# Discouraging Disadvantaged Fathers' Employment: An Unintended Consequence of Policies Designed to Support Families

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***Abstract***

*Substantial declines in employment and earnings among disadvantaged men may be exacerbated by child support enforcement policies that are designed to help support families but may have the unintended consequence of discouraging fathers' employment. Disentangling causal effects is challenging because high child support debt may be both a cause and a consequence of unemployment and low child support order compliance. We used childbirth costs charged in unmarried mothers' Medicaid-covered childbirths, from Wisconsin administrative records, as an exogenous source of variation to identify the impact of debt. We found that greater debt has a substantial negative effect on fathers' formal employment and child support payments, and that this effect is mediated by fathers' prebirth earnings histories.* © *2013 by the Association for Public Policy Analysis and Management.*

## INTRODUCTION

Even prior to the recession that started in 2007, the employment outlook for low-skilled young men in the United States was becoming increasingly gloomy. Young adult males experienced no net gains in employment over the 2000 to 2007 period; in fact, excluding newly employed immigrants, the total employment among men ages 16 to 24 years (who constitute more than two-thirds of our study sample) fell 8.5 percent over this seven-year period (Sum et al., 2011). The recent recession also hit men the hardest, resulting in the highest unemployment rates (over 10 percent) for prime, working-age men since the Bureau of Labor Statistics began tracking this statistic in 1948. For 16- to 24-year-old males with only a high school degree, the unemployment rate in 2010 was more than twice the national rate at 21.1 percent, and it was 34 percent for young black men (Dougherty, 2011; Sum et al., 2011). William Julius Wilson commented that "many black males will give up and drop out of the labor market, and turn more to the underground economy. And it will be very difficult for these people to reenter the labor market in any significant way" (Peck, 2010, "In His 1996 Book," para. 6).

The growing crisis implied by these trends has made understanding disadvantaged men's employment and earnings histories and trajectories, and the potential intervening effects of public policies, the focus of renewed research and policy interest (see, e.g., Smeeding, Garfinkel, & Mincy, 2011). As many poor children live with their mother rather than their father, a policy focus on disadvantaged fathers has

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been largely overlooked in the past.[1] At the same time, for single-mother families whose incomes are below the poverty level, financial support from the noncustodial father is frequently a vital resource, often coming through the formal child support system (Cancian & Meyer, 2005; Sorensen, 2010). Therefore, the substantial declines in disadvantaged fathers' labor force participation and earnings also have direct and distressing consequences for the low-income families that public policies such as child support enforcement (CSE) and the EITC are intended to help.

In this paper, we focus on disadvantaged noncustodial fathers, not married to their child's mother at time of birth, who are obligated to make payments through the CSE system. According to Wheaton and Sorensen (2009), there were approximately 12 million noncustodial parents in the United States in 2004, about half of whom had annual earnings below $30,000, and about 14 percent of whom had no earnings at all. More than 60 percent of the noncustodial parents with earnings below $30,000 paid no child support, and less than a quarter paid partial support. Not surprisingly, by fiscal year (FY) 2010, over $110 billion in back child support was owed in the United States from 11.3 million cases, with over $7 billion of this debt collected and distributed in FY 2010 (U.S. Department of Health and Human Services, Administration for Children and Families, Office of Child Support Enforcement, 2010).

Unpaid child support and high levels of child support debt contribute to hardship and disruption for *both* custodial parents and noncustodial parents, and for their children. For single-mother families with incomes below the poverty level who receive current child support payments, child support makes up about 40 percent of annual family income (Sorensen, 2010). At the same time, noncustodial parents who pay child support face a high implicit tax on earnings, and the CSE system may further discourage work among disadvantaged fathers for a range of reasons related to policies for distribution of child support, debt collection, and interest payments. Recovering the costs associated with public assistance payments to low-income, single-parent families was the federal government's primary motivation for establishing the federal CSE program (Garfinkel, Meyer, & McLanahan, 1998), and the set of CSE tools available to states to enforce collections and impose penalties on delinquent parents has expanded over time to include wage withholding; work requirements; intercepts of tax refunds; the revocation of driver, professional, recreational, and occupational licenses and passports; the imposition of liens on property; asset seizure; and incarceration (Pirog & Ziol-Guest, 2006).[2]

Among the unintended consequences of the interactions of welfare and child support systems has been a greater likelihood that low-income noncustodial parents will accumulate a disproportionate amount of child support debt and face more CSE actions. Noncustodial parents' poor job skills and lack of employment opportunities frequently contribute to their difficulty in paying child support, and policies such as high-interest-rate charges on unpaid child support (e.g., 12 percent in Wisconsin) further add to rapidly growing debt balances, as has been documented in Wisconsin and nationally (Bartfeld & Meyer, 2003; Meyer, Ha, & Hu, 2008; Pate, 2002; Sorensen, Sousa, & Schaner, 2007).[3] Debt problems are also aggravated by

[1] The historic welfare reform of 1996, as well as the dramatic growth in expenditures on the Earned Income Tax Credit (EITC), has disproportionately affected low-income mothers, who have been the subject of most related research (see Ziliak, 2009, for recent reviews).

[2] Families in the child support system who are receiving public assistance have been required to assign their rights to child support collections to the state.

[3] Note, however, that while higher orders may reduce compliance (often measured as the proportion of ordered support paid), at typical levels, higher orders are not associated with lower absolute payments (Meyer, Ha, & Hu, 2008).

noncustodial parents' poor understanding of policies and procedures for adjusting child support orders and their subsequent failure to make adjustments to orders in the face of unemployment, disability, or incarceration (Pate, 2002).

