Net Income, Gross Income, and Bias in Child Support Awards in Gross Income-Shares States

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Net Income, Gross Income, and Bias
in Child Support Awards in Gross Income-Shares States: Utah as An Example

Abstract

In this study I discuss the pros and cons of using net income vs. gross income in gross income-shares states. It is argued that the "standardized net" approach is the best approach in determining child support awards based on the combined principles of equity and accuracy. However most states use gross income approaches for the sake of simplicity. Such gross income approaches can generate biases in support awards. Using 2004 tax structures and taking into consideration Earned Income Tax Credit and child tax credit, I estimate the direction, magnitude, and distribution of such biases under three different scenarios of "gross income" approaches. Results show that these biases can be either positive or negative depending on the particular assumptions made in the gross-to-net income conversion process. In some income combination cases, the biases can be quite substantial.

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To control welfare costs and to assure that parents did not shift the cost of raising children to the society at large, Congress passed the Family Support Act of 1988 requiring each state to develop presumptive child support guidelines. The majority of the states have implemented child support guidelines based on the principle of income sharing, by which parents are expected to share their income with their children to the same extent as if they were living together (Bassi & Barnow, 1993; Bartfeld, 2000). However, the particular details of implementing this principle can be quite different in different states. Three types of guidelines are common: the percentage-of-income guidelines, the income-shares guidelines, and the "Melson formula" guidelines. The percentage-of-income guidelines specify child support as a percentage of non-custodial income without considering the custodial income. The income-shares guidelines specify child support as a percentage of combined non-custodial and custodial incomes, and prorate the total support amount between parents according to each parent's share of combined income. The "Melson formula" guidelines first allow for a self-support reserve for the non-custodial parent, then assign all excess non-custodial income to meet the basic needs of the child(ren), and finally assign a percentage of remaining income to the child(ren). As of the beginning of 2005, 35 states used the income-shares guidelines, 13 (including DC) followed the percentage-of-income guidelines, and 3 used the "Melson formula" guidelines (National Conference for State Legislators, 2004).

In most income-shares and percentage-of-income states, the percentage of parental income assigned to the child(ren) is based on economic studies of expenditure on children using data from the Bureau of Labor Statistics' Consumer Expenditure Survey.

Because most child-rearing expenditures are made from disposable after-tax income, economic studies typically have produced estimates on parental expenditure on children as a percentage of total expenditure and then net income.

States have grappled with whether to base their child support guidelines on gross or net income since guidelines were first developed (Judicial Council of California, 2001). A review of states' guidelines information on the Internet shows that 30 states (including D.C.) used gross income and 21 used net income as of March 2005. Among the 13 states that used the percentage-of-income approach, seven used the net income approach while the other six the gross income approach. Among the 35 states that used the income-shares approach, 11 used net income while 24 used gross income. The three states that used the "Melson formula" approach all used net income. The purpose of this study is to systematically investigate the relationship between gross income and net income approaches in child support guidelines in income-shares states.

Insert Table 1 about here

The relationship between net income and gross income is complicated because tax liability is dependent on family composition and consumption/investment behavior. As such, with the same amount of combined gross income, the available combined net income after divorce is different, sometimes quite substantially, from available combined net income before divorce. For income-shares states that take into consideration both parents' income, the issue is even more complicated because the tax implications are different for the two parents once they split. As a result the non-custodial share of gross income can be very different from the non-custodial share of net income. Three general approaches have been used in income-shares states to deal with the issue of gross income

vs. net income: the “actual net income” approach, the “standardized net income” approach, and the “gross income approach”.

The “actual net income” approach

Under the “actual net income” approach support awards tables are presented by combined net income. Net income is estimated and reported by the parents separately. The actual net incomes from both parents are summed up to become the “combined net income”. The “combined net income” is used to locate the total support amount in the tables. The non-custodial parent then pays his or her share of that total based on his or her percentage share of net income.

As an example, the State of Florida asks the custodial and non-custodial parents to report their federal, state, and local income taxes as part of the allowable deduction, and subtract such taxes from their gross income. Net income is then computed for both parents. The child support award is based on the combined net income and the non-custodial percentage share of net income.

The “standardized net income” approach

Under the “standardized net income” approach support awards tables are also presented by combined net income. In fact, the tables should look exactly the same as the one used under the “actual net income” approach if the same economic estimates on parental expenditure on children are used.

However, parents are asked to report their respective gross income. Each parent's tax liability and net income are estimated separately with standard assumptions on exemption status and child custody.

It is usually assumed that all income is earned income. Standard deductions are used for both parents. Depending on the actual custody arrangement, the filing status of each parent can be either "single" if the parent does not have custody of any children due support, or "head of household" if the parent has custody of children due support. New marriages and subsequent children do not change these standardized assumptions. Federal and state income taxes, FICA, earned income credit (EIC), and child tax credits are explicitly taken into consideration with this approach. The standardized net income is computed for each parent and then summed up to form the "combined net income". This "combined net income" is then used to locate the total support amount in the tables. The non-custodial parent's portion is computed by multiplying the total amount by his or her net income share.

While several states use some form of the standardized net approach, most do not take into consideration EIC and child tax credit. For example, in South Dakota, both the custodial parent and non-custodial parent are allowed to subtract (1) FICA, (2) federal tax withholdings with two exemptions, and (3) mandatory retirement savings from their respective gross income. The true exemption status, EIC, and child tax credits are not taken into consideration.

<u>The "gross income" approach</u>

Under the “gross income” approach the support awards tables are presented by combined gross income. Assumptions about tax liabilities are implicitly incorporated into the tables. Usually one conversion is done to convert the combined gross income to combined net income as part of the construction of the support awards tables. Parents’ combined gross income is used to locate the total child support amount. The non-custodial parent’s child support award is computed by multiplying the total amount by his or her gross income share.

Policy Studies Inc. (PSI), the leading consulting company in the field of child support guidelines policy, has conducted reviews and given recommendations to many states’ child support guidelines. PSI has used this approach for several states, including Arizona, Oregon, Utah, and DC. However, the actual assumptions made when converting combined gross income to combined net income are somewhat different depending on the state.

PSI typically has used withholding tables instead of actual tax rate schedules for the gross-net conversion. Two sets of assumptions have been used recently. One shall be called the “single withholding approach”, applied in Arizona (2003), Oregon (2001), and Utah (2002). The other is the “married withholding approach”, applied for the DC review in 2004. Under both approaches all income is assumed to be wage income. Federal withholding, state withholding, and FICA are computed. Advance earned income credit (AEIC) can be incorporated into the calculations when appropriate. Child tax credit is not explicitly taken into consideration under either of these two withholding approaches.

Under the “single withholding approach”, it is assumed that all combined income is earned by the non-custodial parent with no dependents. Two withholding exemptions

(one for deduction and one for exemption) are claimed. The withholding table for single person or head of household is used (Policy Studies Inc 2001, 2002, 2003). Under this assumption no AEIC is incorporated because single persons with no children are not eligible to receive AEIC, although they may be eligible to receive EIC as a tax refund. Also note under this method the estimated total tax liability is independent of the number of children due support.

