

Marginal Tax Rates Facing Low- and Moderate-Income Workers Who Participate in Means-Tested Transfer Programs

Abstract - The combination of a progressive tax system with credits for low-income workers and means-tested transfer programs can create high marginal tax rates (MTRs) on earned income. We document the extent and distribution of statutory and actual MTRs for Wisconsin households with earned income in 2000 using a unique data set of merged tax, transfer program, and wage data. Nearly a quarter of unmarried tax filers with two or more dependents face MTRs of 50 percent or greater. Households between 100 percent and 250 percent of the federal poverty threshold and those using multiple means-tested programs are more likely to face high rates.

“The possible work disincentives and other efficiencies created by the existence of multiple transfer programs is one of the most important, and one of the oldest, issues in the economics of transfer programs in the U.S.A.”

—Keane and Moffitt (1998)

“It’s like being persecuted for getting a raise.”

—“Karen H.” A Wisconsin home health care worker, upon finding out that her food stamps and housing assistance were reduced after she received a legislatively-mandated hourly wage increase (Romich, 2006)

Stephen D. Holt

*Holt and Associates
Solutions, Milwaukee,
WI 53202*

Jennifer L. Romich

*University of
Washington School of
Social Work, Seattle,
WA 98105*

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INTRODUCTION

Two trends—the increasing use of the tax system for social policy ends and the decoupling of cash welfare from other means-tested programs—have combined to complicate the budget constraints facing low-income working families. Researchers, practitioners and policymakers concerned with the relatively high marginal tax rates (MTRs) created by the phaseout of the Earned Income Tax Credit (EITC) and other transfer programs embedded in the income tax system should also be aware of the implicit tax rates created by the benefit schedules of common social transfer programs, such as Food Stamps.

Over the last two decades, the Internal Revenue Service and state revenue departments are increasingly serving as delivery systems for social policies aimed at increasing the well-being of low- and moderate-income (LMI) households (Dickert-Conlin, Fitzpatrick, and Hanson, 2005). Over the same time period, eligibility rules governing common means-tested programs have been reformed to include families for whom earnings are a significant source of income. As of the early 1980s, eligibility for common means-tested social programs, notably Medicaid, was restricted to members of households receiving cash welfare (what was then known as Aid to Families with Dependent Children, AFDC). The Family Support Act of 1988 de-linked Medicaid from cash assistance. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) enacted further reforms guided by the principle that earnings from employment rather than welfare benefits should raise family income (Haskins, 2002). Reforms aimed at supporting employment and reducing the work disincentives found in the AFDC system included a decentralized combination of time-limited grants with earnings disregards administered by state Temporary Assistance to Needy Families (TANF) programs, and subsidized benefits including TANF child care grants and expansions of public health insurance, notably the loosening of eligibility for Medicaid and the creation of State Children's Health Insurance Programs (SCHIP) (Sawhill and Haskins, 2002). The cumulative effect of tax schedules and the implicit taxation arising from the benefit schedules of other commonly used social transfer programs means that LMI households may routinely face combined MTRs well over 50 percent.

Calculating MTRs

Knowing the size and distribution of such high MTRs can help researchers and

policymakers understand potential effects on labor supply, the relationship between earnings and financial well-being for LMI households, and the possible impact of changes to individual programs to the overall system of support. For a household of a given size and program participation status, calculating the combined tax schedule is a straightforward—if cumbersome—process of applying tax provisions and the benefit formulas of the relevant programs. This requires specifying the one or more combinations of the key parameters of family structure, earnings and program participation. For instance, Acs, Coe, Watson, and Lerman (1998) presented effective MTRs for one-parent, two-child households at four different levels of employment (none, part time at minimum wage, full time at the 1997 federal minimum wage of \$5.15, and full time with a \$9.00 wage). Assuming the household receives food stamps, files state and federal tax returns, and, when applicable, uses TANF cash benefits, they find that the raise in earnings associated with moving from minimum wage to \$9.00 per hour is associated with an effective MTR of 65 percent in the median state in their 12-state sample. Similar analyses have calculated MTRs for different time periods, geographical areas, household types or benefit use packages (Wilson and Cline, 1994; Shaviro, 1999; Ellwood and Liebman, 2001; Sammartino, Toder, and Maag, 2002; Wolfe, 2002). These analyses, while informative as to the budget constraints faced by the exemplar families, do not capture the actual distribution of MTRs within a population with varying patterns of participation in means-tested programs and heterogeneous household structures and earning levels. Assuming that households use all available benefits is not realistic and likely leads to overestimates of the MTRs facing LMI workers.

Calculating the actual distribution of MTRs faced within a population requires combining program rules and

tax schedules with information on individual households' program and tax participation, family structure, and earnings. Creating such estimates requires household-level tax and program participation data, a data need not fulfilled by widely available data sets (Dickert-Conlin, Fitzpatrick, and Hanson, 2005). Common secondary data sources can be used if tax information and some benefit amounts are imputed. For instance, Dickert, Houser and Scholz (1994) used 1990 Survey of Income and Program Participation (SIPP) data in a microsimulation of the marginal return to increased earnings. This approach requires assuming that self-reported income is the same as reported taxable income and is sensitive to misreporting of program participation, which is a significant and arguably growing problem with the SIPP.¹ Administrative data are more accurate, but they do not include both tax and program information. Internal Revenue Service data do not contain information on program participation data. Using quality control data from the Department of Health and Human Services (for AFDC/TANF) or the Department of Agriculture (for Food Stamps) requires imputing or relying on self-reports for EITC participation.

To our knowledge, the current study is the first use of merged tax and program administrative data to calculate a population distribution of MTRs. A unique data set consisting of state human services caseload data merged with Unemployment Insurance and Department of Revenue data allows us to examine program participation and the resulting effective tax rates for substantially all Wisconsin LMI households with earned income in 2000. As background, we begin with an overview of program and tax schedules affecting LMI households. After describ-

ing the process used to assemble our data, we present descriptive evidence on the patterns of joint participation in the tax credits and transfer programs. By applying statutory benefit formulas and tax schedules, we then calculate actual MTRs. We conclude with a discussion of the implications of our findings of a significant incidence of high MTRs among some LMI households.

MTRs ARISING FROM TAX AND BENEFIT SCHEDULES

In this section, we describe the eligibility formulas and schedules governing the MTRs in the tax and transfer systems. We are looking here at hypothetical maximum statutory tax rates, meaning we assume that each household receives all benefits for which it is eligible. We also assume that readers are familiar with the basic structure of the federal income and payroll tax systems and the common means-tested programs covered here. For those interested in greater detail, Scholz and Levine (2002) summarize recent changes in and the current state of programs for the poor, and Hassett and Moore (2005) review tax policies affecting LMI households. Throughout this exposition we use a single parent with two children as the standard household configuration in examples, both because this household is frequently referenced in anti-poverty policy debates and because its circumstances illustrate the issues well.

Our data are from Wisconsin in 2000, so we describe the relevant features of its state income tax system and use statutory rates and rules for that year. Although it was an early adapter of welfare reform, the set of supports offered in 2000 is largely comparable to that offered by other states (Wolfe, 2002). In terms of income

¹ Evidence from SIPP responses validated against administrative records suggests that 15 percent of Food Stamp recipient households do not report participation to SIPP (Bollinger and David, 2005).

and population dimensions that affect the use of means-tested benefits, Wisconsin is reasonably representative. In 2000 Wisconsin had a slightly higher median income than the US average, lower poverty rates, and less unemployment, suggesting that the state is marginally more economically advantaged.² However, the state did have an almost-average portion of the population under age 18, a feature that is relevant since many of the means-tested benefits are most generous to households with children.³

Federal Payroll Taxes, Income Tax, and Tax Credits

Although each dollar of earnings is subject to federal income tax, personal exemptions and the standard deduction operate to shield some low-income families from a positive tax liability. In 2000, the tax threshold was \$14,850 for a single parent with two children. Through a taxable income (income less personal exemptions and the standard deduction) of \$35,150, the tax rate was 15 percent. Taxable income above that level (up to \$90,800) was taxed at 28 percent.