In this paper, we are primarily concerned with the growing, suggestive evidence that low-income parents who face substantial debts and wage withholding are more likely to become discouraged and abandon formal employment. Some studies suggest that rather than facilitating noncustodial fathers' contributions to their children, CSE actions have become counterproductive, exacerbating a problematic cycle in which noncustodial parents with large debt balances are less willing and able to cooperate with the formal child support system and subsequent payments are reduced (Bartfeld, 2005; Waller & Plotnick, 2001). We aim to make both a substantive and a methodological contribution by using a natural experiment to investigate the relationship between child support debt and the formal employment and child support payments of disadvantaged fathers. Disentangling the causal effects of debt is challenging, because high child support debt may be both a cause and a consequence of unemployment and low compliance with child support orders. We take advantage of the fact that birth costs, which may be charged to fathers when an unmarried mother's childbirth costs are covered by Medicaid, appear to be an important, exogenous source of variation in fathers' child support debt, varying substantially by county and over time in ways unrelated to other father or case characteristics. In effect, some fathers with newly established paternity begin their relationship with the CSE system with a large debt (due to the birth costs assessment), while other fathers with similar case characteristics or backgrounds do not have to bear these early and high debt burdens. We exploit this exogenous variation to better understand the impact of child support debt on fathers' employment and support of their children and also to consider the potential impact of related public policies on fathers' employment, such as an expanded EITC for noncustodial fathers.

In the following sections, we review previous literature in this area, describe the policy context that affords our natural experiment, and discuss the data and methods used to derive our results. We then report findings, which suggest that higher child support debt is generally associated with lower formal earnings and lower formal child support payments for fathers. We discuss the implications of these results for the causal interpretation of the relationships described in prior research, as well as for recent policy debates, in the concluding section.

## LITERATURE REVIEW

To identify the true effects of child support debt and enforcement on fathers' employment and support of their children, one would ideally conduct an experiment in which both debt and current support orders (of varying amounts) were randomly assigned to noncustodial parents at the onset. One could then study whether fathers facing higher debt burdens or support obligations were more likely to reduce their employment and earnings and to fail to pay child support (and thus encounter additional CSE actions). Although this type of experiment would not be feasible for legal and ethical reasons, alternative sources of variation in the establishment of payment expectations (for current support and debt) might be used to nonexperimentally investigate these relationships. The successful identification of causal relationships using nonexperimental methods is frequently challenging, however, and typically relies on one's ability to make a strong case that one or more of the sources of variation being used is exogenous (i.e., operates to randomly influence the causal variable of interest). In this research, we argue that a sizable component of the initial debt amount assigned to noncustodial parents (who are assessed birth costs) varies randomly by county and over time and is uncorrelated with their other

observed and unobserved characteristics that also influence employment, earnings, and child support case outcomes.

Researchers have investigated the effects of CSE on noncustodial fathers' paternity establishment, divorce and remarriage, contact with their children, employment and earnings, compliance with ongoing child support obligations, and other outcomes using a variety of methods and data (Aizer & McLanahan, 2006; Argys & Peters, 2001; Bartfeld, 2005; Bartfeld & Meyer, 2003; Bloom, Conrad, & Miller, 1998; Carlson et al., 2004; Freeman & Waldfogel, 2001; Seltzer, McLanahan, & Hanson, 1998). A number of studies have taken advantage of the variation in CSE policies across states and over time (using state and year-fixed effects) to identify the effects of stricter CSE on outcomes such as sexual behavior and fertility (Garfinkel et al., 2003; Plotnick, Garfinkel, & McLanahan, 2004), employment and labor force participation (Freeman & Waldfogel, 1998; Holzer, Offner, & Sorenson, 2005), and child support compliance rates (Huang, Mincy, & Garfinkel, 2005).

In addition, to address concerns about possible unobserved, time-varying heterogeneity across (or within) states that might be correlated with child support policy and case outcomes, a few of these studies have also employed a differences-in-differences strategy (using a comparison group) to estimate outcomes. Holzer, Offner, and Sorenson (2005) used samples of young black men and comparable white men from the Current Population Survey to estimate the effects of child support policy on the employment rates of blacks vs. whites (in models that also included state and time dummy variables).[4] And Freeman and Waldfogel (1998) compared custodial and noncustodial fathers in the same states using data from the Survey of Income and Program Participation, with the expectation that if unobserved factors were not driving the results, they would find only effects of CSE policies on noncustodial fathers. Similarly, Aizer and McLanahan (2006) drew from the Fragile Families and Child Wellbeing Study data to compare the effects of stricter CSE on the fertility and child investment decisions of single women relative to married women living in the same state.

Other studies, including that of Bartfeld (2005), who used Wisconsin data comparable to ours, have employed an instrumental variables (IVs) approach to address the endogeneity problem of unobserved factors influencing both compliance (and subsequent debt) and child support case outcomes. Drawing on a cross-sectional sample of families from the National Survey of Families and Households, Seltzer, McLanahan, and Hanson (1998) used as instruments state practice and statute variables—state effectiveness in child support collections, state CSE expenditures, and information on state statutes governing the collection and distribution of child support payments—to "purge the child support coefficients of unobserved characteristics of fathers and families" (p. 173) that might influence parental involvement (their outcome of interest). The performance of their instruments was weak in some models, and thus they offered a limited interpretation of the results in these cases. In her study of the relationship of child support debt owed to the state and compliance with ongoing support obligations, Bartfeld (2005) used as an instrument a dummy variable indicating whether the child support order had been in effect for more than one year at the time the mother entered welfare, which she suggested would be related to child support debt but not to current compliance. Although Bartfeld did not report on the performance of the instrument, the results from her estimation using actual child support debt differed from those of the IV estimation; the latter

[4] Holzer, Offner, and Sorenson (2005) explain that they attributed the observed effect of CSE policy (an index variable) on whites to unobserved heterogeneity and inferred its effects on blacks only from any additional effect that this variable has on that group.

showed that there was no relationship between child support debt and compliance with current support orders.

Bartfeld's (2005) analysis is of particular interest for our study, as she also investigated the relationship of birth cost assessments to subsequent compliance with current support orders. In addition, she distinguished between discretionary obligors and nondiscretionary obligors in her analysis, where nondiscretionary obligors are those parents who have consistent formal sector employment, and thus may have little control over their support payments (which may be withheld or intercepted automatically). Although she was not able to find a suitable instrument to use in modeling the impact of birth costs on compliance, Bartfeld's multivariate analysis with a rich set of control variables showed that discretionary obligors with birth costs assessments had significantly lower compliance rates in the first two years (after the mother entered welfare). And while this analysis was not able to fully address the standard concerns about endogeneity, it does suggest that these relationships merit further exploration with improved data and methods.

