Does It Pay to Work?

by

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Executive Summary

What is the economic reward for working? The answer is surprisingly complicated. Going to work, earning a living, and spending one's earnings over time raises a variety of taxes and government benefits and lowers a variety of taxes and benefits — and not just in the current year, but in all future years as well.

If you save and invest some of you current earnings and spend the proceeds in the future, you'll raise your future capital income taxes as well as consumption taxes. You'll also limit your ability to qualify for the receipt of future income- and asset-tested government tax credits and welfare benefits. Earning more today will also affect the calculation of your future Social Security benefits as well as the federal income tax assessed on those benefits.

In order to sort through all of these effects, we consider a two-earner couple at various levels of income. The couple has two children and they are assumed to take advantage of a wide array of tax avoidance opportunities, including the mortgage interest deduction, the earned-income tax credit, and the child tax credit. When qualified, the couple also receives the full array of transfer benefits, including Food Stamps and Medicaid.

By incorporating all of the fiscal policies that affect households through time, our model is able to calculate the lifetime consequences of a lifetime of employment. We conclude that:

- The overall fiscal system is highly progressive, particularly at the low end of the income distribution.
- Americans at every income level face a lifetime marginal net tax rate greater than 50 percent.
- That is, for every dollar they earn, they will lose more than 50 cents in higher taxes and reduced transfer benefits.

Furthermore, the highest marginal net tax rates are not imposed on the highest-income families. They are imposed on those with the lowest earnings. For example:

- At two times the minimum wage ($42,800), working couples get to keep less than 30 cents out of each dollar they earn.
- At 1.5 times the minimum wage ($32,100), they get to keep less than 20 cents out of each dollar they earn.
- By contrast, a couple earning $200,000 a year gets to keep 44 cents.

The disincentives to work at the low end of the income scale are even worse if we compare part-time with full-time work:

- A minimum-wage couple that moves from half-time to full-time work will lose 97 cents out of every extra dollar they both earn.
- At 1.5 times the minimum wage, the couple will lose $1.06 for every extra $1.00 they earn; for this couple, *working more literally means having less*.

What causes these marginal tax rates to be so high? In general, loss of transfer benefits is more important for lower-income families, while direct taxes on income are more important for higher-income families. Among full-time working couples:

- At $32,100 (1.5 times the minimum wage), two-thirds of the marginal net tax rate consists of the loss of transfer benefits, while a little more than one in five dollars is lost to income and payroll taxes.
- At $64,300 (triple the minimum wage), half of the marginal net tax rate consists of a loss of benefits, while two in five dollars are lost to income and payroll taxes.
- At $321,400 (15 times the minimum wage), four in five dollars of the marginal net tax are lost to income and payroll taxes.

Marginal net tax rates for low-income families are so draconian because our system makes a very generous package of welfare benefits available to people who do not work and then begins taking away those benefits at a steep rate as they begin to earn a modest income. In our model, for example:

- A couple with two children can expect $489,100 in lifetime benefits if they never work.
- However, if both spouses work full-time and each earns about $16,000, the loss of Medicaid and other welfare benefits will cost them two-thirds of their income over the whole of their worklife.

When all taxes and benefits are considered, the American fiscal system is fairly progressive — at least toward the lower half of the income spectrum. That is, the lower your income, the more generously you are treated. But the price of that generosity is lifetime marginal net tax rates that make working for a living very unattractive.

Introduction[1]

Does it pay to work? That is a tough question to answer. In general, more work means a higher income and, therefore, higher taxes. A higher income usually also leads to fewer entitlement benefits (such as Food Stamps). Moreover, the effects of working today are not limited to today's higher taxes and today's loss of entitlement benefits. Income earned today also affects future taxes and future benefits. In particular, there are five important links between today's decisions and their future consequences:

- Earning more today typically leads to more saving and, therefore, more assets and more income from assets in the future; however, that higher future capital income will result in higher future income taxes.
- More assets and more income in the future also will mean fewer future benefits from entitlement programs that are linked to the income and assets of the recipients (such as Medicaid).
- Earning more today typically will lead to more consumption in the future because asset accumulation makes more consumption possible; however, that higher consumption will result in higher consumption taxes.
- Earning more today will lead to higher Social Security benefits in the future.
- More non-Social Security income in the future, caused by higher earnings and more saving today, will increase the tax on future Social Security benefits.

"To determine if work pays, we must consider lifetime taxes paid and government benefits lost as a result of working."

Calculating the Costs and Benefits of Working. As the above list indicates, understanding the full consequences of deciding to work requires taking into account all future taxes workers will pay plus all future transfer payments workers will lose from going to work. To illustrate this lifetime tax analysis, we have chosen a representative two-earner couple. The couple is assumed to rent in the early years and eventually buy a house. They have two children, who grow up and attend college. Over time, the couple has many opportunities to interact with the tax system by, for example, taking advantage of the mortgage interest deduction and the child tax credit, deciding whether to itemize deductions, paying Federal Insurance Contribution Act (FICA) taxes, paying state income taxes, and using their after-tax earnings to pay sales taxes.

We assume that couples enter the labor market at a specific wage and that their income grows by 1 percent per year in real terms, and we consider this couple at different income levels. For example, if they earn a low income they benefit from the Earned Income Tax Credit (EITC) and the credit for retirement account contributions. If they earn a high income, they are penalized

by the phase-out of itemized deductions and by the alternative minimum tax. We approach entitlement benefits in a similar way. If they earn a low income, the family qualifies for "welfare" benefits including cash assistance, Food Stamps and Medicaid. As their level of income or assets rises, these benefits phase out.

Our approach is also probabilistic. In any given year, there is some chance one or both spouses will die. The death of a spouse triggers entitlement benefits for the remaining spouse and the children (such as survivors benefits under Social Security). These benefits are also affected by what the deceased spouse was earning. We calculate expected taxes and expected benefits for the couple. We do so by calculating the taxes and benefits for each possible lifetime. To get an expected result, we sum over all possible lifetimes, each weighted by its probability of occurring.

Our approach is also comprehensive. We include every major tax and transfer program. In the case of taxes, we include employer-paid taxes, whether corporate income taxes or employer-paid FICA taxes.

The Complexity of the U.S. Tax and Transfer Benefit Programs. It is difficult to exaggerate the complexity of the taxes and transfer programs American workers face. Mastering the federal income tax alone is a major challenge because it has so many special provisions. These include the inflation-indexation of tax brackets, the partial and graduated taxation of Social Security benefits above two noninflation-indexed thresholds, the treatment of retirement account contributions and withdrawals, the phase-out of itemized deductions, the Earned Income Tax Credit, the child tax credit, the alternative minimum tax, and the recently legislated credit to low-income households for contributing to retirement accounts.

"A low-income couple with children is eligible for many tax benefits and transfers that aren't available to middle-income workers."

As if the federal income tax were not difficult enough to decipher, almost all states have income taxes with their own special provisions. For example, Massachusetts has an exemption for the elderly, a child deduction, a rental deduction, and a deduction for employee-paid payroll taxes. Compared to these state taxes, the FICA payroll tax seems straightforward.

As the various interrelated social welfare programs have grown, the U.S. system of transfer benefits has become extremely complicated. It now includes Food Stamps, Medicaid, traditional welfare — renamed Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), housing assistance programs, the Low-Income Home Energy Assistance Program (LIHEAP), the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and several other programs.

Software Program. Understanding the effective net tax on work requires an intertemporal model capable of carefully determining tax and transfer payments at each stage of a person's life cycle, based in part on economic choices in prior periods. This study uses ESPlanner, a financial planning software program developed by Economic Security Planning, Inc., to study the net

tax levied on workers with different earnings capacities. ESPlanner smooths households' living standards subject to constraints on their capacities to borrow. In so doing, it makes highly detailed, year-by-year federal and state income tax and Social Security benefit calculations. [See Appendix for details.]

Reporting the Results. In expressing the results of this study, we have chosen multiples of the minimum wage. A full-time worker earning the minimum wage of $5.15 an hour will earn $10,700 a year. When both spouses earn the minimum wage, their family income will be $21,400. If both spouses earn twice the minimum wage ($10.30 an hour), their joint annual income will be $42,800.

Lifetime Taxes and Lifetime Transfer Benefits

In order to assess the consequences of going to work, we need to calculate over a lifetime the extra taxes paid and extra benefits received or sacrificed as a result of that decision. In what follows, all lifetime taxes and transfer benefits are reported as present values.

Lifetime Taxes. Table I presents the couple's expected lifetime taxes and benefits, measured in current dollars. If we ignore the lowest income levels, the table shows:

"At different income levels, a two-earner couple faces different lifetime tax burdens and lifetime benefits."

TABLE I

Present Values of Lifetime Taxes and Transfer Benefits of Working Couples

(in year 2002 dollars)

Initial Annual Household Income	Present Value of Lifetime Taxes	Present Value of Lifetime Transfer Benefits
$21,400	$101,500	$268,600
$32,100	$206,400	$109,100
$42,800	$302,300	$93,700
$64,300	$509,600	$90,700
$85,700	$746,200	$104,100
$107,100	$994,500	$110,600
$128,500	$1,271,000	$116,800
$150,000	$1,533,000	$123,100
$171,400	$1,785,400	$127,700
$192,800	$2,014,900	$127,700
$214,200	$2,242,000	$127,700
$321,400	$3,435,600	$127,700

Source: Table II-A in the Appendix.

- A couple earning twice the minimum wage can expect to pay more than $300,000 in taxes over the course of their lifetimes — an amount equal to about seven times their initial annual income.
- A couple earning about $100,000 can expect to pay close to a million dollars in lifetime taxes — an amount equal to almost 10 times their initial annual earnings.
- At higher levels of income, expected lifetime taxes tend to be between 10 and 11 times initial annual earnings, regardless of the amount earned.

On the tax side, then, our system is mildly progressive. As a percent of lifetime income, the tax burden rises modestly as income rises, then levels off once income rises above $100,000.

The Composition of Lifetime Taxes. One reason why the overall tax system is not more progressive is that people pay different types of taxes at different income levels. Although the rate structure of the federal income tax system is fairly progressive, payroll taxes tend to be proportional to income (although typically capped at a certain income level) and consumption taxes tend to be regressive, taking a larger portion of lower family incomes. In general, the tax burden borne by lower-income families tends to be weighted toward proportional and regressive taxes. As Figure I shows:

"Half of the lifetime tax burden of a low-income couple consists of payroll taxes."

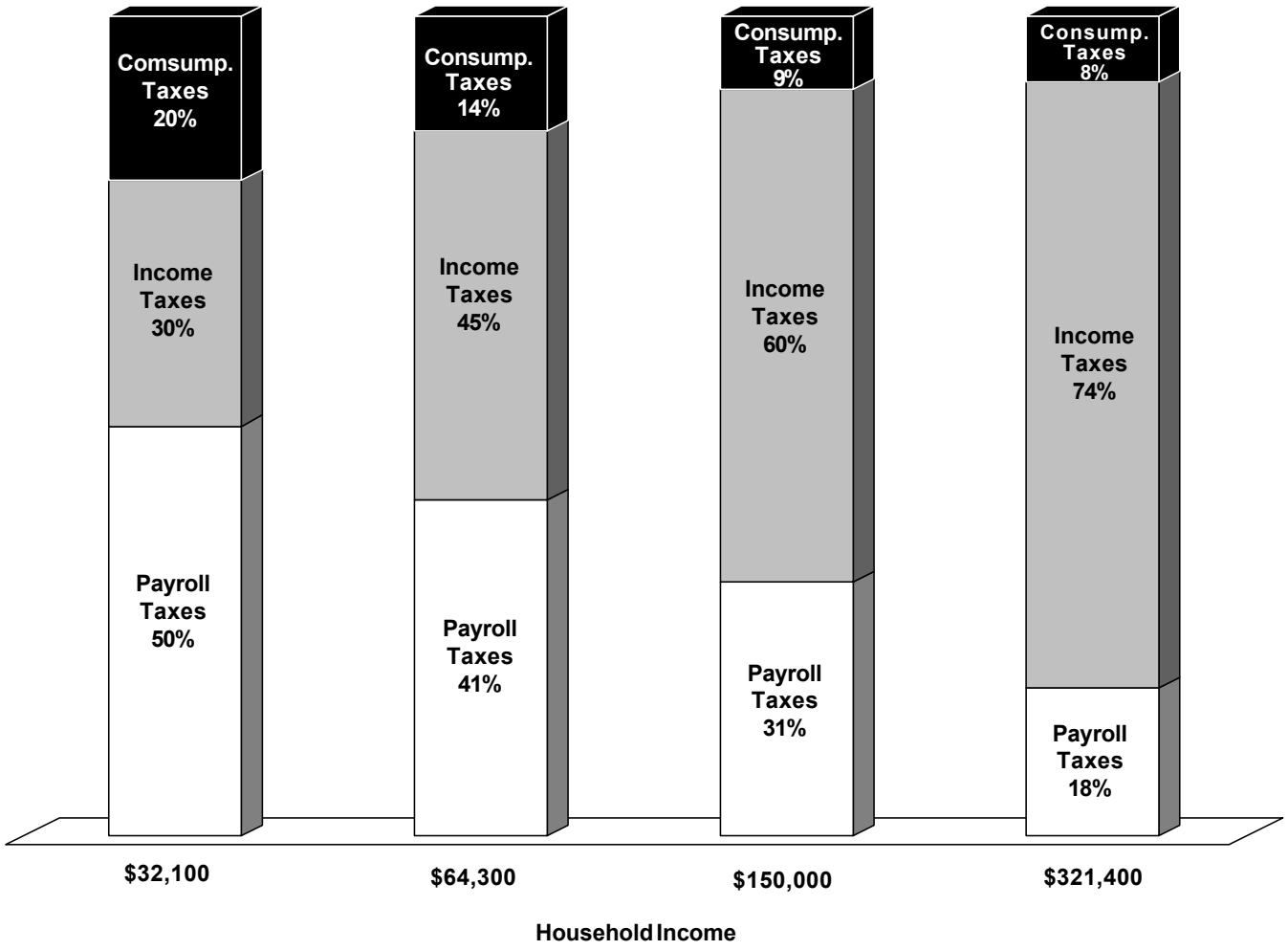
- For a family earning $32,100 a year (1.5 times the minimum wage), half the taxes paid are payroll taxes and only 30 percent are income taxes.
- By contrast, for a family earning $321,400 (15 times the minimum wage), three-fourths of all taxes are paid in the form of income taxes, and less than one in five tax dollars comprises payroll taxes.