Non-refundable tax credits—including the child tax credit (CTC) of \$500 per child⁴ and the child and dependent care tax credit (CDCTC)—may be applied against any positive tax liability. If the single parent with two children incurred the maximum countable child care expenses for the CDCTC (\$4,800, or just

under \$100 a week), the combination of the CTC and the CDCTC would have raised the household's tax threshold to over \$28,000.⁵

The structure of the EITC has the largest impact on the MTRs faced by LMI families due to its size and refundability. The credit phases in as a percentage of earnings with separate rate structures for tax filers with no, one and two or more children. For a person with two qualifying children in 2000, the phase-in rate was 40 percent, meaning that each additional dollar of earnings provided 40 cents in additional EITC. Once the maximum credit is reached (in this case, \$3,888, at an income of \$9,720), the EITC benefit remains flat for a range of income. It then phases out at a constant rate; with two qualifying children in 2000, the phase-out rate was 21.06 percent. This meant that each additional dollar earned at incomes between \$12,690 and \$31,152 resulted in a \$.21 drop in the EITC.

In addition to income tax, each dollar of earnings at lower wage levels is subject to the 6.20 percent Social Security tax and the 1.45 percent Medicare tax, leading to a constant payroll tax rate of 7.65 percent for LMI households.⁶ Although economists generally also assign incidence of the 7.65 percent matching employer payroll taxes to employees, only the direct employee contribution is included here, because the focus is on the direct impact to a worker of an increase in nominal earnings.

² In 2000, the US median household income was \$42,148; for Wisconsin households, the figure was \$45,349 (U.S. Census Bureau, 2001a). Wisconsin also fares slightly better than average in terms of its 2000 poverty rate (US 11.3 percent v. WI 9.3 percent) and unemployment rate (US 4.0 percent v. WI 3.4 percent) (U.S. Census Bureau, 2001b; U.S. Bureau of Labor Statistics, 2001).

³ Wisconsin's population under the age of 18 (25.7 percent) is the same as for the nation as a whole (U.S. Census Bureau, 2003).

⁴ Partial refundability of the CTC was not enacted until 2001.

⁵ In addition to the regular marginal rates, there is a separate MTR impact from the CDCTC because the credit rate (the percentage of countable expenses that can be claimed) decreases in steps from a maximum of 30 percent to 20 percent. Because the phase-down begins well before most households have a positive tax liability against which to apply the credit, few can claim the higher credit rates, but the latter steps of the phase-down can impose an additional MTR on earnings.

⁶ In 2000, earnings in excess of \$76,200 were not subject to the 6.20 percent Social Security tax.

Wisconsin State Income Tax and Tax Credits

As with the federal income tax, a household does not begin to incur the Wisconsin income tax until annual income rises above a minimum threshold. Also as in the federal system, both a personal exemption and a standard deduction determine the tax threshold. For a single parent with two children in 2000, the nominal threshold was approximately \$11,000. The effective tax threshold is generally significantly higher than the nominal one because of the application of non-refundable tax credits, principally a credit for school property taxes that is available to both homeowners and renters. Married filers can also claim a credit based on a percentage of the lower-earning spouse's income. While all of the credits can raise the tax threshold, only the married couple credit has a MTR impact (lowering the MTR for two-earner families).

The tax rate for the initial tax bracket above the threshold was 4.73 percent in 2000. However, the effective rate was higher, because the Wisconsin standard deduction phases out as income rises. The first two tax brackets are relatively narrow in Wisconsin, with a higher nominal rate of 6.33 percent already applicable in 2000 at taxable income above \$7,790 for single (including head-of-household) filers and a 6.55 percent rate beginning above \$15,590.

Wisconsin has its own Earned Income Credit (WEIC) and, as of 2000, it was one of 14 states plus the District of Columbia with state EITCs (Johnson, 2001). The WEIC piggybacks on the federal credit, meaning that it is calculated as a percentage of the federal amount. The credit percentage is four percent for filers

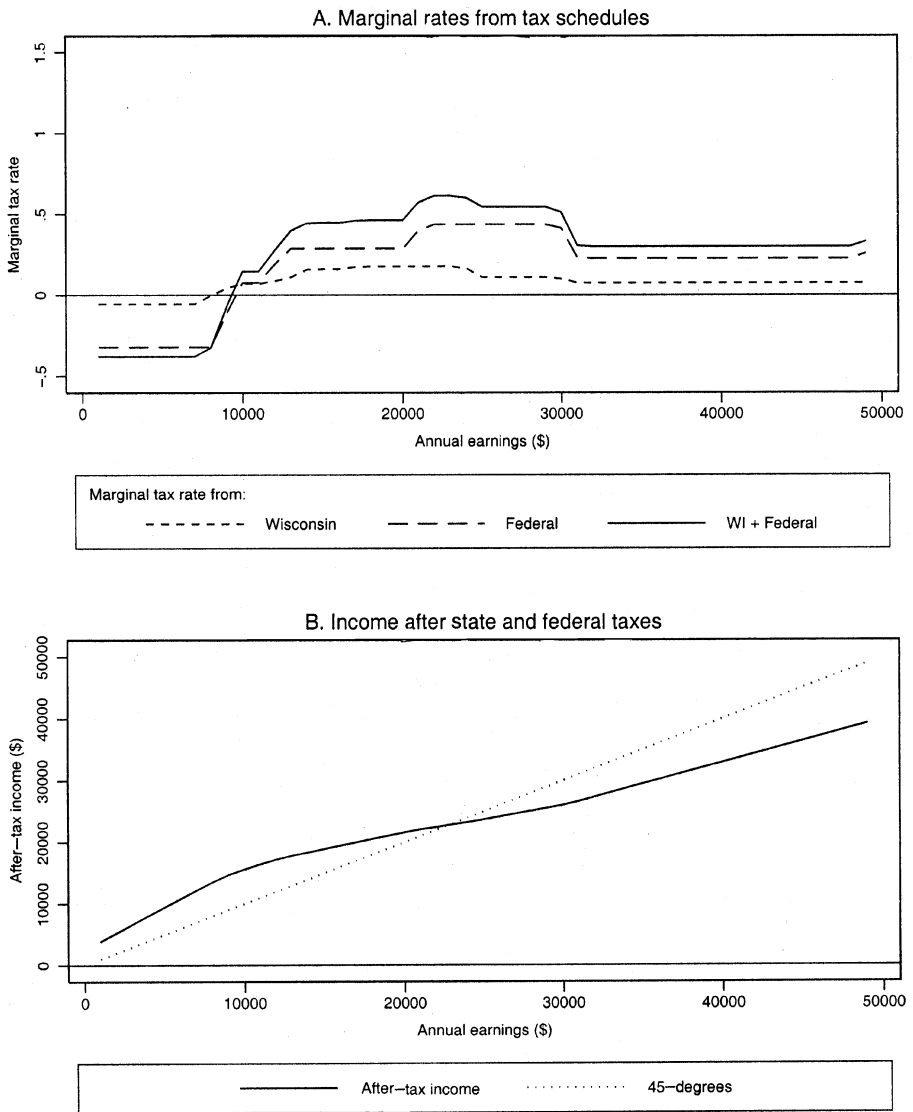
with one child, 14 percent for those with two children, and 43 percent for those with three or more children. Compared to other states with refundable earned income credits, this is less generous than average for households with one or two children and more generous than average for households with three or more children. There is no WEIC for filers with no qualifying children. The MTR impact of the WEIC is to increase both the phase-in and phaseout rates of the underlying federal credit.