Under the "married withholding approach" the family is assumed to be still intact so the married person withholding table is used. The argument for using this approach is that it's consistent with the child-rearing measurements, which are from intact families. The total number of exemptions is two plus the number of children due support (District of Columbia Child Support Guideline Commission Final Reports, 2004). AEIC is explicitly incorporated, although one should note that AEIC is typically lower than actual EIC (the maximum AEIC payment for 2004 was $1,563 while the maximum EIC was $4,300). Total tax liability varies depending on the number of children due support.

A third possible approach is to use the actual filing process for the estimation of tax liabilities instead of using withholding tables. In this case "married filing jointly" would be used with the actual number of children due support claimed on the tax forms. EIC is fully incorporated. So is child tax credit.

Other approaches are possible in the gross to net conversion process. For example, the State of Indiana applies a uniform 21.88% rate to convert gross to net. Because the process of conversion is hidden in the gross income states, unless the original study creating the guidelines can be located (such as Arizona and Oregon) or the process is so simplified that it's written in the law (such as Indiana), the assumptions used in the

conversion process often cannot be reconstructed from guidelines tables alone. As such, these other possible conversion approaches are not investigated in this study.

Pros and Cons of the Three Approaches

Acknowledging that most child-rearing expenditures are made from net income, the policy discussion of pros and cons of these approaches in the literature hinges on three principles: (1) equity, (2) accuracy, and (3) simplicity. Equity refers to one party's interest being unaffected by independent actions and strategies of the other party. This equity principle is equivalent to the principle of avoidance of externalities. Accuracy refers to whether the approach accurately reflects the economic situations of parties involved (American Law Institute, 2002; Judicial Council of California, 2001). The simplicity principle refers to how easy it is to administer a particular approach (Judicial Council of California, 2001).

The principle of equity argues in favor of the "standardized net income" approach and the "gross income" approach over the "actual net income" approach. The "actual net income" approach is the least equitable because tax liability can change significantly with subsequent family structure changes and consumption/investment behavior changes. Remarriage, addition of a child, or purchase of a home will all affect actual net income given the same gross income. As a consequence, the actions of either parent can affect the amount of child support. This approach is thus unfair because the support amount can be affected by the actions and/or strategies of one party without other parties having any control over such actions. The two other approaches can insulate the child support

obligations from these individual actions and strategies and are thus more equitable (American Law Institute, 2002, Judicial Council of California, 2001).

The principle of accuracy argues in favor of treating parents as separate tax units because they are subject to differing tax rules and rates due to different levels of income and dependents claiming status. This separate treatment allows the accurate computation of net income, from which most child-rearing expenditures are made. Among the three approaches presented, parents are treated as separate tax units in the two net income approaches, but as one unit in the "gross income" approach. As such the two net income approaches provide a more accurate picture of the economic situations of the parents than the "gross income" approaches (American Law Institute, 2002; Judicial Council of California, 2001; Rogers, M., 1999).

The principle of simplicity at the administrative level argues in favor of the "gross income" approach. Because tax liability assumptions are implicitly made when the tables are created, users of the tables (parents, administrators, lawyers) need not to have any knowledge of tax liability issues (Judicial Council of California, 2001). This principle would rank the "actual net income" approach the least favorable because the computation and verification of actual tax liability can be very difficult and time consuming. The "standardized net income" approach uses a standard set of tax assumptions to simplify the tax computation process. This approach has the potential of reaching the same level of simplicity as the "gross income" approach with the help of appropriate computer programming.

This paper concerns particularly the principles of equity and accuracy because even if a particular approach is chosen for its simplicity, it is still important for policy

makers to know what prices in equity and accuracy they are paying for this simplicity. As discussed earlier, based on the principle of equity, the "standardized net income" approach and the "gross income" approach are better than the "actual net income" approach. Between the "standardized net income" approach and the "gross income" approaches, the former is more accurate than the latter. As such, the "standardized net income" approach should be considered the best approach with respect to the combined principles of equity and accuracy. Deviations from the support amounts generated from the "standardized net income" approach should be considered a bias. While it is difficult to judge what bias the "actual net income" method can produce because this method involves actual tax situations in calculations of support awards, it is possible to assess the bias when the "gross income" method is used. The important policy questions are: (1) how large is the bias, and (2) how is the bias distributed?

"Gross Income" Approach Bias – Theoretical Relationships

There are two potential issues that may cause bias in income-share states using the "gross income" approach: (1) The income share of non-custodial parent income based on net income may be higher or lower than the income share computed using gross income; and (2) The net income computed under any of the three sets of filing status assumptions may be higher or lower than parents filing separately as either "single" or "head of the household". I will name the first one "income share bias", and the second one "income conversion bias".

Let

P_{net}=Percentage of combined net income spent on children

P_{gross}=Percentage of combined gross income spent on children

G_n=Gross income of non-custodial parent

G_c=Gross income of custodial parent

G_b=Combined gross income (=G_n+G_c)

T_n=Tax liability of non-custodial parent (federal, state, FICA), excluding EIC

E_n=Earned income credit of non-custodial parent

T_c=Tax liability of custodial parent (federal, state, FICA, child tax credit), excluding EIC

E_c=Earned income credit of custodial parent

W_{bs}=Total tax withholding assuming all income earned by non-custodial parent filing single with 2 exemptions.

W_{bm}=Total tax withholding assuming married with (2+ # of children) exemptions

T_b=Total tax liability (federal, state, FICA, child tax credit) filing married jointly, excluding EIC

E_b=Total earned income credit if filing married jointly

S_{1a}=Amount of child support award using "gross income" approach with single withholding

S_{1b}= Amount of child support award using "gross income" approach with married withholding

S_{1c}= Amount of child support award using "gross income" approach with married filing jointly

S_2=Amount of child support award using "standardized net income" approach

We have

(1) $$S_1 = (G_n + G_c) * P_{gross} * \frac{G_n}{G_n + G_c} = P_{gross} * G_n$$

(2) $$S_2 = (G_n - T_n + E_n + G_c - T_c + E_c) * P_{net} * \frac{G_n - T_n + E_n}{G_n - T_n + E_n + G_c - T_c + E_c}$$
$$= P_{net} * (G_n - T_n + E_n)$$

The percentage bias (overpayment if positive and underpayment if negative) is:

(3) $$\frac{S_1}{S_2} - 1 = \frac{P_{gross}}{P_{net}} * \frac{G_n}{G_n - T_n + E_n} - 1$$

The expenditure data give estimates on P_{net}. In the process of converting P_{net} to P_{gross}, assumptions are made about the taxes. Under the "standardized net income" approach, the relationship between P_{gross} and P_{net} is

(4) $$P_{gross} = P_{net} * \frac{G_n - T_n + E_n + G_c - T_c + E_c}{G_n + G_c}$$

If using the "single withholding" approach, then

(5) $$P_{gross1a} = P_{net} * \frac{G_b - W_{bs}}{G_n + G_c}$$

If using "married withholding" approach then

(6) $$P_{gross1b} = P_{net} * \frac{G_b - W_{bm}}{G_n + G_c}$$

If using "married filing jointly" approach then

(7) $$P_{gross1c} = P_{net} * \frac{G_b - T_b + E_b}{G_n + G_c}$$

Substituting (4) into (3), we have

(8) $$\frac{S_1}{S_2} - 1 = \frac{G_n}{G_n + G_c} * \frac{G_n - T_n + E_n + G_c - T_c + E_c}{G_n - T_n + E_n} - 1$$

Equation (8) shows the "income share bias". This is accomplished by assuming separate filing in the conversion from P_{net} to P_{gross}.

