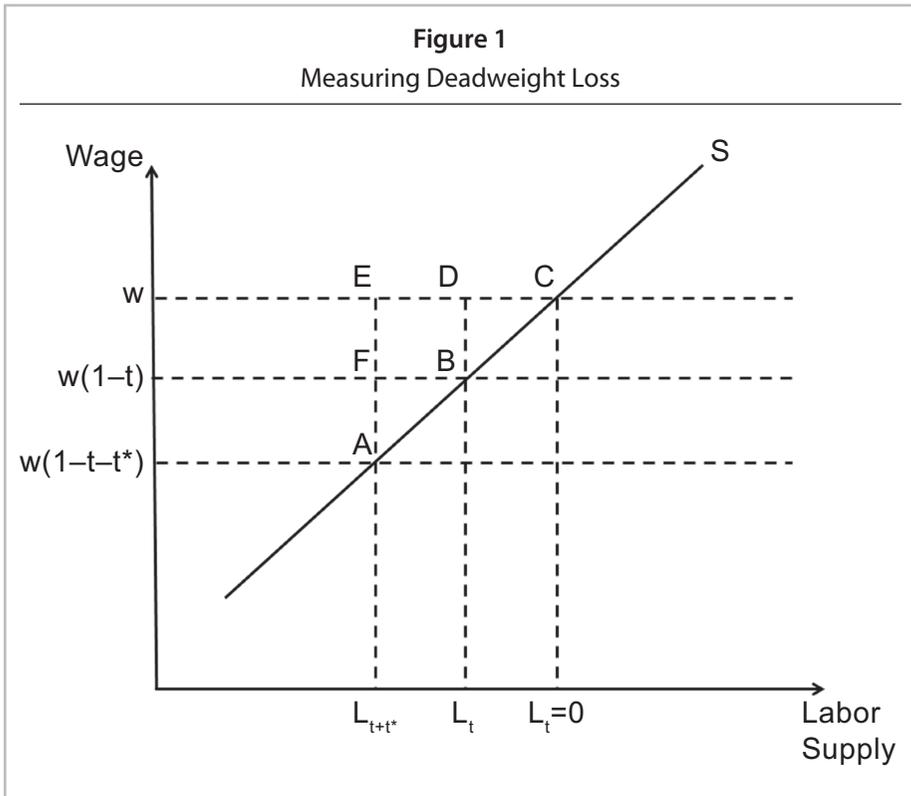
ABF. First, it measures the total deadweight loss (the triangle ACE), and then subtracts the original deadweight loss (the triangle BCD), which leaves the area ABDEF. This measure is then divided by ABF, which produces a ratio that can be multiplied by the initial welfare calculation, measured by

$$(1) \quad \left\{(t+t^*)^2 / \left[1-0.5(t+t^*)\right] - \left[t^2 / (1-0.5t)\right]\right\}$$
$$/ \left\{\left[(t^*)^2(1-Et^2 / (1-0.5t))\right] / \left[1-0.5(2t+t^*)\right]\right\},$$

where E is the elasticity, based on elasticities reported by H&M. The derivation of the formulas and determination of the values of t and E are in an Appendix available from the authors.

IV. AGGREGATE WELFARE CONVERSION ESTIMATES

This section estimates the deadweight loss of the provisions included in H&M. Table 1 is a summary table of H&M's labor supply effects, expressed as percentage point changes in total earnings, for each major provision of the ACA. The labor supply effect of the premium credits and cost-sharing subsidies for individuals in the exchanges is the largest single share (51 percent) of the labor supply effect calculated by H&M. Also in Table 1 are the corresponding estimated welfare effects, using H&M's labor supply estimates as the basis for conversion. The share of the total welfare effect caused by the premium credits and cost-sharing subsidies for individuals is a larger share (71 percent) of the welfare effect calculated by the authors than the labor supply effect calculated by H&M because none of the ACA provisions examined by H&M have positive effects on labor supply, while aspects of the ACA have positive effects on welfare.

A. Health Insurance Coverage Expansions

1. Exchange Subsidies

Effective 2013, premium tax credits may be advanced towards the cost of purchasing private health plans through health insurance exchanges. Premium tax credits phase-out by 400 percent of the federal poverty level (FPL). For states that have adopted the Medicaid changes, individuals below 138 percent of poverty will be eligible for Medicaid and not be in the premium subsidy group. Also effective 2013, cost-sharing subsidies that limit out-of-pocket expenses (such as lower deductibles) are available for individuals who are covered by certain insurance plans in the exchanges and have household income no greater than 250 percent of the FPL.

Consider first the phase-out of the premium and cost-sharing subsidies. H&M report the average change in the marginal tax rate as 28 percentage points and the change

Table 1

Estimates of the Effects of the Affordable Care Act on Labor Supply
and Welfare in 2025

Provision	Percentage Change in Earnings	Percentage Change in Welfare
Health insurance coverage expansion		
Exchange subsidies	–0.43	–0.122
Rules governing insurance	–0.17	0.039
Medicaid expansion	–0.05	–0.009
Subtotal	–0.65	–0.093
Taxes and Penalties		
Hospital insurance surtax	–0.12	–0.058
Employer mandate and penalty	–0.06	–0.013
High-cost health plan excise tax	–0.02	–0.004
Individual mandate and penalty	–0.01	–0.002
Subtotal	–0.20	–0.077
Total	–0.85	–0.171