In general, the substantive results of the above studies suggest that there likely are significant relationships (with important consequences) among CSE activities, the build-up of debt, and subsequent compliance with current support orders and related family outcomes. CSE actions and expenditures have been shown to be positively related to child support collections (Freeman & Waldfogel, 2001; Holzer, Offner, & Sorenson, 2005), negatively related to out-of-wedlock births (Aizer & McLanahan, 2006), and to have some modest effects on parental involvement and employment outcomes. In the analysis that follows, we aim to advance our understanding of these relationships.

## CONCEPTUAL FRAMEWORK AND APPROACH TO ANALYSIS

Child support agencies in some states charge fathers in nonmarital births for medical costs (including prenatal and perinatal expenses) that are paid for by Medicaid. These assessments (or birth costs) may result in large additions to the child support debt fathers owe to the state, with no expected benefits for the custodial parents or their children. Wisconsin is among the few states that has routinely charged birth costs, with the amounts varying by county and over time.[5] Although no systematic information has been collected about birth cost charges over time and across counties, the authors' interviews with individuals familiar with the system have suggested that in the period analyzed here, the level of birth costs assessed in Wisconsin varied with a wide range of idiosyncratic factors.[6] Correlation analyses do not show any significant relationship between birth cost charges and common measures of the strength of CSE.[7] In addition, in ordinary least squares (OLS) regression analyses, we did not find statistically significant relationships between birth costs charges and noncustodial parents' employment and earnings in the three to six quarters

[5] We know of no systematic source of information on the jurisdictions that typically charge Medicaid birth costs to noncustodial fathers. New York, Michigan, and Wisconsin are among the only states known to routinely assess birth costs (personal communication with Vicki Turetsky, March 2009).

[6] A new state policy limiting birth cost charges and providing explicit guidelines for determining birth cost amounts was first implemented in Wisconsin in 2008 (Wisconsin Department of Children and Families, 2009). However, our analysis includes cases in which birth costs were charged between 1998 and 2003, a time period when there were no systemic guidelines for judgments of birth cost charges and no apparent consideration of fathers' income in determining birth costs.

[7] For example, using measures for a point in time (in 1998), we found no significant correlation between birth costs typically assigned in a county and the percent of CSE cases with paternity established, with a court order, or with collections.

preceding the birth of the child.[8] Thus, we assume that this randomly varying assignment of birth costs, for child support cases in which the debt is primarily or entirely composed of birth costs, will result in child support debt burdens that are unrelated to fathers' income or ability to pay child support, or to exposure to CSE efforts.

Theoretically, we adopt the perspective that orders to make payments on current child support obligations and payments on debt may be viewed as a proportional tax on earnings. Child support orders in Wisconsin are typically assessed at 17 percent of income for the first child. In addition, if birth costs constitute more than half (52 percent) of the required current child support order amount, as is typically the case, the assessment of birth charges will mechanically trigger actions to recover the debt, including the establishment of a debt payment plan and county enforcement actions.[9] Thus, similar to obligations to pay current support orders, we expect requirements to make payments on debt balances to function like a proportional tax on the earnings of fathers.[10]

The basic principles of taxation theory suggest that the imposition of a proportional tax on earnings is likely to induce one or both of two contrasting effects on an individual's work behavior. The first of these possible behavioral responses is a substitution effect, in which the individual reduces work effort given that the costs of enjoying more leisure are relatively lower following the assessment of the tax. Alternatively, the child support and debt burdens may induce individuals to work more hours in order to attain the same level of net earnings (or take-home pay) after the payment amounts (analogous to taxes) are deducted. The econometric evidence on the implications of proportional taxation is by and large inconclusive (Keane, 2011), in part because the two effects in combination may cancel each other out, but also due to differences in econometric methods employed across studies (which are discussed in detail by Keane) to assess the responsiveness of labor supply to taxes. Keane concluded that the labor supply of men is likely more elastic than simple averages across seminal studies of males or the conventional wisdom suggests, which implies that the assignment of larger debts (via birth costs) will depress labor supply among these men. Katz (1998) specifically examined the evidence on labor supply elasticities for low-wage, adult U.S. males and concluded that labor supply elasticities for this subgroup are likely larger than the adult male average (approximately 0.4). We also recognize, however, that even with a positive labor supply elasticity, other factors might mediate the effect of added debt burdens that act as a proportional tax, such as the potential for enforcement penalties or implications for a father's relationship with his children or the custodial parent (which we have limited ability to adjust for in our empirical analysis).

We hypothesized that we would observe differential effects of debt burdens for noncustodial fathers with differing histories of labor force attachment and earnings.

[8] Results of these regression analyses are available from the authors upon request.

[9] We estimate that in over 90 percent of cases birth costs exceed the threshold required to trigger enforcement actions to recover the debt. See http://dcf.wisconsin.gov/publications/dwsc_864_p.htm for additional details on income withholding and other child support payment guidelines. In a regression analysis using Wisconsin child support cases with current support orders, we confirmed that the amount of the monthly child support order is a strong, statistically significant, and positive predictor of the dollar amount of any monthly debt payment order (complete results available from the authors upon request).

[10] In the simplest of static formulations, the assessment for monthly debt payments reduces the after-tax wage ($w$) of the noncustodial parent by $w(1 - t)$, where $t$ is the proportional tax on labor supply imposed by the debt repayment obligation. This, in turn, tightens the budget constraint, $C = w(1 - t) \times H + V$, where $C$ is consumption, $H$ is hours of work, and $V$ is nonlabor income. Any additional payments made toward the debt burden (beyond those automatically deducted from wages) would reduce $V$. We assume the noncustodial parent must trade-off preferences between leisure, $L$, and consumption, $C$, in his or her utility maximization, $U(C,L)$, that will ultimately determine labor supply responses.