Substituting (5) into (3), (6) into (3), and (7) into (3) we have

(9) $$\frac{S_1}{S_{2a}} - 1 = \frac{G_n}{G_n + G_c} * \frac{G_b - W_{bs}}{G_n - T_n + E_n} - 1$$

(10) $$\frac{S_1}{S_{2b}} - 1 = \frac{G_n}{G_n + G_c} * \frac{G_b - W_{bm}}{G_n - T_n + E_n} - 1$$

(11) $$\frac{S_1}{S_{2a}} - 1 = \frac{G_n}{G_n + G_c} * \frac{G_b - T_b + E_b}{G_n - T_n + E_n} - 1$$

Equation (9), (10), and (11) take both the "income share" bias and the "income conversion" bias into consideration and thus show the total "gross income" approach bias. The only difference between these three equations is that (9) uses the "single withholding" approach, (10) uses the "married withholding" approach, and (11) uses the "married filing jointly approach".

Estimating "Gross Income" Approach Bias - Simulations

Because of the complexity of U.S. tax codes, the theoretical relationship of this bias does not easily lead to an assessment of the magnitude or even the direction of the bias. Certain tax structure assumptions need to be made for that assessment to be possible. For this study, all income is assumed to be earned income. When possible, the following taxes are considered: (1) federal income tax, (2) FICA (6.2% capped at $87,900 for Social Security tax and 1.45% for Medicare tax with no income cap), (3) EIC or AEIC, (4) child tax credit ($1000 per child until adjusted gross income reaches $75,000 for head of household or $110,000 for married filing jointly, after which the total credit amount decreases by 5 cents per dollar exceeding the limit), and (5) state income tax (Utah for this exercise). The tax codes for year 2004 are used. Additional assumptions are made for each of the approaches when appropriate.

For the “standardized net income” approach all the taxes mentioned above are taken into consideration. The federal and Utah income tax rate schedules are used (see Appendix Table A.1, A2, and A.3). Standard deductions are used in all tax liability calculations. The non-custodial parent is assumed to file as “single”, while the custodial parent is assumed to file as “head of household”. Number of exemptions equals to number of children plus one.

For the “single withholding” method, the single sections of the federal and Utah withholding schedules for annual payroll period are used (see Appendix Table 4, Table 5, and Table 6). Two exemptions are used. Note that neither EIC nor child tax credit can be taken into consideration with this approach. These are the assumptions used by PSI for the “single withholding” method.

For the “married withholding” method, the married sections of the federal and Utah withholding schedules for annual payroll period are used (see Appendix Table 4, Table 5, and Table 6). The number of exemptions equals to (2+ number of children due support). Note that EIC is only partially taken into consideration through the use of Advance EIC. The child tax credit cannot be incorporated with this approach. These are the assumptions used by PSI for the “married withholding” approach.

For the “married filing jointly” method, all taxes mentioned above are taken into consideration. The only difference between this approach and the “standardized net income” approach is the filing status is assumed to be “married filing jointly”. As such, income is combined. So is tax liability.

Because the three sets of tax computations under the “gross income” approach generate different levels of bias in support awards compared to the “standardized net

income" approach, simulations are conducted using each set of these assumptions, plus the "standardized net income" approach. Non-custodial parent's annual gross income is simulated in the range of $12,000 to $96,000, with $6,000 internals in-between. Very low incomes are not included because almost all states have a low income table to address the non-custodial poverty issue. These low income tables are minimum awards computed with mathematical interpolations. They do not follow the economic data on parental expenditures on children. For the custodial parent, annual gross income is simulated in the range of $0 to $96,000. Simulations are conducted for one child, two children, and three children.

In the simulations it is assumed that the custodial parent claims exemptions for the children in his or her custody. Note that in the case of custodial parent earnings zero income, the practical solution is for the non-custodial parent to claim all children due support. While this can be easily incorporated into the computations, it is not done in the simulations for the sake of consistency with the current practice of leaving this arrangement to the court instead of incorporating it into in the guidelines.

Results and Discussion

In this section "income share" bias in gross income-shares states is discussed first. Then the total bias in each of the three "gross income" methods - single withholding, married withholding, and married filing jointly - is discussed.

"Income share" bias

Regardless of which of the three "gross income" approaches is used, the "income share" bias (S_1/S_2-1 in Equation 8) is the same for the same combined gross income and number of children. Figure 1 shows the percentage "income share" bias by non-custodial gross income for two children when custodial gross income is at $0, $6,000, $12,000, $24,000, $48,000, and $96,000.

Insert Figure 1 about here

"Income share" bias is zero when custodial income is zero because in this case the non-custodial income share is always 100%, net or gross. When custodial parent's income is greater than zero, "income share" bias is positive in most cases except for very low non-custodial income coupled with much higher custodial income.

Within the simulation range for two children, the largest positive bias is 23% with $12,000 annual income for each parent. That means in this particular situation the gross income share of the non-custodial parent is 23% higher than the net income share of the non-custodial parent, leading to a support award that is 23% higher than that generated from using the "standardized net" approach, other things equal. This is caused by the custodial parent being able to take almost full advantage of EIC, child tax credit, and the dependent exemptions thereby leading to a negative tax liability (because of EIC). The non-custodial parent, on the other hand, cannot take advantage of any of these tax benefits.

The largest negative bias is -15% with $12,000 non-custodial income and $96,000 custodial income, meaning that the non-custodial parent's gross income share is 15% lower than his/her net income share. This is the case where the custodial parent is in a very high income tax bracket without being able to take full advantage of the tax credits

due to high income, leading to a higher average tax rate compared to the non-custodial parent.

For lower levels of custodial income, the "income share" bias is positive but decreases as the non-custodial income increases. For higher levels of custodial income, the "income share" bias changes from negative to positive as the non-custodial income increases. After non-custodial income reaches about $48,000 the "income share" bias becomes universally positive. The patterns for one child and three children are similar, with -17% to 15% as the largest bias points for the case of one child, and -13% and 23% for the case of three children. The income combination points for these largest bias cases are the same as for the two children case.

Total bias using the "single withholding" method

$S_{1a}/S_2 - 1$ in Equation (9) is the percentage bias in support amount generated using the gross income "single withholding" method compared to that generated from the "standardized net income" method. The formula shows that the number of children does not affect the percentage bias, because the "single withhold method" assumes that the non-custodial parent earns all income and claims no dependents. Figure 2 shows the percentage bias in support award by non-custodial gross income when custodial gross income is at $0, $6,000, $12,000, $24,000, $48,000, and $96,000.

Insert Figure 2 about here

When the non-custodial parent earns all income, the percentage bias in the child support award generated using the "single withholding" method is practically zero. This is not surprising because non-custodial parent earning all income is the scenario assumed

in the gross-to-net conversion under this approach. When the custodial income is nonzero, the bias is negative, meaning that the child support award is lower than that generated from the "standardized net income" approach. Other things equal, the higher the non-custodial income, the smaller the bias. However, other things equal, the higher the custodial income, the larger the bias.