Source: The percentage change in earnings is from Harris and Mok (2015) with a modification to the estimate of the high-cost health plan excise tax by the authors. As noted in the text, the effect of the high-cost health plan excise tax was reduced from 0.03 to 0.02 to account for the allowance of deductibility enacted in December 2015 by Section 102 of the Consolidated Appropriations Act, 2016 (P.L. 114-113), along with a reduction of 0.01 in the appropriate subtotal and the total. All welfare estimates were calculated by the authors.

in labor compensation as 12 percent. As a share of total labor compensation in the economy, it is 0.35 percent. The deadweight loss, however, should be based only on the portion of the change in labor that is due to the substitution effect. For a transfer and phase-out, the income and substitution effects go in the same direction, so the labor supply effect will be smaller. It is necessary to correct labor supply estimates in H&M for income effects. Normally they would not be expected to be large, at least in the H&M calculation, because they rely on a relatively low income elasticity of 0.05, compared to a substitution elasticity that is around 0.3; indeed, only about 5 percent of the labor effect is due to income effects based on the distribution of income in Census data (calculation in Appendix available from authors). Thus, the excess burden is $0.5 \times 0.35 \times 0.95 \times 0.28$, or a welfare loss of 0.046 percent of labor income. To adjust for pre-existing taxes, the prior tax rate is 20 percent and the elasticity is 0.3.

H&M also estimated the effects of the premium credits and subsidies of those who are unemployed part of the year and employed by a company with health insurance. This calculation is the same as the previous one, except that the price effect is 16 percent and the share of labor supply is 0.08 percent. Assuming similar proportional income effects, the estimated stand-alone deadweight loss is $0.16 \times 0.5 \times 0.96 \times 0.08$, or 0.006 percent of compensation. To adjust for pre-existing taxes, the prior tax rate is 20 percent and the elasticity is 0.3.

2. Rules Governing Insurance

The ACA implemented certain requirements for private health insurance plans to address issues such as discrimination based on health status and preexisting health conditions. The presence of affordable insurance in the independent market (quite apart from any subsidies) may cause some workers to leave the work force, as suggested by Gruber and Madrian (2004). H&M address the effects on older workers under age 65, projecting a decrease in the labor supply of older men of 2.25 percent based on a study of the effect of COBRA coverage. In this case, there is a welfare gain because individuals are confronted with an efficient market. No price change was involved, and it is inferred with an assumed elasticity of 0.24. The price change would be $(0.0225)/(0.24)$, or 9.3 percent, and the welfare gain would be $0.17 \times 0.5 \times 0.075$ or 0.006 percent of compensation. This measure assumes a prior tax rate of 20 percent.

3. Medicaid Expansions

Effective 2014, the ACA established 138 percent of the FPL as the new mandatory minimum Medicaid income eligibility level. In June 2012, the U.S. Supreme Court ruling in *National Federation of Independent Business v. Sebelius* effectively made the ACA Medicaid expansion optional for states. As of March 14, 2016, 31 states plus the District of Columbia have adopted the Medicaid expansion (Kaiser Family Foundation, 2016). H&M assume 80 percent of the eligible population will be in states with the Medicaid expansion.

H&M estimate three effects of Medicaid expansions. Those newly eligible for Medicaid were expected to decrease employment by four percent (accounting for 0.03 percent of total compensation). People already eligible will increase work by two percent because they are not as affected by the ceiling, accounting for 0.01 percent of compensation. Workers above the threshold, who did not otherwise qualify for subsidies (generally, secondary workers with employment based health insurance) and who could also reduce labor supply sufficiently to qualify the family for Medicaid, would reduce labor force participation by 15 percent, decreasing total labor compensation by 0.03 percent. Using the same methodology as for the rules governing insurance, the estimates for the three effects (summing two losses and a gain) are a welfare loss of 0.009 percent. Based on indications that tax rates were approximately zero for these taxpayers, no other adjustments were made.

B. Effects of Taxes and Penalties

1. Hospital Insurance Surtax

For workers with wages or compensation, employees and employers are each subject to Medicare hospital insurance (HI) payroll tax of 1.45 percent (2.9 percent total). Effective 2013, the ACA increased the employee share of the HI payroll tax on workers by 0.9 percentage points on wages or self-employment income in excess of an annual threshold of $200,000 for single filers ($250,000 if filing jointly). These thresholds are not adjusted for inflation, and it can be expected that a growing number of workers will be affected by the surtax over time.

H&M estimate that the ACA's HI surtax has a net effect on labor of –0.12 percent, with a substitution effect of –0.15 percent. H&M also indicate that the provision increases the marginal tax rate of affected taxpayer by one percentage point (from 44 percent to 45 percent). The welfare loss (in isolation) is $0.5 \times 0.01 \times (–0.15)$ or –0.00075. To adjust for prior taxes, the prior rate is 44 percent and, since this provision affects high income taxpayers, the elasticity is 0.22.

2. Employer Mandate and Penalty

The ACA generally imposes a penalty on employers if they have 50 or more full-time equivalent workers, do not offer health coverage that meets the ACA's minimum standards of "affordability" and "adequacy," and at least one of their full-time workers receives a health insurance premium credit in the individual insurance exchange markets.

For an affected employer that offers coverage that is not affordable and adequate and one or more of those employees receives premium credits, the monthly penalty is the lesser of one-twelfth of $3,000 for each of those employees that receive credits for exchange coverage or one-twelfth multiplied by $2,000 multiplied by the number of full-time employees minus an exemption for the first 30 workers. An applicable employer who does not offer any coverage will be subject to a penalty equal to the number of its full-time employees minus 30 multiplied by one-twelfth of $2,000 for any applicable month.

