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ABSTRACT

The Affordable Care Act includes four significant, permanent, implicit unemployment assistance programs, plus various implicit subsidies for underemployment, and expanded Medicaid eligibility for adults. Every sector of the economy, and about half of nonelderly adults, is directly affected by at least one of those provisions. This paper calculates the ACA's impact on the average reward to working among nonelderly household heads and spouses. The law increases marginal tax rates by an average of five percentage points (of employee compensation), on top of the marginal tax rates that were already present before it went into effect. The ACA's addition to labor tax wedges is roughly equivalent to doubling both employer and employee payroll tax rates for half of the population.

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Healthcare is valuable but expensive. As a result, many people believe that poor and middle-income households should pay less than full price for their healthcare, and the United States now has its Affordable Care Act (hereafter, ACA) that will soon implement such a policy.

Economics tells us that redistribution typically comes at the cost of reduced incentives to work and earn, yet some economic analyses of the ACA's labor market effects do not even mention explicit or implicit taxes (Cutler 2011). Others note the ACA's employer penalties, without acknowledging that the Act also includes various implicit taxes on the employee side (Gruber 2012) (Cutler and Sood 2010). The purpose of this paper is to quantify the contributions of various ACA provisions to time series for the marginal tax rate on labor income. In doing so, I prepare the estimates so that the various provisions can be compared with each other, compared with other explicit and implicit taxes, put in a historical context, and aggregated with each other for the purpose of aggregate labor market analysis.

The results are startling. The ACA includes both positive and negative tax rate effects, but nonetheless all provisions combined raise marginal tax rates in 2015 by 11 percentage points of total compensation, on average, for almost half of the nonelderly adult population and zero percentage points for the rest. From an aggregate point of view, the employer penalties by themselves are historically significant but nonetheless smaller than each of two of the ACA's implicit tax provisions. The ACA will increase the national average marginal labor income tax rate about fourteen times more (sic) than the 2006 "Romneycare" health reform law increased the Massachusetts average rate.

The results account for the fact that many people will not participate in programs for which they are eligible, the tendency of the act to move people off of means-tested uncompensated care, and the fact that the ACA implicitly taxes unemployment benefits. Although parts of the ACA build "notches" and "cliffs" into household budget sets – that is, infinitesimal income intervals over which marginal tax rates are infinite – my quantitative results are not a consequence of those notches or cliffs.

Section I reviews the index number framework from Mulligan (2012) that permits the measurement of statutory marginal tax rates combined over multiple government programs and averaged over various taxpayer situations. Section II explains how the ACA's penalty provisions act as taxes on work. The ACA's subsidy programs and their contribution to marginal tax rates are reviewed in Section III. Section IV notes how two ACA provisions interact with pre-ACA safety net programs for the purpose of determining a person's reward to working. Section V presents an example of how large the ACA's work disincentives can be. Sections VI-VIII look at the Medicaid expansion and show how the various programs can be weighted for the purposes of comparing and aggregating their labor market impact. Section IX concludes. Appendices to the paper show program-specific results for calendar years 2014 and 2016, give more details on health insurance premiums and the ACA's sliding income scale, and report sensitivity analysis.

A Framework for Measuring Legislated Changes in the Average Marginal Tax Rate on Labor Income

Assistance programs available to help people without work or otherwise with low incomes can be summarized by measuring the combined value of benefits available to a person who does not work, less taxes paid, and comparing it to the net of tax value of benefits available to the same person if he or she were working. The difference between the two combined values is the causal effect of working on the value of benefits available. The difference is also a known as a "wedge" between employer labor costs and employee benefits of working. The more that working reduces the net of tax value of available benefits, the more the programs have reduced the reward to working and have increased the wedge.

The effect of a work decision on the value of assistance received varies by person and by the type of work decision. The effect also depends on calendar time because program eligibility and benefit rules vary over time when new legislation and new regulations are put in place. In order to focus on the latter – especially the effect of the Affordable Care Act on incentives to work in 2014, 2015, and beyond – I use index

numbers to summarize the average incentive among a rich variety of incentives at a point in time. Each type of work decision – moving between employment and unemployment, moving between employment and out of the labor force, and changing weekly hours – has its own "statutory" incentive index time series $\{b_t\}$. The three margin-specific series are combined into an overall statutory work incentive index by taking a fixed-weighted average of the three.

Each of the three incentive indices is a sum of program-specific terms, such as a food stamp term, a payroll tax term, etc.

$$b_t \equiv \sum_j \omega_j E_{jt} B_{jt} \tag{1}$$

where t indexes time and j indexes safety net programs. Each program's term is itself the product of a statutory eligibility index $\{E_{jt}\}$ and a statutory benefit-per-participant index $\{B_{jt}\}$. The two indices, and therefore their product, change only at dates t when new program rules ("statutes") go into effect. The program-specific products $\{E_{jt}B_{jt}\}$ are combined into the statutory incentive index by aggregating them with a set of time-invariant program weights ω_j, which reflect time-invariant estimates of the propensity of people to participate in program j while they are not employed or otherwise with reduced labor supply.

The Affordable Care Act can itself be understood as a collection of programs, each of which has its own term in the sums that form the three work incentive indices. Those programs are: employer shared responsibility penalties, individual mandate relief, health insurance subsidies for persons who are not offered affordable employer-sponsored insurance (hereafter, ESI) even when employed, reconciliation of the advance premium tax credits, health insurance subsidies for persons who are offered affordable ESI when (and only when) they are employed, health insurance subsidies that stop at the poverty line, and Medicaid expansions for the poor.

The ACA provisions interact with related public policies, especially unemployment insurance and uncompensated care. In order to include these interaction terms in my index for the overall safety net, I therefore add two terms quantifying those

interactions: "implicit taxation of unemployment benefits" and "move off implicit compensated care tax."

All nine of these programs are listed in Table 1. The table's top (middle) panel shows each program's benefit (participation weight) terms, respectively.[1] The bottom panel compiles all of the terms into a single benefit index for each of the months of 2015, which can be added to indices of the non-ACA programs. Appendix I reproduces versions of Table 1 for calendar years 2014 and 2016.

Sometimes, as with a constant replacement rate unemployment benefit, the dollar amount of benefits to be received as a consequence of not working varies across persons according to what they earn when they are working. In these cases, I follow Mulligan (2012) and assume a hypothetical person (hereafter, "median earner") who earns $790 (2014 dollars) per week plus fringes, which is what the median nonelderly household head or spouse earned in 2007 during a week that they were working.[2] The same median earner (inclusive of the value of his fringes) is used to convert Table 1's bottom line dollar amounts into a bottom line tax rate. I use a wage from the middle of the skill distribution because the indices are intended to be used for analysis of nationwide employment, aggregate hours, and other labor market activity measures that weight each person equally, rather than giving extra weight to high earners or to people near the poverty line.[3]

When the dollar amounts vary across persons for other reasons, such as marital status or health insurance status or program take-up, I use the average across legally resident non-elderly working household heads and spouses, as noted below. Depending on data availability, the averages are conditioned on working sometime during the calendar year and having weekly earnings within 10 percent of the median earner – I call

[1] The eligibility indices are not shown because they are trivially zero before January 1, 2014 and 1 thereafter, as long as the ACA eligibility-related statutes and regulations remain unchanged.

[2] As of the time of writing, the latest available annual price index was for 2012; for the purposes of calculating 2014 dollars, I assume average annual inflation of 2 percent between 2012 and 2014. The 2014 median working household head and spouse will probably earn slightly more than $790 per week because, among other things, lower skill workers exited the workforce between 2007 and 2014.

[3] Although beyond the scope of this paper, the same methodology could be used to examine other points in the wage distribution as in Mulligan (2013a).

such non-elderly heads and spouses "median earners" – and usually calculated from the March 2011 Current Population Survey (referring to calendar year 2010).

ACA Penalty Components of the Marginal Tax Rate Index

The ACA includes monetary penalties on employers who do not offer health insurance to their full-time employees and on individuals who fail to participate in the health plans that are made available to them. These penalties are known as the employer and individual shared responsibility provisions, respectively. The individual penalty has also been described as the "individual mandate."

Through its employer shared responsibility provision, the ACA penalizes assessable employers: any large employer that does not offer comprehensive health insurance to its full time employees. The amount of the penalty is based on the number of full time employees (beyond 30) on the employer's monthly payroll during the calendar year in which it is assessable. A large employer is one with at least fifty full-time equivalent employees in the prior calendar year.

With a few exceptions related to thresholds and timing, each full-time employee's presence on an assessable employer's payroll creates a marginal cost of employment in the form of the employer shared responsibility penalty: the employer would owe less penalty if the employee were working part time instead, or were absent from the payroll altogether. Because the employer shared responsibility penalty is contingent on a person's work status, it has many of the economic characteristics of unemployment benefits and payroll taxes – at least for the purposes of quantifying incentives to work.

Taking into account interactions between the penalties and corporate, personal, and payroll taxes, the monthly amount of the penalty is $192 per month in 2015 and increases with the growth rate of health care costs thereafter,[4] which I assume to be 1.6

[4] The $192 monthly amount is $2,000 per year times the growth rate factor of 1.016 times (1-0.0765-0.18) for employee payroll and income taxes divided by 1.0765*(1-0.39) for employer taxes. Section 1302 of the ACA provides for a premium adjustment percentage based on the growth of the average per capita premium for health insurance coverage in the United States. The ACA specifies a $2,000 penalty for 2014 as well, but the U.S. Treasury will not be enforcing employer penalties for calendar year 2014.

percent per year in excess of wage growth. Thus, for the purposes of constructing work incentive indices for unemployment and out of the labor force, the shared responsibility index is zero for all months prior to January 2015, $192 for each month of 2015, $195 for each month of 2016, etc. The benefit index is expressed in 2014 dollars and shown in the top row of Table 1's top panel.

The share responsibility penalty can be avoided for employees if their hours are reduced below 30.[5] For the purpose of constructing the statutory index for weekly hours, the benefit index can be either greater or less than it is for unemployment. On one hand, the hourly penalty is about twice as large for hours changes that cross the part-time threshold than for changing employment status.[6] On the other hand, not all hours changes cross the part-time threshold and therefore would not change penalty status. The former effect dominates, so that the hourly penalty is fifteen percent greater when labor supply is adjusted on the weekly hours margin rather than weeks employed.[7]

Individuals who have access to affordable health insurance (either through their employer or through the marketplaces created by the ACA) but fail to participate are liable for the individual mandate penalty, unless they are experiencing hardship. The hardship exemption acts as an implicit tax on work to the extent that not working allows a person to be classified as experiencing hardship. The text of the ACA is unclear as to the relation between employment and hardship for the purposes of granting the exemption. I assume that, conditional on not having insurance, the penalty is paid only when working

[5] The ACA's threshold for part-time work is 30 hours per week for hourly employees. For salaried employees, the threshold is three days per week.

[6] Full-time employed (as measured by the Bureau of Labor statistics: employees working 35 hours per week or more; this part of the calculation is intended to represent labor market conventions rather than statutory definitions of full-time work) household heads and spouses work an average of 43.5 hours per week. Part-time employed heads and spouses average work hours are 21.4: the scaling factor is 43.5/(42.5-21.4). Note that the first weekly hour worked over 30 creates a penalty equivalent to about $60 of weekly wages. Working 43.5 hours rather than 30 therefore costs more than $4 per hour (plus payroll and personal income taxes on the additional wages), which is a significant cost for someone with wages of about $17 per hour.

[7] During the 2008-9 recession, 58 percent of per capita hours reductions by full-time workers involved crossing the part-time threshold (as defined by the BLS: see below for the data source) as opposed to reductions in average hours among the full-time employed. I therefore rescale the benefit index on the employment margins by a factor of 0.58*43.5/(43.5-21.4) = 1.15 in order to obtain a benefit index on the weekly hours margin.

or out of the labor force because unemployed persons will be eligible for a hardship exemption.[8]

When applicable, the amount of the individual mandate penalty is the maximum of a flat amount per uninsured household member and a percentage of household income, both of which vary among the years 2014, 2015, and 2016 (U.S. Internal Revenue Service 2013a). Because my indices are built for the median earner I use the percentages: 1 percent for 2014, 2 percent for 2015, and 2.5 percent thereafter.

The benefit index (unemployment and out of the labor force) for the individual mandate relief program is therefore equal to the penalty percentage applicable in the year times the average monthly household income among uninsured household heads and spouses with weekly earnings within 10 percent of the median. Those amounts are $51 in 2014, $103 in 2015, and $128 in 2016. For the reduced hours index the benefit index is zero because I assume that reduced hours will not be considered hardship for the purposes of relief from the mandate. These amounts derive from relief from the penalty, not the penalty itself.[9] For the reduced hours index the benefit index is zero because I assume that reduced hours will not be considered hardship for the purposes of relief from the mandate.

Jumping onto and Sliding Along the Income Scale: The ACA's Subsidy Components of the Marginal Tax Rate Index

The ACA requires that each state (or the federal government on behalf of the state residents) set up health insurance marketplaces or "exchanges" where individuals can purchase health insurance that conforms to the law. The plans on the exchanges will be

[8] Assuming that out-of-the labor force status counts as hardship would add less than one dollar to my bottom line $204 total work disincentive of the ACA.

[9] A mandate by itself need not act as a significant tax on work (Summers 1989). Kolstad and Kowalski's (2012) study of Massachusetts suggests that the individual mandate increases labor supply. Perhaps they have in mind income effects, which are beyond the scope of this paper, or that Romneycare's promotion of cafeteria plans makes employment the cheapest way to buy health insurance in Massachusetts. This paper intends to measure the impact of health reform on the reward to working more versus less, which would be zero from a mandate that required workers and nonworkers alike to buy health insurance, at least if insurance could be purchased by nonworkers at similar prices to the prices paid by workers.

subsidized from revenues obtained from taxes on employer-sponsored plans. More important, individuals participating in exchange plans may be eligible for significant assistance (at taxpayer expense) with their premium payments and with their out-of-pocket health expenses on the basis of their household income and the fringe benefits available on their job, if any. The income and fringe benefit contingencies create a variety of implicit taxes on work.

Persons not offered insurance by a current employer, not eligible for Medicare or Medicaid, and living in a tax unit (hereafter, "family" or "household") with income between 100 and 400 percent of the federal poverty line (hereafter, FPL), have their cost of exchange-purchased health insurance capped as a percentage of their household income. If in addition, their household income is less than 250 percent of the FPL, then their out-of-pocket costs (copayments, co-insurance, etc.) are discounted. The cap percentages increase, and discount rates decrease, with income.

Figure 1's solid curves show the 2014 sliding scale payment schedule for exchange plan participants, assuming that they were not offered affordable health insurance by their employer (if any). Both premiums and the average amount of participant out-of-pocket costs are included in Figure 1's payment. The schedule for premium payments can be calculated from the ACA without any assumptions about family composition or the prices that will be quoted by insurance providers on the exchanges as long as the schedule specifies a payment less than the full premium, but the out-of-pocket payments depend on the actuarial value (AV) of the policy purchased.[10] Figure 1 therefore shows two extremes: a low ratio of AV to FPL (solid blue) and a high ratio (solid red). Appendix II gives more details on the derivation of Figure 1.