If a father's options for increasing his work hours are limited or difficult to realize, the substitution effect may dominate, leading him to reduce labor force participation. If a father has stable employment, he may be able to increase work hours and also take advantage of income exclusions and deductions that allow him to protect some of his income from taxation and moderate the change in the relative costs of leisure and work effort (see Feldstein, 1999). For fathers who work but not continuously with a stable employer, or for those who are working full-time already and are not able to increase their work hours, either effect might dominate.[11]

As detailed below, we developed a measure of the typical birth costs charged for Medicaid births by county and month.[12] This measure is highly correlated with child support debt but is uncorrelated with observed (and we assume unobserved) characteristics of birth parents that affect child support payments and other outcomes, including age, race, and employment and earnings prior to the birth of the child (as confirmed in multivariate regression analyses). In other words, birth costs satisfy two basic conditions of IVs (Heckman, 1997): they determine child support debt (the "treatment" in this study) but are mean-independent of the error terms in our outcome equations. Exploiting this instrument, we estimated the relationship between child support debt and noncustodial fathers' subsequent formal earnings and formal child support payments after the establishment of the child support order, investigating how these relationships might differ for fathers with stable employment histories vs. those with more limited labor force attachment or no recent earnings.

## DATA AND METHODS

### DATA

We used state administrative records for paternities established in Wisconsin between October 1997 and December 2003. All cases met the following selection criteria: the mother was the custodial parent, the father was assessed birth costs in one of the 23 counties for which we had developed information on typical birth charges,[13] and the child for whom the father's first child support order was established (the focal child) was born between October 1, 1997 and December 31, 2003 (enabling us

[11] Recent research has also shown that child support orders are not always updated with changes in income or in ways that are consistent with earnings changes, including major increases or declines (Ha, Cancian, & Meyer, 2010). On the other hand, Rich, Garfinkel, and Gao (2007) reported that updating of child support obligations is common for families receiving public assistance, suggesting that the effect of child support and debt burdens on noncustodial parents should be to discourage work. If the updating of orders does not closely correspond to earnings, one might alternatively argue that the effect of these burdens will operate more like a lump-sum tax. For those working in the formal economy, a lump-sum tax is expected to induce an increase in labor (i.e., an income effect) to offset the lower income (Fullerton, 1991). However, because income in the informal economy is not directly subject to CSE, a lump-sum tax may also create an incentive to substitute informal for formal employment. Clearly, this is an unresolved issue for which bringing more empirical analysis to bear is essential to better understand the impact of debt burdens on noncustodial parents' employment and earnings outcomes.

[12] These birth cost charges are those used for a reimbursement schedule, not county-time averages of birth costs covered by Medicaid.

[13] Focusing on fathers of children receiving Medicaid helps us to avoid some potential selection bias problems vs. if we included all noncustodial parents with child support orders. At the same time, ours is not a narrow sample; a substantial proportion of child support obligors are poor, and poor obligors owe a majority of the total child support arrears. For example, Sorensen, Sousa, and Schaner (2007) reported that obligors with less than $10,000 of reported annual income represented between 45 and 55 percent of the obligors in the nine states they studied, and these fathers owed 64 to 79 percent of the total arrears in these states.

to match the birth charges to a particular child).[14] We also restricted our sample to those for whom we observed father's and child's dates of birth, date of paternity establishment, and father's Social Security number (to allow matching with earnings records). A full explanation of the sample selection criteria is included in Appendix A.[15] Our final sample for analysis included 8,263 fathers.

We also developed our measure of typical birth costs from these administrative data. The administrative data included information about actual birth costs charged to individual fathers. Standard birth cost amounts were determined at the county level and varied over time. Default birth cost rates set by counties reflected a range of political and fiscal issues, including county priorities related to cost recovery (a portion of recovered birth costs is retained by the county). Even after federal and Wisconsin state policy initiatives were introduced to reduce county discretion, surveys of county officials and advocates suggested substantial variation at the county level, in addition to case-by-case variation within counties (Roulet & Rust, 2004); explicit guidelines for determining birth cost amounts were not implemented in Wisconsin until 2008 (see footnote 6).

While the default county birth cost rate is exogenous, the level of actual birth costs charged to individual fathers may be adjusted by the court or child support agency workers due to the factors related to actual birth costs and the characteristics of individual fathers. In addition, for fathers with private insurance, the birth cost charges may be reduced by the amount paid by insurance. Due to these possibilities, we did not directly model actual birth costs in our analysis, but rather sought to identify typical birth costs, which varied only by county and over time.[16] Because we knew of no documentation of historical birth costs by county, we used the administrative data to determine the modal birth cost in each county and month. We included in our analysis the 23 counties (of a total of 72) for which we had sufficient numbers of observations and sufficiently regular cost amounts, so that we could measure a typical birth cost amount that was unrelated to the characteristics of the individual cases in that county and month.[17] It is also important to note that these 23 counties included 80 percent of the total number of Wisconsin child support cases with paternity established. For a few counties and periods, when it appeared that a new birth charge was phased in over time, we allowed there to be two typical birth costs in a given county and month.[18] See Appendix B for details regarding the calculation of typical birth costs.[19]

[14] Of Medicaid-covered births identified in the CSE system, 87 percent had an order to repay birth costs. While we excluded cases without birth cost orders from our base analysis, including these cases in the analysis (to facilitate a comparison with noncustodial parents with no arrears but a child support order) produced results qualitatively similar to our main results.

[15] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

[16] Our additional analyses suggest that estimates using actual birth costs are very similar to our base estimates using typical birth costs. These results are available from the authors upon request.

[17] We included 23 counties for six years and three months, for a total of 1,725 county/months. Of these we excluded 223 individual county/months because of insufficient sample sizes or inconsistent patterns of birth costs, for a total of 1,502 county/months.

[18] We assigned to each case the most frequent birth cost (first typical cost) for the relevant county and month if the absolute difference between observed birth cost for that case and the first typical cost was less than $150, or otherwise the closest of the two typical charges. Details of the procedures followed in determining typical birth costs are provided in Appendix B. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

[19] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

We defined baseline as the first full quarter after we observed both positive child support owed and an order to pay birth costs, in order to estimate the relationship between debt (instrumented by birth costs at baseline), and the subsequent annual formal child support payments and formal earnings in the first and second year following baseline, respectively. For the 8,263 cases in our sample, the simple correlation between actual birth costs charged to the father and the typical county/month costs was 0.85. Across all of the county/months included in this analysis, the median proportion of cases in which the actual birth cost charge was within $150 of the typical cost was 100 percent. Typical birth charges were also highly correlated with total debt—a correlation of 0.80 at the beginning of year 1 and a correlation of 0.33 at the beginning of year 2. As anticipated, these simple statistics suggested that county/month variation in birth costs would serve as an effective instrument—generally invariant to fathers' individual characteristics but highly correlated with their child support debt.