H&M estimate that the ACA's employer mandate will fall on labor and only affect a worker's decision to accept a full-time job, but not affect decisions about working an additional hour. Relatively few employers are expected to be subject to the employer penalty, since the vast majority of employers already provide health coverage to their full-time employees meeting the ACA's standards (Gravelle and Lowry, 2015).

H&M estimate that the employer mandate and penalty have an effect on labor compensation of –0.06 percent. H&M also indicate that this provision increases the average tax rate of an affected taxpayer by seven percentage points. The efficiency effect of the employer mandate and penalty in isolation can be calculated as $0.5 \times 0.07 \times (–0.06)$ or –0.0021. To adjust for pre-existing taxes, the prior tax rate is 20 percent and the elasticity is 0.24.

3. High-Cost Health Coverage Excise Tax

Currently, ESI coverage is excluded from tax. Generous ESI plans have been cited as one of the drivers of growing health costs over time, as health care consumers are more insulated from the true costs of their health care decisions.

Effective 2020, a 40 percent, deductible excise tax will be levied on the value of applicable employer-sponsored health coverage above specific dollar thresholds (commonly referred to as the "Cadillac tax"). In 2020, these thresholds will be $10,200 for single health insurance coverage and $27,500 for family coverage adjusted for inflation between 2018 and 2020. The thresholds are adjusted for eligible retirees, workers in certain high-risk professions, and plans whose demographics differ from the national workforce. Although the tax will typically be levied on third-party insurance companies or employers (for self-insured firms), H&M expect that the cost of the tax will be passed forward to workers. Because health care premiums have historically grown at a rate faster than general inflation, it can be expected that a growing number of health plans will be affected by the tax over time.

The net effect includes the income and substitution effect, and the estimate assumes the same relationship as for the hospital insurance tax, making the substitution effect 25 percent higher. The tax rate is estimated to increase by 0.1 percentage points.

When H&M's estimates were made, the excise tax was not deductible, so the labor supply effects should now be smaller by 23 percent (based on the revenue gain from the change compared to the original revenue loss). The effect on labor was reduced from 0.03 percent to 0.02 percent, as indicated in Table 1.

The initial efficiency effect of the high-cost health plan excise tax (via higher premiums or wages) would have been estimated as $(-0.5) \times 0.001 \times 1.25 \times (-0.03)$ or -0.000018 percent. In the adjustment for pre-existing taxes, the prior tax rate is 20 percent and the elasticity is 0.24. The calculation reduces the tax rate change by 23 percent to 0.077 percentage points, and the value is reduced to -0.000011 percent. The further adjustments (to account for the rectangle) reduce the overall effect from 0.0071 percent to 0.0055 percent.

The tax also produces a welfare gain due to the change in insurance coverage for those workers who do not retain Cadillac plans. Basically, the plans are effectively subsidized at the point of medical care purchase. The estimates of increase in price of 2.35 percent and decrease in quantity of 2.48 percent as well as projected health expenditures are based on Gravelle (2015). These are used in the formula for deadweight loss multiplied by projected health costs of $1.746 trillion and divided by labor compensation of $13.953 trillion, or $0.5 \times 0.0235 \times 0.0248 \times 1.746/13.953$. This effect is a welfare gain in the amount of 0.000036 percent of compensation. The same report estimated that the existing share of costs paid by the individual was 19 percent, so the calculations presume a pre-existing subsidy of 81 percent and an elasticity of 0.2, consistent with the evidence presented in that study. The reduction of the price change by 23 percent reduces the welfare gain from 0.0014 to 0.0011. The combination of the welfare gain and loss results in a deadweight loss of 0.004 percent.

4. Individual Mandate and Penalty

Effective 2014, the ACA requires most individuals to maintain health insurance coverage meeting certain standards or potentially pay a penalty for noncompliance. In 2016, the penalty is the greater of $695 per person in a household or 2.5 percent of household income in excess of the general tax-filing threshold (subject to specific caps).

H&M estimate that the percentage of income version of the penalty will increase marginal tax rates of affected taxpayers by 2.5 percent, while the fixed dollar version of the penalty will have no marginal effect on labor supplied. These workers are estimated to account for less than 1 percent of total labor compensation in the economy. H&M estimate that about half of the uninsured population will pay the percentage of income version of the penalty, thereby increasing their marginal tax rate from 30 percent to 32.5 percent. This substitution effect reduces labor supply by 0.01 percent. The efficiency effect of the individual mandate and penalty can be calculated as $0.5 \times 0.025 \times (-0.01)$ or -0.000125 percent of labor earnings. In the adjustment for pre-existing taxes, the prior tax rate is 20 percent and the elasticity is 0.24.

V. ISSUES WITH PREVIOUS LABOR SUPPLY ESTIMATES

H&M's approach to measuring labor supply responses is to apply estimates of labor supply response from empirical studies of wages, or after-tax wages, to changes in tax rates. H&M acknowledge uncertainties about the scope of the effect of the ACA, the labor supply elasticities, and also whether that response can be applied to more complex sources of changes in after-tax wages.

This section considers two issues that can be raised about the H&M estimates that suggest the welfare effects should be reduced in magnitude, and perhaps even change sign: the size of the labor supply elasticities and the application to the phase-out of exchange subsidies.