Let S_i denote the calendar year exchange subsidy received by the family of worker *i*, which is the difference, if any, between the full price of the family's health care and the health expenditure caps shown in Figure 1. For the months in which the household is eligible for subsidies, the subsidies are a function $H_i(y)$ of calendar income y reported on the personal income tax return, including spousal income (if any) and characteristics of *i*'s family such as its size and the age of its members. As long as reported family income

[10] Figure 1 shows the payments for the second cheapest silver plan. Participants of any income can upgrade or downgrade their plan by paying (or receiving) the full cost difference. Thus, the slopes of Figure 1's schedules would be the same regardless of plan choice.

is in between 100 and 400 percent of FPL, worker *i*'s family disposable income c_i is, net of taxes, subsidies, and health expenses:

$$\begin{aligned} y_i &= n_i h_i w + (1-n_i) r_i w + a_i \\ c_i &= x_i n_i h_i w + (1-ESI_i n_i) H_i(y_i) - (1-ESI_i) U_i(a_i + n_i h_i w) - T_i \end{aligned} \tag{2}$$

where, for the moment, I ignore the dynamics of earning and reporting incomes for the purposes of determining subsidies. n_i is the fraction of the year person *i* was on a payroll, h_i is weekly work hours (full-time hours are normalized to one), and w is the weekly full-time wage rate excluding untaxed fringes. w does not vary by *i* because, as noted above, when it matters I assume that it is $790 per week. r_i is the replacement rate for unemployment insurance, which is zero for someone ineligible for unemployment insurance during their non-work time. a_i denotes other sources of reported income such as spousal earnings and asset income. $x_i w > w$ denotes the employer cost or total compensation from full-time work, including fringes.

ESI_i is an indicator for having ESI when at work, either through one's own job or through a spouse. T_i denotes non-ACA taxes, subsidies, and health expenses, including uncompensated care when applicable. T_i depends on income, but the marginal tax rates created by that dependence has been examined extensively in previous work (Mulligan 2012); the purpose of this paper is to look at the additional marginal tax rates created by the ACA itself. U_i denotes uncompensated care forgone due to ACA HI coverage and equals zero for persons who would be privately insured but-for the ACA.[11]

The ACA's income-based healthcare payment schedule creates several types of work disincentives because the behavioral variables n and h appear several times in equation (2). First, a household head or spouse is denied access to the payment schedule as long as he or she holds a job that offers health insurance, and (if in a family between 100 and 400 percent FPL and not eligible for coverage from a spouse's employer) granted access when not employed. Formally, look at full-time employer cost $x_i w$ minus the derivative of c_i with respect to n_i in the case that $ESI_i = 1$, $h_i = 1$, and y_i in between 100 and 400 percent of FPL.

[11] Unemployment compensation is assumed to be excluded from consideration in determining the amount of uncompensated care received by an uninsured person.

$$c_i = x_i n_i w + (1-n_i) H_i\left(n_i w + (1-n_i) r_i w + a_i\right) - T_i$$
$$x_i w - \frac{\partial c_i}{\partial n_i} = H_i(y_i) + (1-n_i)\tau_i w - (1-n_i)\tau_i w r_i \qquad (3)$$
$$\tau_i \equiv -H_i'(y_i)$$

The first term H in $\partial c/\partial n$ reflects the access to the schedule that comes with an ESI's worker's time off the payroll. H is *not a slope* of the exchange subsidy schedule, but is the level. As I show below, the H term is perhaps the single largest work disincentive in the ACA, despite is absence from policy analysis to date. The last two terms relate to the slope of the schedule are zero for a full-year worker, and are addressed below.

Second, a household head or spouse can be granted access *as a consequence* of moving from full-time employment to part-time employment if that move results in a loss of opportunity for ESI. Third, working fewer weeks per year or hours per week enhances the exchange subsidies for persons (a) in a household between 100 and 400 percent FPL, (b) who work in a job not offering health insurance, and (c) who purchase insurance on the exchanges. Formally, look at the derivatives of c_i with respect to n_i and h_i in the case that $ESI_i = 0$ and y_i in between 100 and 400 percent of FPL.

$$c_i = x_i n_i h_i w + H_i(y_i) - U_i(a_i + n_i h_i w) - T_i$$
$$x_i h_i w - \frac{\partial c_i}{\partial n_i} = \tau_i h_i w - \tau_i r_i w - \upsilon_i h_i w\,, \quad x_i n_i w - \frac{\partial c_i}{\partial h_i} = \tau_i n_i w - \upsilon_i n_i w \qquad (4)$$
$$\upsilon_i \equiv -U_i'(a_i + n_i h_i w)$$

Equation (4) shows terms for $\partial c/\partial n$ and $\partial c/\partial h$ that relate to the slopes τ and υ of the exchange subsidy schedule H and uncompensated care schedule U, respectively.

The positive terms in equations (3) and (4) represent disincentives – the wedge between employer cost and employee reward is widened – while the negative terms represent incentives. For the purposes of quantifying overall work incentives, each of the terms in equations (3) and (4) is best understood as a separate program, which is why I list them separately in Table 1. The remainder of this section quantifies the incentives

one program at a time. Later sections quantify the sizes of the populations that will experience each of the various incentives.

Jumping onto the Income Scale for Health Payments

A person with ESI who would receive an exchange subsidy when not employed forgoes the value of that subsidy when working, as represented by the *H* term in equation (3). That value depends on the type of plan (a function of household composition) and that person's household income. For the sample of persons with ESI and in households between 100 and 400 percent of FPL, I calculated the average value of the 2014 subsidy under the assumption that a family plan provides benefits valued at $19,000 per year (2014 dollars), an individual plan's benefits are $7,000 per year, and an "employee plus one" plan has a value equal to the average of the two.[12] My subsidy calculation recognizes that, depending on family income, exchange plan participants must pay the plan premium and various out-of-pocket costs like coinsurance according to the ACA's "sliding scales." On average, a month of the 2015 exchange subsidy is worth $508 (2014 dollars), so that $508 is the value of the unemployment and out of the labor force benefit indices for HI subsidies for persons with ESI at work.[13]

Each person has a point on a schedule like the two solid schedules shown in Figure 1 and that point is determined by the amount of his household income when he works, say, 13 fewer weeks of the calendar year. The vertical distance between that point and the full expected medical payment (i.e., premiums plus expected out-of-pocket expenses) associated with the policy is the amount of the ACA's implicit subsidy for not working those 13 weeks. The $508 cited above is the average vertical distance among full-time median earners in the March 2011 Current Population Survey with employer-sponsored health insurance, and in families between 100 and 400 percent of the FPL. For this reason, one could describe this work disincentive as persons "jumping onto" the income scale for health expenses as a consequence of not working.

[12] Appendix III has more details on valuing health insurance plans.
[13] The Congressional Budget Office (2013) also projects that the average exchange subsidy will be about $500 per month.

Full-time ESI employees can also become eligible for exchange subsidies by moving to part time, and part-time (and ESI-ineligible) employees at ESI firms will find that they lose their exchange subsidy by moving to full time. The reduced hours benefit index for this program is $582, which is the $508 scaled by the same factor as used for the employer penalty (see above). This incentive to cut hours from full time to part time is another example of jumping onto the income scale as a consequence of working less.

At first glance, it might appear that Table 1 needs a row to indicate that people leaving ESI jobs lose the implicit subsidy for ESI associated with the exclusion of ESI premiums from income for the purposes of payroll, personal income, and business income taxation. However, Table 1 quantifies the *impact* of the ACA, and the loss of the implicit ESI subsidy occurred before the ACA and will continue to occur after it.[14]

Sliding Along the Income Scale for Health Payments

The third disincentive associated with the income scales like the two shown in Figure 1 involves "sliding down" – rather than jumping onto – the income scale by working less during the calendar year. This case applies to persons who receive exchange subsidies, or has family members receiving them, even when working. For such a person, there are two notable points on the scale: one when working more and a second when working less. The person's ACA penalty for working more is, as a share of household income added by working more, the slope of the line connecting the two points on the scale.[15] Algebraically, the penalty is the τhw or τnw term in equation (4), for the employment and weekly hours margins, respectively.

Unlike the disincentives associated with jumping onto the income scale, the marginal tax rates from sliding along the income scale are especially sensitive to the exact position on the scale because the scale has a number of discrete notches or cliffs in it. For example, a person who earns 390 percent of FPL when working less and 410 percent of FPL when working more would face an ACA marginal tax rate of about 150 percent. In order to emphasize results that are not especially sensitive to notches and

[14] Algebraically, the implicit subsidy for ESI is part of equation (3)'s non-ACA term *T*.
[15] Note that both axes in Figure 1 are in the same units, with each unit representing a dollar amount equal to the federal poverty line.

cliffs, I approximate the slopes of the sliding scales by averaging the various slopes, weighting by the width of the income interval over which they apply. Geometrically, the weighted average slope is equal to the slope of the dashed secants shown in Figure 1. I used the weighted average slopes only for the disincentives associated with sliding along the income scale and not those associated with jumping onto the income scale.

The weighted average slopes still vary across households according to family situations, so I average the weighted average slopes across median earners in the Current Population Survey without employer-sponsored health insurance, and in families between 100 and 400 percent of the FPL. That average is about 24 percent of earnings, which is the $832 per month (algebraically, τw) shown in the third row of Table 1. The same entry is shown in all of the columns of that row because the disincentive depends on income, and not whether a specific income level is achieved through unemployment, or out of the labor force, or reduced hours.

Simultaneously Jumping and Sliding Along the Income Scale

An ESI worker who is employed part of the year may be receiving exchange subsidies during periods of non-employment. When such a worker decides, or is required, to work one less month, he not only jumps onto the income scale for that month – the H term in equation (3) for the wedge between employer cost and employee benefit – but also enhances the subsidy received for the other months of non-employment during the calendar year. Algebraically, the additional disincentive is represented by the $(1-n_i)\tau_i w$ term in equation (3). Workers like these are participating in both the third and fifth programs listed in Table 1. As explained below, when counting the number of persons affected by each program, such workers count once toward the H "jumping" term and at most $(1-n_i) < 1$ times for sliding along the scale.

The double disincentive also applies to workers switching between ESI-eligible full-time employment to part-time (and ESI-ineligible) employment during the calendar year. An additional month of part-time employment not only turns on an exchange subsidy for that month but, by reducing calendar year income, enhances the subsidies received during the other months of the year that employment is part-time (or zero).

Such workers count once in Table 1's reduced hours column toward the *H* "jumping" term and at most $(1-n_i) < 1$ times for sliding along the scale.

Reconciling Advance Premium Credits

The means-tested discounts a family receives during the calendar year (hereafter, "coverage year") will often derive from the income they reported on historical tax returns (usually the return from the second year prior) and its subsidies must be reconciled with its actual income at the conclusion of the coverage year.[16] In principle, the subsidies could be fully reconciled by having subsidy excesses or shortfalls be debited or credited on the family's personal income tax return, in which case there would be no additional earning disincentive from the reconciliation process itself. At the other extreme, reconciliation could be zero in which case the earning disincentives noted above would apply to earnings in the year-before-last rather than earnings in the coverage year, but the reconciliation itself would not create additional disincentives.

Appendix II describes the reconciliation process prescribed by the ACA, which in some ways is in between the two reconciliation scenarios described above. In particular, premium credits are fully reconciled for any family to be credited on its tax return. Cost-sharing subsidies are not reconciled. Families who received excess credits during the coverage year are limited on the amount they must repay, with the limits determined by family income during the coverage year. Appendix II shows how the means-tested reconciliation of excess credits adds an additional 4.5 percentage points to the marginal taxation of income reported on applicable tax returns for the coverage year, which is about $154 per month.

[16] For example, the 2014 federal personal income tax return (filed sometime during calendar year 2015) could provide the income estimate for the purposes of determining health expense discounts received during 2016. Reconciliation of the 2016 subsidies occurs sometime during calendar year 2017 when the family files its 2016 federal personal income tax return. In principle, documents available in late 2015 – such as pay stubs or employer quarterly payroll reports – would be alternate sources of 2016 income estimates.

ACA Subsidies Disappear When Falling Below the Poverty Line

Assuming for the moment that no one above the poverty line is eligible for Medicaid, the eligible calendar-year income range for ACA's exchange subsidies is between 100 and 400 percent of the poverty line. Thus, holding Medicaid eligibility constant, the ACA introduces a subsidy for persons above the poverty line without introducing a subsidy for persons below the poverty line.[17] This by itself increases the incentive (or, due to longstanding programs for people below the poverty line, decreases the disincentive) for earning above the poverty line.

In order to compartmentalize the range of incentives and disincentives in the ACA, the bulk of this paper considers short-duration employment decisions – a couple of weeks – that would push few persons out of, or into, the eligible income range when income is measured on a calendar year basis. Those incentives are represented algebraically by the partial derivatives in equations (3) and (4). The purpose of this section is to complete the incentive calculus by recognizing that longer-duration work decisions sometimes involve significantly different incentives because those decisions are more likely to move a family into or out of the eligible income range: that is, crossing the poverty threshold or crossing four times the poverty threshold. The final result is an additional "HI subsidies stop at the poverty line" row in Table 1 to include long-duration employment decisions in the overall marginal tax rate index, to the extent that their ACA incentives are different from short-duration decisions.

Each column in Table 2 examines a 2014 labor supply decision of a different duration, ranging from one to twelve months, for the purpose of isolating the average incentive consequences of crossing the upper or lower income threshold. For simplicity, Table 2 examines only employment decisions – months unemployed or months out of the labor force – although the same sort of issues arise with respect to the duration of a weekly hours decision. For example, an unemployed person who considers returning to work May 1 rather than January 1 is engaged in a work decision of four month duration.

The consequences for persons crossing an income threshold are different for ESI workers who jump onto the income scale than they are for persons who have exchange coverage even when they are working and thereby slide along the scale. Each of these

[17] The ACA's Medicaid expansion is examined separately below.

cases is examined in a separate panel of Table 2. The first row of Table 1 displays the percentage of non-elderly household heads and spouses working with ESI sometime during 2010 with weekly earnings within 20 percent of the median, and with a work decision (of duration indicated by table column) that would push the family across the poverty line (the lower income threshold).[18] In order to algebraically examine longer duration work decisions among ESI-eligible workers, take the difference between the disposable income formula (3) for the actual work amount n_i and a lesser work amount n^*, holding constant the non-ACA term T_i:

$$(n_i - n^*)x_i w - (c_i - c_i^*) = (1-n^*)H_i(y_i^*) - (1-n_i)H_i(y_i) \quad (5)$$

The left-hand side of equation (5) is the wedge between the employer cost increment and the employee benefit increment. If the work decision moves a family into or out of the eligible income range, equation (5) is significantly different from the wedge formula (3) because one of the two terms on the right-hand side of equation (5) would be zero. Specifically, the first (second) of the two terms is zero for a decision crossing the lower (upper) income threshold, respectively, from above. The second row of Table 2 therefore reports the average $(1\text{-}n)H(y)$ for the sample represented in the first row of the table. The third row reports the forgone subsidy, averaged in the same sample, that was included in Table 1's \$508 population-average subsidy,[19] plus a sliding scale term equal to \$832-\$301 (from two rows of Table 1; the \$301 is scaled by the labor supply weight for unemployment) times one minus the fraction of weeks worked for the sample. Algebraically, the third row of Table 2 is the marginal wedge formula (3). The difference between the third and second row can be interpreted as the average amount by which the rest of Table 1 overestimates the subsidies that would be received during periods of non-employment by ESI workers in the families near the poverty threshold.