Table 1 shows the means and standard deviations of the primary variables used in our analysis, including actual and typical birth costs. Actual birth costs charged to fathers ranged from $10 to $22,584, with a mean of $2,265. Our measure of typical birth costs in a county/month ranged from $1,100 to $13,100, with a mean of $2,305. Seventy-eight percent of fathers had prebirth annual earnings, which averaged $9,089 per year for those with any earnings. Low earnings were expected for this sample of relatively young men who had fathered children outside of marriage (over 40 percent of the fathers were under 21 at baseline) and who had a low-income partner eligible for Medicaid.[20] The top panel of Table 1 shows our dependent variables. Seventy-seven percent of fathers paid some child support in the first year, and 72 percent paid in the second year. Among those paying some support, median amounts were $1,993 and $2,177 in the first and second year, respectively. This was a substantial portion of earnings for many fathers; among the 75 percent of fathers with formal earnings in the first year following the birth costs order, mean earnings were just below $10,000.[21]

### Estimation Methods

In estimating the relationship between child support debt and noncustodial fathers' subsequent child support payments and formal earnings, we began with a very basic approach. In a first set of models, we simply included typical birth costs in an OLS regression with other control variables to assess their effects on formal child support paid and the father's formal earnings. As indicated above, typical birth costs varied by county and over time and were highly correlated with total child support debt.[22] We also estimated various generalized linear models (GLM) to examine the sensitivity of our results to the OLS assumption that the distribution of our outcomes was normal. Across alternative GLM specifications (log-link Poisson, negative binomial, and Gaussian), the OLS and GLM results were largely consistent (i.e., suggesting the same patterns of estimated effects).[23]

We also employed IV techniques in estimation. As in the OLS and GLM models, we included measures of fathers' employment histories during the 7 to 18 months prior to the birth of the focal child for whom fathers' first child support order

[20] Four percent of the 8,263 fathers ($n = 325$) were under 16 at the beginning of the prebaseline year (18 months prior to the child's birth) when prebirth earnings were measured.
[21] Note that the Wisconsin child support guidelines generally call for a father of one child to pay 17 percent of income in support.
[22] We used our measure of typical birth costs, although estimates using actual birth costs are very similar.
[23] The GLM results are available from the authors upon request.

**Table 1.** Descriptive statistics of primary variables used in the empirical analysis.

| $N = 8{,}263$ | Mean (SD) | Median | Minimum | Maximum |
|---|---|---|---|---|
| Dependent variables | | | | |
| Percent paying any child support in first year after baseline | 77.2 | | | |
| Percent paying any child support in second year after baseline | 72.1 | | | |
| Child support paid in first year after baseline | 1,539 (22.2) | 991 | 0 | 98,944 |
| Child support paid in second year after baseline | 1,569 (21.7) | 964 | 0 | 77,590 |
| Child support paid in first year after baseline (conditional on some payment) | 1,993 (26.1) | 1,639 | 2 | 98,944 |
| Child support paid in second year after baseline (conditional on some payment) | 2,177 (26.2) | 1,865 | 2 | 77,590 |
| Percent with any formal earnings in first year after baseline | 74.5 | | | |
| Percent with any formal earnings in second year after baseline | 69.9 | | | |
| Formal earnings in first year after baseline | 9,256 (123.9) | 4,608 | 0 | 82,663 |
| Formal earnings in second year after baseline | 9,613 (133.7) | 4,206 | 0 | 91,704 |
| Formal earnings in first year after baseline (conditional on some earnings) | 12,422 (145.8) | 9,469 | 4 | 82,663 |
| Formal earnings in second year after baseline (conditional on some earnings) | 13,757 (163.6) | 10,582 | 4 | 91,704 |
| Independent variables | | | | |
| Actual birth costs[a] | 2,265 | 2,285 | 10 | 22,584 |
| Typical birth costs | 2,305 (11.7) | 2,300 | 1,100 | 13,100 |
| Child support debt at baseline | 2,370 (12.7) | 2,296 | 0 | 13,025 |
| Child support debt at beginning of second year after baseline | 3,018 (22.2) | 3,019 | 0 | 20,918 |
| Father's employment during 7 to 18 months prior to birth of child | | | | |
| Zero quarters of earnings (percent) | 22.4 | | | |
| One to three quarters of earnings (percent) | 36.9 | | | |
| Four quarters of earnings with only one employer (percent) | 12.3 | | | |
| Four quarters of earnings with multiple employers (percent) | 28.4 | | | |
| Annual earnings of father 7 to 18 months prior to birth of child | 7,052 (101.9) | 3,259 | 0 | 81,052 |
| Annual earnings of father 7 to 18 months prior to birth of child (conditional on being positive) | 9,089 (119.9) | 5,666 | 7 | 81,052 |
| Time difference between the child's birth and birth cost assessment | | | | |
| Birth costs ordered within seven months following birth of child | 48.5 | | | |
| Birth costs ordered 7 to 12 months Following birth of child | 29.1 | | | |
| Birth costs ordered 12 to 24 months following birth of child | 22.4 | | | |

**Table 1.** Continued.

| $N = 8{,}263$ | Mean (SD) | Median | Minimum | Maximum |
|---|---|---|---|---|
| Age of father at baseline | | | | |
| 17 to 19 | 19.7 | | | |
| 20 to 21 | 23.2 | | | |
| 22 to 24 | 25.0 | | | |
| 25 to 28 | 16.0 | | | |
| 29+ | 16.2 | | | |
| Race of father | | | | |
| White | 44.8 | | | |
| Black | 36.4 | | | |
| Others | 1.9 | | | |
| Missing | 16.9 | | | |
| County of child support order | | | | |
| Milwaukee | 48.3 | | | |
| Racine | 8.1 | | | |
| Dane | 5.6 | | | |
| Brown | 4.0 | | | |
| Kenosha | 3.8 | | | |
| Other 18 counties included | 30.3 | | | |
| Year of child's birth | | | | |
| 1998 | 7.0 | | | |
| 1999 | 14.6 | | | |
| 2000 | 17.5 | | | |
| 2001 | 17.6 | | | |
| 2002 | 21.7 | | | |
| 2003 | 21.5 | | | |