Lifetime Transfer Benefits. Returning to Table I, note that a couple in which both spouses initially earn the minimum wage and remain at the bottom of the income ladder throughout their working lives can expect to pay more than $100,000 in taxes over their lifetime. However, they can expect to receive back almost $270,000 in benefits. Thus a low-income household gets a very good return on its taxes. (Note, however, that it is very difficult to work full time and earn only a minimum wage income for four to five decades.) Going beyond the lowest income level, Table I shows that:

- A couple earning twice the minimum wage ($42,800) can expect to receive about $94,000 in lifetime entitlement benefits, measured in current dollars.
- At four times the minimum wage ($85,700), the couple's expected entitlement benefits rise to $104,000.
- At an income level of about $150,000, the couple's entitlement benefits reach about $127,000, where they remain, regardless of the size of the family's income.

FIGURE I

Distribution of Lifetime Tax Burden



Source: Table II-A in the Appendix.

"A high-income couple pays three-fourths of its taxes in the form of income taxes."

Unlike taxes, which tend to be proportional to income once a certain income level is reached, transfer benefits tend to be constant once a certain income level is reached. This means that benefits as a percent of income tend to fall as income rises.

- At twice the minimum wage, couples can expect to get back about $1 in transfer benefits for every $3 they pay in taxes.
- At four times the minimum wage, couples can expect to get back less than one in seven dollars they pay in taxes.
- At about $200,000 in income, they can expect to get back less than one in 16 tax dollars.

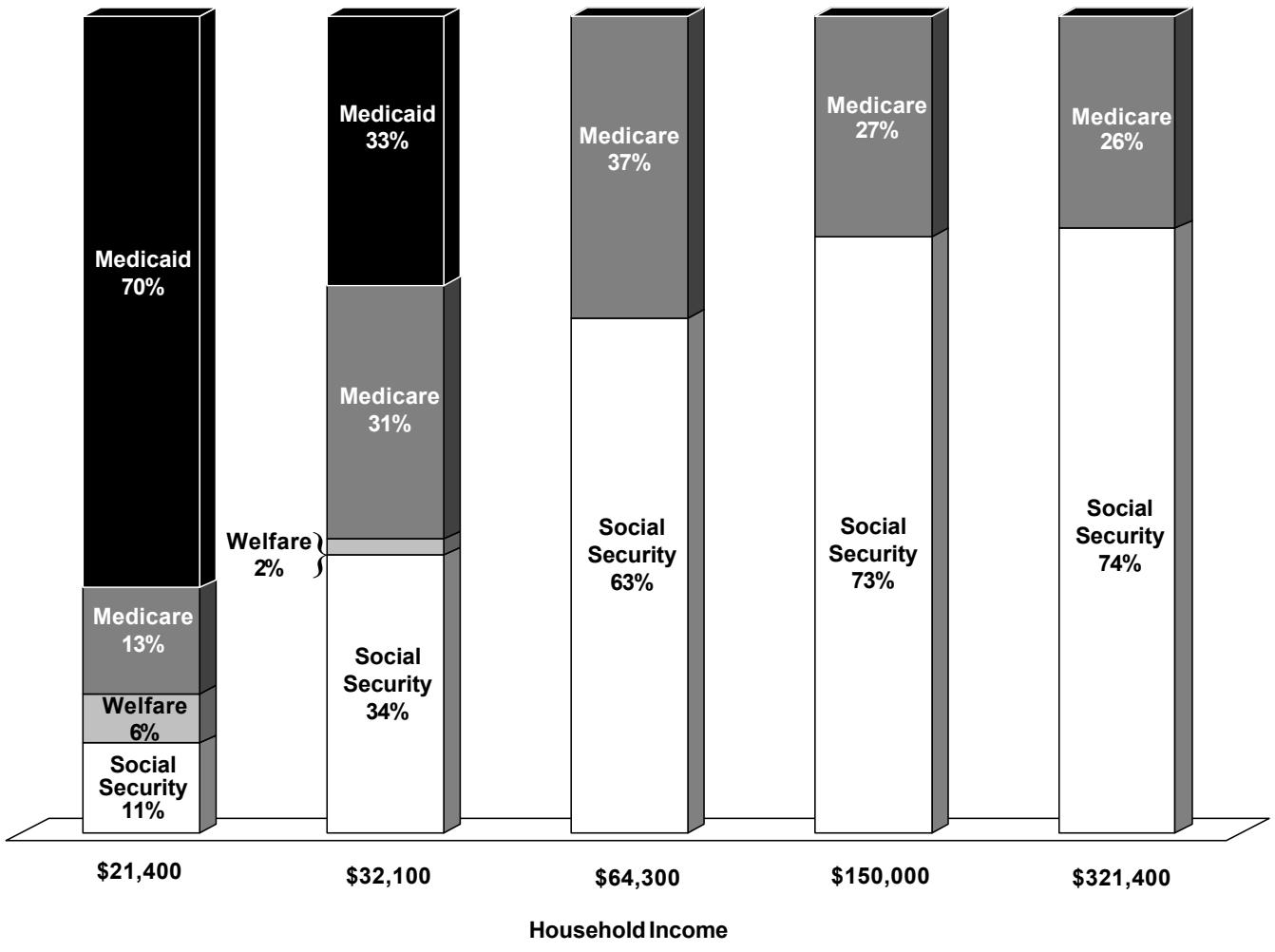
"About 70 percent of the transfer benefits of a minimum wage couple is Medicaid, while Social Security is three-fourths of the benefits of high-wage couples."

Composition of Transfer Benefits. The principal reason why transfer programs tend to be more progressive than the tax system is that many programs are means-tested. Although rich and poor alike participate in Medicare and Social Security, only low-income families have access to means-tested benefits, the most important of which is Medicaid. As Figure II shows:

- About 70 percent of all transfer benefits received by a couple earning the minimum wage over the course of their working lives consists of Medicaid benefits, and only one in four dollars is in the form of Social Security and Medicare benefits.
- By contrast, a couple earning $150,000 (seven times the minimum wage) receives all of its transfer benefits in the form of Social Security (73 percent) and Medicare (27 percent).

FIGURE II

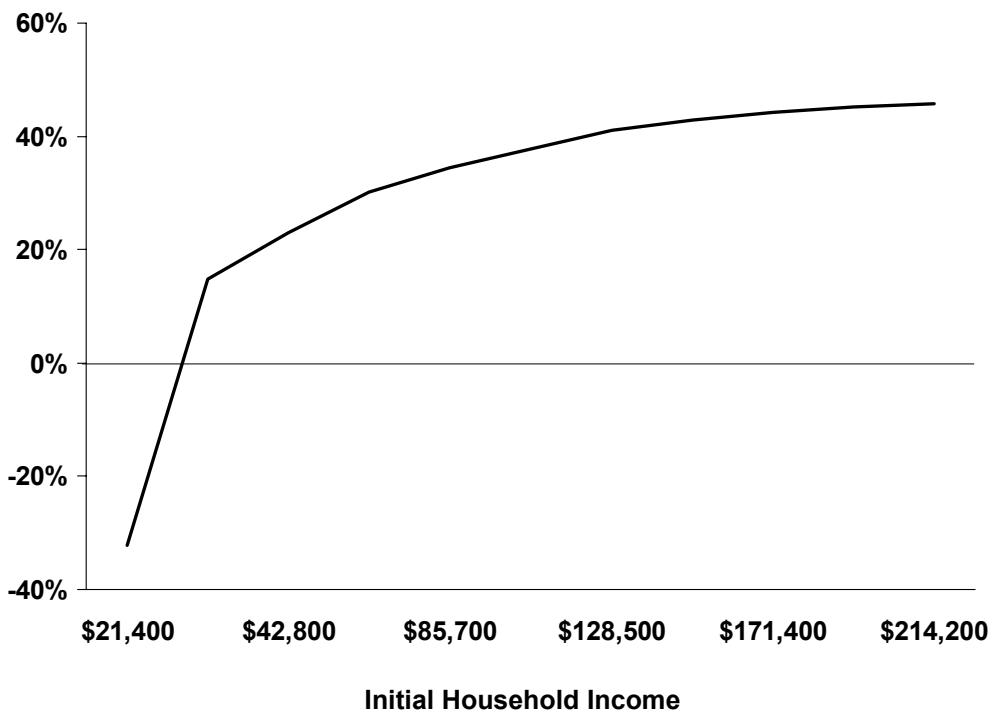
Distribution of Lifetime Transfer Benefits



Source: Table II-A in the Appendix.

"The system as a whole is quite progressive, especially over the bottom end of the income distribution."

FIGURE III



Source: Table I-A in the Appendix.

Policy Implications. From these observations, we can draw three conclusions with important public policy implications. First, most Americans can expect to get back in the form of entitlement benefits only a fraction of what they pay in taxes, although they do receive other government services that presumably are worth paying for. Second, the system as a whole is quite progressive, with low- and moderate-income families having a more favorable relationship with the state than higher-income families. Third, most of the progressivity in our system comes on the benefit side rather than on the tax side of fiscal policy.

One way to appreciate the amount of overall progressivity in the system is to calculate an average lifetime net tax rate, defined as the ratio of lifetime taxes net of any transfer benefits received to lifetime income. The result of that calculation is shown in Figure III. As in Table I, Figure III shows that a couple in which both spouses earn the minimum wage over the whole of their working lives can expect to receive far more in transfer benefits (including EITC refunds) than they pay in taxes. (Yet, as noted above, it is very difficult for someone to stay at the minimum wage over the whole of a work-life.) At 1.5 times the

minimum wage, the couple experiences a positive net tax burden, however, and above that figure those who earn more pay more of their income (on net) to the state. Overall, the system is progressive, but as income rises it becomes only mildly so.

Lifetime Marginal Net Tax Rates

To those for whom progressivity is an important value, these results should be heartening. Yet this progressivity comes at a terrible price. Many entitlement benefits, it turns out, are available to people whether they work or not. And when they decide to work, the withdrawal of benefits plus the imposition of taxes creates very high marginal tax rates.

"All full-time working households face marginal tax rates higher than 50 percent."

Working Versus Not Working. To calculate marginal tax rates, we ignore benefits to which people are entitled whether they work or not. We want to identify changes in taxes paid and benefits received as a result of the decision to work rather than not work. The additional taxes paid plus the net reduction in transfer benefits received divided by the income from working is called the marginal net tax rate. These are depicted in Table II.

TABLE II

Marginal Net Tax Rates

Multiple of Minimum Wage	Initial Annual Household Income When Working Full-Time	Working Full-Time Versus Not Working (percent)	Working Part-Time Versus Not Working (percent)	Working Full-time Versus Half-Time (percent)
1	$21,400	66.5%	36.4%	96.8%
1.5	$32,100	80.6%	55.0%	106.3%
2	$42,800	72.2%	66.5%	77.9%
3	$64,300	63.0%	80.6%	45.5%
4	$85,700	59.1%	72.2%	46.0%
5	$107,100	57.5%	67.1%	48.0%
6	$128,500	57.5%	63.0%	51.9%
7	$150,000	57.0%	60.7%	53.3%
8	$171,400	56.6%	59.1%	54.0%
9	$192,800	56.1%	58.1%	54.1%
10	$214,200	55.7%	57.5%	53.8%
15	$321,400	55.2%	56.8%	53.5%
20	$428,500	54.7%	55.7%	53.6%
30	$642,700	54.2%	55.2%	53.2%
40	$857,000	54.0%	54.7%	53.3%

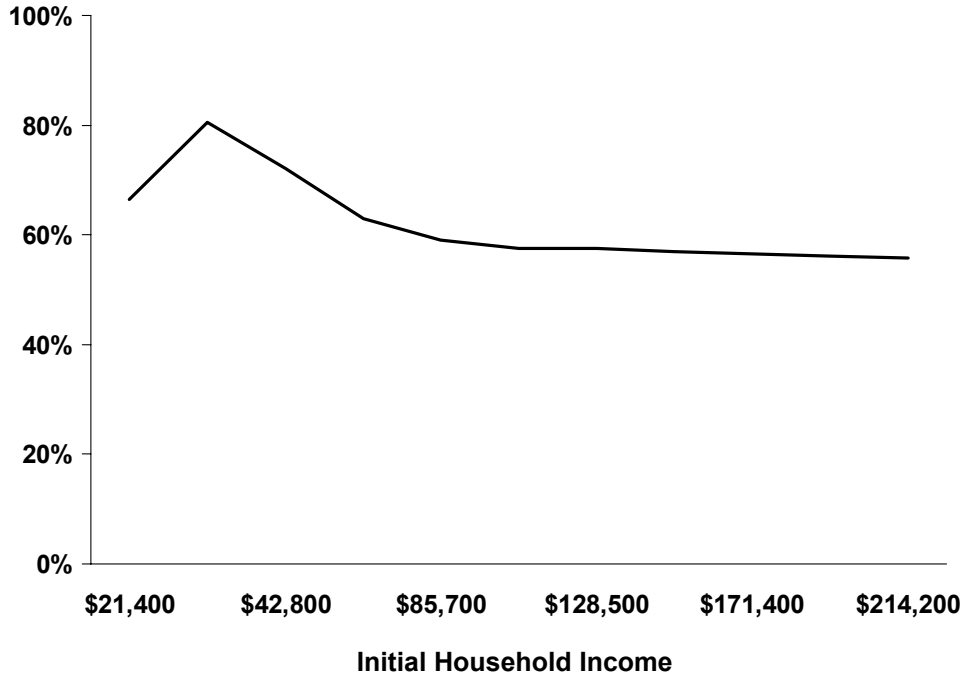
Source: Tables IV-A, V-A and VI-A in the Appendix.

"The marginal tax rate rises to 81 percent for households earning $32,100, and declines as income rises."

FIGURE IV

Marginal Lifetime Tax Rates for Full-Time Working Couples

(net of transfer benefits)



Source: Table IV-A in the Appendix.