[18] As explained below, the percentages reflect the fact that some workers will not receive the ACA subsidies because they can obtain coverage through a spouse's employer, or because they decide not to take up a subsidy for which they are eligible. The percentages also recognize that part of the population receives unemployment benefits when not working, which helps keep the family above the poverty line.

[19] The \$508 is an average over a larger group, most of which would get smaller subsidies when not working and (due to spousal income and distance from the poverty line) cannot cross the poverty threshold even if they weren't working at all during the year.

For example, if a six-month work decision were of interest, the six-month column of Table 2 tells us that 1.3% of working non-elderly heads and spouses would both (a) have ESI when working and (b) move from inside the eligible income range to below the poverty threshold as a consequence of reducing months worked by six. Rather than getting the additional $7,567 subsidy assigned to them by Table 1's rows 3, 5, and 8, they would forgo subsidies worth $920.

The next three rows in Table 2 examine ESI workers whose decisions would push them below 400 percent of the poverty line but not below the poverty line. Because their actual income is outside of the eligible income range, they are assigned zero forgone subsidy in the rest of Table 1, which is why zeros are recorded in the sixth row of Table 2. Equation (5) shows that crossing the upper income threshold initiates a subsidy for all of the months in which the worker is not on the payroll, even those non-employment months that were not the result of the work decision. The average amount of the subsidy initiated (among those workers with decisions that cross the upper threshold) is shown in Table 2's fifth row.

For full-time workers without ESI, the incentives for crossing an income threshold is found in the difference between the disposable income formula (4) for the actual work amount n_i and a lesser work amount n^*, holding constant the non-ACA term T_i and setting $h_i = 1$:

$$(n_i - n^*)x_i w - (c_i - c_i^*) = H_i(y_i^*) - H_i(y_i) - (n_i - n^*)\upsilon w \qquad (6)$$

For decisions that cross the poverty line, the first term on the right-hand side is zero because the poor cannot receive exchange subsidies. The remaining terms are shown in the second row of Table 2's middle panel. The third row shows the disincentive recorded for this group in the rest of Table 1.

The middle term on the right-hand side of equation (6) is zero for decisions that cross the upper income threshold. The remaining terms are shown in the fifth row of Table 2's middle panel. The follow row has zeros because the rest of Table 1 assigns no forgone subsidies to families outside the eligible income range.

The bottom panel of Table 2 combines the results from the four scenarios quantified above. For example, 3.3 percent of non-elderly working heads and spouses

earning near the median on a weekly basis would cross into or out of the eligible income range by working three months less and thereby turn on or turn off their exchange subsidy. On average, a $39 subsidy is lost, or about 0.3 percent of the compensation at stake, by working three months less. By examining only short-duration work decisions, the rest of Table 1 assumes that a $597 subsidy, or 4.7 percent of three month's compensation, is gained by such workers when they work three months less. If three month's work decisions were of interest rather than short-duration decisions, then Table 1 overstates the ACA's impact on the work incentives for this group by 5.0 percentage points (4.7 + 0.3). Because this group is 3.3 percent of the overall working population, Table 1 would overstate the overall average by 0.2 percentage points, which is the amount shown in the last row of Table 2.

The final row of the table shows how ACA incentives for longer duration work decision are less well approximated by the short-duration incentives. Ideally, the distribution of work decisions considered by employers and employees would be measured and each column of Table 2 would be weighted accordingly to arrive an estimate of the ACA's impact on overall work incentives. Measurement of such a distribution is beyond the scope of this paper. For now, I note that the median duration of unemployment rarely surpassed 10 weeks before 2009. The 2008-9 recession added 10-12 weeks to median durations. Thus, a two, three, or four month duration would be a worthy focal point in Table 2.

I take the three month estimate, for which 3.3 percent of the median-earner population face a disincentive that is 5.0 percentage points, or $212 per month, less than they do for short-duration work decisions. -$212 is therefore entered in Table 1's sixth row, with a corresponding 0.033 weight entered in the bottom panel.[20]

ACA Subsidies Interact with Other Safety Net Programs

A multitude of social safety net programs predated the ACA and served to reduce work incentives. The ACA replaces or substitutes for some of them, and thereby might

[20] Table 2 does not examine long duration weekly hours decisions, but the same kinds of effects are present so the same entry is in all three columns of Table 1's sixth row.

reduce work incentives less than the ACA provisions would if they were introduced by themselves into a world with no safety net.

Unemployment insurance (UI) is a major safety net program, and the benefits paid by the UI program are implicitly taxed by the ACA because UI benefits are part of the household income that determines a household's assistance with health insurance premiums and out-of-pocket costs. In particular, persons laid off from a non-ESI job before the ACA would find their UI benefits taxed at normal marginal personal income tax rates but under the ACA those marginal rates jump about 24 percentage points for recipients of exchange subsidies thanks to the ACA's "sliding scale" premium assistance. For someone receiving $1,265 per month in UI benefits – about the average among UI-eligible persons with earnings potential near the median – that's an extra $301 per month in taxes.

The uninsured sometimes receive uncompensated care from health providers, and uncompensated care is likely means-tested. To the extent that the ACA reduces reliance on uncompensated care (Goolsbee 2011, oral testimony at 77:45), it may reduce the implicit income tax associated with it. I am not aware of a calculation of the nationwide average marginal tax rate from uncompensated care, but it can be estimated by assuming that its value is a linear function of household labor income and noting that: (a) the uninsured paid, in 2008, an aggregate of $30 billion in health expenses (another $56 billion was uncompensated care for those patients) and (b) aggregate labor income among the uninsured was $510 billion.[21] This puts the average marginal labor income tax rate (including in the average those among the uninsured who do not use any health care) from uncompensated care of 5.9 percent. According to this estimate, when spending a month prior to the ACA without his $3,424 earnings, an uninsured person could expect to save an average of $201 in medical expenditures by increasing his uncompensated care. After the ACA, this help might not be necessary because he would have private HI coverage. Thus, -$201 per month is shown in the top panel of Table 1 as an ACA impact on the amount of benefits available as a consequence of not working.

[21] Kaiser Commission on Medicaid and the Uninsured (2008, 1).

Part of the Population Will Have Their Work Incentives Erased: An Example

Consider a person comparing a part-time position to a full-time position. The full-time position, shown in the left column of Table 3 requires 40 hours of work and $100 of employment expenses (such as commuting or child care) per week, for 50 weeks per year. The part-time position requires 29 hours of work and $75 employment expenses per week. Each of the positions costs the employer $26 per hour worked, including employer payroll taxes and employer contributions for health insurance (if any).

Only the full-time position includes affordable health insurance, which means that a full-time employee would not be eligible to receive assistance from the ACA for premiums or for out-of-pocket health expenses. The employer pays 78% of the premiums for the family insurance plan, and withholds the remaining premiums of $3,146 from the paychecks of participating full-time employees. Each full-time employee's income subject to tax is $35,021, which excludes employer payroll taxes (7.65% of the $35,021), employer health insurance contributions, and employee premiums withheld.

Part-time employees get less total compensation – $37,700 – because they work fewer hours. The part-time employees are not eligible for ESI and the tax exclusions that go with it, which makes their income subject to tax ($35,021) equal to their total compensation minus employer payroll taxes. It is a coincidence that income subject to tax is the same for full-time and part-time employees: more on this below.

The part-time employees are eligible for subsidized health plans from the ACA's exchanges because they are not offered affordable health insurance by their employer. I assume that the second cheapest silver plan has the same expected medical payments as the employer plan: namely, $17,300 per year including out-of-pocket health expenses. By definition of silver plan, the full premium is $12,110. However, because the employee has a family income subject to tax of 145% of the federal poverty line (the employee is the sole earner in a family of four), the ACA caps premiums for the second cheapest silver plan at 3.7 percent of their income subject to tax, or $1,304 per year. The other $10,806 is paid by the U.S. Treasury to the insurer pursuant to the ACA.

By design, the silver health plans have lower premiums and greater out-of-pocket costs (deductibles, copayments, etc.) than the typical employer plan. That design feature is visible in my Table 3 because exchange plan out-of-pocket costs total $5,190 rather than the $3,000 of out-of-pocket health expenses associated with ESI. However, because the employee's family is at 145% of the poverty line, the employee gets an 80% discount on the out-of-pocket expenses, with the remainder paid by the U.S. Treasury to the insurer pursuant to the ACA.

After health and work expenses, the part-time employee makes $28,929 per year, which exceeds the full-time income ($27,021) after health and work expenses! Table 3 does not show the employee payroll and personal income taxes, but those would be the same for the full-time and part-time employee because the amount of the income subject to the two taxes is, in this example, independent of full-time status.

Table 3's example is special, and a bit simplified, in that part-time employees have: more disposable income than full-time employees, the same income subject to tax, and the same hourly employer cost. But the Table contains a general lesson: moving from full-time employment to part-time employment can trigger generous assistance with health premiums and out-of-pocket expenses that can offset much of the income lost due to reduced work hours. That's why Table 1 includes a significant entry for the "HI subsidies for persons w/ ESI at work" program benefit amount in the reduced hours column. Moreover, Table 3's key parameters – $26 per hour employer cost, $14,300 premiums for ESI, and a single-earner family of four – are not extraordinary, which is a symptom of the fact that, under the ACA, it will not be extraordinary for people to be able to have more disposable income from a part-time position than from a full-time one.

Program Participation Weights

Table 1's top panel shows that the ACA's work incentives vary according to the program, if any, that might be relevant to a worker and his family. For example, a person eligible for the exchange subsidies while working full time will have $832 per month additional help during times of unemployment (minus offsets, if any, from the ACA's implicit taxation of UI benefits and its substitution away from uncompensated care), whereas a worker that is ineligible solely due to his employer's offer of affordable

insurance would get $508 per month added. An uninsured full-time worker is getting only $103 of additional help. For many workers, none of these programs are affecting their incentives to work. The purpose of Table 1's middle panel is to weight the top panel's programs according to the fraction of the population affected.

A program, such as a universally enforced flat-rate payroll tax, that applied to the entire population of non-elderly household heads and spouses would get a program participation weight of one. If instead, say, 30 percent of the population were randomly chosen to pay the tax, then the program weight would be 0.30.

Actual programs, especially on the subsidy side, have eligibility based on personal and household characteristics like income that can be altered by households. For example, giving a subsidy to employees who are not offered health insurance will cause more people to take jobs without health insurance. To form a weight for such a program, I follow index number theory and take the simple average of (i) the fraction of the population that would be eligible and participate with behavior held fixed at its no-ACA values, and (ii) the fraction of the population actually participating under the ACA. Given that I am writing before the ACA goes into full effect, I make conservative estimates of ACA behavioral patterns (i.e., for the purpose of forming weights I error on the side of assuming that the ACA's behavioral effects are minor), drawing on the literature whenever possible. I also report sensitivity analysis in Appendix V.

Table 1's weights often cannot be independently varied, because eligibility for one of the programs often implies ineligibility for another. Table 4 shows how Table 1's weights are related to each other by partitioning the entire population of non-elderly household heads and spouses who would be working absent the ACA. The partitions are based on the source of health insurance (Table 4's "HI holder" column indicates which case applies), the income interval for the person's household (the "FPL interval" column indicates which case applies), and the health benefits offered by his employer (indicated at the top of the table). Each column in each of Table 4's four panels has three entries: one for each labor supply margin. The sum of all of the weights for "FT-not employed" plus the sum of all of the weights for "PT-not employed" is one because the entire would-be working population has the option of reducing their labor supply by not working. Each "FT-PT" weight is identical to the corresponding "FT-not employed" weight

because a full-time employee can reduce labor supply either by reducing hours or by not being employed.

For example, the entry of 0.131 in the top row of Table 4 means that 13.1 percent of the would-be working population of non-elderly household heads and spouses (hereafter, "population") (i) would be employed with ESI from his or her employer (who does not offer health benefits to its part-time employees) (ii) lives in a household with income between 100 and 400 percent of the federal poverty line, (iii) could not obtain coverage through a spouse's employer during periods of non-employment, and (iv) would take up an exchange subsidy if it were available.[22] The majority of the population is represented in the "all others" panel because they are insured through an employer and have household income above 400 percent FPL, or because their household income is below the poverty line, or because they have ESI and would obtain coverage through a spousal employer during times when they were not full-time employed.[23]

Most of Table 4's entries are calculated from cross-tabulations of health insurance status, full-time status, and family income relative to the poverty line. The no-ACA tabulation is from the March 2011 CPS, with income items referring to the prior calendar year. The ACA tabulation is constructed from the no-ACA tabulation and assumed impacts of the ACA on (i) the fraction of employers offering ESI to their full-time employees, weighted by employment of persons in families between 100 and 400 percent of the federal poverty line (-10 percent impact) and (ii) the fraction of the population without insurance (the ACA is assumed to cut the fraction in half among would-be working non-elderly household heads and spouses).[24]

Take, for example, the 0.028 and 0.131 entries in Table 4's second row, which total 0.160 and represent full-time employed persons who would receive an exchange

[22] Recall that Table 4's entries are averages of values for the ACA and no-ACA. The 0.131 entry is the average of 0.125 (ACA) and 0.138 (no-ACA).

[23] The ACA does not subsidize coverage for people who are eligible for coverage through a spouse's employer even if that coverage is quite expensive. If subsequent legislation, or lax enforcement, fixes this so-called "family glitch" by subsidizing all non-employed adults in the eligible income range, then the ACA's impact on the overall marginal labor income tax rate would be even greater.

[24] The Congressional Budget Office (2013) estimates that the ACA will reduce the uninsured population by about half. Forecasts for the fraction of employees who lose ESI range widely; -10 percent (conditional on 100-400 percent FPL) is closer to zero than many, but not all, of the forecasts.

subsidy if they left employment. In 2011, 35.1% of non-elderly working household heads and spouses with earnings potential near the median were simultaneously working full-time, obtaining coverage through their employer, and in a family between 100 and 400 percent of the poverty line. With the ACA, that percentage may fall to 31.5. Multiplying the average of the two by the assumed exchange subsidy participation rate of 48 percent (see below) yields the combined fraction of 0.160 noted above.

The entries are color coded according to the program(s) applicable to the relevant subpopulation. Take the green color codes, for example. The aforementioned 0.131 entry (first row) represents all the persons who would jump onto the sliding income scale for exchange subsidies merely by switching to part-time work: 0.13 is therefore Table 1's entry for the "HI subsidies for persons with ESI at work" program on the "reduced hours" margin. For the employment margin, another 0.033 of the population can also jump onto the sliding scale, as indicated by the green-coded 0.028 and 0.005 entries in Table 1's second and third rows. The sum of all three of Table 4's green-coded employment entries is 0.16, which is entered in Table 1 for the "HI subsidies for persons with ESI at work" program.