*Notes:* Cases categorized as having the year of birth costs in 1998 include two cases (0.02 percent) in which the year of birth costs is actually 1997. Baseline is defined as the first full quarter after we observe both positive child support owed and an order to pay birth costs. The monetary results presented here are based on nominal dollars, they were measured between 1997 and 2005.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

[a]Actual birth costs are not included in the models and are shown here for reference only.

was established (the prebaseline year): an indicator for fathers who worked in one to three quarters in the prebaseline year; an indicator for fathers who worked in all four quarters in the prebaseline year for a single employer; and an indicator for fathers who worked in all four quarters and had more than one employer in the prebaseline year. (Fathers who had zero earnings reported during the 7 to 18 months prior to the birth of their first child are the reference category.)[24] We also included interaction terms between typical birth costs (or predicted arrears) and each of the three indicators of employment status to test the differing predictions of theory about the relationship of fathers' labor market attachment to the effects of the added burden of debt, for which the current base of empirical evidence provides mixed or limited insights.

In one of the IV specifications (estimated using Stata's ivregress and following Wooldridge, 2003), we predicted total child support debt with our typical birth cost

[24] The median time difference between the focal child's birth and the baseline—the first full quarter after we observed both positive child support owed and an order to pay birth costs—was 215 days among our final sample of 8,263 father–child pairs.

measure (varying by county and over time) as the focal IV, and we also included (as instruments) the interactions of typical birth cost measures with measures of fathers' prebaseline employment histories. Other predictors in this equation included the measures of fathers' labor market histories, baseline demographic characteristics (e.g., age, race), and county dummies, as well as other county-level measures of baseline labor market conditions[25] (average earnings by industry and industry employment shares) that we expected might influence debt but are unrelated to fathers' characteristics that affect child support payments and earnings. We focused on the estimated relationships between the instrumented values of both debt and interactions of debt with fathers' prebaseline employment histories and the outcomes of interest (child support payments and earnings in the two subsequent years).

One potential drawback of this particular IV regression procedure is that it can result in over-identifying restrictions if there are many interactions with exogenous variables (Wooldridge, 2002). We therefore also estimated an alternative procedure (suggested by Wooldridge) in which we first obtained the predicted (fitted) values of arrears (i.e., child support debt measured at baseline) from a first-stage model with the same demographic, labor market history, and baseline county-level measures described above, and then we interacted these fitted values with the three measures of fathers' prebaseline employment histories to generate the instruments. Thus, the instruments used in this second approach were the predicted arrears and the interactions of this measure with the three prebaseline employment history measures; the same ivregress procedure (in Stata) was used in the estimation.[26] As there was very little difference in the key coefficient estimates produced in these two IV procedures, we first present and discuss the results from the first approach (in Tables 2 and 3), and then follow with a brief discussion of the sensitivity of the results to alternative estimation approaches (shown in Tables D1 and E1).[27]

## RESULTS

We first considered whether child support debt discouraged payment of formal child support, although as discussed above, child support paid is tightly linked with fathers' earnings through automatic wage withholding. Birth costs, assessed at the beginning of a father's child support payment experience and varying randomly across county and month (i.e., independently of fathers' own characteristics), provided an opportunity to identify the effects of child support debt on child support payments. Table 2 shows two sets of estimates from the OLS and IV model specifications (with typical birth costs), including the interactions with measures of fathers' prebaseline employment histories described above.

[25] Our baseline labor market conditions used in the first-stage model were measured over four full quarters prior to baseline.

[26] The Stata estimation commands (shown for the reduced form equations) for these two procedures are as follows:

1. gen *y2z1 = y2*z1*; gen *z2z1 = z2*z1*; ivregress *y1 z1 X K* (*y2 y2z1 = z2 z2z1*), robust
2. reg *y2 z1 z2 X K*; predict *y2hat*; gen *y2hatz1 = y2hat*z1*; ivregress *y1 z1 X K* (*y2 y2z1 = z2 y2hatz1*), robust

where *z2* is the omitted IV (our typical birth cost measures); *y2* is the variable for which we are instrumenting (child support debt measured at baseline); *y1* is an outcome measure (annual earnings or child support payments in the first or second year after baseline); *z1* are the prebaseline employment measures (interacted with typical birth costs, or instrumented or predicted child support debt); *X* are measures of fathers' characteristics; *K* are macrolevel economic variables (by county and over time) measured before the assessment of birth costs.

[27] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

**Table 2.** OLS and IV models of effects of child support debt on child support paid in the first and second year after baseline with interactions.

| | Model: OLS (with typical county/month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's payments first year after baseline | | Father's payments second year after baseline | | Father's payments first year after baseline | | Father's payments second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Intercept | −16,628 | 17,054 | −34,585* | 19,573 | −8,765 | 16,051 | 448 | 17,609 |
| Typical (county/month) birth costs × 1,000, or instrumented debt levels × 1,000 (at baseline and baseline +1 year) | 138.08** | 64.10 | 169.27** | 66.93 | 125.97 | 120.65 | 144.23 | 106.56 |
| Interactions between father's employment during 7 to 18 months prior to birth of child and predicted debt levels | | | | | | | | |
| Interaction: father has positive pre-earnings for one to three quarters × typical birth costs (or instrumented debt levels) | −237.79*** | 49.47 | −201.84*** | 49.75 | −268.47*** | 48.98 | −234.37*** | 51.34 |
| Interaction: father has positive pre-earnings all four quarters with only one employer × typical birth costs (or instrumented debt levels) | −295.44*** | 64.81 | −314.66*** | 65.19 | −357.31*** | 77.93 | −373.65*** | 82.35 |
| Interaction: father has positive pre-earnings all four quarters with multiple employers × typical birth costs (or instrumented debt levels) | −268.43*** | 52.25 | −271.73*** | 52.61 | −316.37*** | 54.11 | −312.13*** | 57.46 |
| Father's employment during 7 to 18 months prior to birth of child (reference category: zero quarters of earnings) | | | | | | | | |
| One to three quarters of earnings | 283.08** | 119.42 | 233.71* | 120.13 | 394.83*** | 104.35 | 340.18*** | 113.79 |
| Four quarters of earnings with only one employer | 366.18** | 179.00 | 531.13*** | 180.09 | 547.64*** | 181.00 | 700.02*** | 202.01 |
| Four quarters of earnings with multiple employers | 214.48 | 135.73 | 370.58*** | 136.65 | 371.03*** | 123.99 | 506.05*** | 137.90 |