Like several other states, Wisconsin's tax system includes a credit to partially offset property taxes for low-income households. The Wisconsin's Homestead Credit circuit breaker is administered through the income tax system, but is based on property taxes paid (imputed for renters) and a distinct definition of household income. The maximum credit amount in 2000 was \$1,160. A renter paying \$604 a month or more in rent (heat included) could have qualified for the maximum credit. The Homestead Credit phased out at a constant effective rate of 7.03 percent at incomes over \$8,000 (after a deduction of \$250 per dependent).

The top panel of Figure 1 shows the MTRs that result from the tax and credit schedules in the Wisconsin state and federal income tax systems.⁷ The bottom panel shows the resulting after-tax income at corresponding earnings levels. Below \$10,000 in annual earnings, the total MTR is negative; that is, total income increases by more than a dollar for every dollar earned and, accordingly, after-tax income is higher than earnings. This is due to the phase-in portion of the federal EITC and the similar Wisconsin credit. With annual earnings of \$14,150 (the federal poverty guideline figure for a family of

⁷ Figures 1 and 2 show only those households with incomes equal to or less than \$50,000. The observations were generated calculating marginal tax rates associated with a \$500 increase in earnings from baseline earnings in \$10 income increments over the range \$0–\$50,000. For all figures, the results were smoothed by averaging over \$1,000 income ranges.

Figure 1. Marginal Rates and After-Tax Income, Assuming Full Participation in Available Tax Credits (Single Heads of Household with Two Dependents, Wisconsin TY2000)



Notes: Author calculations using TAXSIM. Includes payroll taxes, income taxes, and applicable credits. Marginal rates calculated based on \$500 increases in earnings. See text and appendix for more details.

three in 2000), the worker faces a state MTR of 16 percent and a combined state and federal MTR of 44 percent, due now to the phaseout of the EITC. This marginal tax rate is higher than that for the highest earning households. Appendix Figure A1 replicates the top panel of Figure 1 for households earning up to \$100,000.

Transfer Programs

Implicit taxation results from the benefit schedule of means-tested programs. We focus on three common programs that serve LMI households: Food Stamps, subsidized childcare, and Medicaid/SCHIP. These programs all have progressive designs—such that families with lower incomes receive a greater subsidy—and, hence, benefits decrease as income rises.

Food Stamps benefit amounts are calculated according to a formula that includes family size and household income after deductions for earned income, certain medical and dependent care expenses, child support paid, and particularly high housing costs (U.S. Department of Agriculture, 2004). The basic benefit reduction—or implicit MTR—is 24 percent (30 percent of any increase in net income, mitigated by a 20 percent earned income disregard). But the iterative effects of changes in the elements included in the determination of net income (such as deductions for child care costs and high rent and utility bills that may themselves be affected by changes in income) can affect the actual implicit MTR by several percentage points. In addition, the gradual phaseout of benefits for most non-elderly households converts to an abrupt loss

when gross income exceeds 130 percent of the federal poverty guidelines (FPG). This “cliff” or “notch” can completely negate the effect of a raise and leave a household worse off. The basic formula is consistent across states, but there is local variation in take-up and administrative practice. Wisconsin participation is similar to the national average.⁸

The Wisconsin subsidized childcare program (Wisconsin Shares) includes a co-payment liability that varies by the number of children in subsidized care, the type of care selected, and income. There are stepped co-payment adjustments at each five percent increment of the FPG above 70 percent (i.e., one rate for incomes between 75 percent and 80 percent of the FPG, another at incomes between 80 percent and 85 percent, and so on). This schedule creates an irregular implicit marginal tax as earnings increase. There is a cliff effect of sudden loss of all eligibility at 200 percent of the FPG. Wisconsin’s eligibility limits and average co-payments for subsidized childcare are similar to those in other states (author calculations using National Center for Children in Poverty (2006)).⁹

Public medical programs vary both eligibility and cost sharing based on income. For instance, children in a household below 100 percent of the FPG are generally covered by free Medicaid. With some variation by state, children and some parents in households that earn between 100 percent and 200 percent of the FPG qualify for SCHIP, but cost-sharing measures such as annual enrollment fees, monthly premiums or co-pays apply to some or all families in this range (Dubay, Hill,

⁸ True Food Stamp participation rates, the percentage of eligible households that use the benefit, are hard to estimate given small samples in national data. Using shrinkage estimates that combine administrative data and multiple regression analysis of national survey data, Castner and Shirm (2003) note that 56 percent of eligible Wisconsin households participate, a rate which is statistically indistinguishable from the nation-wide participation rate of 59 percent.

⁹ Wisconsin had a family income cap of \$29,772 and an average co-payment of \$181. This is similar to the national median of \$29,004 and \$179, respectively. Wisconsin served all applicants (no waiting lists). This was true of about 60 percent of all states (author calculations using National Center for Children in Poverty (2006)).

and Kenney, 2002). In 2000, Wisconsin imposed a BadgerCare (SCHIP) premium equal to three percent of countable family income when that income exceeded 150 percent of the FPG. This means that a modest increase in earnings is enough to impose a sizeable hike in cost sharing. A second cliff effect occurs when the household loses all eligibility when countable family income exceeds 200 percent of the FPG. Wisconsin's public health program participation and fee structure are fairly representative.¹⁰

In addition to the three programs described above, other programs and benefits also operate on a means-tested or sliding-scale basis. As families earn more, they may lose eligibility for project- or voucher-based housing assistance; nutrition programs such as WIC (Women, Infants, and Children) or school lunches; Head Start or locally subsidized children's after-school or summer programs; community resources such as Legal Aid; and reduced-fee health clinics. We are not modeling the MTR effects of these other programs.

Combined Schedules

Figure 2 shows the effective MTRs created by the combined effects of the tax system and Wisconsin's work support benefit programs for this hypothetical family, consisting of a single head of household with two children. The family uses Food Stamps, subsidized childcare, and BadgerCare (the Wisconsin SCHIP program). In this case, it is assumed that the household will buy food, childcare, and health insurance at market rates when no longer eligible for subsidies. The spikes in the top panel of Figure 2 show the high effective MTRs associated with the loss of benefits. For instance, at \$25,500, this

family would start paying premiums for BadgerCare, a change that results in a short-run marginal tax rate of over 100 percent. Households with earnings greater than \$35,000 are not eligible for the means tested benefits, so their marginal rates are simply the statutory rates of the combined state and federal tax systems. Note that single heads of household with two children enter a higher tax bracket just before \$50,000, but even the highest rates from the tax system remain below the combined rates faced by those at lower incomes. This is visible in Figure A1 (in the Appendix), which extends this graph up to an income of \$100,000. The bottom panel of Figure 2 shows the effect of the benefit reductions and taxes on disposable income. For a household using Food Stamps, public health coverage, and child care subsidies, there is little change in after-tax, after-transfer income between earnings of \$10,000 and \$30,000.