Table 1's program weights for the individual mandate penalty (employment margin) are small because about 12 percent of the non-poor population is uninsured and about six percent are expected to be uninsured.[25] The program weights for "HI subsidies for persons w/o ESI at work" (that is, movements along the sliding income scale for the exchange subsidies) include the combination of persons who are already covered by non-group insurance and workers who are currently uninsured but will get subsidized NGI once the exchanges come on-line. Both of these groups are thought to be small, which is and by themselves would make a program weight of only 0.07. Thus, while the sliding scale for exchange subsidies may be the most recognized source of high ACA marginal tax rates, it is less common than: the employer penalties, the withholding of exchange

[25] For this purpose, "uninsured" does not include persons aged 25 or less and without dependents because I assume that they satisfy the individual mandate by participating in their parents' plan. The individual mandate program weight of 0.09 does not imply that the ACA would penalize 6 percent of household heads and spouses between the ages of 26 and 64 (about 7 million people) because many of them would be unemployed (indeed, that possibility is the reason why the individual mandate adds to the marginal tax rate). The Congressional Budget Office (2010) predicts that 3.9 million household heads and spouses will be penalized for lack of insurance among family members; my program weight is consistent with about that many penalty payers.

subsidies from persons working in ESI jobs, and perhaps even less common than the hardship relief attached to the individual mandate penalty.

As noted above, ESI workers also slide along the scale to the extent that they are not employed part of the year and satisfy the other eligibility criteria for the exchange subsidies, although, unlike non-ESI workers, the scale is only relevant for their months of non-employment. On the other hand, when an ESI worker slides along the family income scale, his spouse (if any) does too because family income is the combination of income from both spouses. I therefore include the ESI workers represented by the 0.16 entry in the fifth row of Table 1's middle panel, scale down by the average fraction of their year that they would be non-employed if they reduced their labor supply by 6 weeks (0.17: this is the $(1-n_i)$ term in equation (3)), scale down again by the fraction 0.43 of aggregate hours changes that can be attributed to changes in weeks worked (as opposed weekly work hours or the propensity to work any weeks during the calendar year), scale up by one plus the 0.33 fraction of the sample in a dual-earner couple, and add them to the 0.07 non-ESI workers noted above to get an overall sliding scale weight of 0.09 for the two employment margins in Table 1.[26] The formula is used to add to the hours margin weight, but the addition is less because some full-time ESI workers would continue to have ESI if they worked part time.

The participation rate for the exchange subsidies among persons leaving employer plans is an important determinant of the entries shown in Table 4's top panel, and by subtraction a determinant of the entries shown in Table 4's bottom panel. I assume a 48% participation rate. In making my estimate, I noted that law is currently written with Congressmen and their staffs required to get their health insurance on the exchanges and that the Administration plans a large advertising campaign for promoting the exchange plans and keeping them distinct from anti-poverty health programs like Medicaid. In this regard, the exchange plans look like a well-advertised version of the COBRA subsidy provided by the American Recovery and Reinvestment Act, which had about a 48% participation rate among persons laid off from ESI jobs (see Appendix IV). The 48% rate

[26] Each non-ESI dual couples is already counted twice (once for each spouse as a worker who would have been uninsured or covered by a non-group plan) in the 0.07 weight, unless one of the spouses is outside the age 26-64 age range, so it should not be scaled up by a dual-earner propensity.

could also be an underestimate of exchange subsidy participation because hospitals and other health providers will have an incentive to urge their patients to enroll in subsidized exchange plans, which will be more prevalent and more permanent than the COBRA subsidy was. I also note from the Oregon Medicaid Study that 60 percent of households that won by lottery (conditional on meeting an income requirement) a Medicaid participation opportunity filed an application to participate.[27]

Table 1's weights for the employer penalty program are greater than those for the HI subsidies for persons without ESI at work because any full-time employee creates a penalty at the margin if his employer does not offer ESI, even if that employee does not buy insurance from the exchanges or is ineligible for subsidies due to family income. Because I intend to estimate marginal tax rates for market-level analysis, I treat the employer penalty as $2,000 for any full-time employee hired by any firm not offering ESI to its full-time employees, implicitly ignoring the facts that (i) employers with less than 49 full-time equivalent employees will pay zero penalty at the margin and (ii) employers with exactly 49 employees will pay approximately $40,000 for an additional full-time employee. As a result, Table 1's weight for the employer penalty is 0.23, which is the sum of one entry from the last column of each of Table 4's four panels.

Another important determinant of the program weights is the fraction of employees whose employer does not offer ESI, even to its full-time employees. The CBO estimates 27 percent for 2008 (Congressional Budget Office 2007). Using Census Bureau data, Janicki (2013) estimates 29 percent in 2010. Using the Medical Expenditure Panel Survey (MEPS), Carroll and Miller (2011) estimate 13 percent in 2011. The simple average of these three is 23 percent, but I use 24 percent in order to put somewhat less weight on the outlying MEPS estimate.[28] With a few employers dropping ESI under the ACA, the 24 percent could become 28 percent.

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[27] The lottery population is poorer, less educated, etc., than the population represented in my Table 4's top panel, and for this reason the former group might be less likely to accept health insurance assistance than the latter group would be. Medicaid may also be more stigmatized and less well advertised than the exchange subsidies will be. On the other hand, the ACA's exchange subsidies require participants to spend some of their own money, whereas Medicaid participants pay little (if anything) to participate.

[28] The Congressional Budget Office (2007) uses a variety of sources, including the MEPS and the Census Bureau data. Therefore my weight on MEPS is a bit larger than CBO's, but still much less than 50 percent. Cutler and Sood (2010) only consider the MEPS, and thereby conclude that

When a full-year ESI worker considers the alternative of working, say, eleven months, the price of exchange coverage during that month would be set during the coverage year, and there would likely be good information about income for the calendar year, and thereby little need to reconcile a large premium tax credit at the end of the year. Conditional on exchange participation, part-year ESI workers already get a subsidy for that part of the year, and spending more weeks at work might result in an excess credit that has to be repaid (according to the means-tested repayment schedule) at the end of the year. Non-ESI workers are in a similar situation. Since both of these groups are counted in the 0.09 sliding-along the scale weight, the program weight for reconciling advance premium credits is 0.09 times an assumed 50 percent propensity to have actual income sufficiently exceed the amount that was used to estimate income at the time of enrollment.

As explained above, 3.3 percent of non-elderly working heads and spouses earning near the median on a weekly basis would cross into or out of the eligible income range by working three months less. 0.033 is therefore Table 1's participation weight for the "HI subsidies stop at the poverty line" program.

My estimates assume that roughly half of workers with earnings potential near the median are not directly affected by *any* of the ACA provisions noted above. Less than 10 percent of such workers will be uninsured while working and therefore liable for the individual mandate penalty while working. Less than 15 percent will have non-group insurance while working and some of those will not be eligible for subsidies because their household income will be outside the 100-400 percent FPL interval. About 54 percent of median earners will have ESI at work, but more than half of them will not take up the subsidy while not working or will be ineligible for exchange subsidies when not working because their household income will be outside the subsidized interval or because coverage during non-employment is available through the spouse's employer. The

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only 2 million employees work in large firms not offering health insurance, as compared to the CBO's estimate of more than 15 million. This reason alone makes my estimate of the participation weight for the employer penalty program 6 or 7 times greater than it would be under Cutler and Sood's (2010) approach. In addition, Cutler and Sood appear to ignore the extraordinary penalty levied on the 50th employee hired, and did not anticipate that the ACA's employer penalty would not be deductible from employer taxes.

remainder of workers with near median earnings potential will be covered by someone else's plan (e.g., spouse or parents), Medicare, or Medicaid.[29]

The weight for the ACA's implicit taxation of UI benefits is 0.06, which is the program weight for "HI subsidies for persons w/o ESI at work" times the fraction of the workforce who would, during times of unemployment, be UI eligible.[30] The program weight for the uncompensated care interaction term is the (magnitude of the) difference between the weight on the uninsured and the pre-ACA fraction of workers who were uninsured. Unlike several of the other program weights, the uncompensated care weight is not restricted to families between 100 and 400 percent of the poverty line.

Medicaid Expansions for the Poor

Medicaid is a longstanding health insurance program for the poor, and is essentially free for its participants. Income eligibility limits are set by states, and in 2012 averaged 84% of the poverty line for working parents and somewhat less for jobless parents.[31] Many states also impose asset limits, especially for adult participants. The ACA expands Medicaid participation in three ways: raising the income threshold for

[29] Another way to calculate the fraction with work incentives directly affected is to add (i) the fraction of workers with ESI and in a family with income in the 1-4 FPL range (adjusted for imperfect take-up, this is the fraction who would obtain an exchange subsidy as a consequence of leaving their job), (ii) the fraction of workers at firms not offering ESI even to full-time employees (they are affected because their employer pays a penalty, or faces a large marginal cost of expanding beyond 49 employees), (iii) the non-poor uninsured aged 26-64 who work at employers offering ESI to full-time employers (if they remain uninsured, they will be subject to the individual mandate penalty and its relief provisions). The three groups cited above do not overlap. Fraction (i) is roughly 0.25 or 0.30. Fraction (ii) is roughly 0.20 or 0.25, which means that the sum (i)-(iii) is close to or exceeding 0.5.

[30] In order to calculate the benefit index for the "HI subsidies for persons w/ ESI at work," I took the household incomes of workers as they were in 2010, without any reduction for the income that would be lost by working less and thereby somewhat underestimating the amount of the subsidy (recall that subsidies are enhanced by reducing household income). That excluded lost household income would be net of UI benefits, which is why, for consistency, my Table 1 must also exclude an UI offset for "HI subsidies for persons w/ ESI at work."

[31] The cross-state average weights thresholds from Henry J. Kaiser Family Foundation (2012) were weighted by 2010 state population. The average threshold for children aged 1-5 was 141 percent FPL.

adult eligibility (in some states), reducing barriers to participation, and eliminating some of the alternatives to Medicaid.

The ACA gives states the option, and funding if they exercise the option, of increasing the income threshold for adults to 133 percent of the poverty line, without an asset test. Holahan and Headen (2010) estimated that, if all states expanded, Medicaid participation would increase by 27.4 percent. Above I already examine ACA programs made available to persons above 100 percent of the poverty line (defined on a calendar year basis), so this section avoids double-counting by focusing on Medicaid expansions for the poor population. Also note that Medicaid income limits are not necessarily examined on a calendar year basis, and a family could be in poverty for part of a year even while they are above poverty for the calendar year.

Using the March 2011 CPS, I found that, among the non-elderly heads and spouses working some time during 2010 and part of the population examined by Holahan and Headen, 14 percent were both below the poverty line and living in a state where Medicaid will be expanded (or the state was creating a substitute health premium assistance program for that population).[32] I therefore assume that, by increasing the income threshold in some states, the ACA increases the eligibility index (recall equation (1)) for the Medicaid program by 4 percent (14 percent of 24.7 percent). Changes in the eligibility index are translated into expansion program participation weights for Table 1 by multiplying by the Medicaid program participation weight from Mulligan (2012).

In preparing their 24.7 percent estimate Holahan and Headen just looked at the relative size of the population with incomes below the new threshold and below the hold threshold. But the ACA also reduces barriers to participation among persons already eligible. When it works, healthcare.gov is supposed to quickly show people whether they are eligible for Medicaid and facilitate their enrollment. Healthcare.gov will not be asset-testing applicants, and states will be encouraged to waive asset tests too.

Another barrier, so to speak, to Medicaid participation has been the availability of low-premium private health insurance coverage that lower income families sometimes prefer to Medicaid. The ACA eliminates low-premium plans by requiring underwriters

[32] When Holahan and Headen wrote, states were required to expand Medicaid. Now it is optional.

to provide a wide range of benefits, leaving Medicaid as sometimes the next best option (Hopkins 2013). Unlike the private plan participation, Medicaid is income tested, so this transition subjects a part of the population to means test that they otherwise would not have experienced.

Sonier, Boudreaux and Blewett (2013) examine the Massachusetts health reform and estimated that it increased Medicaid participation by 36 percent among persons previously Medicaid eligible. However, they note that part of the 36 percent may be an increase in reported participation rather than actual participation. I also notice that the participation effect visible in their data seems to decline over time. Holahan and Headen (2010) look at the possibility of increased national Medicaid participation, holding eligibility constant, and guess that it could increase 12 percent as a consequence of the ACA. I take the 12 percent estimate and, to avoid double-counting persons above the poverty line, scale it by the incidence of poverty (define annually) among non-elderly heads and spouses working sometime during the calendar year and below 133 percent FPL. The combination of this "barriers" effect and the income-expansion effect noted above is a Table 1 Medicaid expansion program participation weight of 0.07.

Results for the Overall Index

The bottom panel of Table 1 accumulates the results of the top and middle panels. Its top row begins by, conditional on a margin for reducing labor supply, multiplying each program's benefit index by its program participation weight and then summing across programs. The combined effect of the ACA is to add about $204 per month in the assistance that people with median earnings potential get when they spend time not employed.

On average, the ACA adds $207 per month to the assistance, if any, they get when they move from full-time work to part-time work. In order to be comparable with the results for the other margins, the $207 has already been scaled (see also above) so that the change in labor supply on each of the three margins reflects the same impact on

aggregate hours.[33] The $207 is historically unusual because a number of pre-ACA safety net programs are designed to help primarily people without jobs whereas few (if any) are designed to primarily help people with jobs at reduced hours.[34] The employer shared responsibility penalty can be avoided either by non-employment or reduced hours, but the penalty is also unusual – and different from a flat-rate payroll tax – in that it can be avoided with a lesser percentage reduction in hours than in employment.

The final two rows of Table 1 report the results of aggregating across labor supply margins using the weights shown in the table reflecting the relative contribution of each margin to the reduction in aggregate work hours during the recession of 2008-9 (Mulligan 2012).[35] The ACA adds $204 per month to the overall statutory index.[36] This assistance is in addition to the cash flow assistance they already get from unemployment insurance, food stamps, tax policy, and a host of other safety net programs.

$204 per month is 4.8 percent of the total compensation of a person of median earnings potential who is working full-time. Thus, I conclude that the ACA adds 4.8 percentage points to the average marginal labor income tax rate in 2015. In 2014 and 2016, the percentage point additions (relative to the no-ACA baseline) are 3.6 and 4.9, respectively.

Table 4 shows that 58 percent of household heads and spouses who would be working without the ACA – the sum of the table entries without any color codes – are not eligible for, or would not participate in, any of the subsidies or penalties that are created

[33] E.g., reducing weekly hours by 20 (roughly half of full time) would be the same as reducing the probability of employment during a week by one half. Another example: a new flat-rate payroll tax would add the same dollar amount to the benefit index regardless of whether the labor margin was unemployment, OLF, or reduced hours.

[34] See also Mulligan (2012).

[35] The data used to measure the three labor supply weights can also be used to quantify the relative contributions to aggregate work hours changes of hours reductions by full-time employees that changed their status to part-time and hours reductions that did not change their status; this is the source of the 0.58 scaling factor used above to calculate benefit indices for the reduced hours margin.