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**Table 2.** Continued.

| | Model: OLS (with typical county/ month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's payments first year after baseline | | Father's payments second year after baseline | | Father's payments first year after baseline | | Father's payments second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Annual earnings of father 7 to 18 months prior to birth of child × 1,000 (conditional on some earnings) | 115.15*** | 7.09 | 102.51*** | 7.13 | 112.95*** | 8.35 | 100.61*** | 9.14 |
| Squared annual earnings of father 7 to 18 months prior to birth of child × 1,000,000 (conditional on some earnings) | −0.61*** | 0.16 | −0.66*** | 0.16 | −0.59** | 0.24 | −0.63** | 0.27 |
| Time difference between the child's birth and birth cost assessment (reference category: within seven months) | | | | | | | | |
| Birth costs ordered 7 to 12 months following birth of child | −22.69 | 42.38 | 8.85 | 42.63 | −22.74 | 37.04 | 5.20 | 39.53 |
| Birth costs ordered 12 to 24 months following birth of child | −102.35** | 49.62 | 12.70 | 49.91 | −96.00** | 44.48 | 19.54 | 47.44 |
| Age of father at baseline (reference category: 17 to 19) | | | | | | | | |
| 20 to 21 | 81.93 | 59.13 | 99.52* | 59.50 | 89.78** | 37.74 | 103.08** | 42.94 |
| 22 to 24 | 189.36*** | 59.40 | 153.67** | 59.80 | 198.94*** | 72.21 | 160.56** | 65.30 |
| 25 to 28 | 248.55*** | 67.45 | 257.00*** | 67.89 | 262.97*** | 55.69 | 268.44*** | 58.50 |
| 29+ | 393.76*** | 69.01 | 414.78*** | 69.45 | 396.42*** | 58.73 | 420.23*** | 64.63 |
| Race of father (reference category: black) | | | | | | | | |
| White | 523.14*** | 52.91 | 551.48*** | 53.20 | 525.72*** | 81.16 | 551.99*** | 72.49 |
| Others | 187.82 | 142.80 | 395.77*** | 143.88 | 188.51 | 159.65 | 404.44** | 161.2 |
| Missing | 466.80*** | 59.55 | 436.75*** | 59.92 | 463.90*** | 69.30 | 434.46*** | 65.42 |
| Year of birth costs (reference category: between October 1997 and December 1998) | | | | | | | | |
| 1999 | 129.14 | 111.67 | 38.06 | 113.92 | 94.77 | 128.08 | 62.81 | 128.68 |
| 2000 | −85.08 | 138.27 | −120.65 | 141.22 | −107.22 | 137.38 | −67.05 | 156.26 |

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**Table 2.** Continued.

| | Model: OLS (with typical county/ month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's payments first year after baseline | | Father's payments second year after baseline | | Father's payments first year after baseline | | Father's payments second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| 2001 | −146.93 | 178.74 | −130.19 | 184.78 | −156.30 | 168.88 | −12.02 | 184.77 |
| 2002 | −164.94 | 217.28 | −230.21 | 235.49 | −175.37 | 221.51 | −65.14 | 235.63 |
| 2003 | −104.46 | 272.09 | −259.08 | 273.55 | −176.85 | 279.11 | −71.74 | 284.19 |
| $R^2$ | 0.278 | | 0.240 | | 0.275 | | 0.237 | |

*Notes:* Also included in these models but not shown in this table were county dummies and county-level controls for average total employment, average earnings by industry, and industry employment shares. Baseline is defined as the first full quarter after we observe both positive child support owed and order to pay birth costs.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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**Table 3.** OLS and IV models of effects of child support debt on father's earnings in the first and second year after baseline with interactions.

| | Model: OLS (with typical county/ month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's earnings first year after baseline | | Father's earnings second year after baseline | | Father's earnings first year after baseline | | Father's earnings second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Intercept | −57,546 | 83,220 | −220,673* | 130,623 | −102,709 | 90,854 | −28,418 | 104,478 |
| Typical (county/month) birth costs × 1,000, or instrumented debt levels × 1,000 (at baseline and baseline +1 year) | 181.13 | 312.79 | 512.19 | 368.44 | 239.79 | 401.79 | 437.24 | 461.85 |
| Interactions between father's employment during 7 to 18 months prior to birth of child and predicted debt levels | | | | | | | | |
| Interaction: father has positive pre-earnings for one to three quarters × typical birth costs (or instrumented debt levels) | −156.11 | 241.42 | −328.04 | 273.82 | −158.66 | 252.01 | −380.95 | 283.58 |
| Interaction: father has positive pre-earnings all four quarters with only one employer × typical birth costs (or instrumented debt levels) | −345.17 | 316.27 | −612.79* | 358.76 | −435.57 | 450.73 | −727.95 | 496.55 |
| Interaction: father has positive pre-earnings all four quarters with multiple employers × typical birth costs (or instrumented debt levels) | −491.68* | 254.96 | −721.93** | 289.41 | −583.54** | 296.87 | −851.15** | 332.63 |
| Father's employment 7 to 18 months prior to birth of child (reference category: zero quarters of earnings) | | | | | | | | |
| One to three quarters of earnings | 1,002.44* | 582.73 | 1,356.99** | 660.90 | 1,048.21* | 594.64 | 1,543.35** | 654.57 |
| Four quarters of earnings with only one employer | 924.49 | 873.49 | 1,893.14* | 990.77 | 1,161.22 | 1,203.03 | 2,261.96* | 1,344.84 |
| Four quarters of earnings with multiple employers | 1,010.64 | 662.35 | 2,073.46*** | 751.59 | 1,280.38* | 766.27 | 2,461.73*** | 854.84 |

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**Table 3.** Continued.