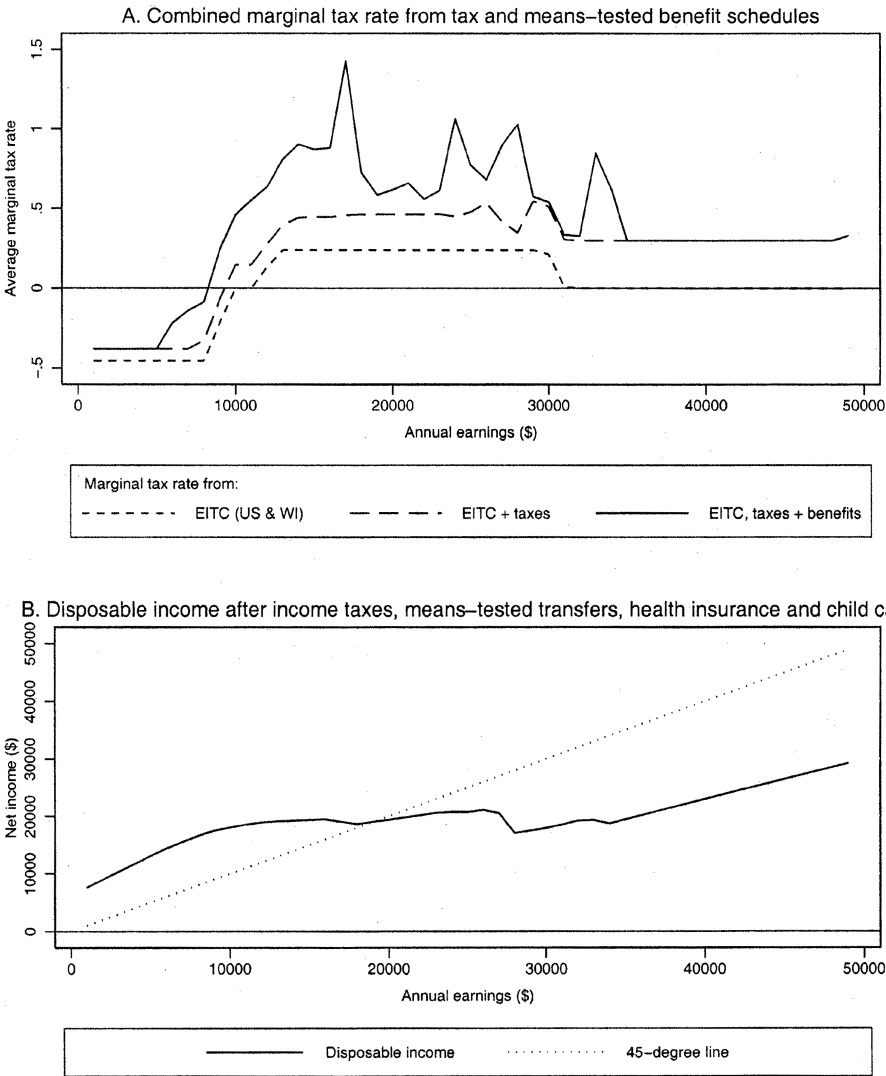
Combining tax and program schedules may overestimate the extent to which these high MTRs apply, because their actual application depends on participation. Figure 2 only applies for families who claim available tax credits and participate in all three programs. In the next section we describe the unique data set that allows us to examine actual tax and program participation.

DATA

To determine the distribution of MTRs in Wisconsin in 2000, we use a unique data set assembled from several Wisconsin state administrative sources. The overall goal was to assemble the most comprehensive possible data set of LMI Wisconsin households headed by a working-age (non-elderly) adult. The Institute for Research on Poverty at the University

¹⁰ In 1999, an estimated 72 percent of eligible children nationwide were enrolled in Medicaid. Estimates using the National Survey of American Families suggest that Wisconsin's participation was slightly higher (75 percent), but this difference is statistically insignificant (Dubay, Hill, and Kenney, 2002).

Figure 2. Combined Marginal Rates and Disposable Income, Assuming Full Participation in Means-Tested Programs (Single Heads of Household with Two Dependents, Wisconsin TY2000)



Notes: Author calculations using TAXSIM. Includes taxes (payroll taxes, income taxes, and applicable credits). and in-kind transfer benefits (Food Stamps, Medicaid/Badgercare, WisconsinShare Child Care). Marginal rates calculated based on \$500 increases in earnings. See text and appendix for more details.

of Wisconsin–Madison, on behalf of the Wisconsin Departments of Workforce Development and Health and Family Services, provided case record data from Unemployment Insurance wage reports, focal income support programs (Medicaid/BadgerCare, Wisconsin Shares, and Food Stamps), and other administrative sources (Wisconsin Works TANF subsidies, non–elderly Medical Assistance, and child support enforcement).¹¹ The Wisconsin Department of Revenue used Social Security Numbers to merge these case records with tax return data. Households not in this dataset are those with no documented participation in the formal economy and those whose income support program participation is limited to Supplemental Security Income, Social Security, or elderly–related Medicaid.

The dataset required additional manipulation to 1) link program participants not matched to a tax return to a tax–filing household, 2) group the remaining unmatched program participants into case–based households,¹² and 3) determine income, marital status, and family size (see Appendix A). This process yielded 2,769,493 households.¹³ The full study population (2,452,165 households) consists of this dataset minus those definitively identified in tax records as

elderly and those whose presence in the data is limited to child support. These data, therefore, likely capture almost all Wisconsin households with an earner or possible earner; that is, this is a reasonable estimation of households likely to experience MTRs on earnings.

These data have the advantage of encompassing income, tax filing status, and whether households participate in programs, but they include neither benefit amounts nor several categories of information necessary for precise calculations of benefit and tax amounts. For instance, we know whether or not a household participates in the Food Stamp program, but we do not know the value of the benefit received or the value of many factors included in the benefit formula, such as housing costs and medical expenses. Hence, a series of assumptions were necessary to calculate MTRs; these assumptions are summarized in Appendices A and B. We used the best available data from the assembled data sets for variables on income, family size, and marital status. For other data, we used local cost estimates for all households. For instance, housing costs (needed for both benefit calculation and the Homestead Credit) were based on the number of dependents and the median area rent for urban areas. Many of the assumptions are

¹¹ Case information from Wisconsin Works (W–2, the TANF cash benefits) and child support enforcement records were used to create the universe of households in the analysis, as they contain many non–working households. However, program participation from these households is not included in our calculations of marginal tax rates. Although it seems appropriate to include W–2 cash transfers and their benefit reduction rates, Wisconsin was so successful in reducing its welfare rolls that fewer than 20,000 households, less than one percent of the population, used cash benefits in 2000 (U.S. Administration for Children and Families, 2001).

¹² Each benefit program has its own definition of household. For instance, the Food Stamp program serves a “food assistance unit” composed of persons living together who buy and prepare their food together. This may encompass multiple households as defined for tax purposes. Our analysis uses the broader definition for Food Stamp cases in which no member can be matched to a tax–filing household.

¹³ Of these, 2,509,786 had filed individual income tax returns as full–year Wisconsin residents. This is comparable to the 2,560,004 federal individual income tax returns filed during federal fiscal year 2000 (Internal Revenue Service, 2003). The number of full–year resident households is larger than the 2000 Census count of 2,084,544 households in Wisconsin (U.S. Census Bureau, 2006). We believe differences in definitions and timing explain much of this gap. Whenever possible, our unit of observation is a household as defined for tax purposes; a Census household may contain more than one tax household. Our data encompasses those with a Wisconsin nexus at any point during calendar year 2000; the Census is a static, point–in–time measure as of April 1, 2000.

more realistic for low-wage earners that are the main focus of our analysis. Some assumptions—such as assuming all filers take the standard deduction and have no investment earnings—are not realistic for higher earners, yet this does not affect the current purpose of calculating MTRs facing LMI workers. Those interested in MTRs on higher incomes may consult a recent Congressional Budget Office report (Harris, 2005).

INCOME TAX FILING AND PROGRAM USE

Elevated MTRs result from participation in means-tested programs and the highest rates arise from participation in multiple programs. Using our merged data set, we calculate program participation by program and then by combinations of programs. These figures include families that use a program at any point over a year; point-in-time figures would be lower. Since our focus here is on MTRs resulting from program use, we present data on the rate of program use among all households rather than program take-up (the rate of use of programs among eligible households).

Table 1 displays the number of households claiming the WEIC or using one of the focal means-tested programs, Food Stamps, Wisconsin Shares, or Medicaid/BadgerCare. The WEIC is the most commonly used support, used by 186,894

households (7.62 percent of the full study population), including 62.54 percent of single heads of household with two dependents. Subsidized childcare is the benefit used by the fewest households, with 54,049 households, including just over 20 percent of single parents with two children participating.