[36] The $204 per month result is not sensitive to the labor supply margin weights because the margin specific totals have a pretty tight range: $202 to $209. The $204 also excludes the ACA's Additional Medicare Tax of 0.9 percent of earnings above a threshold (approximately $200,000 per year), beginning in 2013, because a median earner does not earn enough to be subject to this tax (U.S. Internal Revenue Service 2013b). Among all non-elderly heads and spouses, about one percent will pay the tax in 2014, which makes its contribution to average marginal tax rates about 0.01 percentage points: at least two orders of magnitude less than the rest of the ACA.

by the ACA, except perhaps the Medicaid expansions. Thus, about half of the household heads and spouses who would be working without the ACA have their marginal tax rate unchanged by the ACA and the remainder have their marginal tax rate increased by an average of 11 percentage points.

Taking into account both the benefit amounts and the participation weights, Figure 2 shows that the three largest components of the $204 per month disincentive are, in order: (a) the premium assistance that becomes available when a person transitions from ESI employment to non-employment (and is withheld when transitioning back), (b) the premium assistance that is enhanced when a worker with premium assistance works a lesser fraction of the year, and (c) the employer penalties.

Figure 3 displays the overall marginal tax rate for non-elderly household heads and spouses with near median earnings potential, including the safety net programs that pre-dated the ACA. The series through December 2011 is from Mulligan (2012). I updated that series through December 2016 by (i) adding the ACA components (3.6, 4.8, and 4.9 percentage points in 2014, 2015, and 2016, respectively), (ii) accounting for the reduction of the maximum duration of unemployment benefits through mid-2013, (iii) accounting for the erosion of real food stamp benefits by inflation through October 2013, (iv) accounting for the November 2013 expiration of the ARRA enhancement of food stamp benefit amounts and assuming that future farm bills and inflation adjustments will increase nominal benefits so that, on average, they are the same as in November 2013, (v) accounting for the December 2012 expiration of the payroll tax cut, and (vi) assuming that the work disincentives of mortgage modification erode at 3.5 percent per year after December 2011. In addition, I assume two alternative scenarios for the duration of UI benefits: (i) they remain unchanged after November 2013 and (ii) Emergency Unemployment Compensation (EUC) ends in December 2013 and benefit duration remains at 26 weeks thereafter.

The tax rate series in Figure 3 do not include sales taxes. If the series are to be used to examine labor supply by multiplying them by an inflation-adjusted wage rate, then the series should not be adjusted for sales tax hikes to the extent that sales tax hikes are part of the inflation adjustment. If instead the series are used to quantify labor market

distortions, sales tax hikes (of about 0.2 percentage points on Figure 3's scale, since 2007) need to be added.

The 2009-10 peak for marginal tax rates comes from various provisions of the "stimulus" law and the 99 week duration of unemployment benefits in several states. At the end of 2012, the marginal tax rate index reached its lowest value since 2008: less than 44 percent. One year later (January 2014), the solid index is close to 50 percent due to the combination of the full payroll tax and all of the provisions shown in Table 1, except for the employer penalties. The employer penalty adds more than a percentage point in 2015, while other ACA provisions strengthen their disincentives for the various reasons cited above.

By 2016, the solid index exceeds 50%, which is 10 percentage points greater than it was in early 2007. Over that time frame, the marginal after-tax share falls from 60 percent to 50 percent, which means that at a given marginal productivity of labor the reward to working fell 17 percent.

As of the time of writing, EUC is scheduled to expire at the end of 2013, but the solid series in Figure 3 assumes that Congress will extend the expiration date, as it has several times in the recent past. If EUC really does expire as currently scheduled, then the marginal tax rate series is the dashed series in Figure 3 and marginal tax rates in 2014 are hardly different than they were in 2013 because the EUC expiration offsets much of the marginal tax rate hike associated with the ACA's subsidies. Nevertheless, the employer penalty will add again to marginal tax rates in 2015 so that, by 2016, marginal tax rates exceed 47 percent: about a percentage point away from their 2009-10 peak.

As noted above, the resulting time series for my statutory benefit index (1) is necessarily a summary of a rich multidimensional distribution of labor market wedges created by taxes and subsidies. Although the same methodology can be used to examine the evolution of other parts of the wedge distribution (Mulligan 2013a), I follow Barro and Sahasakul (1983), Gruber and Wise (1999) and many others and begin the analysis with a scalar index summary of the distribution across persons and types of supply decisions.[37] Below I discuss the fraction of people experiencing something like the

[37] For the purposes of examining aggregate labor supply, one might be interested in the average log after-marginal-tax share rather than average marginal tax rate, but Table 2 demonstrates that

incentives represented by the summary index, and how incentives changes differ among the various margins of labor supply.

Conclusions

The possible labor market effects of the ACA's employer penalties have already attracted much discussion. But economists have long recognized that penalizing employees for working, or subsidizing people for not working, has essentially the same substitution effects on the quantity and productivity of labor as penalizing employers on the basis of their payrolls. The ACA's employer penalties by themselves are historically significant but nonetheless smaller than two of the law's other implicit tax provisions.

A number of the ACA's implicit taxes are linked in one way or another to its income-based healthcare payment schedules, which create several types of work disincentives for persons in households with income in or near the 100-400 percent FPL range. First, in order of aggregate importance, a household head or spouse is denied access to the payment schedule as long as he or she holds a job that offers health insurance, and likely granted access when not employed. Second, working fewer weeks per year or hours per week enhances the exchange subsidies for persons in a job not offering health insurance while purchasing insurance on the exchanges. Third, a household head or spouse can be granted access *as a consequence* of moving from full-time employment to part-time employment if that move results in a loss of opportunity for ESI. Another implicit tax comes from the hardship exemption for the penalties on uninsured individuals.

The ACA's implicit taxes will be experienced primarily by persons above the poverty line. Close to half of non-elderly household heads and spouses with weekly earnings near the median (and employed sometime during the calendar year) will have

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the average log share is minus infinity because a non-trivial fraction of the population will get no reward from increasing their labor supply. Even if marginal tax rates were never as high as 100 percent, the measured average log after-marginal-tax share could nonetheless be infinite because tax rate measurement errors sometimes put the micro-level measured rate over 100 percent. The 100 percent tax rate examples also raise the questions of whether workers have accurate estimates of their marginal tax rates and whether worker decisions are made in a group context, but even in these cases the evolution of the average marginal tax rate can be informative about aggregate behavior.

their marginal labor income tax rate hiked by the ACA. 42 percent of sometime-employed household heads and spouses generally (without regard for weekly earnings) will experience a rate hike, without including others with work incentives reduced by the Medicaid expansion.

Among the near-median heads and spouses with marginal tax rate hikes, the hike as of 2015 will average about 11 percentage points of total compensation, on top of all of the marginal tax rates that were present before the ACA. Their new tax wedge will, on average, be similar to doubling their employer and employee payroll taxes. As Table 3 illustrates, some middle-class workers will find that they can work substantially less without losing any disposable income. The average marginal tax rate hike among all sometime-employed non-elderly near-median household heads and spouses – including in the average those with no hike – is five percentage points.

Five percentage points is large by historical standards. While it lasted, the payroll tax cut of 2011 was one third of the magnitude of the ACA's tax rate hike.[38] Several SNAP (formerly food stamp program) expansions in combination were a quarter of the ACA's magnitude. In terms of its impact on average marginal tax rates, the ACA hike is almost double the effect of permanently increasing unemployment benefit payments to 99 weeks from a baseline of 26 weeks (Mulligan 2012).

Cutler (2011) argues that the ACA will increase employment because it will cut (or slow the growth of) employer health costs without commensurate reductions in the amount employees value their health benefits. He draws on the work of Baicker and Chandra (2006), who treat a specific type of health sector waste as a tax effect, thereby suggesting that cutting health sector waste could be included in my Table 1 that itemizes the ACA's incentive-related provisions. I am not sure about Cutler's approach, because unlike the tax effects in Table 1, reducing health sector waste is not a pure redistribution: health sector wastes are real resources that have an adverse wealth effect on labor supply. More important, Cutler's cost effect is trivial on the scale of Table 1, and could be in either direction.[39]

[38] As shown in Figure 3, the ACA hike comes a year or two after the hike associated with the expiration of the payroll tax cut.

[39] Other economists believe that the ACA will increase employer health costs without a commensurate increase in the value of health benefits to employees by, for example, requiring

The ACA has not been introduced into a tax-free economy, so its marginal tax rate hikes add to marginal tax rates already in effect. I estimate that, by 2015, the average marginal after-tax share among household heads and spouses with near-median weekly earnings will have fallen to 0.50 from 0.60 in 2007, largely from the ACA but also from other expansions in safety net programs. That is a massive 17 percent reduction in the reward to working – akin to erasing a decade of labor productivity growth without the wealth effect – that would be expected to significantly depress the amounts of labor and consumer spending in the economy even if the wage elasticity of labor supply were small (but not literally zero).[40] The large tax rate increases shown in Figure 3 are the primary reason why it is unlikely that labor market activity will return even near to its pre-recession levels as long as the ACA's work disincentives remain in place.

The labor market has much experience with (implicit and explicit) taxes on earnings and employment. A novel part of the ACA is that it taxes weekly work hours directly: that is, the new law requires employers to report the amount of time that employees work, and bases taxes and subsidies on that report. This new type of taxation should create new types of avoidance behaviors, and may also change society's willingness to use earnings and employment taxes.

By significantly taxing weekly work hours, it might seem that the ACA would encourage employers to hire in order to compensate for the shorter workweek of the average employee (Congressional Budget Office 2011, 8-9). However, Table 1 shows that the ACA encourages unemployment and labor force exits about as much as it encourages reduced hours, so it would be surprising if the indirect effect on employment through weekly hours would dominate the direct effects of ACA employment taxes. Table 1 does suggest that the reduction in aggregate hours to be created by the ACA will be more intensive in weekly hours and less unemployment intensive than was the recession of 2008-9 because the marginal tax rate hikes during the recession were

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employers to include medical benefits that they would have excluded without the ACA (Cannon 2009) (Kessler 2013). Mulligan (2013b) shows how even Cutler's estimate (the ACA reduces health premiums by 5 percent as of 2015) and approach imply that the cost channel is something like a 0.3-0.6 percentage point reduction in marginal labor income tax rates: health waste amounting to 5 percent of health expenses is 0.3-0.6 percent of the total reward to employment.

[40] If Emergency Unemployment Compensation expires on schedule, then the after-tax share falls from 0.60 to 0.53, which is a 12 percent reduction.

primarily taxing weeks worked per year rather than hours worked per week (Mulligan 2012). If the end of Emergency Unemployment Compensation, which is not part of the ACA, were coincident with the beginning of ACA subsidies in 2014, then the ACA's additions to implicit employment taxes may be largely offset by a subtraction via the unemployment insurance program, leaving the combined 2014 marginal tax rate hike primarily on weekly work hours rather than employment. If, in addition, the employer mandate were repealed, then combined employment taxes might never far exceed the taxes we have now.

This paper assumes that the employer penalty will not be further delayed, or eliminated. As shown by the difference between marginal tax rates for 2014 and 2015, the magnitude of the ACA's impact on marginal tax rates would be significantly less, but far from zero, in any year without employer penalties. Appendix V contains sensitivity analysis with respect to various other policy parameters and population estimates, showing that another important assumption is that families will (gross of out-of-pocket costs) value the benefits from a family health plan obtained on the exchanges at about $19,000 per year. The valuation assumption is also related to my assumption that 48 percent of persons leaving ESI jobs will actually purchase health plans from the exchanges. Altering the valuation assumptions puts the ACA's addition to the 2016 marginal tax rate in a range of 4.1 to 6.0 percentage points.

The Obama Administration and other advocates of the ACA have dismissed concerns that the law might be trading off labor market activity for more redistribution, citing the absence of a Massachusetts-specific labor market contraction when that state passed its law mandating health insurance coverage.[41] As Jonathan Gruber (2011, 27:02) put it, "we've actually run this experiment, folks: we ran it in Massachusetts." However, this argument assumes that the Massachusetts reform increased marginal tax rates in Massachusetts by roughly the same magnitude that the ACA will increase them in the United States. This assumption is no longer necessary, because the methodology used in this paper can be applied to Massachusetts as well. Table 5, reproduced from Mulligan (2013c) is the Massachusetts analogue to Table 1, referring to the effect of the

[41] Cutler (2013). See also the Department of Health and Human Services statement that "The experience in Massachusetts … suggest[s] that the health care law will improve the affordability and accessibility of health care without significantly affecting the labor market." (Contorno 2013)

Massachusetts reform on marginal tax rates in that state as of 2010. Not surprisingly, Massachusetts marginal tax rates were elevated by its health reform. However, the average increase in Massachusetts was only 0.3 percentage points, as compared to the ACA's 4.8 percentage point impact on nationwide marginal tax rates. The obvious conclusion from these data is to expect the ACA to depress labor markets by at least an order of magnitude more than the Massachusetts reform did.

Appendix I: ACA Marginal Tax Rate Components for 2014 and 2016

Table 6 reproduces Table 1 using the law's parameters for calendar year 2014. Table 7 shows the results for calendar year 2016.

Appendix II: Details about the Sliding Scale Exchange Subsidies

Table 8 displays the sliding scale parameters. Each row is a household income interval relative to the federal poverty line beginning at the income amount indicated in the first column. The second column shows the premium charge for a family with income at the bottom end of the interval, expressed as a percentage of household income.[42] The premium percentage increases smoothly within the interval and as it crosses the next income threshold, with the exceptions (noted in the last column) of: (a) the 1 – 1.33 interval where the percentage is constant at 2 percent and jumps discretely to 3 percent and (b) the 4+ interval where there is no premium cap (the premium jumps from 9.5 percent of income to the full premium).

Plan participants pay their designated premium and then receive benefits that are expected to be less than (typically 70 percent of) total medical expenses, with the remainder charged to plan participants as various out-of-pocket costs such as co-

[42] The premium charge is for the second-cheapest silver plan, which is expected to pay 70 percent of medical bills. Participants can choose a more expensive plan at their own expense, or choose a less expensive plan in order to reduce the premium they pay.

payments, coinsurance rates, etc. The third column of the table shows the "cost-sharing" discount families receive as a function of their household income. This discount is a step function of income, jumping from 80 to 57 percent at 1.5 FPL, to 10 percent at 2 FPL, and then to zero at 2.5 FPL. For example, someone at 1.4 FPL on a silver plan can expect (in the actuarial sense) to have their premiums cover 70 percent of medical expenses. Of the remaining 30 percent, 6 percentage points would be paid by the participant and the remaining 24 percentage points paid by taxpayers in the form of a cost-sharing subsidy for the plan participant.

Over the income range 1-4 FPL, Table 8 alone has all of the parameters needed to graph household income versus premium (both expressed as a ratio to FPL). The slope of this graph is the rate at which the premium subsidy is phased out with household income, and is less than 100 percent except at the jumps at 1.33 and 4 FPL. Note that Table 1 does not indicate the absolute amount of the premium subsidy, because the absolute amount is the difference between the full cost of the second cheapest silver plan and the premium cap and the plan full cost will vary by year, family size and composition, and state and is not yet known at the time of writing this paper.