The first thing to note is that all full-time working households face marginal net work tax rates in excess of 50 percent! In going to work, all American households hand over half or more of every dollar they earn to state and federal government in taxes paid net of benefits received.

The second thing to note is that the lowest-income households face the highest marginal net tax rates:

- The marginal net tax rate of households earning 1.5 times the minimum wage is 81 percent; *families at this income level keep less than one-fifth of the income they earn.*
- At two times the minimum wage the marginal net tax rate is 72 percent; *these families keep less than 30 cents out of each dollar they earn.*

The third thing to note is that at higher income levels, marginal net tax rates *decline* as income rises. On the whole, marginal net tax rates tend to be regressive, imposing the highest burdens on those with the lowest earnings. [See Figure IV.]

Perhaps the most striking feature of Table II is that the minimum wage household faces a 67 percent net marginal tax on working full time. This family keeps only one in every three dollars it earns on net! The principal reason is that households in which no one works receive very substantial transfer benefits. Many of these benefits are either entirely lost or greatly reduced when household members go to work full time. In addition, the household must pay federal income, state income, and FICA taxes on its earnings. Offsetting these factors is the increase in Social Security benefits associated with working and the availability of the Earned Income Tax Credit.

"A minimum wage household faces a 67 percent marginal net tax on full-time work."

Households earning 1.5 times the minimum wage also lose benefits when they go to work. In addition, they lose virtually all of their Earned Income Tax Credits. In addition, their higher earnings limit the degree of progressivity of the Social Security benefit schedule.[2] This is the reason marginal net tax rates are higher for households earning 1.5 times the minimum wage than for those with higher incomes.

The Composition of Marginal Net Tax Rates. Figure V shows the composition of marginal net tax rates for couples at different income levels. Note that the lower the family's income, the more important the loss of the transfer benefits is. Conversely, the higher the family's income, the more important direct taxes on income are. For example:

- At $32,100 (1.5 times the minimum wage), two-thirds of the marginal net tax rate consists of the loss of transfer benefits, while a little more than one in five dollars is lost to income and payroll taxes.[3]
- At $64,300 (triple the minimum wage), half of the marginal net tax rate consists of a loss of benefits, while two in five dollars are lost to income and payroll taxes.
- At $321,400 (15 times the minimum wage), four in five dollars of the marginal net tax are lost to income and payroll taxes.

Working Part-Time. Table II also shows marginal net tax rates for those who go from no work to part-time work and from part-time to full-time work. As the table reveals, fiscal policy discourages full-time work more than half-time work for low- and moderate-income couples:

- At the minimum wage, the marginal net tax rate on going to work half-time is 36 percent versus 67 percent for working full-time.
- At 1.5 times the minimum wage, the rate for half-time work is 55 percent versus 81 percent for full-time work.
- At two times the minimum wage, the rate for half-time work is 67 percent versus 72 percent for full-time work.

Thus fiscal policy encourages families at the bottom of the income ladder to work half-time rather than full-time, if they work at all. However, at higher income levels, these incentives are reversed.

- A family earning three times the minimum wage faces a marginal net tax rate of 81 percent for half-time work versus 63 percent for full-time work.
- At four times the minimum wage, the rates are 72 percent for half-time versus 59 percent for full-time.

Another way of looking at this issue is to ask what happens to people who move from half-time to full-time work. As Table II shows:

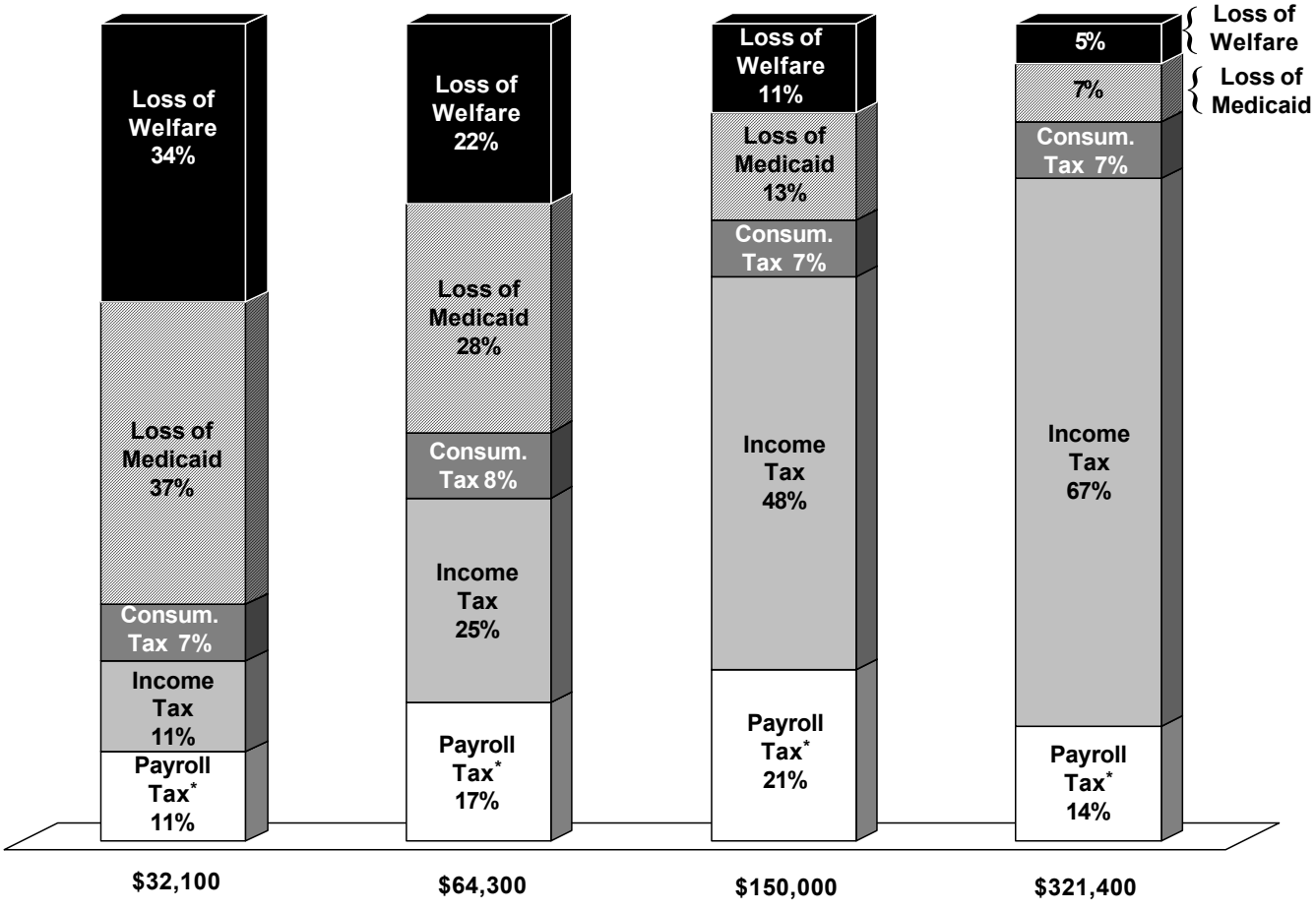
"For low-income workers, the marginal cost of working is mostly lost benefits."

- A minimum-wage couple that moves from half-time to full-time work will lose 97 cents out of every extra dollar they both earn.
- At 1.5 times the minimum wage, the couple will lose $1.06 for every $1.00 they earn; for this couple, *working more literally means having less.*

FIGURE V

Marginal Net Tax Rates

(the marginal cost of working versus not working)



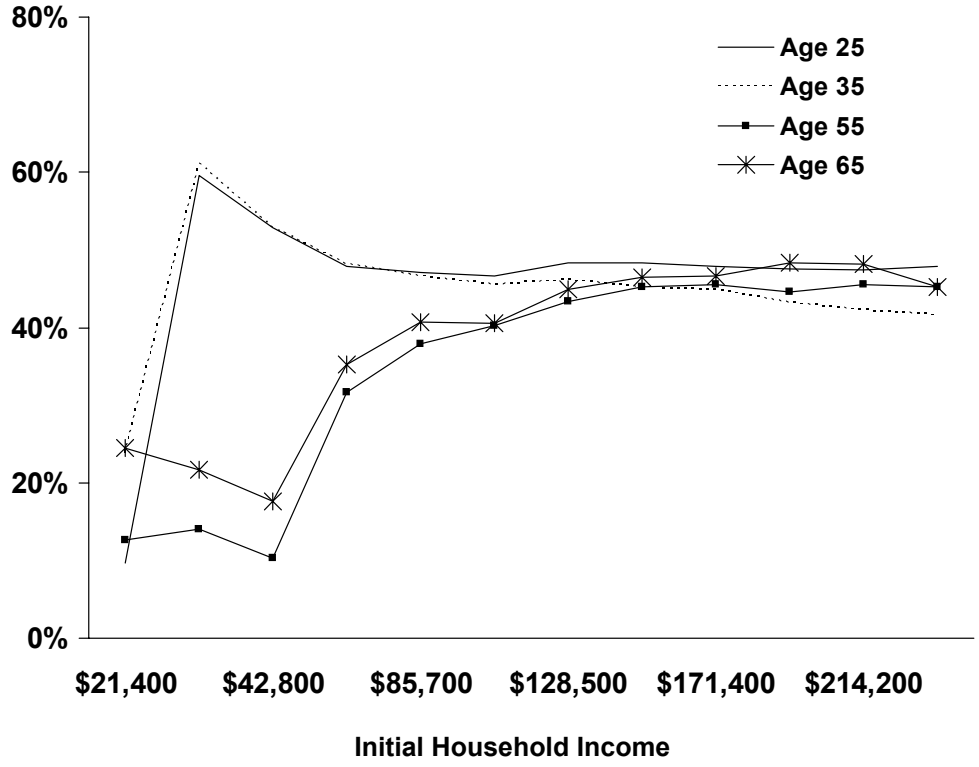
* Net of increase in Social Security benefits.

Source: Authors' calculations.

"Fiscal policies designed to help children create the highest marginal net tax rates."

FIGURE VI

Marginal Net Tax Rates for Full-Time Working Couples at Different Ages and Income Levels



Source: Authors' calculations.

Marginal Net Tax Rates at Different Ages. Figure VI shows marginal net tax rates for couples at different ages. Note that at higher income levels, marginal net tax rates are roughly the same regardless of the amount earned. However, at lower income levels, there is a significant difference. Specifically:

- At 1.5 times the minimum wage, the marginal net tax rate is 60 percent and 61 percent for couples ages 25 and 35 respectively.
- At ages 55 and 65, these rates drop to 14 percent and 22 percent respectively.

The difference stems from taxes and spending programs that relate to children and are means-tested. These programs impose steep marginal net tax rates on young couples. It is ironic that the very fiscal policies designed to help children are the ones most responsible for discouraging low- and moderate-income families from working.

Conclusion

To accurately measure lifetime average and marginal net tax burdens, we have included in fine detail every major tax and transfer program affecting American households. What emerges is a picture of a fiscal system with six characteristics:

- Our fiscal system is highly progressive over the bottom half of the income distribution. Couples working full-time and earning the minimum wage get back 32 cents in benefits (net of taxes) for every dollar they earn, while couples earning $64,000 (or three times the minimum wage) pay 30 cents in taxes (net of benefits) per dollar earned. Over the top half of the income distribution, the system is only mildly progressive.
- Most of the progressivity in our fiscal system comes from means-tested spending programs rather than taxes, and these are concentrated at the bottom of the income ladder.
- Workers at every income level face very steep lifetime marginal tax rates. Virtually all full-time American workers lose more than half of their earnings in taxes and forgone transfer benefits.
- The very highest marginal net tax rates are imposed on the lowest-income earners, largely because of the withdrawal of means-tested transfers and tax benefits. Indeed, working couples in the bottom half of the income distribution keep only a third or less of the income they earn, on net.
- If low-income household members work at all, our system strongly encourages them to work part-time rather than full-time. Couples earning 1.5 times the minimum wage actually reduce their standard of living if they work full-time rather than half-time.
- The principal reason for very high marginal net tax rates for low-income households is the existence of means-tested tax and welfare benefits tied to children. For example, a 25-year-old couple with children, earning 1.5 times the minimum wage, gives up 60 cents for every dollar earned; the marginal net tax rate on the same couple drops to 14 percent at age 55, when they are well past the child-rearing years.

"The price of generosity to those with low incomes is a system that strongly discourages work."

Overall, our system is very generous to those at the bottom of the income ladder. But the price of that generosity is an incentive structure that strongly discourages those with the lowest skills from participating in the labor market.

Notes

[1] This study is based on Jagadeesh Gokhale and Laurence J. Kotlikoff, "Does It Pay to Work?" revised, November 2002. Laurence Kotlikoff is deeply grateful to The Smith Richardson Foundation, Boston University, Economic Security Planning, Inc., the Employment Policies Institute, and the National Institute on Aging for research support. The views expressed here and findings reported here are solely those of the authors and not those of their respective institutions.

[2] Higher-earning couples experience the loss of benefits when they go to work. But the higher their level of earnings, the smaller is this loss as a share of the increase in spending associated with working.

[3] Note: These are payroll taxes net of increases in Social Security benefits.

Appendix

Modeling Taxes and Transfers

This appendix is divided into three sections. Section I discusses our calculation of federal income, payroll, and state income taxes; Section II, our calculation of Social Security benefits; and Section III, our calculation of non-Social Security benefits.

I. The Calculation of Taxes

The Federal Income Tax

ESPlanner's calculations of federal income taxes in each future year assume that the household's filing status is "married and filing jointly" for married households and "single" for single households. "Single" is assumed when spouses of married households are by themselves — as when one spouse outlives the other at the end of the planning horizon or in calculating the financial plan for a surviving spouse and her or his household. All federal income tax calculations are based on the 2001 tax law, which we assume is not phased out at the end of the decade but is maintained after 2010 with its 2010 provisions.