The largest bias within the simulation range is -24% for a non-custodial income of $12,000 and custodial income of $96,000. The smallest bias is almost zero when custodial income is zero. These percentages can be converted to dollar amounts of monthly underpayment or overpayment using the PSI table of support proportions by net income with Rothbarth parameters (Appendix Table 7). An example case of a lower income household with $12,000 non-custodial income and $12,000 custodial income has a bias of -8%, resulting in a monthly underpayment of $16 for one child, $22 for two children, and $27 for three children. A middle income household with $36,000 non-custodial income and $24,000 custodial income has a bias of -8%, resulting in a monthly underpayment of $43 for one child, $57 for two children, and $64 for three children. A higher income household with $60,000 non-custodial income and $36,000 custodial income has a bias of -5%, resulting in a monthly underpayment of $40 for one child, $53 for two children, and $59 for three children.

As noted earlier in the theoretical relationship section, the total bias is composed of two components: the "income share" bias and the "income conversion" bias. In the case of the "single withholding" method, the combined tax liability is very much overestimated, resulting in a much lower combined net income than the actual situation. This negative "income conversion" bias leads to a lower support award. On the other

hand, the usually positive "income share" bias leads to a higher support award. With the "single withholding" method, the magnitude of the "income conversion" bias is larger than that of the "income share" bias, resulting in lower support awards in virtually all the cases within the simulation range except for the zero custodial income situation.

Total bias using the "married withholding" method

$S_{1b}/S_2 - 1$ in Equation (10) is the percentage bias in support amount generated using the gross income "married withholding" method compared to that generated from the "standardized net income" method. The formula shows that the number of children does affect the percentage bias, because the number of children affects how many exemptions can be claimed. Figures 3 shows the percentage bias in support award for two children by non-custodial gross income when custodial gross income is at $0, $6,000, $12,000, $24,000, $48,000, and $96,000.

Insert Figure 3 about here

The support awards generated under the "married withholding" method are generally higher than that generated under the "standardized net income" approach, except for some cases where non-custodial income is lower than custodial income. The largest upward percentage bias is for the case of $12,000 non-custodial income and zero custodial income. The bias is 20% for one child, 20% for two children, and 21% for three children. The largest downward percentage bias is for the case of $12,000 non-custodial income and $96,000 custodial income. The bias is -17% for one child, -16% for two children, and -15% for three children.

As an example, a lower income household with $12,000 non-custodial income and $12,000 custodial income has a bias of 2% ($4 monthly overpayment) for one child, 4% ($12 monthly overpayment) for two children, and 6% ($21 monthly overpayment) for three children. A middle income household with $36,000 non-custodial income and $24,000 custodial income has a bias of 1% ($5 monthly overpayment) for one child, 2% ($14 monthly overpayment) for two children, and 4% ($32 monthly overpayment) for three children. A higher income household with $60,000 non-custodial income and $36,000 custodial income has a bias of bias of 4% ($32 monthly overpayment) for one child, 5% ($53 monthly overpayment) for two children, and 6% ($74 monthly overpayment) for three children.

The "married withholding" percentage bias patterns for one child and three children are similar to that of two children. For one child, the largest negative bias is -17% for $12,000 non-custodial income and $0 custodial income, while the largest positive bias is 29% for $12,000 non-custodial income and $96,000 custodial income. For three children, the respective numbers are -15% and 21% at the same income combination points.

Estimates of tax liability using the "married withholding" method are lower than estimates using the "single withholding" method because more withholding exemptions are claimed. With the exception of the zero custodial income case and some low custodial income/high non-custodial income combinations, the "married withholding" method tends to produce negative "income conversion" bias, meaning the estimated combined tax liability is higher than the actual combined tax liability, possibly due to the exclusion of child tax credit. However, the magnitude of the mostly negative "income conversion"

bias is smaller than the mostly positive "income share" bias, resulting in a positive overall bias in most cases. Thus under the "married withholding" approach the child support awards are typically higher than that generated from the "standardized net income" approach.

Total bias using the "married filing jointly" method

$S_{1c}/S_2 - 1$ in Equation (11) is the percentage bias in support amount generated using the gross income "married filing jointly" method compared to that generated from the "standardized net income" method. The formula shows that the number of children does affect the percentage bias, because the number of children affects the number of exemptions, amount of EIC, and amount of child tax credit. Figures 4 shows the percentage bias in support award for two children by non-custodial gross income when custodial gross income is at $0, $6,000, $12,000, $24,000, $48,000, and $96,000.

Insert Figure 4 about here

Within the simulation range, the maximum bias is 47% overpayment for child support in the case of non-custodial parent earning $12,000 a year and the custodial parent earning $0. The largest negative bias within the simulation range is -12% for the case of custodial parent earning $96,000 and the non-custodial parent earning $12,000.

In general, the lower the non-custodial parent's income, the larger the magnitude of the bias, in both directions. As long as the income of the custodial parent is lower than or equal to the income of the non-custodial parent, the bias is positive. When the income of the custodial parent is much higher than the income of the non-custodial parent, the bias is negative.

As custodial parent's gross income rises, the percentage overpayment in support award decreases, regardless of the income level of the non-custodial parent. The "married filing jointly" bias patterns for one child and for three children are similar to that of two children. For one child, the largest bias points are -14% for $12,000 non-custodial income and $96,000 custodial income, and 31% for $12,000 non-custodial income and $0 custodial income. For three children, the respective biases are -10% and 47% for the same income combination points.

"Income conversion" bias is large when the two parents' incomes are in disparity with one much higher than the other. That is because of the commonly referred to "marriage tax bonus" enjoyed by some households. In these cases not being able to file "married jointly" causes the combined tax liability to increase substantially, leading to a decrease in total combined net income. On the other hand, if both parents' incomes are similar, then the combined net income under married filing jointly can be lower than the combined net income under separate fillings – an example of marriage tax penalty. In this situation the "income conversion" bias is negative.

Selected Scenarios

Table 2 illustrates some examples of income combinations (gross and net) and bias decomposition under different gross-net conversion methods for a household with two children. The odd number cases (1, 3, 5, 7, and 9) are cases where the non-custodial parent is the sole earner, with annual gross income of $12,000, $24,000, $36,000, $60,000, and $96,000. In these cases the "income share" bias is 0, because the non-custodial parent earns 100% of either gross or net income. The even number cases, 2, 4, 6,

and 8, show situations where both parents earn income. In these cases the "income share" bias is quite large, at 23%, 20%, 12%, and 9%, respectively under the three different conversion methods.

Insert Table 2 about here

In all these nine cases, the support awards generated from the "single withholding" approach are the same as the "standardized net income" approach when the custodial income is zero. In all other cases the "single withholding" approach generates lower payments, ranging from -4% ($22 underpayment per month) for the $24,000/$12,000 combination to -8% ($57 underpayment per month) for the $36,000/$24,000 income combination.

The support awards generated from the "married withholding" approach and the "married filing jointly" approach are all higher than that from the "standardized net income" approach in these nine cases. The largest overpayment is 47% ($134 per month) for the $12,000/$0 income combination with the "married filing jointly" approach, followed by 28% ($138 per month) for the $12,000/$12,000 income combination with the "married filing jointly" approach. The smallest overpayment is 2% ($14 per month) for the $36,000/$24,000 combination under the "married withholding" approach, followed by 4% ($12 per month) for the $12,000/$12,000 combination.