Solely for the purpose of preparing Figure 1, I calculated a dollar range of participant cost-sharing by assuming that plans' EMPs (full premium plus full out-of-pocket costs) ranges from $7,000 to $19,000 per year and using the discount percentages noted in Table 8.[43] In order to get a FPL range for the cost-sharing amount, I assumed that the $7,000 EMP applied to a family of one and the $19,000 EMP applied to a family of three.[44] These participant cost-sharing amounts (one for each end of the $9,000 - $19,000 EMP range) are added to the premiums implied by Table 8 and shown in Figure 1 in the main text of the paper.

The means-tested discounts noted above are delivered to health insurers before the end of the coverage year but at the same time are based on the insured's income that cannot be fully documented before the year end. In principle, calendar year income

[43] The quantitative results in the rest of the paper do not depend on the numerical results presented in Figure 1.

[44] For the purposes of putting an upper bound on participant cost sharing, my assumption does not rule out the possibility that families of four or more would have an EMP of $20,000, because their EMP is less in FPL units than a family of three with a $20,000 EMP because the dollar amount of the FPL increases with family size.

would be accurately estimated when enrolling in coverage, and end-of-year documentation would just be a formality. In this case, Figure 1's income (horizontal axis) and payments (vertical axis) would be measured in the same year.

In practice, the means-tested discounts a family receives during the calendar year (hereafter, "coverage year" t) will often derive from the income they reported on historical tax returns (usually the return from the second year prior, t - 2). Its cost-sharing subsidies are never reconciled, which means that cost-sharing rules create disincentives for earning in t – 2, or during whatever other accounting period that is examined at the time of enrolling for year t coverage. The advance premium credits will be reconciled with its actual income at the conclusion of the coverage year.[45] In order to understand how reconciliation itself adds to marginal tax rates, assume that advance premiums for year t are set based on year t – 2 tax returns. Let $F(y)$ denote the premium credit schedule (the middle column of Table 8) and $G(x,y)$ be the repayment schedule, where y denotes income and x the excess credit. The total premium credit S_t for calendar year t is, ignoring interest between the calendar year and the time of tax filing:

$$S_t = F(y_{t-2}) - G\left(F(y_{t-2}) - F(y_t), y_t\right) \tag{7}$$

The ACA places a cap on the repayments of excess credits, which means that the advanced credits are repaid in full (algebraically, $G(x,y) = x$) if and only if the full excess $F(y_{t-2})$ - $F(y_t)$ is less than the cap, which depends on y_t.[46]

Figure 4's solid step functions – one for individuals and another for families of three – display the actual reconciliation caps as a function of y_t, expressed as a ratio to the federal poverty line. The step functions have "notches" or "cliffs" in which marginal tax rates are infinite over an infinitesimal income interval, but (as I did with the sliding scales shown in Figure 1) I abstract from the notches and cliffs by approximating the step functions with dashed linear schedules whose slopes are equal to the weighted-average

[45] Households have the option of forgoing advance credits and receiving their entire premium credit at the end of the year. For the reasons explained below, advanced premium credits will eventually be understood to be more valuable than end-of-year credits because only the former creates an opportunity for an excess credit.

[46] Aside from the unlimited cap for families above 400 percent FPL, the caps are six dollar amounts according to three income/FPL intervals ((0,2), (2,3), and (3,4)) crossed with two family types (individual and family) (U.S. Government Printing Office, 77 FR 30394).

slope of the corresponding step function with the weights determined by the width of the income interval over which the slope applies. The weighted-average slopes are 4.1 percent and 4.9 percent for individuals and families of three, respectively, which I summarize as a 4.5 percent slope.

Notice from equation (7) that the year t subsidies potentially create disincentives to report income in both years $t - 2$ and t. To examine this more precisely, consider smooth approximations to F and G so that their derivatives are finite and add the derivatives of (7) with respect to y_t and y_{t-2}:

$$\frac{\delta S_t}{\delta y_{t-2}} + \frac{\delta S_t}{\delta y_t} = F'(y_{t-2}) + G_x\left(F(y_{t-2}) - F(y_t), y_t\right)\left[F'(y_t) - F'(y_{t-2})\right] - G_y\left(F(y_{t-2}) - F(y_t), y_t\right) \quad (8)$$

The top line of equation (8) is a weighted average of $F'(y_{t-2})$ and $F'(y_t)$, which means that G_y is an extra disincentive to the extent that it differs from zero. For households above 400 percent of the poverty line, households with $y_t < y_{t-2}$, and households with $F(y_{t-2}) - F(y_t)$ less than the cap (that is, their income rose less than 5 percent or so between $t - 2$ and t), G_y is zero because their premium credits are fully reconciled.[47] For the rest, G_y is approximately the slope shown in Figure 4: 4.5 percent.

I assume that half of tax units receiving premium assistance for the entire calendar year have an income for that year that ultimately exceeds their two-years-ago income by 5 percent or more, which makes the program weight for "Reconcile advance premium credits" 0.04: half of the program weight for "HI subsidies for persons w/o ESI at work."

Year-round ESI workers who consider, by working less, jumping onto the income scale for exchange subsidies must also consider that they would face the means-tested reconciliation caps at the end of the calendar year. However, I do not include them in the program weight for "Reconcile advance premium credits" because (a) they would be enrolling in an exchange plan during the calendar year when their income might be more

[47] A tax unit whose annual income increased from $50,000 to $52,500 between years $t - 2$ and t would have an excess credit of about $600 (recall that the typical slope in Figure 1 is about 24%), which is at or above the reconciliation cap for any family less than 400 percent FPL.

accurately estimated (e.g., from an unemployment benefit pay stub) and (b) their income might, by spending part of the year out of work, be less than it was two years prior.

Appendix III: Health Insurance Values

The Congressional Budget Office (2010) estimated that 2016 bronze plan annual premiums would be about $12,250 ($4,750) for family (single) coverage, respectively. By definition, bronze plan premiums cover 60% of expected medical expenses, which would be $20,417 ($7,917).

For my purposes, I need to know how people value the insurance they get, rather than the actuarial cost. These two are related because people demand insurance from their employers, and ultimately receive less cash by the amount of the actuarial value: in effect employees are spending their own cash on the ESI. However, it is conceivable that cost of administration, bureaucracy, and other loadings mean that exchange plans will need to have greater expenses in order to deliver the same benefits as ESI. In this case, the actuarial value of ESI may be a better measure of the value of exchange plans to their participants.

The Kaiser Foundation's survey of employer plans for 2012 found that average annual premiums were $15,745 ($5,615) for family (single) coverage, respectively (Claxton, et al. 2012, Exhibit 1.1). Employer plans tend to have premiums equal to about 83% of participant costs, with the other 17% covered by various forms of out-of-pocket payments (Gabel, et al. 2012). Thus, the Kaiser results suggest that annual medical payments (premiums plus out-of-pocket expenses) averaged about $18,970 ($6,765) for family (single) coverage by employer plans, respectively, in 2012. With 4 percent annual cost growth (the rate of growth measured between the 2011 and 2012 Kaiser surveys), these amounts may be $20,518 ($7,317) by 2014, respectively, and $22,192 ($7,914) by 2016.

Based on these various estimates, my benchmark calculations use a conservative $19,000 ($7,000) expected medical payments for family (single) coverage, respectively, in 2014. Employee plus one coverage value is taken as the average of the two.

As a sensitivity analysis, I assigned an expected medical payment value to each household member on the basis of his or her age and household composition, based on the Kaiser Foundation's silver plan premium calculator (hereafter, "KFF calculator") for calendar year 2014, and then summed across household members. I convert silver plan premiums to expected medical payments (EMP) by dividing by 0.7. Each non-elderly household head or spouse in the CPS is assigned the EMP associated with his or her age. For the purpose of calculating the household sum associated with a married head or spouse, the other spouse is assumed to be of the same age. Per the KFF calculator, children under 18 are each assigned an EMP of $2,737 (2014 dollars), except that the total EMP for a household's children under 18 is capped at $8,211. Adults other than the head or spouse, as well as heads or spouses less than age 21, are assigned the EMP for a 21-year-old, regardless of their actual age. As shown in Appendix V, the KFF calculator delivers a slightly larger marginal tax rate.

Appendix IV: Using the ARRA's COBRA Subsidy to Forecast Participation in the ACA's Premium Assistance

Since the 1980s, federal and state laws give employees leaving ESI jobs the option of continuing their health coverage for up to 18 months (United States Department of Labor 2013). Family ESI coverage can also be continued. The former employees reimburse their former employer for the full cost of the coverage with after-tax dollars, plus a small administration fee. The continuation coverage is usually referred to as "COBRA coverage;" COBRA is the acronym for one of the statutes regulating such coverage.

Under the March 2009 American Recovery and Reinvestment Act (hereafter ARRA), 65 percent of the employee cost of COBRA coverage was paid by the federal government to the former employer on behalf of the former employee if the former employee was involuntarily terminated after September 1, 2008 and was not eligible for another group health plan or for Medicare. Subsidy recipients were required to pay 35 percent of the coverage. Upon filing for personal taxes for the year in which the subsidy

was received, the subsidy was clawed back for filers with AGI exceeded $125,000 ($250,000 married filing jointly).

The ARRA subsidy has a lot in common with the exchange subsidies created by the ACA. Both subsidies become available to an ESI employee only when he leaves the payroll, and then only if they have no other group plan option such as spousal coverage. The ARRA subsidy was more restrictive in that it excluded voluntary terminations such as quits or retirements, and did not subsidize out-of-pocket health expenses. Both subsidies were paid directly to the insurer (the employer in the case of ESI and an insurance company in the case of the exchange subsidy).[48] In both cases, the subsidized household was paying some of the health insurance premiums with their own after-tax dollars. Both programs could have imperfect take-up among the unemployed because, among other things, people might be unaware of the program, or might choose to forego health insurance. Under the ACA, however, former ESI employees will have to change health plans – leave their former employer plan and join an exchange plan – in order to obtain the subsidy.[49] The ARRA COBRA subsidy was enacted as a temporary subsidy, and was in fact terminated after less than two years. The ACA subsidies were enacted permanently, although of course a future Congress could modify or terminate them.

In order to estimate the fraction of ESI job terminations among non-elderly household heads and spouses in families satisfying the ACA's income criteria that will result in exchange subsidies, including the fact that some eligible families will elect not to participate, I estimate the fraction of non-elderly ESI employees involuntarily terminated during 2009 who received COBRA subsidies as household head or spouse. To measure the numerator, I have the U.S. Treasury's report that 1.05 million households received the COBRA subsidy during the fourth quarter of 2009, although they noted that they would receive additional 2009 subsidy claims after their report went to press.

Ideally the denominator would be the number of non-elderly household heads and spouses who were involuntarily terminated from ESI jobs after September 1, 2008 and

[48] The former employers received the ARRA subsidy by taking a credit on their payroll tax deposits.

[49] Given that members of Congress and their staffs also have to obtain health coverage in the ACA exchanges, it is possible that the exchange plans will be perceived by consumers to be good quality plans. Moreover, employer plans are converging with exchange plans, for example, as a number of employers are enrolling employees via "private insurance exchanges."

were still unemployed as of the fourth quarter of 2009, which is approximately a 12 month window of terminations. I use the March 2010 CPS to make an approximation to the denominator to a slightly different window of terminations: calendar year 2009.

Using the non-elderly household heads and spouses employed at the time of the March 2010 CPS interview and working at least one week in 2009, I estimate the probability of having ESI at the time of the interview as a linear function of a cubic in age, and a full set of interactions between gender, marital status, presence of children, and (most important) full-time work status in 2009. I project the probability to the unemployed in the sample who had worked at least one week in 2009 and were unemployed at least one week in 2009, and predict that 58 percent of those 3.8 million would be in ESI jobs if they were working.

Mulligan (2012) estimated that 68 percent of non-elderly household heads and spouses receive UI during at least part of their unemployment spell. Because unemployment benefits (hereafter, UI) also have involuntary termination as an eligibility criterion, I also use the 68 percent as an estimate of the fraction of unemployed household heads and spouses who were terminated involuntarily.

Finally, some of those unemployed at the end of 2009 returned to work or left the labor force before the March CPS interview. I therefore rescale by a factor of 1.44, which is the ratio of the number of non-elderly household heads and spouses in December 2009 unemployed 1-49 weeks to the number of non-elderly household heads and spouses in March 2010 unemployed 14-62 weeks.

Assuming that UI eligibility and ESI eligibility are uncorrelated, the denominator of my subsidy incidence rate estimate would be 2.18 million = 1.44*0.68*0.58*3.8 million. The corresponding subsidy incidence rate estimate is 48 percent.

The ACA is said to have a "family glitch": the unemployed (among others) are obligated to obtain coverage from their spouse's employer (regardless of the cost of that coverage) rather than obtaining subsidized coverage on the ACA's exchanges. The ARRA's COBRA subsidy had the same glitch because persons with available spousal coverage (among others) were ineligible for the subsidy. As an estimate of the propensity to get ACA subsidies upon termination of ESI employment, my 48 percent estimate therefore accounts for the family glitch, at least if the spousal coverage

obligation will be enforced under the ACA in the same way it was enforced (or not) under the ARRA. The fact that the ACA spousal coverage provision has been described as a glitch suggests that it may not be fully enforced or may be modified with new legislation. I expect the incidence of ACA subsidies among married persons leaving ESI jobs to be greater the less that the spousal coverage provision is enforced.

Also note that the demand for health insurance among household heads and spouses leaving ESI jobs is significant, even when they have to pay full price for that coverage. Using the same approach as above, I estimate that 59 and 56 percent of the non-elderly unemployed household heads and spouses in the March 2009 and March 2011 CPS, respectively, working at least one week in the prior calendar year would have ESI when working. 34 and 29 percent of them (including those who did not leave ESI jobs), respectively, had coverage from a former employer at the time of the interview – while they were unemployed. In other words, more than half of non-elderly unemployed household heads of spouses retain employer coverage when they transition from employment to unemployment, even when they pay the full cost of that coverage with after-tax dollars.

The COBRA experiences suggest that more than half of household heads and spouses leaving ESI jobs under the ACA, and living in households between 100 and 400 percent of the poverty line, would buy subsidized coverage on the exchanges, at least if they viewed the coverage to be as valuable as their former employer coverage. On the other hand, exchange coverage will not be identical to employer coverage. I therefore take 48 percent as my benchmark value for the incidence of exchange coverage among household heads and spouses leaving ESI employment, and living in households between 100 and 400 percent of the poverty line. My sensitivity analysis considers alternative values of 30 percent and 70 percent.

Appendix V: Sensitivity Analysis

Table 9 shows how the 2014-16 results change with changes in various assumptions about group sizes and policy parameters. The entries are ACA impacts on work disincentives, expressed as a percentage of compensation of the median worker

(defined in the main text). The top row is the benchmark specification: namely, the bottom line from each of Tables 6, 1, and 7, respectively. The next rows show the results from subtracting or adding one percentage point to the assumed 1.6%/year growth of health care costs. Worker valuation of participation in exchange health plans is explored in the next three rows. After that, results are shown from assuming 30 percent or 70 percent participation in exchange subsidies among persons leaving ESI employment, rather than the benchmark assumption of 48 percent participation.