A. Elasticities Used in the CBO Study

Using the standard methodology of applying elasticities to tax changes requires a single measure of the elasticity to make a point estimate, which determines the size of the deadweight loss. H&M's selected numbers are consistent with an average of empirical estimates. Their overall substitution elasticity weighted by earnings is 0.24, with higher values for lower income primary workers and for secondary workers, and lower values for high income primary workers. Overall the elasticity for men was 0.25, weighted by income, but would be higher weighted by hours (falling between 0.31 and 0.22). These numbers are taken from cross-section empirical estimates based on judgments (McClelland and Mok, 2012).

If each study is given an equal weight, the mean is 0.28. Thus, 0.25 appears to be a reasonable value for the average of the findings. Examining the studies, however, it is clear that two values are outliers: 0.75 and 0.84; excluding them reduces the mean to

0.22 and the range to 0.04 to 0.45. But suppose the measure of central tendency were the median value? The median is 0.15, and the median excluding the two high values is 0.13. As elasticities go these numbers are not very far apart, but in measuring welfare the unadjusted mean of the studies results in an effect 86 percent larger than the median.

In the case of women's labor supply, the elasticity was set at 0.32. There were five studies, and the mean and median choices would be about the same, (around 0.30 using the median of studies with a range of findings). The study with the highest value, with a midpoint of 0.5, was based on data from 1985 and 1989, and there is some agreement that women are becoming more attached to the labor force and less responsive — more like men (Kumar and Liang, 2016). If that study were excluded, the mean and the median would fall to 0.25.

A second reason these numbers may be too high is that the upward sloping labor supply curve is not consistent with historical observation. The combination of a –0.05 income elasticity and a 0.24 substitution elasticity lead to a net positive labor supply elasticity for men of 0.19. For example, if the real wage doubled, as certainly occurred over some historical period, labor supply should increase by 20 percent. This elasticity is difficult to square with historical observations that show little variation in either hours or participation over periods of time with significant changes in wages and taxes. While substantial wage growth has not occurred recently (and thus it might not be surprising to see little change in hours or participation over time), consider the period 1947 to 1967, before the entry of women into the labor force and before the baby boom altered demographics. Average weekly hours were 40.3 in 1947 and 38.0 in 1967. Hourly earnings, however, grew by 58 percent (Council of Economic Advisers, 1989). Labor force participation also declined, during that period, from 86.4 percent to 79.7 percent, although that decline was largely due to older and younger workers. Men age 25 to 54 barely changed their participation rates, and one analysis suggests the decline among older workers was due to increased retirement options including Social Security (Fullerton, 1999). What is observed during this period is little change in hours worked or the participation rate, despite a significant increase in the wage rate.

Over a longer period of time there is a fall in labor hours, as hours fell from 70 hours a week in 1856 to 40 hours in 1940 (Zeisel, 1958). It appears that the response to increased earnings was shorter, not longer, hours. There are, of course many factors that influence participation and hours of work, but history would suggest that labor supply is backward bending or relatively fixed, not consistent with an upward sloping labor supply function.

The historical record for women is more difficult to interpret given the lower participation in history and the sea-change in participation rates that began in the late 1960s, a change that likely reflected a mix of social attitudes, more control over child-bearing, and innovations in household production. Beginning around 1990, the participation rate for women became relatively constant.

A third issue with the substitution elasticities is the possibility of publication bias. Because of sampling variability, studies would likely produce a range of estimates. If the true elasticity is close to zero, some studies should produce negative results. Referees

may be unlikely to recommend and journal editors may be unlikely to publish results contrary to theory. Thus, researchers are unlikely to pursue a study that produces results contrary to theory. The distribution of the results would, in that case, be truncated at zero (which does appear to be the case for the survey substitution elasticities). This effect is not a trivial concern. Havránek (2015) examined another behavioral elasticity, the intertemporal elasticity of substitution, and estimated publication bias to be responsible for reducing the value by 0.5 points and the value among macroeconometric studies to zero.

These observations suggest the substitution elasticity used in H&M is likely overstated, and the labor supply effects and the deadweight loss should be smaller.

B. Do Individuals Respond to Phase-Outs?

Of the labor supply effects estimated by H&M, one provision, the phase-out of subsidies for health insurance purchased on the exchanges, accounts for half of the labor supply effect, and 70 percent of the welfare loss. Yet, a strong case can be made that this particular behavioral effect is greatly exaggerated, or even virtually non-existent, as the effective increase in the marginal tax rate arising from a phase-out of benefits may not be realized by the individuals.

The literature on tax salience addresses the issue of whether, and under what circumstances, people are able to perceive and respond to tax changes. To frame the discussion, some tax changes can directly affect wages (such as the employer penalty, or the Cadillac tax if high cost plans are retained). Under reasonable models of economic behavior, taxes on labor income that are imposed on employers will be passed on in wages, and the labor supply responses gleaned from the labor supply literature would be appropriate. The response to this type of tax change should be no different than an ordinary response to wage reductions, although it is likely to reflect an average effect. Other tax effects come from statutory rates (such as the rates in the individual income tax rate structure), which may be more visible. An example of this type of change is the hospital insurance surtax. The third type of change is one that is not explicitly stated but arises from phase-outs of benefits, as is the case of the exchange subsidies. An important question, which H&M raised, is whether individuals will be less responsive to these implicit changes in marginal tax rates.

Both the literature on tax saliency and evidence on a similar program, the phase-out of earned income tax credit (EITC), suggest that individuals will not perceive or respond to these implicit marginal tax rates in the same way as wages, and, indeed, that the response is likely to be negligible. The review of the findings on knowledge and saliency below focuses on studies in the United States, although Sheffrin (1994) has found supporting evidence in other countries.