While it is quite clear that the "married filing jointly" approach generates the largest bias, it is not as straight forward to judge whether the "married withholding" or the "single withholding" approach is better, with one likely to generate underpayment while the other overpayment. As the figures and the examples show, sometimes the bias

can be quite large, making the guidelines particularly unfair to parents who happen to have certain income combinations.

Conclusions

The results in this study show that in gross income share states, the child support awards tend to be biased, sometimes quite substantially, relative to the preferred awards that are generated from the "standardized net income" approach, due to both an "income share" bias and an "income conversion" bias. When states review their Child Support Guidelines, the issue of net income vs. gross income seems to come up quite a bit. Often it has been argued that each approach has its advantages and disadvantages. As such, most states opt to continue to use whatever method they have been using before. Philosophically, the "standardized net income" approach is better than both the "actual net income" and the "gross income" approaches in terms of the combined principles of equity and accuracy, while "gross income" approach has the advantage of being simple to administrate. Committees and experts conducting future reviews of States' Child Support Guidelines should seriously consider the implications of this policy choice in order to make Child Support Guidelines as fair as possible to all parties involved. If the "standardized net income" approach cannot be adopted for political or technical reasons, there should be an awareness of the potentially large bias these "gross income" approaches can cause, with the "single withholding" method generally resulting in underpayments and the "married withholding" method generally resulting in overpayments.

For the purpose of this study, the tax structure of Utah is used. Other states' tax structure may lead to larger or smaller biases. When considering their policy changes, states should conduct such bias studies using their own tax structure. In addition, tax codes change over time. If states continue to use the gross income share approach, such bias studies should be conducted every time there are major tax code changes that can affect the size of such bias in order for Child Support Guidelines policies to be up to date and reflect the actual economic situations of all parties involved.

It should also be noted that this study considers only uncomplicated cases with no joint custody and no unearned income. However these adjustments are usually made either before or after this base support award calculation process and therefore should not affect the general conclusion of this study.

In conclusion, it is strongly recommended that the income-shares states use the "standardized net income" approach with guidelines tables constructed by net income instead of gross income. The "standardized net income" approach is not difficult or complicated to use in this age of computing technology. Parents only need to report their gross income and the custody situation of the children due support. Computer programs can be implemented to automatically compute their respective net income taking into consideration filing status, exemptions, EIC, child tax credit, and FICA when applicable. This computation can be done with joint custody cases as well as split custody cases.

To go one step further, in order to maximize the combined net income, computer programs can be designed to configure the best allocation of children's exemption status and assign as such (regardless of the actual custody arrangement). If it is deemed that the combined net income is the highest if the non-custodial parent claims the children for tax

purposes, as in the case of zero or very low custodial income, then such an arrangement should be incorporated in the support agreement (instead of being negotiated and signed over each year). As a result of this claim status arrangement, the “standardized net income” approach would automatically increase the non-custodial parent’s support amount to reflect this net income increase of the non-custodial parent. When income situations of either or both parents change significantly, computations can be done again to reconfigure the optimal arrangement. In the end, the non-custodial parent, the custodial parent, and the children can all benefit economically from such an optimization process.

References

American Law Institute (2002): Principles of the Law of Family Dissolution: Analysis and Recommendations. LexisNexis: http://www.lexisnexis.com

Bartffeld, Judi (2000). Child support and the postdivorce economic well-being of mothers, fathers, and children. Demography, 37(2): 203-213

Bassi, Laurie J.; Barnow, Burt S. (1993). Expenditures on children and child support guidelines. Journal of Policy Analysis and Management, 12(3, Summer): 478-97

District of Columbia Child Support Guidelines Commission (2004): Report of the District of Columbia Child Support Guideline Commission Final Recommendations. Retrieved March 21, 2005, from the Washington DC Office of Attorney General, Child Support Services Division Web site: http://csed.dc.gov/csed/cwp/view,a,3,q,588962,pm,1,csedNav,%7C31158%7C.asp.

Judicial Council of California, Administrative Office of the Courts (2001) Child Support Project (AB 1058). Retrieved March 21, 2005, from the Judicial Council's Administrative Office of the Courts, Center for Families, Children & the Courts Web site: http://www.courtinfo.ca.gov/programs/cfcc/programs/description/1058study2001.htm

Rogers, Mark R. (1999). Wisconsin-style and income shares child support guidelines: Excessive burdens and flawed economic foundation. *Family Law Quarterly*, 33(1): 135-156

National Conference of State Legislatures (2004). Guideline Models by States. Retrieved March 23, 2005, from the National Conference of State Legislatures Web site, http://www.ncsl.org/programs/cyf/models.htm

Policy Studies Inc. (2001). Economic Basis for Updated Child Support Obligation Table: State of Oregon. Retrieved April 27, 2005, from the Oregon Division of Child Support Web site: http://dcs.state.or.us/oregon_admin_rules/psi_final_report.pdf

Policy Studies Inc. (2002). Economic Basis for Updated Child Support Obligation Table: State of Utah. Submitted to the Utah State Department of Human Services, Salt Lake City, Utah.

Policy Studies Inc. (2003). Economic Basis for Updated Child Support Schedule, State of Arizona. Retrieved March 21, 2005, from the Supreme Court of the State of Arizona Web site: http://www.supreme.state.az.us/dr/Pdf/psi1.pdf.

Table1.

States Child Support Guidelines Models

Percentage-of-income States		Income-shares States		Melson Formula
Net Income	Gross Income	Net Income	Gross Income	Net Income
Alaska	D.C	California	Alabama	Delaware
Arkansas	Georgia	Connecticut	Arizona	Hawaii
Illinois	Massachusetts	Florida	Colorado	Montana
Minnesota	Nevada	Michigan	Idaho	
North Dakota	Mississippi	Nebraska	Indiana	
Tennessee	Wisconsin	New Jersey	Iowa	
Texas		Pennsylvania	Kansas	
		South Dakota	Kentucky	
		Vermont	Louisiana	
		Washington	Maine	
		Wyoming	Maryland	
			Missouri	
			New Hampshire[1]	
			New Mexico	
			New York	
			North Carolina	
			Ohio	
			Oklahoma	
			Oregon	
			Rhode Island	
			South Carolina	
			Utah	
			Virginia	
			West Virginia	

1. PSI study (California) has classified New Hampshire has a net income state. An examination of New Hampshire's support guidelines tables shows that there is one combined gross income converted into one combined net income leading to support amount. As such, although New Hampshire has the net income to gross income conversion process built into the support table, it is still using a gross income approach because net income is not computed for two parents separately.