All tax calculations are based on nominal income levels by converting real pretax income amounts to their nominal counterparts at the assumed rate of inflation. Thus if the user inputs a 3 percent inflation rate, all nominal amounts in the user's federal income tax calculation (such as nominal bracket amounts and nominal exemption amounts) are multiplied by 1.03 percent for purposes of calculating 2002 taxes, by 1.03 times 1.03 for purposes of calculating 2003 taxes, and so on. The federal income tax schedule is applied to the program's calculation of federal taxable income. Federal taxable income equals federal Adjusted Gross Income (AGI) less personal exemptions and less the standard deduction or the sum of itemized deductions, whichever is larger.

The AGI for each year includes projected incomes in current dollars from sources that include labor income (wages and salaries), self-employment income, asset income projected by the program based on user inputs of initial non-tax-favored net worth and rates of return, and on the optimal spending plan computed by the program. AGI also includes taxable asset income, taxable Social Security benefits, taxable special receipts, taxable distributions from defined benefit pension plans and taxable withdrawals from tax-favored saving plans. Each of these items is based on the user's inputs and preferences. Nontaxable special receipts and withdrawals from Roth IRA accounts are not included in AGI. Deductible contributions to retirement accounts are subtracted from income in calculating each year's AGI. Employer contributions to retirement accounts are not included in AGI, but withdrawals from these accounts are included.

The Indexation of the Tax Schedule. Tax-rate brackets and infra-marginal tax amounts (all of the dollar amounts listed in the tax schedules) are adjusted for inflation in each year over the household's lifetime. This is done to ensure that the schedule keeps pace with the growth of income in current dollars. The indexation is done using the user-specified rate of inflation. In accordance with current policy, the thresholds for taxing Social Security benefits are not indexed for inflation.

Standard Deductions and Exemptions. Standard deductions and exemptions are indexed for inflation for each future year, based on the user-specified future rate of inflation. The number of personal

exemptions allowed is two plus the number of children for married and filing jointly and one plus the number of children for single filing statuses.

The personal exemption amount that can be deducted from AGI in calculating taxable income is phased out if AGI is above certain dollar limits, depending on filing status. ESPlanner takes into account the phase-out of personal exemptions based on these dollar limits indexed for inflation. The year-by-year phase-in of changes in the phase-out provisions enacted in the 2001 tax reform are included in ESPlanner's tax calculating code.

The Decision to Itemize. ESPlanner takes the maximum of the standard deduction or sum of itemized deductions, where the latter includes mortgage interest payments, property taxes, state and local income tax payments, and tax-deductible special expenditures the user specifies, such as charitable contributions. Note that state and local income tax payments are deductible only if they are being withheld from pay or the user makes estimated tax payments during the tax year. ESPlanner assumes withholding or prepayment.

The Phase-Out of Itemized Deductions. As modified in the 2001 tax reform, federal income tax rules phase out itemized deductions for high-income taxpayers (both married filing jointly and single payers). The reduction does not apply to certain components of the itemized deductions claimed — such as medical expenses, investment interest, and casualty and theft losses. Because ESPlanner does not distinguish between these and other sources of itemized deductions, the phase-out rules are applied to all itemized deductions.

The Child-Tax Credit. The child-tax credit depends on the number of qualifying children in the household. The tax credit is phased out if AGI is over a threshold, the value of which depends on marital status. The phase-out rate is $50 for each $1,000 of income in excess of the applicable threshold. The amount of the child-tax credit equals the smaller of a) the computed amount or b) the federal income tax liability net of the Earned Income Tax Credit (EITC). If the EITC exceeds the federal income tax liability, the child-tax credit is applied against payroll taxes.

The Earned Income Tax Credit. The program's calculation of the EITC adheres to the EITC worksheet in federal Form 1040. ESPlanner first checks for eligibility to receive the EITC based on a) investment income, b) taxable earned income, c) nontaxable earned income such as employer 401(k) contributions, d) earned income thresholds for households with no qualifying children, and earned income thresholds for households with at least one qualifying child. Next, the EITC is computed based on the EITC schedule for taxable and nontaxable income and the household's level of AGI.

The Taxation of Social Security Benefits. Social Security benefits are included in the federal income tax base in the following manner. If the sum of AGI and 50 percent of Social Security benefits falls short of a lower threshold, which is marital-status specific, then none of the benefits are taxable. If the sum exceeds the applicable dollar threshold, but the excess is less than a martial-status specific sum, the smaller of one-half of the excess or 50 percent of the benefit is taxable and is included in the federal income tax base. In addition, if the aforementioned excess is greater than the second dollar threshold, 85 percent of this excess or 85 percent of the benefit, whichever is smaller, is also added to the federal income tax base.

The Low-Income Tax Credit for Retirement Account Contributions. This nonrefundable tax credit was introduced in the 2001 tax law. The credit reimburses X percent of the individual's first

$2,000 in contributions to retirement accounts. The value of X for households with very low incomes is 50 percent, but it quickly phases out to zero at higher income levels.

Payroll Taxes

For purposes of this study, ESPlanner's payroll tax calculator is modified to incorporate employer-paid payroll taxes. In each year, the payroll tax for a married household is the sum of the two spouses' payroll taxes. Each spouse's tax equals the employee plus employer 12.4 percent Old-Age, Survivors, and Disability Insurance (OASDI) tax rate applied to labor earnings up to the taxable maximum level plus the employee plus employer 2.9 percent Hospital Insurance (HI) tax rate applied to all labor earnings.

Massachusetts State Income Taxes

Massachusetts taxes labor and interest and dividend income at a 5.95 percent rate.[1] The tax base includes earnings from wages and salaries, self-employment income, pension income, and distributions from tax-favored saving accounts, as well as other taxable receipts such as alimony. Federally taxable Social Security benefits are not included. A rental deduction, available to both single and joint filers, is allowed up to 50 percent of rent paid on one's principal residence or $2,500, whichever is smaller. A single $1,200 deduction is allowed for dependent children under the age of 12. Capital gains are taxed at a lower rate, but this feature of the Massachusetts tax code is not explicitly modeled.

II. The Calculation of Social Security Benefits

Social Security Retirement Benefits

Eligibility. Before ESPlanner provides household heads and spouses Social Security retirement benefits, it checks that they are *fully insured*. Individuals must be *fully insured* to receive retirement benefits based on their earnings records. Becoming fully insured requires sufficient contributions at a job (including self-employment) covered by Social Security. For those born after 1929, acquiring 40 *credits* prior to retirement suffices for fully insured status. Earnings between 1937 and 1951 are aggregated and divided by $400, and the result (rounded down to an integer number) are the pre-1952 credits which are added to the credits earned after 1950 in determining insured status. After 1951, workers earn one credit for each quarter of the year they work in Social Security-covered employment and earn above a specified minimum amount. The year of *first eligibility* for retirement benefits is the year in which the individual reaches age 62. The individual is *entitled* to retirement benefits after an application for benefits is submitted, but never before age 62.

Determination of Primary Insurance Amount (PIA). The PIA is the basis for all benefit payments made on a worker's earnings record. There are several steps in computing the PIA. *Base years* are computed as the years after 1950 up to the first month that entitlement to retirement benefits begins. For survivor benefits, base years include the year of the worker's death.

Elapsed Years. Elapsed years are computed as those years after 1950 (or after attainment of age 21, whichever occurs later) up to (but not including) the year of first eligibility. The maximum number of elapsed years for an earnings record is 40 (it could be shorter for purposes of calculating survivor benefits if the person dies prior to age 62).

Computation Years. Computation years are calculated as the number of elapsed years less five, or if that equals less than two is set at two years. Earnings in base years (up to the maximum taxable limit

in each year and through age 60 or two years prior to death, whichever occurs earlier) are wage-indexed according to economy-wide average wages. Of these, the highest earnings in years equaling the number of computation years are added together and the sum is divided by the number of months in computation years to yield Average Indexed Monthly Earnings (AIME).

Bend Points. The AIME is converted into a PIA using a formula with *bend points*. The bend point formula is specified as 90 percent of the first X dollars of AIME plus 32 percent of the next Y dollars of AIME plus 15 percent of the AIME in excess of Y dollars. The dollar amounts X and Y are also wage-indexed and are different for different eligibility years. The dollar amounts pertaining to the year of attaining age 60 (or, for survivor benefits, the second year before death, whichever is earlier) are applied in computing the PIA.

Benefits. A person who begins to collect benefits at his or her "normal retirement age" (currently age 65) receives the PIA as the monthly retirement benefit. In subsequent years, the monthly benefit is adjusted according to the Consumer Price Index (CPI) to maintain its purchasing power.

Increases in Normal Retirement Ages. After 2003 normal retirement ages are scheduled to increase by 2 months for every year that a person's 65th birthday occurs later than the year 2003. This progressive increase in the normal retirement age for those born later ceases between the years 2008 through 2020; those attaining age 65 in these years have a normal retirement age of 66. The postponement in retirement ages resumes after 2020 so those born after 2025 have a normal retirement age of 67. All cohorts attaining age 65 after that year have a normal retirement age of 67.

Reductions for Age. A person who begins to collect retirement benefits earlier than the normal retirement age receives a reduction for age. The reduction factor is 5/9 of 1 percent for each month of entitlement prior to the normal retirement age. The reduced benefit payment (except for the inflation adjustment) continues even after the person reaches or surpasses the normal retirement age. If the number of months of reduction exceeds 36 months (for example, in case of entitlement at age 62 when the normal retirement age is 67), the reduction factor is 5/12 of 1 percent for every additional month of early entitlement.

Delayed Retirement Credits. Those who begin to collect benefits after their normal retirement age (up to age 70) receive delayed retirement credits. The amount of the delayed retirement credit for each month of delayed entitlement depends on the year in which a person attains normal retirement age. For example, those attaining age 65 in 1997 receive an additional 5 percent in monthly benefits for each year of delay in entitlement. However, those attaining age 65 in the year 2008 will receive an additional 8 percent in benefits for each year of delayed entitlement.

Earnings Test. If a person continues to work and earn after the month of entitlement and the person is under age 65, benefits are reduced because of an earnings test. Beneficiaries lose $1 for each $2 earned above an earnings limit. The earnings limits are scheduled to grow with average wages in subsequent years. All benefits payable on a worker's earnings record, including the worker's own retirement benefits and spousal and child dependent benefits, are proportionally reduced by the testing of the worker's earnings.

Recomputation of Benefits. Earnings in any year after entitlement to benefits are automatically taken into account in a recomputation of the PIA for determining the subsequent year's benefit amount. However, these earnings are not indexed before they are included in the AIME calculation. If such

earnings are higher than some prior year's earnings (indexed earnings through age 60 or unindexed earnings after age 60), they result in an increase in the PIA and benefit payable. If they are lower than all previous year's earnings, they will not lower the PIA or benefits, since only the highest earnings in base years are included in the calculations.

Spousal and Child Dependent Benefits

Eligibility. Wives and husbands of insured workers (including divorced spouses) are entitled to *spousal benefits* if the couple was married for at least 10 years at the time of application for spousal benefits, the spouse is over age 62 or has in care a child under age 16 entitled to benefits under the insured worker's record, and the insured worker is collecting retirement benefits. Children of insured workers under age 16 are entitled to *child dependent benefits* if the child is unmarried and the worker is collecting retirement benefits.

Benefits. Spousal and child benefits are each 50 percent of the insured worker's PIA. Child dependent benefits may be lower only if the *family maximum* applies. Spousal benefits may be lower due to the family maximum, a reduction for age, the application of the earnings test, or the spouse's receipt of retirement benefits based on her or his own earnings record.

Family Maximum. All benefits paid under a worker's record (except retirement benefits or divorced spousal benefits) are reduced proportionately to bring them within the family maximum benefit level. The maximum benefits payable on a worker's earnings record is determined by applying a bend point formula to the PIA similar to that applied to the AIME in calculating the PIA. For example, the family maximum equals 150 percent of the first $X of PIA plus 272 percent of the next $Y of the PIA plus 134 percent of the next $Z of the PIA plus 175 percent of the PIA greater than $X+$Y+$Z. The values X, Y, and Z are adjusted for each year of the calculation according to the growth in economy-wide average wages. In case the spousal benefit is eliminated for any reason, the benefits payable on the insured worker's record are again subject to the family maximum test, treating the spouse as though she or he were not eligible for spousal benefits. This may result in higher benefits for children eligible for dependent benefits under the worker's record.

Reduction of Spousal Benefits for Age. Spouses eligible for the spousal benefit may elect to receive (may become entitled to) their benefits before normal retirement age. In this case the spousal benefit is reduced by 25/36 of 1 percent for each month of entitlement prior to normal retirement age. If the number of months of reduction exceeds 36 months (for example, in case of entitlement at age 62 when the normal retirement age is 67), the reduction factor is 5/12 of 1 percent for every additional month of early entitlement.

Earnings Testing of Spousal Benefits. If a spouse is earning above the amount allowed by the earnings test, the spousal benefits she or he is eligible to receive will be earnings tested according to the pre- and post-normal retirement schedule described above.

Redefinition of Spousal Benefits. If a spouse is already collecting retirement benefits, the spousal benefit is redefined as the greater of the excess of the spousal benefit over the spouse's own retirement benefit or zero.

Survivor Benefits (Widow(er), Father/Mother, and Children)

Eligibility. The surviving spouse of a deceased worker is eligible for *widow(er) benefits* if the widow(er) is at least age 60, is entitled (has applied for widow(er) benefits), the worker died fully in-

sured, and the widow(er) was married to the deceased worker for at least nine months. The widow(er) of a deceased worker is eligible for *father/mother benefits* if the widow(er) is entitled to benefits (has applied), the worker died fully insured, and the widow(er) has in care a child of the worker. A surviving child is eligible for *child survivor benefits* on the deceased worker's record if the child is under age 18 and is entitled (an application has been filed) and the worker was fully insured.