Numerous studies show that individuals are not well informed about the taxes they pay or are not able to translate them into action (Enrick, 1963, 1964; Gensemer, Lean, and Neenan, 1965; Morgan, Dye, and Hybels, 1977; Fujii and Hawley, 1988; Rupert and Fischer, 1995; Rupert and Wright, 1998; Rupert, Single, and Wright, 2003; Massarat-Mashhadi and Sielaff, 2012).

The U.S. Government Accountability Office (2008, 2012) and Gravelle and Driessen (2015) conclude that the complexity created by multiple tax benefits for higher education tuition assistance have led some taxpayers to claim tax provisions that do not provide them with the largest tax benefit. Miller and Mumford (2015) found evidence that taxpayers did not appear to understand the interaction between the child and dependent care credit and the child credit.

Beyond surveys and data that indicate a lack of understanding of marginal tax rates, some studies of taxpayer behavior appear to confirm limits on the response to taxes. Chetty, Looney, and Kroft (2009) found in a field experiment in a grocery store that taxpayers underreacted to sales taxes that were not included in price: demand and revenue quantity fell by 8 percent when additional price tags were posted inclusive of a 7.375 percent sales tax. Some additional tests suggested that the taxpayers were largely knowledgeable about the sales tax rate but did not respond to it. In their second statistical study, they compared the effect of alcohol excise taxes that are included in the price to sales taxes that are added at the register, and found a much larger response to the excise tax change. Some additional tests suggested that the taxpayers largely knew about the sales tax rate but did not respond to it. These results indicate that either taxpayers don't know about tax rates or, even if they do, they may not fully take them into account.

In addition to the evidence of a labor supply response to the phase-out of the exchange subsidies from the tax saliency literature, there is a significant body of evidence from study of the EITC, a program that has some features similar to the phase-out of the exchange subsidies. The EITC first phases in, then provides a flat dollar amount, and finally phases out. The EITC's phase-out may be more obvious than the exchange subsidy phase-out (it is explicitly associated with earning income, not subsidizing insurance). But even in the case of the EITC, while a positive effect on participation by single women has been generally found, there is virtually no evidence of a reduction in hours in response to the phase-out, a finding that is consistent across many studies (Eissa and Hoynes, 2006). While less work has been done on married couples (a smaller part of the EITC population), the results are mixed. Heim (2010) finds a small effect on hours but virtually none on participation. In studying EITC recipients overall, Chetty, Friedman, and Saez (2013) find some bunching at kink points (where the credit is maximized) and some effect of the phase-in of benefits, but not of the phase-out range.

This body of evidence on tax salience suggests that the phase-out of the exchange subsidies is not likely to lead to labor supply responses commensurate with responses to wages (either gross or net of tax). If these responses are negligible, the overall welfare loss from the ACA arising from explicit and implicit taxes reported by H&M is reduced by 70 percent, falling from 0.17 percent to 0.05 percent of earnings.

VI. A BROADER VIEW OF WELFARE

The previous analysis has focused primarily on the labor supply effects of the explicit or implicit taxes in the ACA rather than the presence of individual insurance that is available outside of employer coverage. Employer health insurance was beneficial because

it avoided adverse selection and spread risk across employees and their families. At the same time, the insurance system existing prior to the availability of individual exchanges under the ACA resulted in limited access to individuals with pre-existing conditions who lost their employer coverage because of job loss, layoff, benefit reduction, or divorce or the death of a spouse who supplied employer health coverage. Such insurance was not available or, if available, was likely to be unaffordable. In addition to the effects on individuals who lost coverage because of these events, some individuals may have failed to purchase individual insurance when younger and healthier.

In addition to the risk to which individuals were exposed because of the condition of the individual market, the benefits of employers' health insurance distorted the voluntary decisions of the employee who might have wished to retire, exit the work force for household and child care reasons, engage in self-employment, or take a job that did not include health insurance. Therefore, two aspects of the ACA would be expected to increase welfare: providing for broader risk sharing and eliminating the distortions in labor supply and job choice caused by lack of individual insurance in the face of employer health insurance.

H&M estimated effects on retirement by equating the effects to those of continuation insurance under the Consolidated Omnibus Budget Reconciliation Act (COBRA). The methodology here was less clear than in the cases of tax effects, and this estimate is also subject to uncertainty.

As noted previously, Gruber and Madrian (2004) review the empirical literature on the effect of health insurance on labor decisions in the era before enactment of the ACA. They find clear evidence that health insurance affects retirement decisions, as well as evidence that it is not important for low-income mothers. There is also evidence that it affects decisions of married women. The authors report mixed results on the effect on job mobility but overall thought the evidence pointed to an effect.

Subsequent research appears to support the pronounced findings on the link between health insurance and early retirement. French and Jones (2011), Blau and Gilleskie (2008), and Nyce et al. (2013), as well as other articles summarized in these papers, found significant effects of retiree health insurance for men. Kapur and Rogowski (2011), Congdon-Hohman (2015), and others reviewed in these studies found effects for women and joint effects for married couples. Decker and Selck (2012) found results for Medicaid consistent with limited effects on low-income mothers. A number of studies of Medicaid focused on the effects of nontraditional recipients, such as childless adults, with mixed results. Garthwaite, Gross, and Notowidigodo (2014) and Dague, Deleire, and Leininger (2014) found significant effects, while Baicker et al. (2014) found no effect. Direct studies examining the effects of the ACA Medicaid expansion, including Garrett and Kaestner (2015), Gooptu et al. (2016), and Kaestner et al. (2015) found no effects. Farooq and Kugler (2016) found more generous Medicaid coverage resulted in more risky, but better, jobs.