Table 2.
"Gross Income" Approach Bias in Selected Scenarios: Two Children

			Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Non-custodial parent gross income			12,000	12,000	24,000	24,000	36,000	36,000	60,000	60,000	96,000
Custodial parent gross income			0	12,000	0	12,000	0	24,000	0	36,000	0
Standardized net approach		Combined net income	10,474	25,856	19,129	34,511	27,634	51,546	42,424	73,973	64,455
		Monthly award	***321***	***299***	***578***	***542***	***788***	***709***	***1,133***	***1,060***	***1,636***
Gross income	Single withholding	Combined net income	10,479	19,176	19,176	27,678	27,678	42,382	42,382	64,150	64,150
		Monthly award	**321**	**275**	**578**	**520**	**788**	**652**	**1,133**	**1,007**	**1,636**
		% bias ("income share" bias + "income conversion" bias)	0% (0% +0%)	-8% (23% -31%)	0% (0% +0%)	-4% (20% -24%)	0% (0% +0%)	-8% (12% -20%)	0% (0% +0%)	-5% (9% -14%)	0% (0% +0%)
	Married withholding	Combined net income	12,616	21,752	21,752	30,115	30,115	47,119	47,119	71,242	71,242
		Monthly award	**385**	**311**	**659**	**569**	**859**	**723**	**1,258**	**1,113**	**1,816**
		% bias ("income share" bias + "income conversion" bias)	20% (0% +20%)	4% (23% -19%)	14% (0% +14%)	5% (20% -15%)	9% (0% +9%)	2% (12% -10%)	11% (0% +11%)	5% (9% -4%)	11% (0% +11%)
	Married filing jointly	Combined net income	15,382	24,410	24,410	32,298	32,298	49,916	49,916	74,408	74,408
		Monthly award	**465**	**358**	**716**	**610**	**915**	**787**	**1,312**	**1,154**	**1,846**
		% bias ("income share" bias + "income conversion" bias)	47% (0% +47%)	17% (23% -8%)	28% (0% +28%)	13% (20% -7%)	17% (0% +17%)	8% (12% -4%)	18% (0% +18%)	9% (9% +0%)	15% (0% +15%)

Note: The monthly support award numbers are slightly different from the actual guidelines because the tax structure for different states and for different years are used. As per guidelines tradition, these base support awards exclude child care expenses and extraordinary medical expenses.

Figure 1.

"Income Share" Bias in Support Award in "Gross Income" Approach by Non-Custodial and Custodial Annual Gross Income: Two Children

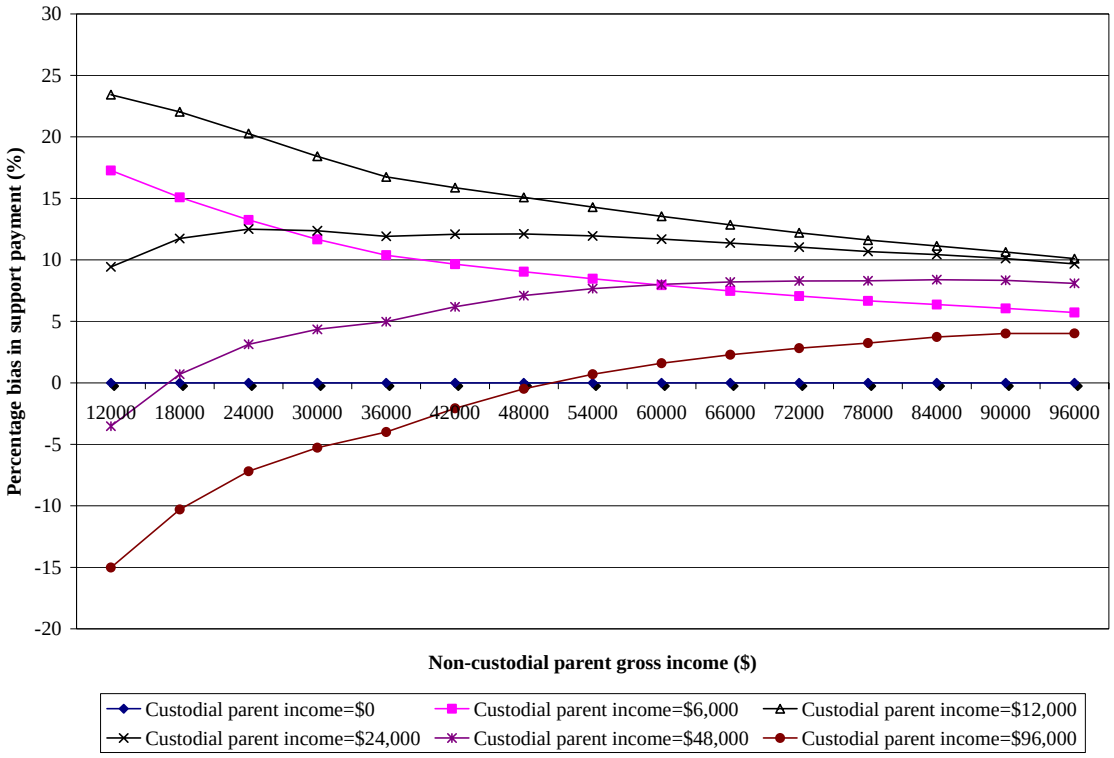


Figure 2.
Total “Single Withholding” Bias in Support Award by Non-Custodial and Custodial Annual Gross Income Regardless of Number of Children

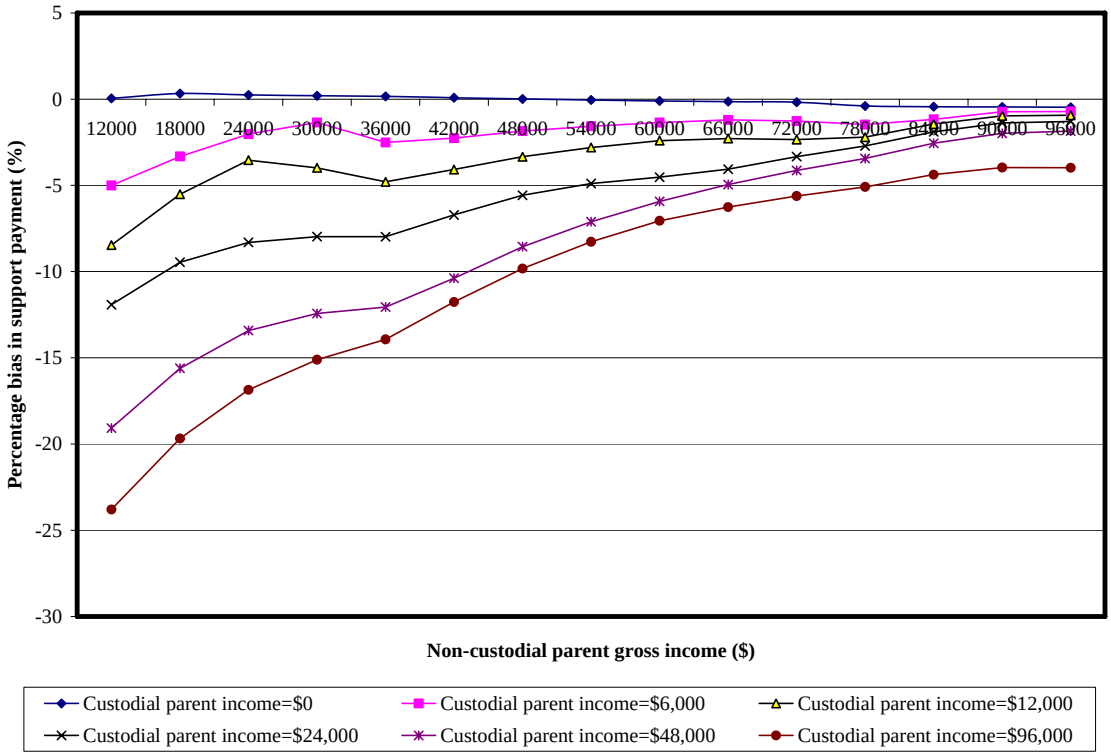


Figure 3.
Total "Married Withholding" Bias in Support Award by Non-Custodial and Custodial Annual Gross Income: Two Children