Households that participate in multiple programs will face higher implicit MTRs if they are in the phaseout portion of two or more programs' schedules. Table 2 summarizes multiple program participation among the full study population and among the subset of households that claimed the WEIC. Just fewer than ten percent of all households participated in one of the three means-tested transfer programs at some point in 2000. Most of these participated in only one of the programs, with Medicaid/BadgerCare being the most common single program. Among households that participated in two programs, Medicaid/BadgerCare plus Food Stamps was the modal combination. A total of 37,503 households (1.53 percent of study sample) use all three programs. Not surprisingly, program use is greater among households that claim the EIC, with almost half of EIC claimants also participating in one or more transfer programs. A total of 25,446 households claimed the EIC and participated in all three means-tested programs. These multi-program take-up rates suggest that relatively few households use the set of

TABLE 1
HOUSEHOLDS PARTICIPATING IN INCOME SUPPORT PROGRAMS

	Full Study Population		Single Heads-of-Household with 2 Dependents	
	N	%	N	%
	2,452,165		59,580	
Wisconsin Earned Income Credit	186,894	7.62	37,263	62.54
In-kind transfers				
Food Stamps	145,179	5.92	17,942	30.11
Medical (Medicaid or BadgerCare)	167,340	6.82	24,315	40.81
Wisconsin Shares child care	54,049	2.20	12,153	20.40

Source: Authors' calculations of merged 2000 State of Wisconsin administrative records; see text for details.

TABLE 2
IN-KIND TRANSFER PROGRAM AND EITC PARTICIPATION

	Full Study Population			Single Heads-of-Household with 2 Dependents		
	N	%	as % of all using...	N	%	as % of all using...
Full study population	2,452,165			59,580		
No use of focal programs	2,228,092	90.86		33,430	56.11	
One in-kind transfer program	119,081	4.86	...one pgm	7,047	11.83	...one pgm
Medicaid/BadgerCare	63,635		53.44	5,413		76.81
Food Stamps (FS)	51,952		43.63	806		11.44
WIShires child care (CC)	3,494		2.93	828		11.75
Two in-kind transfer programs	67,489	2.75	...two pgms	9,946	16.69	...two pgms
Med/BC, FS	54,437			7,778		
Med/BC, CC	11,765			1,967		
FS, CC	1,287			201		
All three programs	37,503	1.53		9,157	15.37	
EIC claimants	186,894			37,263		
EIC only, no focal programs	95,653	51.18		17,343	46.54	
EIC + one in-kind program	33,013	17.66	...EIC+one	5,482	14.71	...EIC+one
Medicaid/BadgerCare (Med)	28,083		85.07	4,230		77.16
Food Stamps (FS)	2,840		8.60	564		10.29
WIShires child care (CC)	2,090		6.33	688		12.55
EIC + two in-kind programs	32,782	17.54	...EIC+two	7,061	18.95	...EIC+two
Med/BC, FS	24,948		76.10	5,160		73.08
Med/BC, CC	7,137		21.77	1,719		24.34
FS, CC	697		2.13	182		2.58
EIC + all three in-kind programs	25,446	13.62		7,377	19.80	

Source: Authors' calculations of merged 2000 State of Wisconsin administrative records; see text for details.

programs that combine to create to the "worst case" MTR scenario in Figure 2.

COMBINED MTRs

Next we compute the total MTRs given household income and program participation. We compare total income at the given earnings level with projected total income after a \$500 increase in annual earnings, spread evenly across 12 months

for benefits calculated based on monthly earnings. This amount is intuitive (equal to about a \$0.25 per hour raise for a full-time worker) and less sensitive to small notches than smaller increments.¹⁴ Income includes earnings, federal and Wisconsin tax credits, and the cash value of Food Stamps, minus federal and Wisconsin tax liabilities and estimated childcare and health insurance costs for those who participate in subsidized programs. We

¹⁴ To verify that the choice of a \$500 increment did not affect our overall findings, we ran all analyses using increments of \$1, \$250, \$500 or \$1,000 on a five percent sample of the data. The results using each increment were essentially similar. The choice of denominator for calculating an MTR is arbitrary and different approaches have been used. A strict definition of marginal suggests using the point-slope of the given schedule or, more practically, the smallest possible unit, perhaps a dollar. This is the calculation returned by TAXSIM. Others use larger income ranges. Dickert, Houser and Scholz (1994) use a raise of \$10 per month per worker, and Gentry and Hubbard (2004) create measures of income convexity based on increases of ten to 200 percent of current earnings. Our choice of \$500 falls between these two options.

rely on program rules to calculate Food Stamp benefits and health coverage and child care co-payment amounts.¹⁵

We assume that households using subsidized childcare and public health coverage will continue to use them when the \$500 increase in annual earnings causes an increase in co-pays.¹⁶ When the increased income would cause a household to lose eligibility all together (i.e., when a household “falls off a cliff”), we assume that the household continues to buy the good, but we cap the total MTR at 200 percent, or \$1,000 in additional annual costs.

We use an annual accounting period, as tax credit eligibility and amounts depend on a full year’s income.¹⁷ Since participation in other programs is month-to-month or follows other periods, this approach will calculate the upper limit of the MTR faced by families over the course of the year and will overstate the maximum point-in-time MTR for households that have non-overlapping spells of in-kind transfer use. However, the most common combinations of program use involve the WEIC, figured annually, and medical coverage, which has an annual eligibility review, so this restriction seems less arbitrary than other options.

Distribution of MTRs

Table 3 summarizes the MTRs at different points of the distribution. For the full study population of Wisconsin households in tax year 2000, the median MTR was 30 percent. One quarter of households

faced rates of 15.6 percent or less, and one quarter faced rates of 43 percent or more. Over 30,000 households, 1.23 percent of the full sample, faced a negative MTR, meaning that they were claiming the EITC and had incomes in the phase-in portion of the credit. About twice as many (a total of 3.01 percent) faced an MTR of more than 50 percent.

The next three panels of Table 3 show how these rates differ across family types, income levels, and program use patterns. For single tax filers with no children, the MTR distribution mirrors the tax brackets.¹⁸ The rate at the first quartile is the 7.7 (7.65 rounded to the tenth) payroll tax paid by workers with no state or federal tax liability. The highest rate of 43 percent applies to earners in the highest federal and state tax brackets. Rates for single adults with dependent children are much higher, since it is this group that most commonly uses the means-tested benefits included in our analysis. At the 25th percentile of MTRs, the rate is 22.7 percent; 11.44 percent of all single heads of household with dependent children face a rate of 50 percent or more, with the highest rates concentrated among those with two or more children. MTRs are less distributed among married heads of household, reflecting this group’s higher household earnings and lower use of means-tested benefits. Fewer than one percent of married households with dependent children have a negative net MTR, and only 2.82 percent face a rate greater than 50 percent.

¹⁵ If administrative time lags or caseworker discretion result in lower effective marginal tax rates on benefits, this approach will overestimate the MTR for a given income level. However, since administrative systems will eventually capture changes in a household’s earnings and street-level discretion is limited, this will have the effect of “shifting” the MTRs out to a higher earnings point.

¹⁶ Our focus is on the effect of tax and benefits program structures on net earnings. We do not attempt to model secondary effects due to changes in demand associated with an increase in earnings. This may underestimate overall marginal costs, particularly for non-subsidized workers. For example, a household earning more by working additional hours may have higher costs if purchasing childcare by the hour.

¹⁷ The federal EITC can be claimed during the year, but in practice very few households use this “advance” option (author citation).

¹⁸ Households without dependent children are eligible for a narrow range of income supports, including a small federal EITC at very low incomes, Food Stamps, and the Wisconsin Homestead Credit.