More recent studies support the notion of job lock. The U.S. Government Accountability Office (GAO, 2011) reviewed 31 studies of job lock and found evidence con-

sistent with an effect in 29 of them. Heim and Lurie (2015) studied the Massachusetts health care reform experience and found decreased job separations among most men but more mobility among married young and low-income taxpayers. The literature they reviewed tended to support job lock effects but also had some mixed results. Colman and Dave (2016) found that the ACA's dependent coverage mandate reduced the labor supply of young adults who no longer had to work to obtain insurance coverage. More time was spent on activities and socializing, and to a lesser extent, educational activities and job searches.

Gruber and Madrian (2004) review the rare exceptions among the pre-ACA literature where an attempt is made to measure welfare consequences of health insurance. Dey (2000) estimates the loss of productivity from job lock. Given the size of the deadweight losses measured above, he finds what the authors consider small effects to be more significant, ranging from somewhat less than 1 percent to 3 percent. He does not calculate an overall effect for the economy. This loss does not include possible spillover effects to other workers from better job matches or changes in worker satisfaction.

Monheit and Cooper (1994), who use the average wage change for job changers, find a gain of about one-third of one percent of GDP. Assuming labor compensation is two-thirds of GDP, this estimate is about one-half of 1 percent of labor compensation. Thus, this effect more than offsets the welfare costs of the taxes in the ACA, whether 0.17 percent, 0.05 percent, or less.

Gruber and Madrian produce an estimate by considering the cost of replacement insurance either through COBRA or through purchases on the individual market, which should in theory be an upper bound on the cost of losing insurance. This approach produces a value of 0.03 percent to 0.09 percent of GDP. If converted into percentages of labor compensation, it would amount to 0.05 percent to 0.14 percent of labor compensation. Moreover, the authors note that even though it could be characterized as an upper bound, it may not be because non-group policies were variable and risky, as well as generally providing smaller benefits than group plans.

Gruber and Madrian also discuss a fourth approach which they pursued in Gruber and Madrian (1997), examining the reemployment earnings of job leavers and how they changed as a function of continuation coverage. These estimates were about three times the upper limit in the previous approach which caused them to be skeptical of the results.

More recent attempts to measure welfare gains used a life cycle model where individuals are subject to random medical and labor shocks (Nakajima and Tuzemen, 2015; Pashchenko and Porapakkarm, 2013). These models find welfare gains of 0.5 percent of consumption in Nakajima and Tuzemen (2015) to almost 1 percent of consumption in Pashchenko and Porapakkarm (2013). The gains came largely from redistribution of income both from the rich to the poor and from the healthy to the sick.

The attempts, however constrained, to measure some of these welfare effects, combined with the analysis of the welfare effects of implicit and explicit taxes suggest that the ACA has likely enhanced welfare, and provides a different perspective on the law than the current focus on labor supply and output.

VII. CONCLUSION

This paper indicates that alternative assumptions can make small estimates of the ACA's labor supply effects and welfare effects even smaller. For example, an argument can be made that individuals are generally unable to perceive the single largest provision — subsidies for insurance coverage in the individual health exchanges — that drives the estimates of the net labor supply effect of the law.

This paper also calls for re-centering analysis of the law around the criteria of effects on aggregate welfare. In their review of economic studies on health insurance, labor supply, and job mobility, Gruber and Madrian (2004, p. 137) noted, "Much work remains to be done on the implications of health insurance for welfare. Empirical work has run vastly ahead of theory in this area ..." After all, labor is a means to an end, and not an end in itself (at least for most people) — with the end being increased consumption, leisure, and enhancements in quality of life. Labor supply effects are one part of a large body of economic literature that has examined the effects of health insurance coverage on several other piecemeal outcomes that affect societal welfare. Even if this paper is unable to quantify some of these effects as they pertain to provisions in the ACA, hopefully subsequent research will be able to do so.

ACKNOWLEDGMENT AND DISCLAIMERS

DISCLOSURES

REFERENCES

Baicker, Katherine, Amy Finkelstein, Jae Song, and Sarah Taubman, 2014. "The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment." *American Economic Review* 104 (5), 322–328.

Blau, David M., and Donna B. Gilleskie, 2008. "The Role of Retiree Health Insurance in the Employment Behavior of Older Men." *International Economic Review* 49 (2), 475–514.

Chetty, Raj, John N. Friedman, and Emmanuel Saez, 2013. "Using Differences in Knowledge across Neighborhoods to Uncover the Impact of the EITC on Earnings." *American Economic Review* 103 (7), 2683–2721.

Chetty, Raj, Adam Looney, and Kory Kroft, 2009. "Salience and Taxation: Theory and Evidence." *American Economic Review* 99 (4), 1145–1177.

Colman, Gregory, and Dhaval Dave, 2016. "It's About Time: Effects of the Affordable Care Act Dependent Coverage on Time Use." IZA Discussion Paper No. 9710. Institute for the Study of Labor (IZA), Bonn, Germany, http://ftp.iza.org/dp9710.pdf.

Congdon-Hohman, Joshua, 2015. "Love, Toil, and Health Insurance: Why American Husbands Retire when They Do." *Contemporary Economic Policy* 33 (1), 118–140.

Congressional Budget Office, 2010. *The Budget and Economic Outlook: An Update*. Congressional Budget Office, Washington, DC.