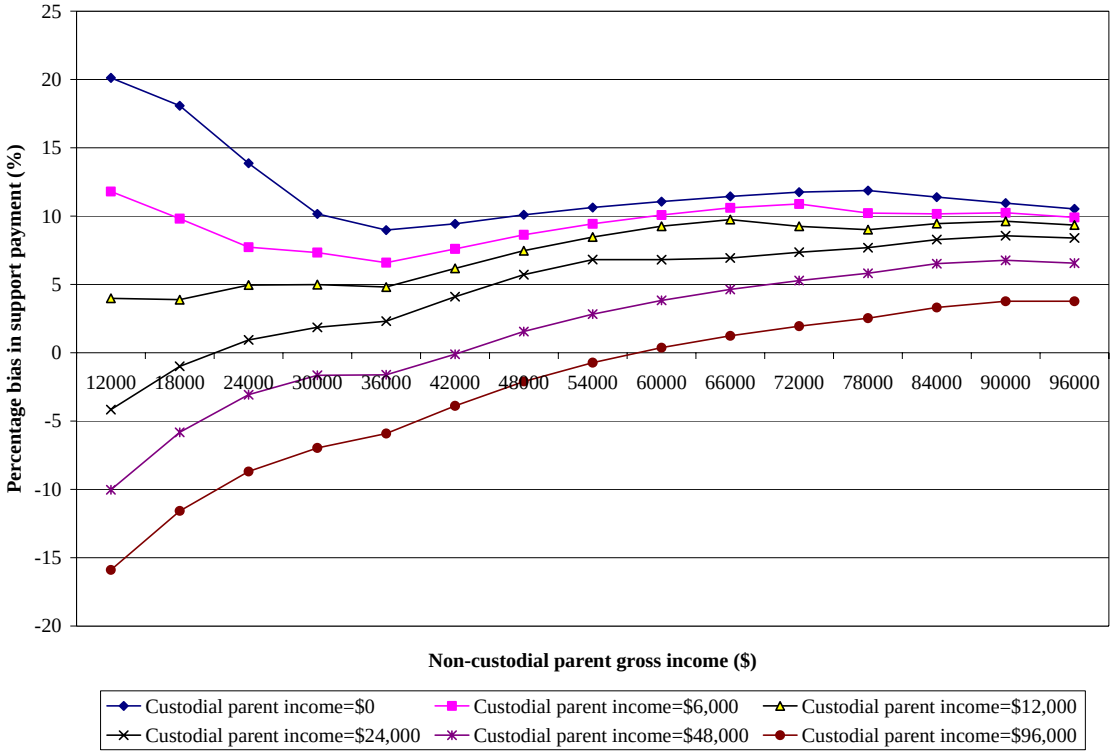
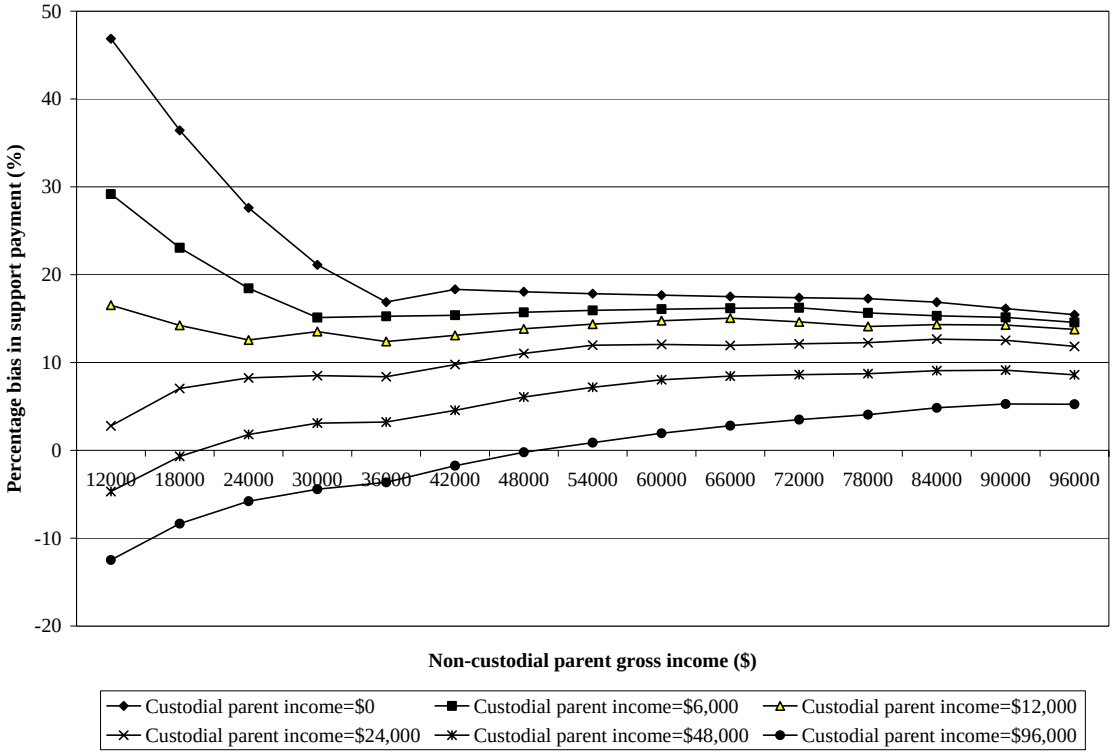


Figure 4.
Total "Married Filing Jointly" Bias in Support Award by Non-Custodial and Custodial Annual Gross Income: Two Children



Appendix

Table A.1.
2004 Federal Tax Rate Schedules for Single, Head of Household, or Married Filing Jointly

If filing status is single (Standard deduction=$4,850, Each exemption=$3,100)	
Taxable income (I) range	Tax is
$0 – 7,149	I*10%
7,150 – 29,049	715.00+(I-7,150)*15%
29,050 – 70,349	4,000.00+(I-29,050)*25%
70,350 –146,749	14,325.00+(I-70,350)*28%
146,750 –319,099	35,717.00+(I-146,750)*33%
Over 319,099	92,592.50+(I-319,100)*35%
If filing status is head of household (Standard deduction=$7,150, Each exemption=$3,100)	
Taxable income (I) range	Tax is
$0 – 10,199	I*10%
10,200 – 38,899	1,020.00+(I-10,200)*15%
38,900 – 100,499	5,323.00+(I-38,900)*25%
100,500 – 162,699	20,725.00+(I-100,500)*28%
162,700 – 319,099	38,141.00+(I-162,700)*33%
Over 319,099	89,753.00+(I-319,100)*35%
If filing status is married jointly (Standard deduction=$9,700, Each exemption=$3,100)	
Taxable income (I) range	Tax is
$0 – 14,299	I*10%
14,300 – 58,099	1,430.00+(I-14,300)*15%
58,100 – 117,249	8,000.00+(I-58,100)*25%
117,250 – 178,649	22,787.50+(I-117,250)*28%
178,650 – 319,099	39,979.50+(I-178,650)*33%
Over 319,099	86,328.00+(I-319,100)*35%

Source: IRS 2004 1040 Instructions. Retrieved on March 25, 2005 from the IRS Web site: http://www.irs.gov/pub/irs-pdf/i1040.pdf