TABLE 3
DISTRIBUTION OF MARGINAL TAX RATES

	N	MTR Percentiles				% with Rate	
		25th	50th	75th	90th	<0.0	>0.50
Full study population	2,452,165	0.156	0.300	0.430	0.433	1.23	3.01
By marital status and number of children							
Single or head of household							
No children	1,134,540	0.077	0.227	0.300	0.430	<0.01	1.45
With dependent children	342,822	0.227	0.300	0.430	0.523	7.59	11.44
1 child	165,123	0.246	0.307	0.430	0.473	6.41	7.08
2 children	70,841	0.151	0.360	0.465	0.576	14.28	23.16
3+ children	34,066	0.077	0.300	0.455	0.688	15.61	23.57
Married							
No children	387,685	0.294	0.381	0.433	0.433	<0.01	0.40
With dependent children	578,817	0.294	0.400	0.433	0.433	0.72	2.82
1 child	186,830	0.294	0.401	0.433	0.433	0.49	0.77
2 children	244,307	0.303	0.422	0.433	0.433	0.69	2.87
3+ children	147,680	0.294	0.324	0.433	0.449	1.10	5.41
By poverty level, marital status, and presence of children							
Up to 100% FPL							
Single/HOH, no children	429,653	0.077	0.077	0.077	0.218	0.01	2.66
Single/HOH, with children	80,255	-0.277	0.077	0.306	0.438	32.43	7.59
Married, no children	23,918	0.064	0.077	0.077	0.077	0.02	0.36
Married with children	34,074	0.006	0.077	0.317	0.387	12.38	6.89
Total	567,900	0.077	0.077	0.077	0.227	5.33	3.51
Between 100% and 250% FPL							
Single/HOH, no children	351,401	0.156	0.227	0.298	0.298	-	2.27
Single/HOH, with children	113,666	0.300	0.453	0.500	0.603	-	26.37
Married, no children	48,444	0.156	0.156	0.292	0.292	-	0.42
Married with children	115,901	0.292	0.294	0.303	0.463	-	9.00
Total	629,412	0.156	0.292	0.300	0.470	-	7.72
Above 250% FPL							
Single/HOH, no children	434,579	0.300	0.325	0.430	0.430	-	0.08
Single/HOH, with children	76,109	0.300	0.307	0.430	0.430	-	0.07
Married, no children	315,323	0.303	0.422	0.433	0.433	-	0.41
Married with children	428,842	0.303	0.422	0.433	0.433	-	0.85
Total	1,254,853	0.300	0.422	0.433	0.433	-	0.43
By in-kind transfer program and EITC participation							
Uses no in-kind transfers	2,228,092	0.156	0.300	0.430	0.433	0.32	1.03
Nor EITC	2,132,439	0.156	0.300	0.430	0.433	-	0.25
Uses EITC	95,653	0.292	0.407	0.473	0.544	7.53	18.45
Uses only one in-kind transfer	119,081	0.077	0.294	0.437	0.586	4.38	20.10
No EITC, only...							
Food Stamps	49,112	0.077	0.294	0.516	0.587	-	31.80
Medicaid/Badgercare	35,552	0.077	0.156	0.300	0.324	-	2.26
WiShares Child Care	1,404	0.292	0.303	0.374	0.433	-	2.07
Uses EITC and...							
Food Stamps	2,840	-0.140	0.355	0.544	0.724	28.13	30.85
Medicaid/Badgercare	28,083	0.077	0.317	0.465	0.562	15.49	19.51
WiShares Child Care	2,090	0.403	0.520	0.613	0.694	3.25	54.26
Uses 2-3 in-kind transfers	104,992	0.077	0.316	0.503	0.688	17.00	25.67
No EITC	46,764	0.077	0.246	0.336	0.476	-	9.31
Uses EITC	58,228	-0.185	0.387	0.608	0.767	30.66	38.81

Note: - = no tax or program combination generates marginal rates within range.

Source: Authors' calculations with Wisconsin 2000 administrative data. Marginal rate calculated based on \$500 increase in annual earnings. Calculated using TAXSIM and program rules. See text for more details.

Examining the MTR distribution by poverty level, marital status and the presence of children (Table 3, panel 3) shows that negative rates are limited to those below the FPG (corresponding to households in the phase-in portion of the EITC). Below and at the poverty line, 32.43 percent of single heads of household with children and 12.38 percent of married households with children have negative MTRs. However, a total of 3.51 percent of poor households face rates of 50 percent or more. The highest rates are experienced by those between 100 and 250 percent of the FPG. At these income levels, 7.72 percent of all households and 26.37 percent of single heads of households with children face rates of 50 percent or greater. In contrast, above 250 percent of the FPG, fewer than one percent of households face these rates.

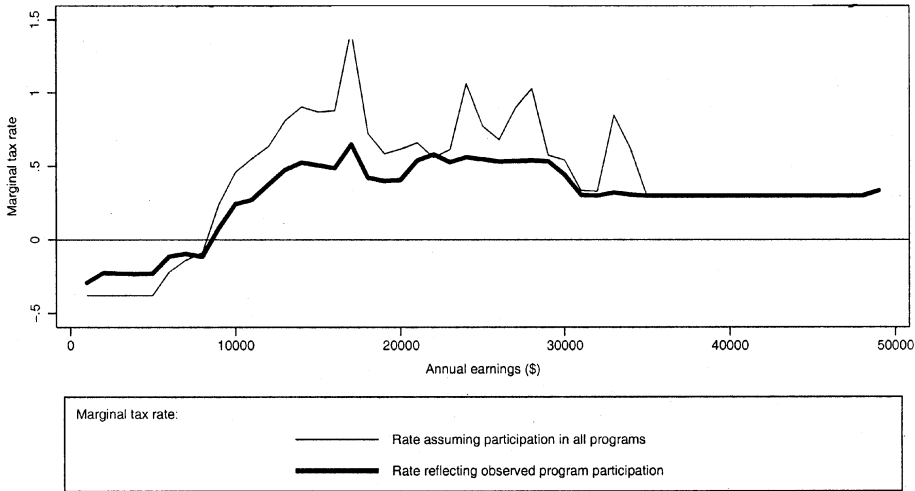
Total MTRs vary by program participation, both because of benefit schedules and because program participation is related to household income. The final panel of Table 3 shows MTRs by in-kind

transfer program use and EITC participation. Among households that do not use Food Stamps, Medicaid/BadgerCare, or Wisconsin Shares, those that use the EITC face higher rates, with a median MTR of 40.7 percent among EITC households versus a median rate of 30 percent among non-EITC households. The highest MTRs apply to Food Stamp users and those that concurrently use childcare subsidies and claim the EITC; over 30 percent of Food Stamp households and 54 percent of the Wisconsin Shares/EITC households face an MTR of 50 percent or more.

Visualizing Findings from Merged Data

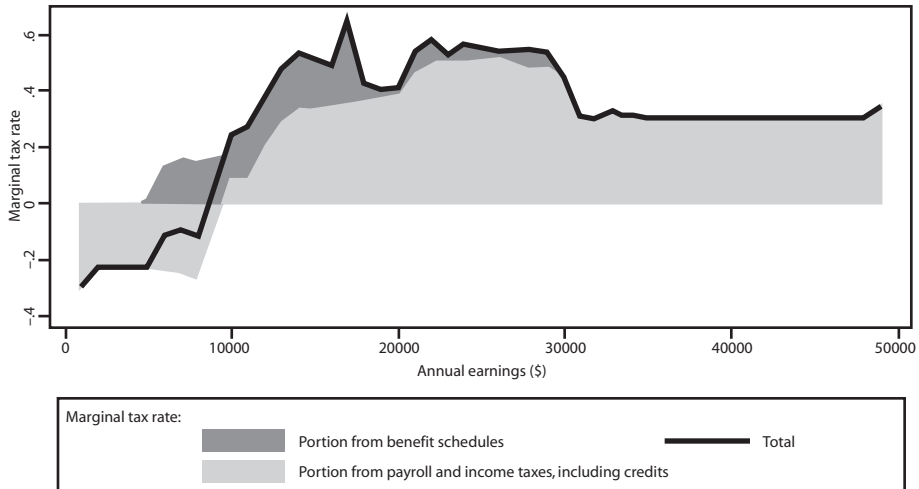
Assuming households participate in all programs for which they are eligible will overestimate the magnitude of MTRs. Using merged program participation and income data rather than hypothetical maximum rates allows for a more realistic description. Figure 3 displays this difference for single heads of household with two dependents (the same refer-

Figure 3. Combined Marginal Tax Rates, Comparing Hypothetical Full Participation and Observed Participation (Single Heads of Household with Two Dependents, Wisconsin TY2000)



Notes: Author calculations with Wisconsin 2000 administrative data. Marginal rate calculated based on \$500 increase in annual earnings. Calculated using TAXSIM and program rules. See text and appendix for more details.