Survivor Benefits. Monthly benefits equal 100 percent of the worker's PIA for a widow(er); they equal 75 percent of the PIA for father/mother and child survivor benefits. Widow(er) and child survivor benefits may be lower only if the family maximum applies. Widow(er)s may become entitled to survivor benefits earlier than normal retirement age, but not earlier than age 60. In this case the reduction is 19/40 of 1 percent for each month of entitlement prior to normal retirement age. After the widow(er) is 62, she or he may be entitled to retirement benefits based on her or his own past covered earnings record. In this case the widow(er) benefits are redefined as the excess over own retirement benefit or zero, whichever is greater. Finally, widow(er) survivor and own retirement benefits are also subject to the earnings test. If the deceased worker was already collecting a reduced retirement insurance benefit, the widow(er)'s benefit cannot be greater than the reduced widow(er) benefit or the greater of 82.5 percent of the worker's PIA or the worker's own retirement benefit. If the deceased worker was already collecting a retirement insurance benefit greater than the PIA because of delayed retirement, the widow(er) is granted the full dollar amount of the delayed retirement credit over and above the (reduced) widow(er) benefit. Father/mother benefits are not similarly augmented by delayed retirement credits the deceased worker may have been receiving.

Father/Mother Benefits. These benefits may be reduced if the family maximum applies or if the father or mother is entitled to his or her own retirement benefit. In this case the benefit is redefined as the excess over the father or mother's own retirement benefit or zero, whichever is greater. Father/mother benefits are also subject to the earnings test. However, they are not reduced for age. For those eligible to receive both widow(er) and father/mother benefits, the program calculates both and takes the larger benefit.

Calculation of a Deceased Worker's PIA. The calculation of survivor benefits in the case of a widow(er) uses the larger of two alternative calculations of the deceased worker's PIA. These are the "wage-indexing" method and the "re-indexing" method. The year up to which the worker's wages are indexed may be different, depending upon whether the deceased worker would have become age 62 before or after the widow(er) attains age 60.

The Wage-Indexing Method. The last year for indexing earnings is the earlier of a) the year the worker dies minus two years or b) the year the worker would have attained age 60. Bend point formula dollar amounts are taken from the earlier of the year the worker dies or the year the worker would have attained age 62. The PIA thus calculated is inflated by the CPI up to the year the widow(er) turns age 60 (if later) to obtain the PIA value on which widower benefits would be based. Where applicable, these benefits are then adjusted for the family maximum, reduction for age, delayed retirement credits, and the earnings test.

The Re-indexing Method. The worker's original earnings are indexed up to the earlier of the year the widow(er) attains age 58 or b) the year the worker attains age 60. The elapsed years are computed as the number of years from 1951 (or the worker's age 22, if later) through the year the

widow(er) attains age 60. The computation years equal elapsed years minus five years (computation years cannot be less than two). Bend point formula dollar values are applied from the year the widow(er) attains age 60. There is no subsequent indexing of the PIA for inflation.

The Sequencing of Widow(er) Benefit Calculations. Widow(er) benefit reductions proceed in a particular sequence. First the widow(er) plus children's benefits are subjected to the family maximum. Second, the widow(er) benefit is reduced for early entitlement (of the widow(er) prior to normal retirement age). Third, the widow(er) benefit is compared to the widow(er)'s own retirement benefit if the individual is entitled to the latter. Fourth, the widow(er) benefit is redefined as the excess over her or his own benefit if the latter benefit is positive. Finally, the earnings test is applied, first to the widow(er)'s own benefit and then to the widow(er) benefit that is in excess of own benefit. If the widow(er) benefit is eliminated as a result of these tests, the benefits payable on the insured worker's record are subjected to the family maximum test again, treating the widow(er) as though she or he were not eligible for the widow(er) benefit. This procedure can potentially increase children's benefits if the family maximum limit was binding the first time through.

III. The Calculation of Non-Social Security Benefits

The calculation of non-Social Security benefits occurs in two stages. First, fungible (cash) benefits are calculated within ESPlanner, taking into account each fungible benefit program's asset and income tests and eligibility restrictions. Second, the household's nonfungible benefits in each year are calculated, based on the household's asset accumulation and income path as determined by ESPlanner. While nonfungible benefits are not incorporated in ESPlanner's consumption smoothing optimization, they are included in the calculation of average and marginal net tax rates. Specifically, in the formulas for those tax rates specified above, the nonfungible benefits in a particular year are treated as additional spending in that year for purposes of determining the expected present values of spending when the fiscal system is assumed to be operational.

The first-stage calculations involve dynamic programming in which fungible benefit levels are determined in each year for each possible level of household assets and income in that year. This first stage also includes the calculation of federal income, state income, and payroll taxes.

The fungible benefits incorporated in ESPlanner's consumption smoothing are:

- Social Security retirement, spousal, survivor, mother, father, child, and divorcee benefits
- Transitional Assistance to Families with Dependent Children (TAFDC) or TANF
- Supplemental Security Income (SSI)
- Housing assistance programs
- Low-Income Home Energy Assistance Program (LIHEAP)

The nonfungible benefits calculated in the second stage and treated as additional spending are:

- Food Stamps
- Special Supplemental Nutrition Program for Women, Infants and Children (WIC)
- Medicaid
- Medicare

Family Composition and Benefit Eligibility. In computing the fungible and nonfungible benefits available to particular households in a particular year, we take into account how eligibility for particular benefits within each program depends on the size and composition of the family. For example, in a year when a couple has two children at home, eligibility is based on the income standards for a family of four; when the children have left the household upon reaching age 19, eligibility is based on the income standards for a family of two.

Asset Tests. We include asset tests for each type of benefit that stipulates such a test. The following table indicates asset limits for program eligibility.

Program	Asset Test Limits
TAFDC	$2,500 for a family
SSI	$2,000 for a single; $3,000 for a couple
Medicaid	no asset test under 65; over 65 same as SSI
QMB/SLMB	$4,000 for a single; $6,000 for a couple
Food Stamps	$2,000 for a family with members under 60 / $3,000 for a family with members over 60

Prepaid funeral arrangements, up to a certain limit, usually are not counted as assets. In implementing our asset tests, we assume that the first $3,000 in assets held by a couple is exempt from the asset test and treated as a funeral arrangement.

We consider two different ways to implement asset tests. The first assumes that if assets at the beginning of the year exceed a particular program's eligibility standard, the family loses eligibility for benefits from that program for the entire year. The second calculates, for each program, the amount of assets in excess of that program's asset limit and reduces that program's benefits by the amount of excess benefits, with the maximum reduction being the entire benefit.

Growth in Benefits over Time. In our explanation of the benefits calculation below, we omit a description of our adjustment of real benefit levels in light of growth over time in economy-wide living standards. But we do make such an adjustment. Specifically, we assume that all benefit amounts, brackets, premiums, and deductions grow in real terms at the assumed rate of labor productivity. In our base case, this rate is 1 percent.

Adjusting for the Probability of Benefit Receipt. In our analysis we incorporate the probability of benefit receipt in the case of benefits triggered by illness (e.g., Medicare and Medicaid benefits) or by the rationing of program participation (e.g., housing assistance, LIHEAP, and WIC). For both types of programs, we first determine the average benefit (net of the asset test) per recipient in a particular program and then multiply by the probability of actually receiving the benefit in question.

In forming our measures of average benefits received, we assume that our household members apply for all benefits for which they may be eligible. For example, when we calculate average Medicaid benefits received by 70-year-old males who meet the Medicaid income-eligibility test, we assume that all such males apply for those benefits. As another example, we assume that all income-eligible households apply for housing assistance, but that their chance of receiving the average housing benefit equals the ratio of the number of recipient households to the number of applicant households.

Modeling Specific Benefit Programs

Each program has eligibility rules and benefit formulas that deal with special cases. We consider the rules and benefit formulas that apply to the standard cases. We describe below the eligibility rules and benefit formulas for each of the transfer programs.

Transitional Aid to Families with Dependent Children (TAFDC). TAFDC is a cash-assistance program designed to help needy families that include a dependent child or a pregnant woman. TAFDC is the formal name in Massachusetts of the program formerly known as AFDC (Aid to Families with Dependent Children); most other states have adopted the name Temporary Assistance to Needy Families (TANF). The terms "transitional" and "temporary" reflect the new program objectives: to assist needy families and to encourage their quick return to the labor force. Under the current TAFDC rules, eligible households generally may receive assistance for no more than 24 months during any five-year period.

There are several steps in defining eligibility for benefits. The calculations needed to determine eligibility, both nonfinancial and financial, and the benefit levels can be complicated even for the standard cases we consider.

Nonfinancial eligibility requires that the child be deprived of the care or support of at least one parent. Deprivation factors are death, continued absence, physical or mental incapacity, and unemployment or underemployment of (a) parent(s). A dependent child may be under age 19 or, if a full-time student, age 19. We assume that our family units meet these program-specific requirements.

Household Size	Eligibility Standard (185% of the Need Standard)	Need Standard/ Payment Standard
2	$876	$474
3	1,045	565
4	1,204	651

To meet requirements for financial eligibility, a household must pass two income tests. First, family unit gross income cannot exceed 185 percent of the need standard that applies, given family size. Second, gross income minus certain applicable deductions cannot exceed the need standard itself.

Standard monthly deductions include:

- A $90 deduction for each employed family member
- An extra $30 plus one-half of gross income above $120 deduction for the employed TAFDC benefit recipients or applicants who received benefits in the previous four months.
- Dependent-care deductions that range between $50 to $200 for a child under age two and $44-$175 for a child two or over, depending on the hours a recipient worked.

We applied the $90 deduction per working individual for all 12 months of each year of eligibility and the maximum deduction levels for child care for children between ages one and five. To avoid complications in our dynamic programming algorithm, we did not implement the extra deduction.

If the family unit passes both income tests, it gets financial assistance defined as the difference between the maximum payment standard and net income after deductions. In accordance with standard program restrictions on the length of benefit receipt, we limited the receipt of benefits to no more than 24

months within any five-year period. Hence, for those of our stylized households who are eligible for assistance, benefits follow a cyclical pattern: two years on followed by three years off, provided the asset test criterion is met. Hitting the TAFDC asset test limits, however, would disqualify a household from receiving benefits in one of the years and would result in modification of the TAFDC lifetime benefits pattern in levels and/or in timing. TAFDC regulation in Massachusetts assumes that families receiving benefits may also receive $40 of monthly housing allowance, which we add on top of the monthly TAFDC benefit.

Sources

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Supplemental Security Income (SSI)

Family Size	Income Limit (Federal)	Income Limit (Massachusetts)
1	$512	$641
2	769	971

Supplemental Security Income is a federal program that makes monthly payments to people who have limited income and resources if they are 65 or older or are disabled. In our study we ignore payments to the disabled. If individuals meet the program's income limits, after deductions, they receive monthly benefits. Payments up to the federal income limits are received from the federal government, while states provide supplements that are calculated as the difference between federal and state income limits. Standard deductions are $20 per month plus a) an additional $65 per month if labor income exceeds $65 per month and b) one-half of wages over $65. In Massachusetts, an SSI-eligible person is automatically enrolled in Medicaid.

For every year we first determine age eligibility for each spouse, then income eligibility for the household. When both are eligible, their combined benefit equals the difference between the income limit for a two-person household and the spouses' combined income after deductions. When only one spouse is age-eligible, the eligible spouse's benefit is calculated according to the regulations using either an

individual- or couple-income limit, depending on the level of the income of the ineligible spouse. The SSI asset test was implemented as described above.

Sources

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Food Stamps

The Food Stamp program seeks to improve the diets of low-income families by increasing their food-purchasing power. Households must satisfy both state and federal requirements to qualify for Food Stamps. There are several steps in determining program eligibility and calculating the value of the stamp benefits.

First, gross monthly (earned and unearned) income cannot exceed the limits specified in the table below for households of different sizes. Unearned income includes Social Security and private pension benefits, SSI benefits, unemployment insurance benefits, and TAFDC payments. In our study we include SSI and TAFDC payments as part of the income used to calculate the value of Food Stamps.

The following monthly deductions apply:

- $134 per household
- 20 percent of gross income
- Dependent day care: under age two, up to $200 per month; over age two, up to $175 per month. We apply here the TAFDC program dependent care deduction for every child between the ages of one and five.
- Medical expenses of individuals over 60 years old are deductible beyond the first $35. These expenses are calculated as the sum of payments for prescription drugs, Medicare premiums, deductibles, and coinsurance payments.
- Excess housing costs, which are defined as housing expenses in excess of half of the household's income after other deductions. Prior to age 60, the maximum level of deductible excess housing costs is $300. In calculating Food Stamp benefits, we include housing assistance benefits (see below) as part of gross monthly income.

Net monthly income (monthly income after deductions) cannot exceed the family-size-specific limits given in the table below. The value of the stamps is the maximum monthly allotment less 30 percent

of net income. The 30 percent figure reflects the expectation that recipient households will spend about 30 percent of their resources on food.

Household Size	Gross Monthly Income Limitation		Monthly Net Income Limits	Maximum Monthly Allotment
	Under 60 Years	Over 60 Years or Disabled		
1	$893	$1,133	$687	$127
2	1,199	1,521	922	234
3	1,504	1,909	1,157	335
4	1,810	2,297	1,392	426

As indicated, calculating the annual value of Food Stamp benefits for Medicare recipients requires adjusting for Medicare deductibles and coinsurance payments. The coinsurance payments depend on actual utilization of medical services. Our estimate of Food Stamp benefits is determined by the weighted average of four possible medical outcomes: only the husband receives medical services subject to Medicare copayments, only the wife receives medical services subject to Medicare copayments, both spouses receive medical services subject to Medicare copayments, and neither spouse receives medical services subject to Medicare copayments.

In calculating the Food Stamp benefits for the three cases in which one or both spouses receive Medicare-covered medical services, we assume that all medical services occur and are paid for in a single month that differs for the two spouses.

The weights used in forming the weighted average benefit are determined by the age-specific probabilities of the husband and wife receiving Medicare benefits in each year.

As explained above, Food Stamp benefits are not included in the *ESPlanner's* consumption smoothing used to generate each household's lifetime profile of tax payments and asset accumulation. However, this asset accumulation profile is used to implement the Food Stamps asset test. We apply the test by simply reducing benefits from that program by the value of excess assets in each year.

Sources

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Special Supplemental Nutrition Program for Women, Infants and Children (WIC). WIC is designed to improve the health of pregnant women, new mothers, and their infants. WIC targets population groups that have low income and are at nutritional risk, specifically:

- Pregnant women through pregnancy and up to six weeks after birth or after pregnancy ends
- Breastfeeding women through their infant's first birthday
- Infants through their first birthday
- Children up to age five

WIC benefits include supplemental nutrition, nutrition counseling, and screening services. In most WIC state agencies, WIC participants receive actual food items or food vouchers to purchase specific foods. Different food packages are provided for different categories of participants.