Table A.2.
2004 Federal EIC Formula

Filing single with no children	
Earned income (I) range	EIC is
$1 – 5,099	2.130917+I*0.076384
$5,100 – 6,399	390
$6,400 – 11,490	876.1214-I*0.076384
Filing head of household with one child	
Earned income (I) range	EIC is
$1 – 7,649	9+I*0.34
$7,650 – 14,049	2,604
$14,050 – 30,338	4,844.507-I*0.15984
Filing head of household with two children	
Earned income (I) range	EIC is
$1 – 10,749	10+I*0.4
$10,750 – 14,049	4,300
$14,050 – 34,458	7,251.73-I*0.21061
Filing married jointly with one child	
Earned income (I) range	EIC is
$1 – 7,649	9+I*0.34
$7,650 – 15,049	2,604
$15,050 – 31,338	5,004.19-I*0.15982
Filing married jointly with two children	
Earned income (I) range	EIC is
$1 – 10,749	10+I*0.4
$10,750 – 15,049	4,300
$15,050 – 35,458	7,462.916-I*0.21063

Note: The formulas in this table are author's computation from IRS's EIC table for 2004. The category of married with no children is not included because it is not relevant to this study. The original EIC table can be found in IRS 2004 1040 Instructions. Retrieved on March 25, 2005 from the IRS Web site: http://www.irs.gov/pub/irs-pdf/i1040.pdf

Table A.3.
2004 Utah Tax Rate Schedule

If filing status is single or married filing separately (Standard deduction=Federal standard deduction, Each exemption=$2,325)	
Utah taxable income (I) range	Tax is
$0 – 863	I*2.3%
864 –1,726	20+(I-863)*3.3%
1,727 – 2,588	48+(I-1,726)*4.2%
2,589 – 3,450	85+(I-2,588)*5.2%
3,451 – 4,313	129+(I-3,450)*6%
Over 4,313	181+(I-4,313)*7%
If filing status is head of household or married filing jointly (Standard deduction=Federal standard deduction, Each exemption=$2,325)	
Utah taxable income (I) range	Tax is
$0 – 1,726	I*2.3%
1,727 – 3,450	40+(I-1,726)*3.3%
3,451 – 5,176	97+(I-3,450)*4.2%
5,177 – 6,900	169+(I-5,176)*5.2%
6,901 – 8,626	259+(I-6,900)*6%
Over 8,626	362+(I-8,626)*7%

Source: Utah Individual Income Tax 2004 TC-40 Forms and Instructions. Retrieved on March 25, 2005 from Utah State Tax Commission Website, http://tax.utah.gov/forms/current/tc-40inst.pdf. For the purpose of this study, Utah taxable income is Federal AGI minus federal standard deduction, minus total exemptions, and minus one half of federal tax.

Table A.4.
2004 Federal Tax withholding Schedule for Annual Payroll Period

Single or head of household (Per exemption withholding allowance = $3,100)	
Withholding income (I) range	Withholding amount is
$0 – 2,649	0
2,650 – 9,699	(I-2,650)*10%
9,700 – 30,799	705.00+(I-9,700)*15%
30,800 – 68,499	4,870.00+(I-30,800)*25%
68,500 – 148,699	13,295.00+(I-68,500)*28%
148,700 – 321,199	35,751.00+(I-148,700)*33%
Over 321,200	92,676.00+(I-321,200)*35%
Married (Per exemption withholding allowance = $3,100))	
Withholding income (I) range	Withholding amount is
$0 – 7,999	0
8,000 – 22,299	(I-8,000)*10%
22,300 – 64,749	1,430.00+(I-22,300)*15%
64,750 – 118,049	7,797.50+(I-64,750)*25%
118,050 – 185,549	21,122.50+(I-118,050)*28%
185,550 – 326,099	40,022.50+(I-185,550)*33%
Over 326,100	86,404.00+(I-326,100)*35%

Source: IRS Publication 15-T (6/2003). New Withholding Tables For Wages Paid Through December 2004 (Table 7). Retrieved on March 25, 2005 from the IRS Web site, http://www.irs.gov/publications/p15t/index.html

Table A.5.
2004 Federal Advance EIC Payment Table

Single or head of household	
Withholding income (I) range	AEIC amount is
$0 – 7,659	I*20.40%
7,660 – 14,039	1,563
Over 14,039	1,563-(I-14,040)*9.588%
Married without spouse filing certificate	
Withholding income (I) range	AEIC amount is
$0 – 7,659	I*20.40%
7,660 – 15,039	1,563
Over 15,039	1,563-(I-15,040)*9.588%

Source: IRS Publication 15 (1/2004). (Circular E), Employer's Tax Guide (Table 7). Retrieved on March 25, 2005 from the IRS Web site, http://www.irs.gov/pub/irs-pdf/p15_04.pdf

Table A.6.
2004 Utah Tax withholding Schedule for Annual Payroll Period

Single or head of household (Per exemption withholding allowance = $1,800)	
Withholding income (I) range	Withholding amount is
$0 – 2,299	0
2,300 – 3,162	(I-2,300)*2.3%
3,163 – 4,025	20+(I-3,163)*3.1%
4,026 – 4,887	47+(I-4,026)*4.0%
4,888 – 5,749	81+(I-4,888)*4.9%
5,750 – 6,612	123+(I-5,750)*5.7%
Over 6,612	172+(I-6,613)*6.5%
Married (Per exemption withholding allowance = $1,800)	
Withholding income (I) range	Withholding amount is
$0 – 2,299	0
2,300 – 4,025	(I-2,300)*2.3%
4,026 – 5,749	40+(I-4,026)*3.1%
5,757 – 7,475	93+(I-5,750)*4.0%
7,476 – 9,219	162+(I-7,476)*4.9%
9,200 – 10,925	246+(I-9,200)*5.7%
Over 10,925	344+(I-10,926)*6.5%

Source: 2004 Utah Withholding Tax Guide. Retrieved on March 25, 2005 from Utah State Tax Commission Web site, http://tax.utah.gov/forms/pubs/pub-14.pdf

Table A.7.
PSI Table of Support Proportions by Net Income: Rothbarth Parameters

	Number of children		
Net income ranges	One	Two	Three
< $15,463	.2590	.3678	.4288
15,463 - 20,616	.2574	.3629	.4206
20,617 - 25,772	.2517	.3522	.4067
25,773 - 30,926	.2464	.3421	.3932
30,927 - 36,081	.2450	.3398	.3899
36,082 - 41,235	.2391	.3306	.3776
41,236 - 46,389	.2348	.3205	.3619
46,390 - 51,544	.2324	.3154	.3547
51,545 - 61,852	.2288	.3080	.3454
61,853 - 72,162	.2276	.3045	.3396
72,163 - 82,471	.2240	.2997	.3337
82,472 - 103,088	.2223	.2956	.3271
103,089 - 128,861	.2196	.2914	.3220
>128,861	.2127	.2776	.3025

Source: District of Columbia Child Support Guidelines Commission (2004): Report of the District of Columbia Child Support Guideline Commission Final Recommendations (Technical Appendix A Table 4). Retrieved March 21, 2005, from the Washington DC Office of Attorney General, Child Support Services Division Web site: http://csed.dc.gov/csed/cwp/view,a,3,q,588962,pm,1,csedNav,%7C31158%7C.asp