Figure 4. Marginal Tax Rates by Source, Using Observed Tax Credit and Program Participation (Single Heads of Household with Two Dependents, Wisconsin TY2000)



Notes: Author calculations with Wisconsin 2000 administrative data including observed program use. Marginal rate calculated based on \$500 increase in annual earnings. Calculated using TAXSIM and program rules. See text and appendix for more details.

ence group used for Figures 1 and 2). The thinner line replicates the hypothetical maximum MTR from Figure 2, panel A. The thicker line reflects actual program participation observed using our unique data. When observed program participation is factored in, average MTRs at most income levels are lower, but they still hover around or slightly above 50 percent for much of the \$15,000 to \$30,000 annual income range. Even after substantial program non-participation is figured in, the MTRs faced by LMI households exceeds those faced by higher earning families (see Appendix Figure A2).

Figure 4 shows the relative contribution of benefit and tax program schedules to the total MTR for the same set of single heads of households with two dependents. The negative MTRs at the lower levels of income are from the phase-in portion of the EITC. Benefit reductions offset the phase-in of the EITC and bring the total MTR to zero for households earning around \$9,000 per year. At annual earnings higher than \$9,000 per year, the combined MTR reflects a combination

of benefit reductions and tax rates until eligibility for the means-tested benefits ends just before \$30,000. Overall, for single heads of household with two dependents and earnings below \$50,000, benefit reductions contribute 25.3 percent of the total MTR; the remainder results from the income and payroll tax systems (author calculations). Marginal tax rates resulting from means-tested benefit reductions are smaller for other demographic groups. Figure A2 (in the appendix) both expands Figure 4 to \$100,000 and presents it for two different household types—married households with two dependents and single persons without dependents. Relative to the focal household type of a single head of household with two dependents, these other household types face smaller benefit phaseouts.

DISCUSSION AND CONCLUSION

Taken together, a progressive tax system and means-tested transfer programs can create high MTRs on earned income for households who use one or more transfer

programs. However, not all eligible households use the available means-tested benefits, so assuming full take-up of means-tested programs will overstate the MTRs facing LMI households. In this paper, we used data on income, tax filing status, and transfer program participation to calculate the probable MTRs actually faced by Wisconsin households in 2000. This study differs from prior examinations of combined MTRs by drawing on data that combined administrative reports of both income and program participation. Although our approach is limited by the static nature of an annual accounting period and the need to impute some elements for benefits calculation, this work provides new evidence on the extent to which LMI households may benefit less from additional labor supply than other workers.

Overall, three percent of non-elderly Wisconsin households face MTRs of 50 percent or greater, meaning they keep less than half of each additional dollar earned. The incidence of high rates is significantly greater among certain households. Among single tax filers with dependent children, 11.44 percent face MTRs of 50 percent or greater. High rates are most concentrated among those families using means-tested supports; more than one in four single heads of households between 100 percent and 250 percent of the FPG lose more than half of additional earnings to benefit reductions and net tax increases. Fewer than three percent of all households use multiple means-tested programs and claim the EITC. This means that the incidence of the highest combined statutory rates is limited, but not negligible; over one-quarter of all households that claim the EITC and use two or three means-tested programs face rates of 50 percent or greater.

Discussions of high MTRs as a public policy issue generally center on higher-income households. Lowering marginal income tax rates has been a focus of tax legislation (Calomiris and Hassett, 2002). This analysis has shown that the effective MTRs arising from public policy are higher among the sizeable number of lower-income households taking advantage of the programs developed to make work pay. Should this be a matter of concern? Empirically, there is strong evidence that policies designed to supplement labor income have increased labor force participation among potentially welfare-reliant households (Meyer and Rosenbaum, 2000; Meyer, 2002). Working pays better than not working. The same body of evidence is less clear regarding the effect of high MTRs among households already in the labor market. For two-adult households, Eissa and Hoynes (2004; 2005) find that the labor supply of second earners in two-adult households is reduced in response to the phaseout portion of the EITC schedule, but such responses do not appear to occur for single heads of household.

The incidence of high MTRs indicates that this topic warrants further inquiry on both empirical and normative grounds. Many of those affected are likely unaware of their cumulative MTR (Romich, 2006). An inability over time to see a sufficient return from earning more may result in less obvious labor supply problems. For example, skills development may be seen as not worth the effort, to the detriment of both individual households and the larger economy.¹⁹ The depressive effect of multiple program participation on improving household well-being over time may itself suppress participation, reducing the efficacy of income support programs among the target

¹⁹ Heckman, Lochner, and Cossa (2002) estimate that the EITC suppresses skills development among workers with lower levels of education.

population. Beyond the economic effects, high MTRs may be problematic on moral grounds in that low earners with strong labor force participation receive the least rewards for increasing their efforts.

Acknowledgments

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APPENDIX A—DATA SOURCES AND DATASET ASSEMBLY

Data were used under a data exchange agreement between the Wisconsin Departments of Workforce Development, Health and Family Services, and Revenue (WDOR) and the New Hope Project. The Institute for Research on Poverty at the University of Wisconsin–Madison provided a merged file containing data from provided files from state health and human services programs (Medicaid/BadgerCare, Wisconsin Shares, Food Stamps) and from the state Unemployment Insurance administration. This file was sent to WDOR and merged with tax records using Social Security Numbers. Data sources and key contents are listed in Table A1. Households were constructed as follows:

- *Household identification.* The primary unit of analysis is the tax filing unit. This includes as separate households the 11 percent of tax records where the filer could be claimed as a dependent on another return. Program participants were matched to filing households through administrative case files. Program participants not matched to a tax

return were also included as independent households (1.7 percent of all households).

- *Exclusion of elderly households.* This analysis focuses on non-elderly households. Tax-filing households were excluded if they claimed additional Wisconsin personal exemption(s) for a primary or secondary filer (or both) aged 65 or older. The administrative files do not include cases receiving elderly-related medical assistance.
- *Household configuration (marital status, number of children).* For tax-filing households, marital status was determined from filing status and number of children set to number of dependent exemptions claimed. For non-filing households, marital status and number of children was imputed for some cases from administrative data. If marital status was indeterminate from program files, the household was assumed to be headed by an unmarried adult.

APPENDIX B—CALCULATING MARGINAL TAX RATES

Combined MTRs were calculated by using available data to create an estimate of post-tax, post-transfer income at different earnings levels. Input data included household size, structure, income, and program participation, but did not contain all necessary information. Table A2 summarizes the assumptions used in applying the program benefit schedules and tax rules to calculate benefit and tax amounts.