Congressional Budget Office, 2014. *The Budget and Economic Outlook: 2014 to 2024*. Congressional Budget Office, Washington, DC.

Council of Economic Advisers, 1989. *Economic Report of the President*. Council of Economic Advisers, Washington, DC.

Dague, Laura, Thomas DeLeire, and Lindsey Leininger, 2014. "The Effect of Public Insurance Coverage for Childless Adults on Labor Supply." IZA Discussion Paper No. 8187. Institute for the Study of Labor (IZA), Bonn, Germany, http://ftp.iza.org/dp8187.pdf.

Decker, Sandra L., and Frederic W. Selck, 2012. "The Effect of the Original Introduction of Medicaid on Welfare Participation and Female Labor Supply." *Review of Economics of the Household* 10 (4), 541–556.

Dey, Matthew S., 2000. "Welfare and Mobility Effects of Employer-Provided Health Insurance." Manuscript. University of Chicago, Chicago IL, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.198.558&rep=rep1&type=pdf.

Eissa, Nada, and Hillary W. Hoynes, 2006. "Behavioral Responses to Taxes: Lessons from the EITC and Labor Supply." In Poterba, James M. (ed.), *Tax Policy and the Economy, Volume 20*, 73–110. MIT Press, Cambridge, MA.

Enrick, Norbert Lloyd, 1963. "A Pilot Study of Income Tax Consciousness." *National Tax Journal* 16 (2), 169–173.

Enrick, Norbert Lloyd, 1964. "A Further Study of Income Tax Consciousness." *National Tax Journal* 17 (3), 319–321.

Farooq, Ammar, and Adriana Kugler, 2016. "Beyond Job Lock: Effects of Public Health Insurance on Occupational and Industrial Mobility." NBER Working Paper No. 22118. National Bureau of Economic Research, Cambridge, MA.

French, Eric, and John Bailey Jones, 2011. "The Effects of Health Insurance and Self-Insurance on Retirement Behavior.*" Econometrica* 79 (3), 693–732.

Fujii, Edwin T., and Clifford Hawley, 1988. "On the Accuracy of Tax Perceptions." *Review of Economics and Statistics* 70 (2), 344–347.

Fullerton, Howard N., 1999. "Labor Force Participation: 75 Years of Change, 1950–98 and 1998–2025." Bureau of Labor Statistics, Washington, DC, http://www.bls.gov/mlr/1999/12/art1full.pdf.

Garthwaite, Craig, Tal Gross, and Matthew J. Notowidigdo, 2014. "Public Health Insurance, Labor Supply, and Employment Lock." *Quarterly Journal of Economics* 129 (2), 653–696.

Garrett, Bowen, and Robert Kaestner, 2015. "Recent Evidence on the ACA and Employment: Has the ACA Been a Job Killer?" Robert Wood Johnson Foundation and Urban Institute, New Jersey and Washington, DC, http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000327-Recent-Evidence-on-the-ACA-and-Employment-Has-the-ACA-been-a-Job-Killer.pdf.

Gensemer, Bruce L., Jane A. Lean, and William Neenan, 1965. "Awareness of Marginal Income Tax Rates Among High Income Taxpayers." *National Tax Journal* 18 (3), 258–267.

Gooptu, Angshuman, Asako S. Moriya, Kosali I. Simon, and Benjamin D. Sommers, 2016. "Medicaid Expansion Did Not Result in Significant Employment Changes or Job Reductions in 2014." *Health Affairs* 35 (1), 111–118.

Gravelle, Jane G., 2015. *The Excise Tax on High-Cost Employer-Sponsored Health Insurance: Estimated Economic and Market Effects*. CRS Report R4419. Congressional Research Service, Washington, DC.

Gravelle, Jane G., and Grant A. Driessen, 2015. *Selected Recently Expired Individual Tax Provisions ("Tax Extenders"): In Brief*. CRS Report R43688. Congressional Research Service, Washington, DC.

Gravelle, Jane G., and Sean Lowry, 2015. *Affordable Care Act and Small Business*. CRS Report R43181. Congressional Research Service, Washington, DC.

Gruber, Jonathan, and Brigitte C. Madrian, 1997. "Employment Separation and Health Insurance Coverage." *Journal of Public Economics* 66 (3), 349–382.

Gruber, Jonathan, and Brigitte C. Madrian, 2004. "Health Insurance, Labor Supply, and Job Mobility: A Critical Review of the Literature." In McLaughlin, C. (ed.), *Health Policy and the Uninsured*, 97–178. The Urban Institute Press, Washington, DC.

Harris, Edward, and Shannon Mok, 2015. "How CBO Estimates the Effects of the Affordable Care Act on the Labor Market." Congressional Budget Office Working Paper (December 9). Congressional Budget Office, Washington, DC.

Havránek, Tomas, 2015. "Measuring Intertemporal Substitution: The Importance of Method Choices and Selective Reporting." *Journal of the European Economic Association* 13 (6), 1180–1204.

Heim, Bradley T., 2010. "The Impact of the Earned Income Tax Credit on the Labor Supply of Married Couples: A Structural Estimation." Manuscript. School of Public and Environmental Affairs, Indiana University, Bloomington, IN.

Heim, Bradley T., and Ithai Z. Lurie, 2015. "The Impact of Health Reform on Job Mobility: Evidence from Massachusetts." *American Journal of Health Economics* 3 (1), 374–398.