Although federally funded, WIC is administrated by state agencies and managed by local agencies. WIC eligibility is based on income and nutritional risk. In order to qualify, WIC applicants must show medically verified evidence of health or nutritional risk. In addition, their family income generally must be below 185 percent of the federal poverty level (FPL). Certain applicants can be judged income-eligible for WIC based on their participation in Food Stamps, Medicaid, and AFDC/TANF programs.

WIC does not serve all eligible individuals; participation is limited by the availability of federal funding. Usually, program applicants are ranked by need. The program is estimated to serve about 81 percent of women, infant, and child applicants.

The reported 2000 average monthly WIC benefit for recipients in Massachusetts was $29. For the nation as a whole, the average monthly WIC benefit was estimated at $33. For simplicity, when the household is eligible for Food Stamps, our model assumes the family also applies for WIC. Pregnant women, infants, and young children are allocated the average WIC benefit with an 81 percent probability. The annual value of the $29 multiplied by .81 is $282.

Sources

1. *Women, Infants And Children.* U. S. Department of Agriculture. 2000. Internet: http://www.fns.usda.gov/wic/FAQs/FAQ.HTM.
2. *WIC Program*. Food and Nutrition Service. Program Data. Internet: http://www.fns.usda.gov/pd/wichome.htm.
3. *1998 Green Book*. Program Descriptions. Internet: http://aspe.hhs.gov/98gb/15bother.htm.

Food Stamp Deduction for Out-of-Pocket Expenditures on Prescription Drugs. The elderly spend a considerable part of their income on prescription drugs. Most are covered by one or another form of private or public medical insurance that pays for part or all of their prescriptions. However, about one-third of Medicare beneficiaries have no drug coverage from any source.

The Food Stamp program provides a deduction for the elderly against income, based on out-of-pocket health expenses. From the sources listed below, we estimated relative profiles by age of out-of-pocket spending on prescription drugs in 1996 for the elderly. We did this separately for those who were covered by drug insurance and those who were not. We then applied these profiles to the average estimated year 2000 values of out-of-pocket expenditures by different groups of Medicare beneficiaries to obtain age- and sex-specific average out-of-pocket prescription drug expenditures for the following two groups: those covered by Medicaid and those having other coverage, including no coverage. Next we inflated those values to get to year 2001 levels. Finally, we deducted corresponding monthly amounts

in order to determine the net income used to calculate Food Stamp benefits as medical-related deductions for individuals over 60. Annual values are given in the table below; we extended average prescription drug expenditures of the group ages 65-70 to the group ages 60-64**.**

Sources

1. *Universal Prescription Drug Benefit Necessary to Ensure Affordable Coverage for All Medicare Beneficiaries*. Health Care Financing Administration. March 2000. Internet: http://cms.hhs.gov/media/press/release.asp?Counter=179.
2. *Out-of-Pocket-Spending on Prescription Drugs by Women and Men Age 65 and Older: 1999 Projections*. Prepared by Mary Gibson and Lisa Foley. AARP. April 2000.
3. *Effects of Prescription Drug Coverage on Spending and Utilization*. Internet: http://www.aspe.hhs.gov/health/reports/drugstudy/chap02.htm.
4. Testimony of Michael Hash, Deputy Administrator of the HCFA, on prescription drug coverage for Medicare beneficiaries before the House Commerce Committee, Subcommittee on Health and Environment. September 28, 1999. Internet: http://cms.hhs.gov/media/press/testimony.asp?Counter=546.

Medicare. Medicare is a federal health insurance program for the aged and disabled; we ignore disability benefits and focus on the benefits for the aged only. The program incorporates two parts: Hospital Insurance (HI), also known as Part A, and Supplemental Medical Insurance (SMI), also known as Part B.

Medicare Part A primarily is financed through a mandatory 2.9 percent payroll tax. Part B is financed in part by participant premium payments of $45.50 per month regardless of benefits received. In addition, there are specific cost-sharing arrangements. In particular, under Part A in each benefit period a recipient of benefits pays: $776 for a hospital stay of 1-60 days; an additional $194 per day for days 61-90; an additional $338 per day for days 91-150; and all costs for each day beyond 150 days.

We assume that at age 65 both husband and wife enroll in both Part A and Part B. Individuals typically enroll in both plans (in 1998, 95 percent of all enrollees joined Plan A and Plan B at the same time). We assume that in each year an individual, if she or he receives benefits, stays in the hospital less than 60 days and so pays the fixed fee of $776. Under Part B, participants receiving benefits must first meet an annual $100 deductible and, in most cases, cover 20 percent of the approved amount after the deductible.

In our calculations, we impute to each age-eligible spouse at a particular age their expected net Medicare benefits at that age. If a participant is exempt from cost-sharing and/or premium payments, we consider that Medicaid covers those costs, as described in the section below on Medicare-Medicaid interactions. Any actual out-of-pocket cost-sharing and premium payments are correspondingly deducted from the gross income in calculations of the Food Stamp benefits for eligible individuals.

Our calculation of average expected Medicare benefits at a given age multiplies the age- and sex-specific probability that participants receive benefits by the average benefit received at that age by benefit recipients (we apply the same probability for Part A and Part B). According to 1996-1997 data, 76.9 percent of elderly male participants and 84.7 percent of elderly female participants receive Medicare benefits.

Reimbursement per Person Enrolled (by Age)
1997 Preliminary Annual Summary

	Part A		Part B	
Age	**Men**	**Women**	**Men**	**Women**
65 & Over	$3,062	$3,024	$1,674	$1,565
65, 66	1,748	1,526	1,178	1,173
67, 68	1,982	1,709	1,312	1,250
69, 70	2,301	1,987	1,451	1,376
71, 72	2,548	2,220	1,581	1,471
73, 74	2,867	2,578	1,699	1,546
65-69	1,930	1,676	1,279	1,239
70-74	2,638	2,328	1,607	1,488
75-79	3,493	3,144	1,887	1,668
80-84	4,534	4,132	2,107	1,806
85 & Over	5,562	5,253	2,139	1,847

Our data on Medicare benefits for the aged in 1997 come from the Health Care Financing Administration (HCFA), now called the Centers for Medicare and Medicaid Services (CMS). HCFA provides average Medicare benefits under Part A and Part B, classified by age and sex. Finding that, in the aggregate, average benefits per person enrolled were 26 percent and 5 percent greater, respectively, under Plan A and Plan B, in Massachusetts compared to the national averages, we incorporate that adjustment for all age cohorts and both sexes. We converted all 1997 amounts to 2000 dollars using the CPI.

Sources

1. *Medicare*. Health Care Financing Administration. Internet: http://cms.hhs.gov/medicare/.
2. *2000 Green Book: MEDICARE*. Internet: http://aspe.hhs.gov/2000gb/sec2.txt.

Medicaid. Medicaid is a joint federal-state program that provides medical care to the poor. In 1996 Medicaid recipients constituted 14 percent of the U.S. population. Among children to age five and elders at least age 85, the coverage rate reached 35 percent. The 1998 Current Population Survey explored health insurance coverage of low-income, single-family married households with two children. The survey indicated that over 50 percent of all Medicaid income-eligible infants, children, and adults had no access to any other form of private or public health insurance. However, not all eligible individuals apply for Medicaid. Of Medicaid eligibles with no any other type of insurance, only 60 percent of infants, 40 percent of children, and 20 percent of adults were enrolled in Medicaid in 1998. For purposes of this study, however, we assume that our households, when eligible, apply for and receive all Medicaid benefits to which they are entitled.

MassHealth, the "qualified vendor" to the state's Medicaid population, provides the following:

- Inpatient hospital services
- Outpatient services: hospitals, clinics, doctors, dentists (limited dental coverage for adults), family planning, and home health care
- Medical services: lab tests, X-rays, therapies, pharmacy services, dental services, eyeglasses, hearing aids, medical equipment and supplies, adult day health, and adult foster care
- Mental health and substance abuse services: inpatient and outpatient

- Living in nursing homes
- Payment of the Medicare premium, coinsurance, and deductibles for certain groups of elderly

Like Medicare, Medicaid operates as a vendor payment program; recipients receive benefits directly in the form of medical services provided by qualified vendors. Benefits are provided as long as the individual meets general and financial eligibility criteria. Financial eligibility criteria include income eligibility requirements, which may be different for different family members, and asset eligibility requirements. MassHealth Standard Program specifies that the family monthly income before taxes and deductions cannot exceed:

- 200 percent of the Federal Poverty Level (FPL) for pregnant women
- 150 percent of the FPL for children under age 19
- 133 percent of the FPL for parents with children under age 19

Under MassHealth the income limit for an eligible individual or couple aged 65 and over is 100 percent of FPL. In addition, in Massachusetts if an individual is eligible for SSI, she or he also is eligible for Medicaid. The table below presents the respective income limits.

	Federal Poverty Levels			
Family Size	**100%**	**133%**	**150%**	**200%**
1	$687	$914	$1,030	$1,374
2	922	1,226	1,383	1,844
3	1,157	1,539	1,735	2,314
4	1,392	1,851	2,088	2,784

Note: Income standards as of April 1, 1999.

Medicaid eligibility may be extended to individuals with incomes greater than the above income limits if they are deemed "medically needy." States provide residual financing of such individuals' medical treatment costs, provided they spend their excess resources (income and assets) down to the eligibility limits. This is particularly the case for individuals moving into nursing homes with insufficient resources to fully finance their stays. For simplicity, we do not consider coverage of the medically needy in this analysis.

In each year we determine for each family member of a particular age and sex if she or he meets appropriate income standards of eligibility and then allocate to that individual the Medicaid age- and sex-specific benefit projected for that year. To adjust for the fact that for some age groups the Massachusetts data show a greater number of recipients than eligibles, in calculating average benefits we divided total expenditures by the maximum of a) the number of eligibles and b) the number of recipients. When the beneficiary in our stylized case is a child under 19, we ignore gender difference in benefits. Our estimates of the average benefits for the most recent data, for 1998, are presented in the table below in the column headed "Reported Benefit per Recipient."

We make two adjustments to these benefit amounts. One is for Medicaid-financed nursing home stays. The other is for Medicaid payment of the Part B Medicare premium for certain low-income individuals.

From the 1995 National Nursing Home Survey, we know the age distribution of nursing home residents. Assuming the same age distribution for 1997 Massachusetts Medicaid recipients residing in nursing homes, we obtain counts of Medicaid-financed nursing home residents by age. Comparing these numbers with the total number of Medicaid participants in particular age groups permits us to determine the probability that a Medicaid participant of a particular age will reside in a nursing home. This probability is multiplied by the average Medicaid expenditure per nursing home resident.

If a person over age 65 is eligible for Medicaid, her or his Medicare cost-sharing will be partially or fully financed by Medicaid. There are two broad groups of dual-eligibles: those for whom Medicaid pays only Medicare Part B premiums (" SLMB eligibles") and those who get extensive coverage from Medicaid (see the discussion on Medicaid-Medicare interactions below). Our calculated average benefit values for aged eligibles reflect Medicaid payments made for both groups. However, we impute full Medicaid benefits only to the elderly with incomes less than 100 percent of the federal poverty line, and we treat SLMB eligibles separately. Specifically, for those over 65 who are eligible for the full coverage, after adjustment for nursing home benefits we further adjust the average Medicaid benefits by excluding payments for SLMB eligibles, using data on the fraction (4.6 percent) of those receiving benefits from both Medicare and Medicaid who are SLMB recipients, the size of the SLMB Medicaid benefit (equal to the annual Part B premium), and the overall average Medicaid benefit net of nursing home financing. Our final calculated adjusted age- and sex-specific Medicaid benefits for 1998 appear in the table below. We use the CPI to measure 1998 benefit levels in 2001 dollars.

To estimate our benefits net of nursing home stay financing, we start with the data on age distribution of nursing home residents in the 1997 Nursing Home Surveys. With information on age profile and the average duration of stay from the survey as well as with data on total number of nursing home residents financed by Medicaid from the Health Care Financing Administration, we estimate the age profile of the Medicaid nursing home recipients in 1997. We then apply that profile to the most recent 1998 Medicaid data on recipients. Observing that there is little variation in daily charges in nursing homes for different age groups, we distribute the total 1998 Medicaid expenditure for nursing home financing proportionally to the number of recipients in each age group. In this way, we estimate 1998 non-nursing-home recipients, expenditures, and average benefits for different cohorts of men and women nationwide. After further adjustment for exclusion of the SLMB recipients (assuming the same fixed proportion of the SLMB recipients in each age group), we compare the resulting average benefits per recipient to the initial reported benefits we started with and derive corresponding age- and sex- specific ratios. We then apply these ratios to the reported 1998 Massachusetts benefits per recipient to estimate the MassHealth benefits net of nursing homes and SLMB program financing in Massachusetts. Our final calculated adjusted age- and sex-specific Medicaid benefits per recipient in Massachusetts for 1998 appear in the table below. Finally, we estimate benefits per eligible in Massachusetts by applying 1997 Massachusetts age-specific probabilities of being eligible and getting benefits. We use the CPI to measure 1998 benefit levels in 2001 dollars.

In each year we determine for each family member of a particular age and sex whether she or he meets the appropriate income standards for eligibility and then allocate to that individual the Medicaid age- and sex-specific benefit projected for that year. When the beneficiary in our stylized case is a child under 19, we ignore gender difference in benefits.