The next four rows show results of alternative assumptions about the effect of the ACA on insurance status. The row labeled "50% take-up of hardship exemption" shows the result of assuming that only half of those leaving ESI to be uninsured and unemployed are eligible for a hardship exemption from the individual mandate. The final two rows of the table show the results of putting alternative weights on each of the three labor supply margins.

Table 1: ACA and Related Components of the Statutory Marginal Tax Rate Index
Calendar year 2015, average among household heads and spouses with median earnings potential

Benefit Index Amounts (constant 2014 dollars per month): benefits accruing as a consequence of working less.

	Margins for Reducing Labor Supply			
Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	192	192	220	starts at 192 in 2015,then grows at wages +1.6%/yr
Individual mandate relief	103	0	0	grows with inflation after 2016
HI subsidies for persons w/o ESI at work	832	832	832	
Reconcile advance premium credits	154	154	154	
HI subsidies for persons w/ ESI at work	508	508	582	grows 1.6%/year more than wages
HI subsidies stop at the poverty line	-212	-212	-212	
Medicaid expansions for the poor	198	198	198	grows 1.6%/year more than wages
Implicit taxation of unemployment benefits	-301	0	0	grows with wages
Move off implicit uncompensated care tax	-201	-201	-201	grows with wages

Program Participation Weights (fractions)

Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	0.23	0.23	0.23	
Individual mandate relief	0.09	0	0	
HI subsidies for persons w/o ESI at work	0.09	0.09	0.09	
Reconcile advance premium credits	0.04	0.04	0.04	all program participation
HI subsidies for persons w/ ESI at work	0.16	0.16	0.13	weights are constant by
HI subsidies stop at the poverty line	0.03	0.03	0.03	definition
Medicaid expansions for the poor	0.07	0.07	0.07	
Implicit taxation of unemployment benefits	0.06	0	0	
Move off implicit uncompensated care tax	0.03	0.03	0.03	
Statutory index, all ACA programs	**202**	**209**	**207**	
LFS weights	0.583	0.089	0.328	
Statutory index, all ACA programs	**$204/month**			
& all supply margins	**= 4.8% of employer cost**			

Table 2. Long-duration Employment Decisions Crossing Eligibility Thresholds
Among non-elderly household heads and spouses, calendar year 2014

	Duration of work decision in months							
Working with ESI	1	2	3	4	5	6	9	12
lower threshold crossed								
percentage of workers affected	0.0%	0.2%	0.3%	0.6%	0.9%	1.3%	4.5%	6.5%
forgone ACA subsidy value, per worker	-8,394	-2,183	-1,708	-1,253	-1,095	-920	-323	-229
forgone ACA subsidy value, Table 1 extrapolated	1,641	2,945	4,351	5,665	6,794	7,567	6,821	8,690
upper threshold crossed								
percentage of workers affected	0.9%	1.6%	2.1%	2.7%	3.2%	3.7%	5.0%	5.7%
forgone ACA subsidy value, per worker	216	543	907	1,318	1,750	2,207	3,788	5,711
forgone ACA subsidy value, Table 1 extrapolated	0	0	0	0	0	0	0	0
Working without ESI								
lower threshold crossed								
percentage of workers affected	0.0%	0.1%	0.3%	0.4%	0.7%	0.9%	2.4%	3.3%
forgone ACA subsidy value, per worker	-15,897	-14,911	-13,269	-13,692	-12,882	-12,781	-10,240	-10,120
forgone ACA subsidy value, Table 1 extrapolated	712	1,424	2,136	2,848	3,560	4,272	6,408	8,544
upper threshold crossed								
percentage of workers affected	0.2%	0.5%	0.7%	0.8%	0.9%	1.0%	1.2%	1.2%
forgone ACA subsidy value, per worker	3,461	3,107	3,121	3,336	3,609	3,816	4,533	5,065
forgone ACA subsidy value, Table 1 extrapolated	0	0	0	0	0	0	0	0
Both groups combined								
Threshold crossers as share of all workers	1.2%	2.3%	3.3%	4.6%	5.8%	6.9%	13.2%	16.8%
forgone ACA subsidy value, per worker	227	-23	-39	-123	-184	-151	-113	214
forgone ACA subsidy value, Table 1 extrapolated	42	293	597	1,055	1,503	1,989	3,498	5,063
Compensation at stake	4,225	8,451	12,676	16,902	21,127	25,352	38,029	50,705
ACA impact on the overall MTR, percentage points								
with threshold crossings	3.9	3.7	3.6	3.5	3.3	3.2	2.6	2.2
without threshold crossings (rest of Table 1)	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
threshold crossing contribution	0.1	-0.1	-0.2	-0.3	-0.5	-0.6	-1.3	-1.6

Table 3. The ACA's Implicit Tax on Full-time Work: An Example

beginning in 2014, for employers offering health insurance to full-time employees.
All dollar amounts are annualized unless noted otherwise.
Subsidies are calculated for a family of four with one earner.

	full-time position	part-time position	
Health insurance source	ESI	ACA exchange	
Employee costs			
weekly hours worked	40	29	(1)
weekly work expense	$ 100	$ 75	(2)
Employer costs			
hourly basis	26	26	(3)
annual	52,000	37,700	(4) = 50*(3)*(1)
employer payroll taxes	2,679	2,679	(5) = 50*[(4)-(6)-(7)]*0.0765/1.0765
Health insurance premiums			
employer	11,154	0	(6) = 78% of total premium (ESI only)
employee, excluded from tax base	3,146	0	(7) = 22% of total premium (ESI only)
employee, included in tax base	0	1,304	(8) = 3.7% of (12)
ACA	0	10,806	(9) = 70% of total health expenses - (8)
out-of-pocket health expenses			
employee	3,000	1,038	(10) = 17% (6%) of total ESI (exch.) expenses
ACA	0	4,152	(11) = (3/7)*[(8)+(9)]-(10)
Employee income subject to tax			
total	35,021	35,021	(12) = (4) - (5) - (6) - (7)
ratio to FPL	1.45	1.45	(13) = (12)/24100
after health & work expenses, annual	27,021	28,929	(14) = (12) - (8) - (10) - 50*(2)

Notes: Both types of employees work 50 weeks per year. The ACA exchange plan is assumed to be a silver plan (70% actuarial value).

Table 4. Building Blocks of the Program Participation Weights

The table entries are averages of ACA and no-ACA values.

			Type of Employer		
		HI offer to FT?	yes	yes	no
		HI offer to PT?	yes	no	no
HI holder	FPL interval	Supply margin			
own	1-4	FT-PT	0.028	0.131	0.056
		FT-not employed	0.028	0.131	0.056
		PT-not employed	0.005	0.011	0.002
family NGI	1-4	FT-PT	0.000	0.000	0.002
		FT-not employed	0.000	0.000	0.002
		PT-not employed	0.000	0.002	0.000
none	1+	FT-PT	0.000	0.000	0.078
		FT-not employed	0.000	0.000	0.078
		PT-not employed	0.000	0.012	0.002
all others		FT-PT	0.089	0.415	0.095
		FT-not employed	0.089	0.415	0.095
		PT-not employed	0.008	0.039	0.023
sum of weights		reduced hours	0.117	0.547	0.231
		not employed	0.130	0.611	0.259

Count as both "slide down" and "jump onto": 0.012

Legend for ACA-related labor wedges

- slide down scale for exchange payments
- jump onto scale for exchange payments
- hardship relief from individual mandate
- turn off employer penality
- none

Abbreviations: HI=health insurance, FPL=federal poverty line, FT=full time, PT=part time, NGI=non-group insurance

Table 5: Romneycare and Related Components of the Statutory Marginal Tax Rate Index
Calendar year 2010, average among MA household heads and spouses with median earnings potential

Benefit Index Amounts (constant 2014 dollars per month)

	Margins for Reducing Labor Supply		
Program	Unemployed	OLF	Reduced hours
Employer shared responsibility penalty	25	25	25
Individual mandate relief: sliding scale	147	147	147
Individual mandate relief: hardship exemptio	95	0	0
HI subsidies for persons w/o ESI at work	400	400	400
HI subsidies for persons w/ ESI at work	0	262	301
Medicaid/CHIP expansion for children	389	389	389
Implicit taxation of unemployment benefits	-155	0	0
Move off implicit uncompensated care tax	-233	-233	-233

Program Participation Weights (fractions)

Program	Unemployed	OLF	Reduced hours
Employer shared responsibility penalty	0.17	0.17	0.17
Individual mandate relief: sliding scale	0.03	0.03	0.03
Individual mandate relief: hardship exemptio	0.02	0	0
HI subsidies for persons w/o ESI at work	0.03	0.03	0.03
HI subsidies for persons w/ ESI at work	0	0.02	0.01
Medicaid/CHIP expansion for children	0.01	0.01	0.01
Implicit taxation of unemployment benefits	0.02	0	0
Move off implicit uncompensated care tax	0.03	0.03	0.03

Statutory index, all Romneycare programs	**14**	**20**	**19**
LFS weights	0.583	0.089	0.328
Statutory index, all Romneycare programs & all LFS	**$16/month = 0.3% of employer cost**		

Table 6: ACA and Related Components of the Statutory Marginal Tax Rate Index
Calendar year 2014, average among household heads and spouses with median earnings potential

Benefit Index Amounts (constant 2014 dollars per month): benefits accruing as a consequence of working less.

	Margins for Reducing Labor Supply			
Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	0	0	0	starts at 192 in 2015,then grows at wages +1.6%/yr
Individual mandate relief	51	0	0	grows with inflation after 2016
HI subsidies for persons w/o ESI at work	832	832	832	
Reconcile advance premium credits	154	154	154	
HI subsidies for persons w/ ESI at work	500	500	573	grows 1.6%/year more than wages
HI subsidies stop at the poverty line	-212	-212	-212	
Medicaid expansions for the poor	195	195	195	grows 1.6%/year more than wages
Implicit taxation of unemployment benefits	-301	0	0	grows with wages
Move off implicit uncompensated care tax	-201	-201	-201	grows with wages

Program Participation Weights (fractions)

Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	0.23	0.23	0.23	
Individual mandate relief	0.09	0	0	
HI subsidies for persons w/o ESI at work	0.09	0.09	0.09	
Reconcile advance premium credits	0.04	0.04	0.04	all program participation
HI subsidies for persons w/ ESI at work	0.16	0.16	0.13	weights are constant by
HI subsidies stop at the poverty line	0.03	0.03	0.03	definition
Medicaid expansions for the poor	0.07	0.07	0.07	
Implicit taxation of unemployment benefits	0.06	0	0	
Move off implicit uncompensated care tax	0.03	0.03	0.03	
Statutory index, all ACA programs	**152**	**163**	**155**	
LFS weights	0.583	0.089	0.328	
Statutory index, all ACA programs & all supply margins	**$154/month = 3.6% of employer cost**			

Table 7: ACA and Related Components of the Statutory Marginal Tax Rate Index
Calendar year 2016, average among household heads and spouses with median earnings potential

Benefit Index Amounts (constant 2014 dollars per month): benefits accruing as a consequence of working less.

	Margins for Reducing Labor Supply			
Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	195	195	223	starts at 192 in 2015,then grows at wages +1.6%/yr
Individual mandate relief	128	0	0	grows with inflation after 2016
HI subsidies for persons w/o ESI at work	832	832	832	
Reconcile advance premium credits	154	154	154	
HI subsidies for persons w/ ESI at work	516	516	592	grows 1.6%/year more than wages
HI subsidies stop at the poverty line	-212	-212	-212	
Medicaid expansions for the poor	201	201	201	grows 1.6%/year more than wages
Implicit taxation of unemployment benefits	-301	0	0	grows with wages
Move off implicit uncompensated care tax	-201	-201	-201	grows with wages

Program Participation Weights (fractions)

Program	Unemployed	OLF	Reduced hours	growth rate after 2014
Employer shared responsibility penalty	0.23	0.23	0.23	
Individual mandate relief	0.09	0	0	
HI subsidies for persons w/o ESI at work	0.09	0.09	0.09	
Reconcile advance premium credits	0.04	0.04	0.04	all program participation
HI subsidies for persons w/ ESI at work	0.16	0.16	0.13	weights are constant by
HI subsidies stop at the poverty line	0.03	0.03	0.03	definition
Medicaid expansions for the poor	0.07	0.07	0.07	
Implicit taxation of unemployment benefits	0.06	0	0	
Move off implicit uncompensated care tax	0.03	0.03	0.03	
Statutory index, all ACA programs	**207**	**211**	**209**	
LFS weights	0.583	0.089	0.328	
Statutory index, all ACA programs	**$208/month**			
& all supply margins	**= 4.9% of employer cost**			

Table 8. Sliding Scale Exchange Subsidies
as a function of household income for the calendar year

Income as a ratio to FPL	Percentage of income owed as premium	Discount on out-of-pocket cost (jumps when crossing thresholds)	Notes on interval
1	2%	80%	premium percentage is constant on this interval, jumping at 1.33
1.33	3%	80%	
1.5	4%	57%	
2	6.3%	10%	
2.5	8.05%	0%	
3	9.5%	0%	premium percentage is constant on this interval
4	9.5%	0%	
4+	full premium	0%	premium jumps here because the premium cap is eliminated

Notes: (a) the first column indicates the bottom threshold of the income interval
(b) income percentages change continuously between thresholds unless otherwise noted.
(c) FPL = federal poverty line.