TABLE A1
DATA SOURCES AND CONTENTS

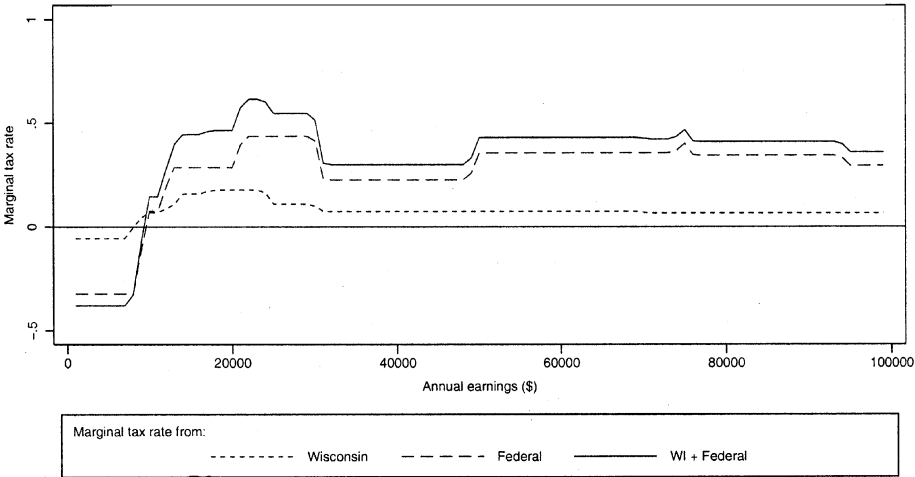
Program Source	Number of Records	Key Contents
Medicaid	1,221,848	Number of individuals in case, monthly data on individual eligibility
BadgerCare	426,312	Number of individuals in case, data on individual eligibility, net earned income, premium paid
Wisconsin Shares	336,725	Number of parents and children in case, income, co-payment, participation and payment for each child
Food Stamps	946,504	Number of individuals in case, data on individual eligibility, net income, dependent care disregard amount, shelter and utility expenses, benefit amount
Unemployment insurance	11,799,901	Wages by quarter, employer and location; link to employer data
State tax file (WDOR)	2,732,419	Filing status, number of dependents, federal adjusted gross income and EITC as reported on state return, state adjusted gross income, WEIC, Homestead Credit, other data

TABLE A2
VARIABLE CONSTRUCTION PROCESSES AND ASSUMPTIONS

Variable	Notes
Income	Income is the greater of tax income or wage income. Tax income is Wisconsin adjusted gross income for full-year residents filing a tax return, federal adjusted gross income for nonresident or part-time resident filer. Wage income equals totals from unemployment insurance records for primary and secondary Social Security Numbers from tax files. For households not filing tax returns, income from administrative data was used when available. Income was bottom-coded at zero and top-coded at \$1,000,000.
Filing status	Filing status is as reported on Wisconsin tax records when available. Otherwise, it was assumed that one-adult households with no dependents were single; one-adult households with dependents were head-of-household; and two-adult households were married. Per TAXSIM rules, married filing separate households are treated as single.
Number of Dependents	Topcoded at 15, per TAXSIM rules.
Number of taxpayers age 65+	Based on the exclusion of elderly households (see Appendix A), we assumed all households contained adults age 18 to 65.
Wage income of primary, secondary taxpayer	Primary wages equal income for single and head-of-household filers. For married filers, wages allocated with primary wages set equal to two-thirds of income and secondary wages equal to one-third of income.
Rent paid over year	Rent is used to calculate property tax and homestead credits. Rent is set equal to U.S. Department of Housing and Urban Development 2000 Fair Market Rent for Milwaukee metropolitan area, assigned as follows: 0 bedroom—single, no dependents; 1 bedroom—married, no dependents; 2 bedroom—1 or 2 dependents; 3 bedroom—3 to 6 dependents; 4 bedroom—7 or more dependents. Rent includes utility costs.
Child care expenses eligible for federal tax credit	The number of children in childcare and the cost per child is needed to estimate childcare expenses for the CDCTC. The number of children in care was imputed as the closest integer of the value of the total number of dependents times a random number generated from a uniform (0,1) distribution, i.e., $\# \text{ in care} = \text{round}(\text{uniform} * \text{depex}).$ For households receiving subsidized childcare, the minimum of this generated number or one was used since these cases were known to have at least one child in care. For households receiving subsidized childcare, assumed to equal co-payments assessed over a year based on income and nincc value (see above). For other households with nincc >1, assumed to equal to 50 percent of the rate set for licensed home-based childcare in Wisconsin (\$4,125 per year for one or two children and \$3,750 for each additional child).
Number of dependents under age 17	All dependents are assumed to be children under 17 for purposes of calculating the CTC.
Other items	The following were assumed to be zero: unemployment compensation benefits, mortgage interest paid, short-term capital gain or loss, long-term capital gain or loss, dividend income, interest and other property income, taxable pension income, gross Social Security benefits, property tax paid, and other itemized deductions.

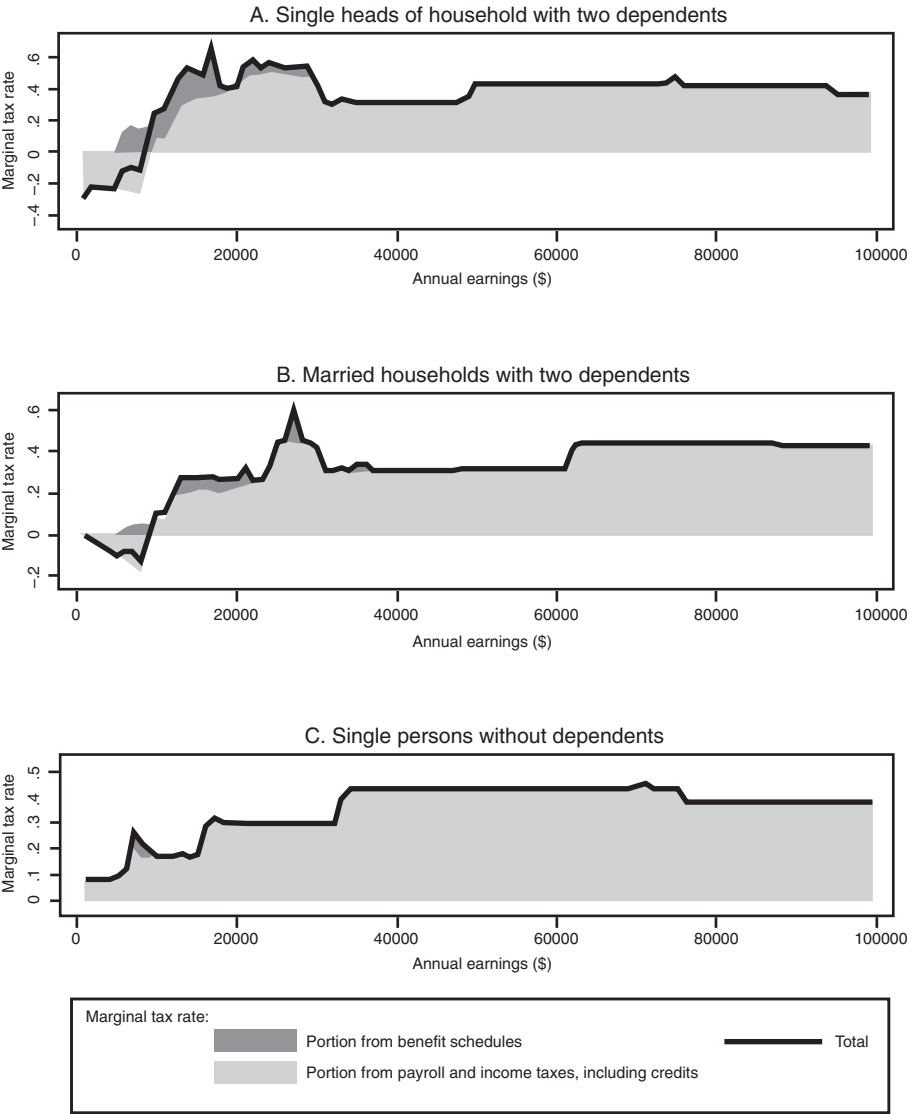
APPENDIX C

Figure A1. Marginal Rates from Tax Schedules, Assuming Full Participation in Available Tax Credits (Single Heads of Household with Two Dependents, Wisconsin TY2000)



Notes: This extends Figure 2, panel A from text to \$100,000. Author calculations using TAXSIM. Includes payroll taxes, income taxes, and applicable credits. Marginal rates calculated based on \$500 increases in earnings. See text and appendix for more details.

Figure A2. Marginal Tax Rates by Source, Tax Schedules and Means-Tested Benefits (Wisconsin TY2000)



Notes: Panel A extends Figure 4 in text. Author calculations with Wisconsin 2000 administrative data. Marginal rate calculated based on \$500 increase in annual earnings. Calculated using TAXSIM and program rules. See text and appendix for more details.

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