Estimated 1998 Medicaid Benefits in Massachusetts Net of Nursing Home Stay and the SLMB Program Financing

	Reported Benefit Per Recipient		Estimated Adjustment Ratio		Adjusted 1998 Benefits Per Recipient		1997 Probabilities for Eligibles	Estimated Net Benefits Per Eligible	
	Male	Female	Male	Female	Male	Female	Unisex	Male	Female
Total	$4,917	$5,179							
Under 1	3,458	3,276	100%	100%	$3,458	$3,276	0.82	$2,838	$2,689
1-5	1,651	1,468	100%	100%	1,651	1,468	0.88	1,459	1,297
6-14	1,782	1,446	100%	100%	1,782	1,446	0.90	1,596	1,296
15-20	2,306	2,541	100%	100%	2,306	2,541	0.89	2,048	2,257
21-44	7,385	3,937	92%	93%	6,824	3,662	0.86	5,857	3,143
45-64	9,823	7,967	94%	97%	9,263	7,758	0.88	8,157	6,832
65-74	9,826	7,739	70%	74%	6,865	5,734	0.94	6,437	5,377
75-84	12,633	12,705	59%	66%	7,501	8,400	1.00	7,501	8,400
85 & Over	12,013	15,349	51%	67%	6,170	10,304	1.00	6,170	10,304

Sources

1. *HCFA-2082 Report for Federal Fiscal Year 1998*. Health Care Financing Administration. Internet: http://cms.hhs.gov/medicaid/msis/2082-98.asp.
2. *Information about MassHealth*. The Division of Medical Assistance. Massachusetts. Internet: http://www.state.ma.us/dma/masshealthinfo/applmemb_IDX.htm.
3. *MassHealth Member Booklet*. Internet: www.state.ma.us/dma/masshealthinfo/memberbklt.pdf.
4. *Medicaid*. Health Care Financing Administration. Internet: http://cms.hhs.gov/medicaid/.
5. *The National Nursing Home Survey: 1997 Summary*. National Center for Health Statistics. Internet: http://www.cdc.gov/nchs/data/series/sr_13/sr13_147.pdf.

Medicaid-Medicare Interactions

1999 Monthly Income Limits

	Pays Medicare's	Individual	Couple
QMB	Premium, deductibles, and coinsurance	$696	$938
SLMB	Part B Premium	$835	$1,125

Source: Medicare Office.

Medicare beneficiaries with low incomes and limited resources may receive help to pay Medicare premiums and other cost-sharing payments from their state Medicaid programs. Medicaid's level of assistance varies, based on the Medicare beneficiary's characteristics. Medicare beneficiaries who are

eligible for Medicaid assistance fall into two categories: those who are sufficiently poor and qualify for full Medicaid benefits, and those who receive partial assistance from Medicaid. In the second group, the two most important categories are Qualified Medicare Beneficiaries (QMB) and Specified Low-Income Medicare Beneficiaries (SLMB). To qualify, one must meet asset restrictions and have limited income, as specified in the table. For QMBs, income must be below 100 percent of the FPL, while for SLMBs it must be below 120 percent of the FPL. The state pays Medicare premiums as well as deductibles and coinsurance for QMBs. The basic difference between the fully covered and the QMBs is that states may impose limits on payments to QMBs. For SLMBs, Medicaid pays only Part B monthly premiums. The asset test limits for QMB and SLMB programs are $4,000 and $6,000 for an individual and a couple, respectively.

For persons enrolled in both Medicare and Medicaid, the latter is always payer of last resort, which means that any Medicare-covered services are paid by Medicare before any payments are made by the Medicaid program. In 1995, there were 6 million dual-eligible beneficiaries nationwide. They constituted 16 percent of the Medicare enrollees and 17 percent of the Medicaid population. In 1996, 4.6 percent of the dual-eligibles were SLMBs, 45 percent were QMBs, and 50.4 percent received full Medicaid coverage.

The presence of dual eligibles means that the reported Medicaid payments for individuals over 65 will include Medicare cost-sharing payments as well as other Medicaid-provided services. Assuming also that any out-of-pocket Medicare copayments are deducted from the gross income included in the calculation of value of Food Stamp benefits, we develop a measure of combined net payments from Medicare, Medicaid, and Food Sstamps.

Those who do not qualify for QMB or SLMB status pay Medicare copayments and premiums in the full amounts, and their out-of-pocket health expenditures are included as medical-related deductions in our model's Food Stamp benefit calculations. The households involved here have annual incomes between about $13,500 and $18,000; above $18,000, they no longer qualify for Medicare copayment subsidies but still are eligible for Food Stamps because the latter's gross income standards for seniors are higher. Generally, these households receive no Medicaid benefits and fully cost-share with Medicare but receive somewhat higher Food Stamp benefits as a result of these additional medical cost deductions.

For those who are SLMBs (couples with annual incomes between about $11,200 and $13,500), Medicaid covers only Medicare Part B premiums, which we include as a transfer payment. We do not impute to them any other Medicaid benefits; SLMBs still cost-share with Medicare, and their out-of-pocket Medicare cost-sharing payments, which do not involve the Part B premiums paid on their behalf, are deductible in the Food Stamps income calculation.

Finally, poor elderly couples (those with annual incomes less than about $11,200) pay no Medicare costs and have no Medicare-related deductions when it comes to determining income by the Food Stamps program. We do not distinguish between fully covered and QMB beneficiaries: when income of our household falls below 100 percent of the FPL, we simply impute calculated average Medicaid benefits from the table and do not deduct Medicare-related premiums, deductibles, and coinsurance from their gross income. When individuals temporarily lose their eligibility for the full Medicaid coverage based on the asset test and receive reduced benefits, we assume that that they remain eligible for the Medicaid subsidy of Medicare copayments under the QMB program.

Sources

1. *A Profile of QMB-Eligible and SLMB-Eligible Medicare Beneficiaries*. Barents Group LLC: Prepared for Health Care Financing Administration. April 7,1999.
2. *List and Definition of Dual Eligibles*. Health Care Financing Administration. Internet: http://www.cms.hhs.gov/dualeligibles/bbadedef.asp.

Housing Assistance[2]

A number of federal programs address the housing needs of lower-income households. Three broad categories of housing aid are available: subsidized rental housing, public housing, and home ownership opportunities for low-income, first-time home buyers.

Rental assistance programs generally reduce tenants' rent payments by a fixed percentage, usually 30 percent or higher, depending on the treatment of heating costs of their adjusted income, with the government paying the remaining portion of the rent. In Massachusetts, there are three types of rental assistance programs: the Section 8 program, the Massachusetts Rental Voucher Program (MRVP), and the Alternative Housing Voucher Program (AHVP). The federal government funds Section 8 assistance, and the state funds the MRVP and AHVP programs. While the income-eligibility limit for the Section 8 program is 80 percent of the area median income ($50,200 for a family of four in Boston), a participant in the state rental voucher program or the alternative program can earn no more than 200 percent of the federal poverty level ($34,100 for a household of 4, as of April 2000). Income limits depend on the size of the household.

Public housing apartments are built and subsidized by either the state or federal government. The rent a public housing tenant pays is based on household income and whether the costs of any utilities are included: 30 percent of net income for rent if the rent includes any basic utilities and 25 percent of net income if no utilities are provided. To be eligible to live in public housing, a household typically must earn no more than 80 percent of the area median income. Income limits also vary depending on the number of persons in the household and the region.

A variety of programs are available to help low- or moderate- income people purchase a home. Most programs are limited to first-time homebuyers. Federal government assistance comes with the long-term commitments to reduce mortgage interest, when interest subsidies are provided for mortgages financed by private lenders. Those programs generally limit combined mortgage payments, property taxes, and insurance costs to a fixed percentage of income. The current percentage is 28. As an example, the Soft Second Mortgage Program is a state-funded program that helps with the purchase of first homes. The program requires a minimum 5 percent downpayment. The state will subsidize a second mortgage on behalf of a homeowner who also has a conventional mortgage. In 1997, 11 percent of all the assisted units were newly purchased first homes; the rest were rental units.

Housing assistance is not provided to all households that qualify for aid. Each year a limited amount of federal funding is allocated to new and existing housing assistance. As a result, in most cases new applicants are put on very long (one- to two-year) waiting list.

Several studies of housing and welfare reform document that in 1996 approximately one quarter of the families receiving AFDC/TANF benefits lived in assisted housing. However, this ratio varied significantly from state to state. Barbara Sard and Jennifer Daskal (1998), analyzing data for Massachu-

setts, showed that estimates of the percentage of AFDC households that also received housing assistance in 1996 ranged between 32 percent and 43 percent. Daskal (1998) presented estimates of the percentage of the poor receiving housing assistance classified by various characteristics. At the aggregate level, she showed that 40 percent of the families with incomes less than 50 percent of the FPL received some form of rent subsidy. For incomes between 50 percent and 99 percent of the FPL, between 100 percent and 149 percent of the FPL, and between 149 percent and 200 percent of the FPL, respective recipient rates were 33 percent, 21 percent, and 12 percent. Our analysis uses these rates as income-specific probabilities of a household's receiving some form of subsidy.

In our stylized cases, our households rent living accommodations, and if income-eligible, we assume that they apply to the rent assistance program. The just-described income-specific recipient rates refer to population of AFDC recipients; we extend these rates to the whole population of the households with qualifying levels of income. In so doing, we disregard factors of age and the presence of children that might make actual probabilities differ from those used in the study.

Following the regulations, we assume that the authorities subsidize rent in excess of 30 percent of family income, and we treat this difference (multiplied by the probability of receiving the benefit) as an additional government transfer payment.

Housing subsidies become part of the gross monthly income that we use in determining eligibility for the food stamp program.

Sources

1. G. Thomas Kingsley. "Federal Housing Assistance and Welfare Reform: Uncharted Territory." Number A-19 in Series, *New Federalism: Issues and Options for States*. Urban Institute. 1997. Internet: http://newfederalism.urban.org/html/anf19.html.
2. Barbara Sard. *The Importance of Issues at the Intersection of Housing and Welfare Reform for Legal Services Work*. Center for Law and Social Policy. Internet: http://www.clasp.org/DMS/Documents/1011376654.72/the%20importance%20of%20issues.pdf.
3. Barbara Sard and Jennifer Daskal. *Housing and Welfare Reform: Some Background Information*. Center on Budget and Policy Priorities. November 5, 1998. Internet: http://www.cbpp.org/hous212.htm.
4. Jennifer Daskal. *In Search of Shelter: The Growing Shortage of Affordable Rental Housing*. Center on Budget and Policy Priorities. 1998. Internet: http://www.cbpp.org/615hous.pdf.
5. *1998 Green Book*. Program Descriptions. Federal Housing Assistance. Also: *Transitional Assistance to Families with Dependent Children*. Internet: http://aspe.hhs.gov/98gb/15other.htm.

Low-Income Home Energy Assistance Program (LIHEAP). LIHEAP is a block-grant federal program that allocates funds between states to operate various home energy assistance programs for needy households. The funds may be used for home heating and cooling assistance, energy-crisis intervention, and low-cost weatherization or other energy-related home repairs.

LIHEAP helps eligible low-income households to meet the heating or cooling portion of their residential energy needs. Low-income households are defined as households with incomes that do not

exceed the greater of 150 percent of the poverty level or 60 percent of state median income ($28,135, $34,755, and $41,375 for 2-, 3-, and 4- person families respectively in Massachusetts in 2001). States may set their income eligibility at or below this maximum standard. LIHEAP payments can be made to households where one or more persons are receiving Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC/TANF), or Food Stamps. Priority may be granted to those households with the greatest energy cost in relation to income, taking into consideration the presence of children and elderly.

In Massachusetts in 1995, 140,000 households received an average of $348 from the single largest program component — heating assistance. That number comprised only one-fifth of the households eligible to receive heating or winter crisis assistance in that year.

We treat LIHEAP benefits in our analysis in the same way as housing assistance benefits. With a probability of 20 percent (the national estimate), we add the CPI-inflated value of the annual benefit to the income of eligible households.

Sources

1. *Low-Income Home Energy Assistance Program*. Block Grant Overview. Internet: http://www.save-liheap.org/overview/contents.htm.
2. *Low-Income Home Energy Assistance Program* (LIHEAP). U.S. Department of Health and Human Services. Internet: http://www.acf.hhs.gov/programs/liheap/.
3. *1998 Green Book. Program Descriptions*. Low-Income Home Energy Assistance Program (LIHEAP). Internet: http://aspe.hhs.gov/98gb/15other.htm.
4. *The Low-Income Home Energy Assistance Program* (LIHEAP). CRS Report for Congress. Congressional Research Service. Updated September 29, 2000. Internet: http://www.ncseonline.org/NLE/CRSreports/energy/eng-41.cfm?&CFID=6744506&CFTOKEN=51070440.

[1] We ignore scheduled future reductions in Massachusetts income tax rates from 5.95 percent to 5.0 percent. Given the current fiscal crisis in Massachusetts, this tax cut is likely to be repealed.

[2] This section and the next section draw heavily on the housing program descriptions cited as data sources.

TABLE I-A

Average Net Tax Rates for Full-Time Worker[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Household Income	Present Value of Spending with Taxes and Transfers	Present Value of Spending without Taxes or Transfers	Net Tax Rate (percent)
1	$21.4	$654.9	$495.4	-32.2%
1.5	$32.1	$633.1	$743.1	14.8%
2	$42.8	$764.2	$990.8	22.9%
3	$64.3	$1,038.3	$1,486.2	30.1%
4	$85.7	$1,299.2	$1,981.6	34.4%
5	$107.1	$1,541.8	$2,477.8	37.8%
6	$128.5	$1,753.4	$2,974.0	41.0%
7	$150.0	$1,981.0	$3,470.1	42.9%
8	$171.4	$2,208.1	$3,958.7	44.2%
9	$192.8	$2,431.4	$4,426.4	45.1%
10	$214.2	$2,657.4	$4,894.2	45.7%
15	$321.4	$3,729.0	$7,233.4	48.4%
20	$428.5	$4,826.8	$9,572.6	49.6%
30	$642.7	$7,012.6	$14,251.0	50.8%
40	$857.0	$9,199.2	$18,929.4	51.4%

[1] Present values are actuarial and assume a 5 percent real discount rate. The net tax rate is calculated as 100 times the quantity 1 minus the ratio of a to b, where a is column 3 and b is column 4.