Table 9. Sensitivity Analysis

	Marginal Tax Rate Impact, percentage points		
	2014	2015	2016
Benchmark	3.6	4.8	4.9
Health care cost growth, annual rate			
-1 pct point	3.6	4.8	4.9
+1 pct point	3.6	4.9	5.0
Health plan values			
-10 pct	3.1	4.3	4.4
KFF calculator	3.7	4.9	5.0
+10 pct	4.1	5.3	5.4
Exchange participation when leaving ESI jobs			
30 pct	2.8	4.0	4.1
70 pct	4.6	5.9	6.0
Percentage of uninsured getting coverage			
-15 pct points	3.5	4.8	4.8
+15 pct points	3.7	4.9	5.0
Percentage of ESI moving to exchanges			
none	3.4	4.6	4.7
+10 pct points	3.9	5.1	5.2
50% take-up of hardship exemption	3.6	4.8	4.8
Labor force weights			
Move 10 pct points from UE to OLF	3.7	4.9	4.9
Move 10 pct points from UE to underemployment	3.6	4.8	4.9

Figure 1. 2014 Health Payments as a Function of Household Income and Policy Type

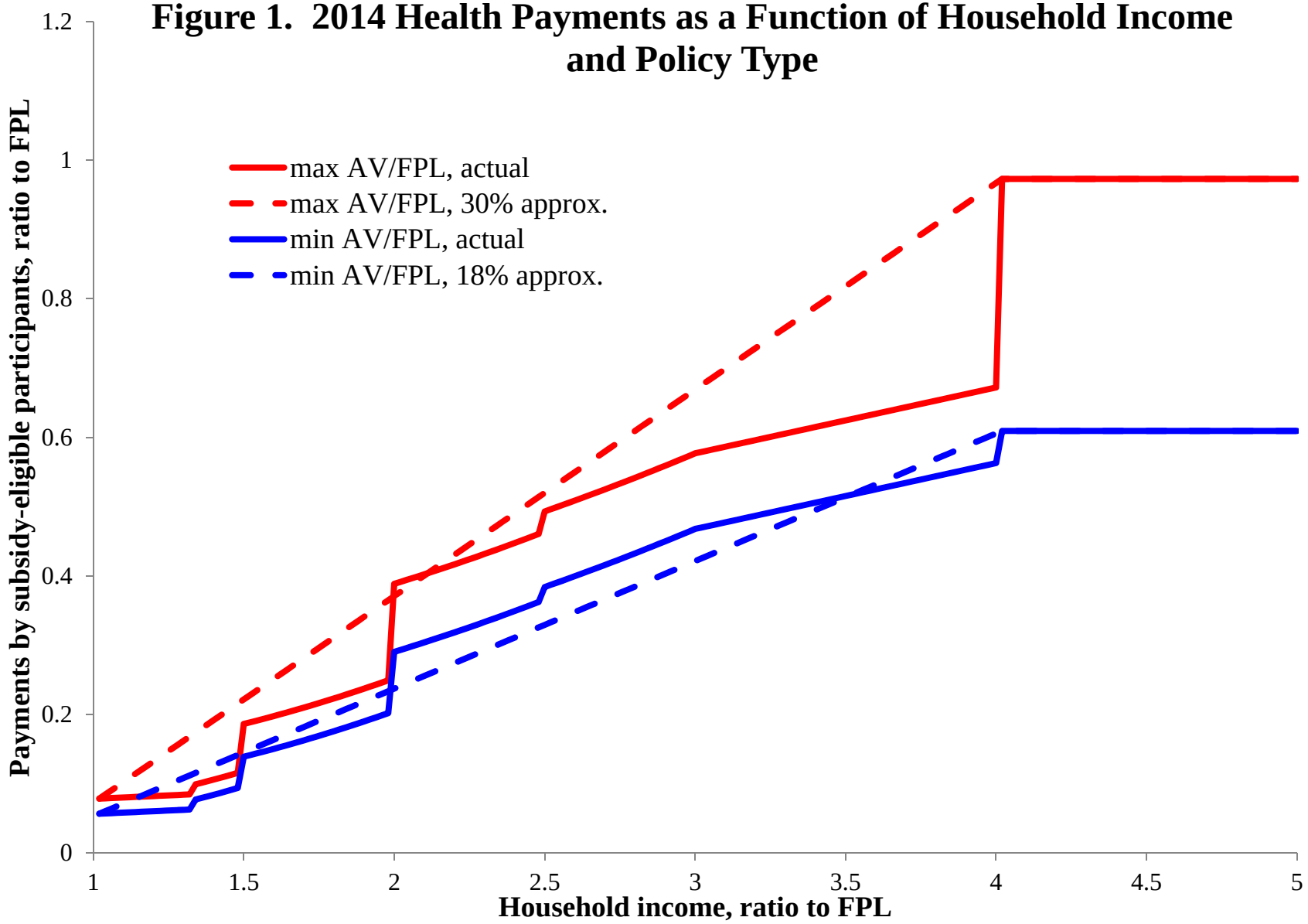


Figure 2. ACA Provisions Changing Marginal Tax Rates

Provisions sum to the 4.8 percentage point overall impact

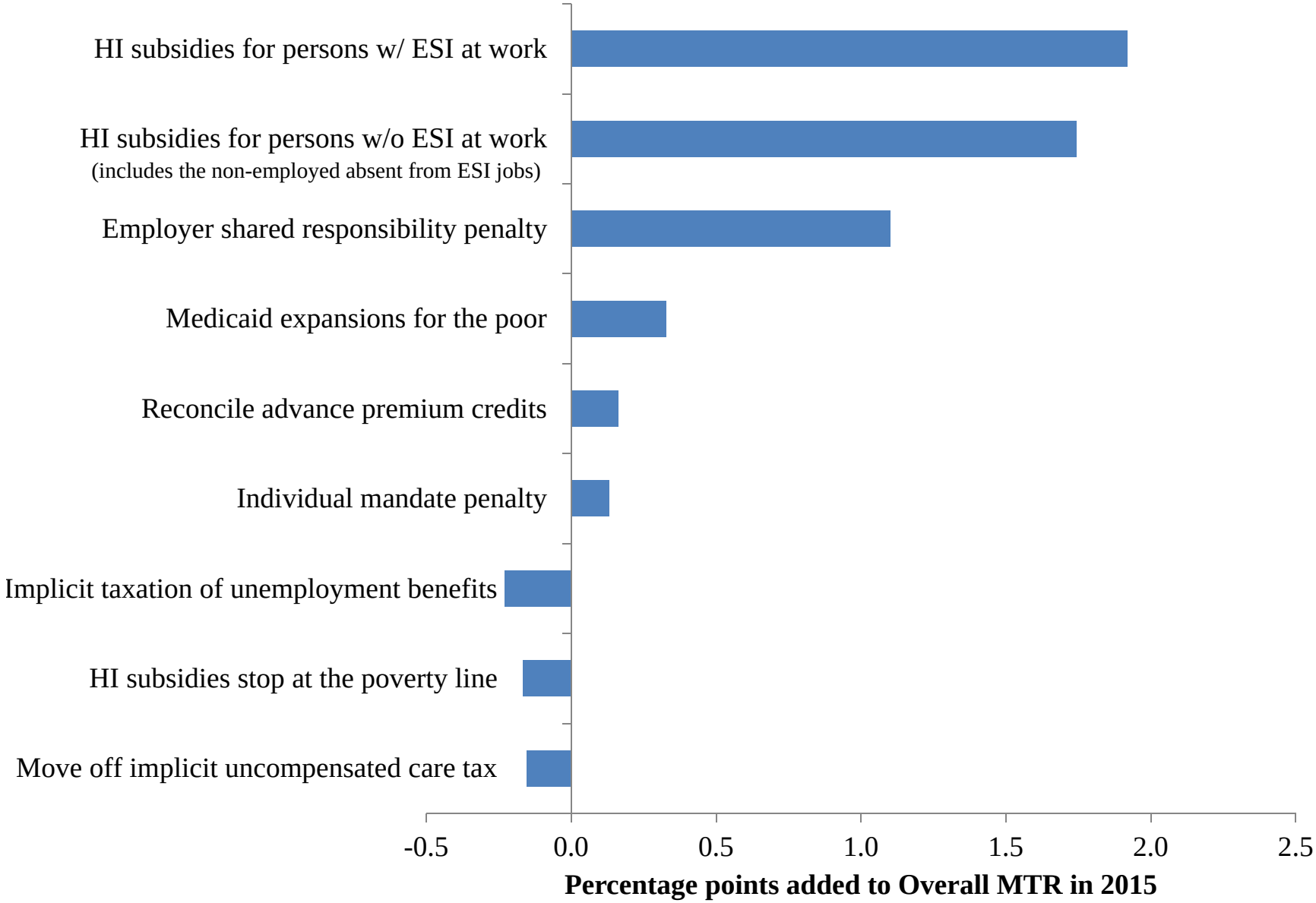


Figure 3. Statutory Marginal Labor Income Tax Rates over Time

avg. among non-elderly heads and spouses with median earnings potential. includes subsidies

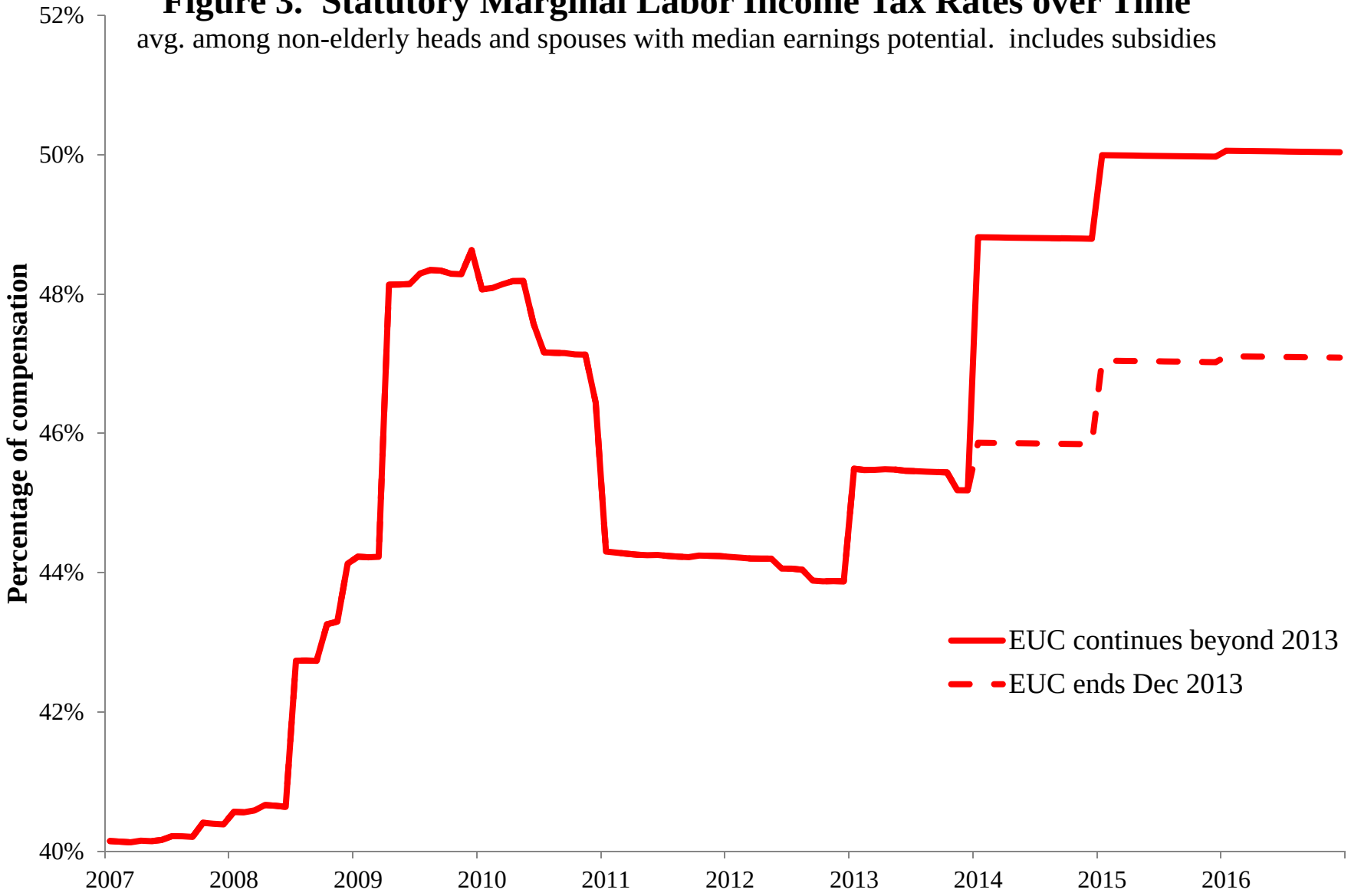
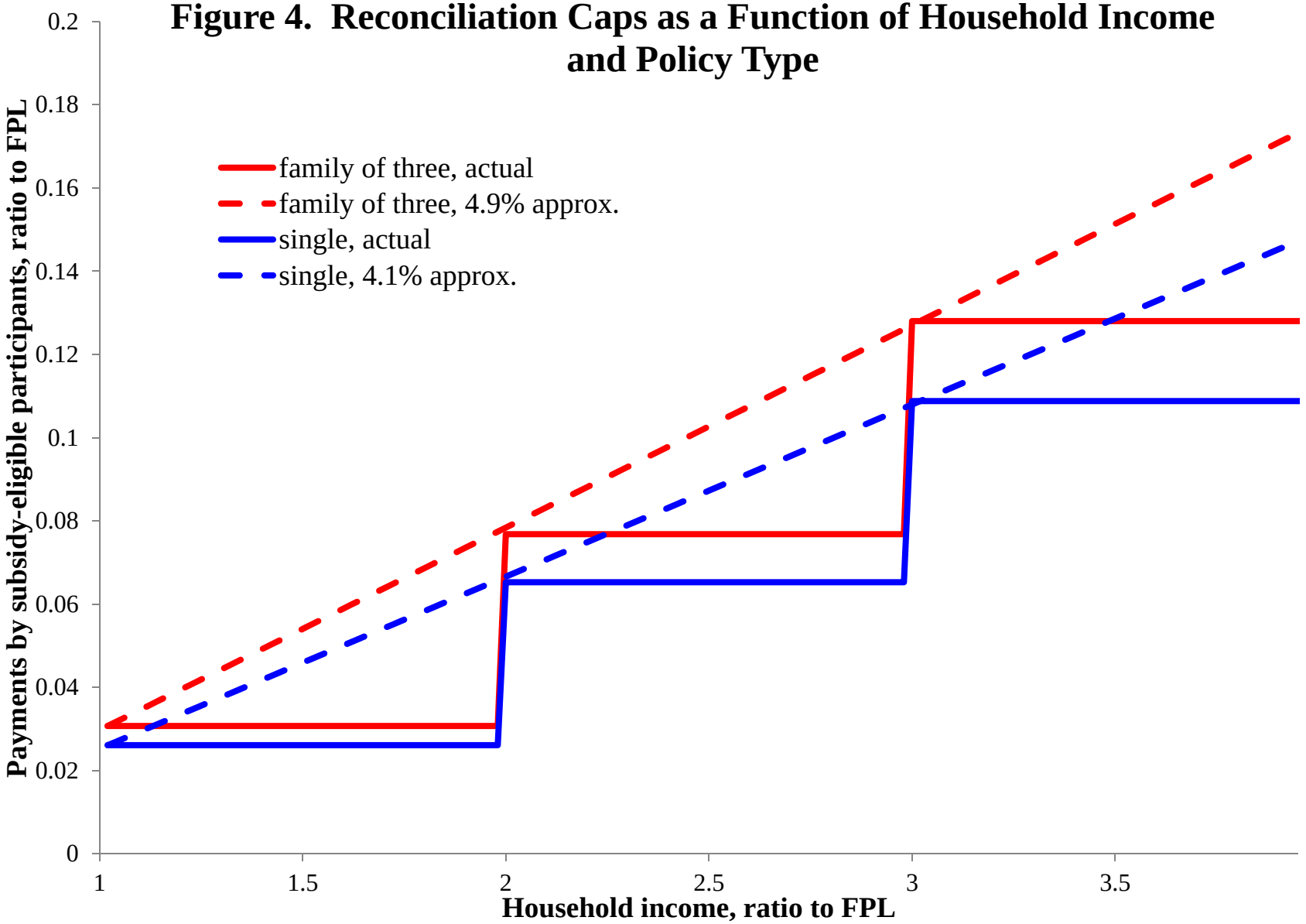


Figure 4. Reconciliation Caps as a Function of Household Income and Policy Type



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