Jorgensen, Helene, and Dean Baker, 2013. "The Affordable Care Act: A Hidden Jobs Killer?" Center for Economic and Policy Research," Washington, DC, http://cepr.net/documents/publications/aca-job-killer-2013-07.pdf.

Kaestner, Robert, Bowen Garrett, Anuj Gangopadhyaya, and Caitlyn Fleming, 2015. "Effects of ACA Medicaid Expansions on Health Insurance Coverage and Labor Supply." NBER Working Paper No. 21836. National Bureau of Economic Research, Cambridge, MA.

Kaiser Family Foundation (KFF), 2015. "Employer Health Benefits Annual Survey, 2015." KFF, Washington, DC, http://kff.org/health-costs/report/2015-employer-health-benefits-survey/.

Kaiser Family Foundation (KFF), 2016. "Status of State Action on the Medicaid Expansion Decision (as of March 14)." KFF, Washington, DC, http://kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/.

Kapur, Kanika, and Jeannette Rogowski, 2011. "How Does Health Insurance Affect the Retirement Behavior of Women?" *Inquiry* 48 (1), 51–67.

Kumar, Anil, and Che-Yuan Liang, 2016. "Declining Female Labor Supply Elasticities in the United States and Implications for Tax Policy: Evidence from Panel Data." *National Tax Journal* 69 (3), 481–516.

Massarat-Mashhadi, Nima, and Christian Sielaff, 2012. "Testing Taxpayers' Cognitive Abilities: Survey Based Evidence." *International Journal of Economic Sciences and Applied Research* 5 (1), 7–22.

McClelland, Robert, and Shannon Mok, 2012. "A Review of Recent Research on Labor Supply Elasticities." Working Paper 2012-12. Congressional Budget Office, Washington, DC.

Miller, Benjamin M., and Kevin Mumford, 2015. "The Salience of Complex Tax Changes: Evidence from the Child and Dependent Care Credit Expansion." *National Tax Journal* 68 (3), 477–510.

Monheit, Alan C., and Philip F. Cooper, 1994. "Health Insurance and Job Mobility." *Industrial and Labor Relations Review* 48 (1), 68–85.

Morgan, James N., Richard F. Dye, and Judith H. Hybels, 1977. "Results From Two National Surveys of Philanthropic Activity." In Commission on Private Philanthropy and Public Needs (ed.), *Research Papers Volume 1: History, Trends, and Current Magnitudes*, 157–324. U.S. Department of the Treasury, Washington, DC.

Moriya, Asako S., Thomas M. Selden, and Kosali I. Simon, 2016. "Little Change Seen In Part-Time Employment as a Result of the Affordable Care Act." *Health Affairs* 35 (1), 19–123.

Nakajima, Makoto, and Didem Tuzeman, 2015. "Health-Care Reform or Labor Market Reform? A Quantitative Analysis of the Affordable Care Act." Working Paper No. 15–34. Federal Reserve Bank of Philadelphia, Philadelphia, PA.

Nyce, Steven, Sylvester H. Schieber, John B. Shoven, Sita Nataraj Slavov, and David A. Wise, 2013. "Does Retiree Health Insurance Encourage Early Retirement?" *Journal of Public Economics* 104 (1), 40–51.

Pashchenko, Svetlana, and Ponpoje Porapakkarm, 2013. "Quantitative Analysis of Health Insurance Reform: Separating Regulation from Redistribution." *Review of Economic Dynamics* 16 (1), 383–404.

Rupert, Timothy J., and Carol M. Fischer, 1995. "An Empirical Investigation of Taxpayer Awareness of Marginal Tax Rates." *Journal of the American Taxation Association* 17, 36–59.

Rupert, Timothy J., Louise E. Single, and Arnold M. Wright, 2003. "The Impact of Floors and Phase-Outs on Taxpayers' Decisions and Understanding of Marginal Tax Rates." *The Journal of the American Taxation Association* 17, 83–99.

Rupert, Timothy J., and Arnold M. Wright, 1998. "The Use of Marginal Tax Rates in Decision Making: The Impact of Tax Rate Visibility." *Journal of the American Taxation Association* 20 (1), 36–59.

Sheffrin, Steven M., 1994. "Perceptions of Fairness in the Crucible of Tax Policy." In Joel Slemrod (ed.), *Tax Progressivity and Income Inequality*, 309–334. Cambridge University Press, Cambridge, U.K.

University of California Berkeley Labor Center, 2013. "Data Brief: Which Workers are Most at Risk of Reduced Work Hours Under the Affordable Care Act?" University of California Berkeley Labor Center, Berkeley, CA, http://laborcenter.berkeley.edu/healthcare/reduced_work_hours13.pdf.

U.S. Government Accountability Office, 2008. *Multiple Higher Education Tax Incentives Create Opportunities for Taxpayers to Make Costly Mistakes*. GAO-08-717T. U.S. Government Accountability Office, Washington, DC, http://www.gao.gov/products/GAO-08-717T.

U.S. Government Accountability Office, 2011. *Health Care Coverage: Job Lock and the Potential Impact of the Patient Protection and Affordable Care Act*. GAO-12-166R. U.S. Government Accountability Office, Washington, DC, http://www.gao.gov/assets/590/586973.pdf.

U.S. Government Accountability Office, 2012. *Improved Tax Information Could Help Families Pay for College*. GAO-12-560. U.S. Government Accountability Office, Washington, DC, http://www.gao.gov/products/GAO-12-560.

Zeisel, Joseph, 1958. "The Workweek in American Industry, 1850–1956." *Monthly Labor Review*, 81 (1), 23–29.