TABLE II-A

Present Values of Taxes and Transfers of Full-Time Workers[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Annual Household Income	Payroll Taxes	State Taxes	Federal Taxes	Consumption Taxes	Corporate Taxes	Social Security Benefits	TAFDC*	SSI	Food Stamps and WIC	Housing Benefits	Medicare	Medicaid
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.5	27.8	78.5	1.8	33.8	252.6
1	21.4	69.0	13.0	-13.6	31.9	1.2	30.6	2.4	3.8	7.5	2.2	33.8	188.0
1.5	32.1	103.5	25.9	33.6	41.5	1.9	37.0	0.0	1.4	0.4	0.0	33.8	36.5
2	42.8	138.0	39.0	70.6	52.0	2.7	43.5	0.0	0.2	0.2	0.0	33.8	16.0
3	64.3	207.0	66.3	160.6	71.3	4.4	56.6	0.0	0.0	0.3	0.0	33.8	0.0
4	85.7	276.0	94.3	282.1	87.8	6.0	70.1	0.0	0.0	0.2	0.0	33.8	0.0
5	107.1	345.1	122.5	415.2	104.2	7.5	76.7	0.0	0.0	0.1	0.0	33.8	0.0
6	128.5	414.1	150.8	578.9	118.1	9.1	83.0	0.0	0.0	0.0	0.0	33.8	0.0
7	150.0	483.1	178.8	727.1	133.6	10.4	89.3	0.0	0.0	0.0	0.0	33.8	0.0
8	171.4	537.1	207.3	879.7	149.0	12.3	93.9	0.0	0.0	0.0	0.0	33.8	0.0
9	192.8	550.2	236.4	1,049.6	163.9	14.8	93.9	0.0	0.0	0.0	0.0	33.8	0.0
10	214.2	563.3	265.4	1,215.5	180.5	17.3	93.9	0.0	0.0	0.0	0.0	33.8	0.0
15	321.4	628.7	410.8	2,105.0	260.7	30.4	93.9	0.0	0.0	0.0	0.0	33.8	0.0
20	428.5	694.1	558.1	2,960.0	342.9	46.3	93.9	0.0	0.0	0.0	0.0	33.8	0.0
30	642.7	824.9	853.2	4,669.6	507.2	78.6	93.9	0.0	0.0	0.0	0.0	33.8	0.0
40	857.0	955.7	1,148.2	6,379.5	671.4	110.9	93.9	0.0	0.0	0.0	0.0	33.8	0.0

* Transitional Assistance to Families with Dependent Children — Massachusetts TANF program.

[1] Present values are actuarial assuming a 5 percent real discount rate.

TABLE III-A

Present Value of Taxes and Transfers of Full-Time Workers as a Percent of Spending in Absence of Taxes and Transfers[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Annual Household Income	Payroll Taxes	State Taxes	Federal Taxes	Consumption Taxes	Corporate Taxes	Social Security Benefits	TAFDC*	SSI	Food Stamps and WIC	Housing Benefits	Medicare	Medicaid
1	21.4	13.9	2.6	-2.7	6.4	0.2	6.2	0.5	0.8	1.6	0.4	6.8	38.0
1.5	32.1	13.9	3.5	4.5	5.6	0.3	5.0	0.0	0.2	0.0	0.0	4.5	4.9
2	42.8	13.9	3.9	7.1	5.2	0.3	4.4	0.0	0.0	0.0	0.0	3.4	1.6
3	64.3	13.9	4.5	10.8	4.8	0.3	3.8	0.0	0.0	0.0	0.0	2.3	0.0
4	85.7	13.9	4.8	14.2	4.4	0.3	3.5	0.0	0.0	0.0	0.0	1.7	0.0
5	107.1	13.9	4.9	16.8	4.2	0.3	3.1	0.0	0.0	0.0	0.0	1.4	0.0
6	128.5	13.9	5.1	19.5	4.0	0.3	2.8	0.0	0.0	0.0	0.0	1.1	0.0
7	150.0	13.9	5.2	21.0	3.8	0.3	2.6	0.0	0.0	0.0	0.0	1.0	0.0
8	171.4	13.9	5.2	22.2	3.8	0.3	2.4	0.0	0.0	0.0	0.0	0.9	0.0
9	192.8	12.4	5.3	23.7	3.7	0.3	2.1	0.0	0.0	0.0	0.0	0.8	0.0
10	214.2	11.5	5.4	24.8	3.7	0.4	1.9	0.0	0.0	0.0	0.0	0.7	0.0
15	321.4	8.7	5.7	29.1	3.6	0.4	1.3	0.0	0.0	0.0	0.0	0.5	0.0
20	428.5	7.3	5.8	30.9	3.6	0.5	1.0	0.0	0.0	0.0	0.0	0.4	0.0
30	642.7	5.8	6.0	32.8	3.6	0.6	0.7	0.0	0.0	0.0	0.0	0.2	0.0
40	857.0	5.0	6.1	33.7	3.5	0.6	0.5	0.0	0.0	0.0	0.0	0.2	0.0

* Transitional Assistance to Families with Dependent Children — Massachusetts TANF program.

[1] Present values are actuarial assuming a 5 percent real discount rate.

TABLE IV-A

Marginal Net Tax Rates: Working versus Not Working[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Household Income	Present Value of Spending with Taxes and Transfers Assuming No Work	Present Value of Spending without Taxes or Transfers Assuming Full-time Work	Present Value of Spending with Taxes and Transfers Assuming Full-time Work	Marginal Net Work Tax Rate (percent)
1	$21,400	$489,100	$495,100	$654,900	66.5%
1.5	$32,100	$489,100	$743,100	$633,100	80.6%
2	$42,800	$489,100	$990,800	$764,200	72.2%
3	$64,300	$489,100	$1,486,200	$1,038,300	63.0%
4	$85,700	$489,100	$1,981,600	$1,299,200	59.1%
5	$107,100	$489,100	$2,477,800	$1,541,800	57.5%
6	$128,500	$489,100	$2,974,000	$1,753,400	57.5%
7	$150,000	$489,100	$3,470,100	$1,981,000	57.0%
8	$171,400	$489,100	$3,958,700	$2,208,100	56.6%
9	$192,800	$489,100	$4,426,400	$2,431,400	56.1%
10	$214,200	$489,100	$4,894,200	$2,657,400	55.7%
15	$321,400	$489,100	$7,233,400	$3,729,000	55.2%
20	$428,500	$489,100	$9,572,600	$4,826,800	54.7%
30	$642,700	$489,100	$14,251,000	$7,012,600	54.2%
40	$857,000	$489,100	$18,929,400	$9,199,200	54.0%

[1] Present values are actuarial and assume a 5 percent real discount rate. The net tax rate is calculated as 100 times the quantity: 1 minus the ratio of a to b, where a is column 5 minus column 3 and b is column 4.

TABLE V-A

Marginal Net Tax Rates: Working Half-Time versus Not Working[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Household Income	Present[1] Value of Spending with Taxes and Transfers Assuming No Work	Present Value of Spending without Taxes or Transfers Assuming Full-time Work	Present Value of Spending with Taxes and Transfers Assuming Full-time Work	Marginal Net Work Tax Rate (percent)
1	$10,7000	$411,300	$248,100	$646,900	36.4%
1.5	$16,100	$411,300	$372,200	$656,500	55.0%
2	$21,400	$411,300	$495,400	$654,900	66.5%
3	$32,100	$411,300	$743,100	$633,100	80.6%
4	$42,800	$411,300	$990,800	$764,200	72.2%
5	$53,600	$411,300	$1,238,500	$896,800	67.1%
6	$64,300	$411,300	$1,486,200	$1,038,300	63.0%
7	$75,000	$411,300	$1,733,900	$1,170,000	60.7%
8	$85,700	$411,300	$1,981,600	$1,299,200	59.1%
9	$96,400	$411,300	$2,229,700	$1,422,700	58.1%
10	$107,100	$411,300	$2,477,800	$1,541,800	57.5%
15	$160,700	$411,300	$3,718,200	$2,093,600	56.8%
20	$214,200	$411,300	$4,894,200	$2,657,400	55.7%
30	$321,400	$411,300	$7,233,400	$3,729,000	55.2%
40	$428,500	$411,300	$9,572,600	$4,826,800	54.7%

[1] Present values are actuarial and assume a 5 percent real discount rate. The net tax rate is calculated as 100 times the quantity: 1 minus the ratio of a to b, where a is column 5 minus column 3 and b is column 4.

TABLE VI-A

Marginal Net Tax Rates: Half-Time versus Full-Time Working[1]

(thousands of 2002 dollars)

Multiple of Minimum Wage	Initial Household Income when Working Full-Time	Present Value of Spending from Working Full-Time with Net Taxes	Present Value of Spending from Working Part-Time with Net Taxes	Present Value of Spending from Working Full-Time without Net Taxes	Present Value of Spending from Working Part-Time without Net Taxes	Marginal Net Work Tax Rate (percent)
		a	b	c	d	[1-(a-b)/(c-d)]*100
1	$21,400	$654,900	$646,900	$495,400	$248,100	96.8%
1.5	$32,100	$633,100	$656,500	$743,100	$372,200	106.3%
2	$42,800	$764,200	$654,900	$990,800	$495,400	77.9%
3	$64,300	$1,038,300	$633,100	$1,486,200	$743,100	45.5%
4	$85,700	$1,299,200	$764,200	$1,981,600	$990,800	46.0%
5	$107,100	$1,541,800	$896,800	$2,477,800	$1,238,500	48.0%
6	$128,500	$1,753,400	$1,038,300	$2,974,000	$1,486,200	51.9%
7	$150,000	$1,981,000	$1,170,000	$3,470,100	$1,733,900	53.3%
8	$171,400	$2,208,100	$1,299,200	$3,958,700	$1,981,600	54.0%
9	$192,800	$2,431,400	$1,422,700	$4,426,400	$2,229,700	54.1%
10	$214,200	$2,657,700	$1,541,800	$4,894,200	$2,477,800	53.8%
15	$321,400	$3,729,000	$2,093,600	$7,233,400	$3,718,200	53.5%
20	$428,500	$4,826,800	$2,657,400	$9,572,600	$4,894,200	53.6%
30	$642,700	$7,012,600	$3,729,000	$14,251,000	$7,233,400	53.2%
40	$857,000	$9,199,200	$4,826,800	$18,929,400	$9,572,600	53.3%

[1] Present values are actuarial and assume a 5 percent real discount rate.

About the Authors

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About the NCPA

The NCPA was established in 1983 as a nonprofit, nonpartisan public policy research institute. Its mission is to seek innovative private sector solutions to public policy problems.

The center is probably best known for developing the concept of Medical Savings Accounts (MSAs). The *Wall Street Journal* called NCPA President John C. Goodman "the father of Medical Savings Accounts." Sen. Phil Gramm said MSAs are "the only original idea in health policy in more than a decade." Congress approved a pilot MSA program for small businesses and the self-employed in 1996 and voted in 1997 to allow Medicare beneficiaries to have MSAs. And a June 2002 IRS ruling frees the private sector to have a flexible medical savings account and even personal and portable insurance. A series of NCPA publications and briefings for members of Congress and the White House staff helped lead to this important ruling.

The NCPA also outlined the concept of using tax credits to encourage private health insurance. The NCPA helped formulate a bipartisan proposal in both the Senate and the House, and Dr. Goodman testified before the House Ways and Means Committee on its benefits. Dr. Goodman also helped develop a similar plan for then presidential candidate George W. Bush.

The NCPA shaped the pro-growth approach to tax policy during the 1990s. A package of tax cuts, designed by the NCPA and the U.S. Chamber of Commerce in 1991, became the core of the Contract With America in 1994. Three of the five proposals (capital gains tax cut, Roth IRA and eliminating the Social Security earnings penalty) became law. A fourth proposal — rolling back the tax on Social Security benefits — passed the House of Representatives last summer.

The NCPA's proposal for an across-the-board tax cut became the focal point of the pro-growth approach to tax cuts and the centerpiece of President Bush's tax cut proposal. The repeal by Congress of the death tax and marriage penalty in the 2001 tax cut bill reflects the continued work of the NCPA.

Entitlement reform is another important area. With a grant from the NCPA, economists at Texas A&M University developed a model to evaluate the future of Social Security and Medicare. This work is under the direction of Texas A&M Professor Thomas R. Saving, who was appointed a Social Security and Medicare trustee. Our online Social Security calculator (www.mysocialsecurity.org) allows visitors to discover their expected taxes and benefits and how much they would have accumulated had their taxes been invested privately.

An innovative nationwide volunteer campaign called Team NCPA (www.teamncpa.org) is under way to raise awareness of the problems with the current Social Security system and the benefits of personal retirement accounts. Former Sen. Daniel Patrick Moynihan (D-N.Y.), speaking at an NCPA Sumners Lecture, said that there is no serious proposal anywhere in the United States that would cut benefits for current retirees.

In the 1980s, the NCPA was the first public policy institute to publish a report card on public schools, based on results of student achievement exams. We also measured the efficiency of Texas school districts. Subsequently, the NCPA pioneered the concept of education tax credits to promote competition and choice through the tax system. To bring the best ideas on school choice to the forefront, the NCPA

and Children First America published an Education Agenda for the new administration, policy makers, congressional staffs and the media. This book provides policy makers with a road map for comprehensive reform. And a June 2002 Supreme Court ruling upheld a school voucher program in Cleveland, an idea the NCPA has endorsed and promoted for years.

The NCPA's Environmental Center works closely with other think tanks to provide commonsense alternatives to extreme positions that frequently dominate environmental policy debates. A pathbreaking 2001 NCPA study showed that the costs of the Kyoto agreement to halt global warming would far exceed any benefits. The NCPA's work helped the administration realize that the treaty would be bad for America, and it has withdrawn from the treaty.

NCPA studies, ideas and experts are quoted frequently in news stories nationwide. Columns written by NCPA scholars appear regularly in national publications such as the *Wall Street Journal*, the *Washington Times*, *USA Today* and many other major-market daily newspapers, radio talk shows, television public affairs programs and public policy newsletters. According to media figures from Burelle's, nearly 3 million people daily read or hear about NCPA ideas and activities somewhere in the United States.

The NCPA Internet site (www.ncpa.org) links visitors to the best available information, including studies produced by think tanks all over the world. Britannica.com named the NCPA Web site one of the best on the Internet when reviewed for quality, accuracy of content, presentation and usability. NCPA Web sites average 4 million hits per month.

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- TIME

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- FORMER TEXAS GOV. (NOW PRESIDENT) GEORGE W. BUSH

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