| | Model: OLS (with typical county/ month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's earnings first year after baseline | | Father's earnings second year after baseline | | Father's earnings first year after baseline | | Father's earnings second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Annual earnings of father 7 to 18 months prior to birth of child × 1,000 (conditional on some earnings) | 802.16*** | 34.58 | 756.17*** | 39.22 | 801.25*** | 53.31 | 753.88*** | 64.14 |
| Squared annual earnings of father 7 to 18 months prior to birth of child × 1,000,000 (conditional on some earnings) | −1.58** | 0.78 | −0.60 | 0.88 | −1.60 | 1.55 | −0.62 | 1.87 |
| Time difference between the child's birth and birth cost assessment (reference category: within seven months) | | | | | | | | |
| Birth costs ordered 7 to 12 months following birth of child | −541.91*** | 206.82 | −611.23*** | 234.43 | −523.37** | 205.95 | −596.06** | 233.02 |
| Birth costs ordered 12 to 24 months following birth of child | −708.12*** | 242.12 | −276.70 | 274.47 | −692.57*** | 239.05 | −263.43 | 264.62 |
| Age of father at baseline (reference category: 17 to 19) | | | | | | | | |
| 20 to 21 | −253.12 | 288.52 | −615.50* | 327.20 | −252.37 | 228.27 | −632.20** | 269.78 |
| 22 to 24 | −86.92 | 289.87 | −298.55 | 328.90 | −91.55 | 247.48 | −298.14 | 292.31 |
| 25 to 28 | 336.29 | 329.14 | −211.00 | 373.36 | 323.88 | 327.09 | −194.49 | 364.91 |
| 29+ | −106.07 | 336.74 | −605.78 | 381.96 | −127.43 | 338.13 | −629.72* | 377.57 |
| Race of father (reference category: black) | | | | | | | | |
| White | 2,598.35*** | 258.22 | 2,937.75*** | 292.61 | 2,586.29*** | 273.63 | 2,928.78*** | 306.72 |
| Others | 551.26 | 696.83 | 580.53 | 791.33 | 515.54 | 645.62 | 563.64 | 735.36 |
| Missing | 3,414.71*** | 290.59 | 3,631.70*** | 329.57 | 3,371.43*** | 326.34 | 3,619.16*** | 359.59 |

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**Table 3.** Continued.

| | Model: OLS (with typical county/ month birth costs) | | | | Model: Instrumental variables model | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's earnings first year after baseline | | Father's earnings second year after baseline | | Father's earnings first year after baseline | | Father's earnings second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Year of birth costs (reference category: between October 1997 and December 1998) | | | | | | | | |
| 1999 | −256.33 | 544.91 | −883.12 | 633.35 | −515.61 | 593.09 | −1,265.66* | 689.90 |
| 2000 | −786.53 | 674.72 | −2,147.34*** | 805.11 | −1,395.95* | 847.75 | −2,241.43** | 979.02 |
| 2001 | −1,707.17* | 872.21 | −2,933.68*** | 1,054.05 | −2,407.08** | 986.77 | −3,090.30*** | 1,138.66 |
| 2002 | −1,537.90 | 1,060.28 | −2,957.13** | 1,322.79 | −2,031.59* | 1,223.36 | −2,562.21* | 1,407.20 |
| 2003 | −228.71 | 1,327.76 | −2,315.28 | 1,524.38 | −1,293.88 | 1,408.45 | −1,754.49 | 1,620.71 |
| $R^2$ | 0.450 | | 0.393 | | 0.451 | | 0.393 | |

*Notes:* Also included in these models but not shown in this table were county dummies and county-level controls for average total employment, average earnings by industry and industry employment shares. Baseline is defined as the first full quarter after we observe both positive child support owed and order to pay birth costs.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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In Table C1, we report the results of the first-stage estimation from the IV model that predicts fathers' child support debt at baseline and one year after baseline.[28] We found that at baseline, fathers' debt increased by $707 for each $1,000 in typical birth costs charges, decisively confirming the validity of our focal instrument, typical birth costs, as a strong, statistically significant predictor of total child support debt levels. One year later, typical birth costs charges were still a very strong predictor of fathers' child support debt, with debt increasing by $529 for each $1,000 in typical birth costs charges. Other instruments such as employment shares in retail and manufacturing and average weekly earnings in industry sectors (e.g., construction, wholesale trade, transportation, and others) were also statistically significant predictors in the first-stage estimation. Since the equation was over-identified (i.e., there were more instruments than problematic explanatory variables), we expected these strong instruments to yield coefficient estimates with negligible bias and approximately normal standard errors, given our large sample size (Murray, 2006).

The parameter estimates in the models in Table 2 are generally consistent with prior research. Child support payments were higher for fathers with higher earnings, and particularly for those with more stable recent employment (i.e., fathers who worked all four quarters for a single employer in the prebaseline year). Child support payments were also higher for older fathers and for nonblack fathers. Fathers who experienced a longer time lag between their focal child's birth and establishment of birth cost orders paid less support in both years.

Our estimates of the total effects of child support debt on child support payments allowed for effects to vary by prebaseline work history. For fathers with no prebaseline work history, only the estimated main effect of birth charges on child support payments was relevant. For those with work histories, we were particularly interested in the interaction of birth charges with fathers' work histories. The OLS and IV models (as well as the GLM models, not shown) produced patterns of estimated effects of child support debt on subsequent child support payments that were largely comparable. This is not surprising, given that actual birth costs were highly correlated with the county default birth costs (the instrument). Given that actual birth costs were sometimes adjusted for circumstances of the birth or the parents, we are more confident in a causal interpretation of the IV estimates.

The OLS estimates of the main effect of an additional $1,000 of typical birth charges showed that it increased child support paid by an average of $138 (about 9 percent of average child support paid) in the first year and $169 (11 percent) in the second year. These were also the total effects for fathers with no employment in the 7 to 18 months prior to the birth of their first child (the reference category). The comparable IV model estimates suggested increases of $126 and $144, in years 1 and 2, respectively, in child support paid by these fathers for each $1,000 in debt, although these estimates were not statistically significant in the IV models.

To fully understand the effects for fathers who worked prior to the birth of their first child, we needed to take into account the statistically significant interactions between labor market attachment and birth costs that are shown in Table 2. These results alternatively showed that for fathers who were employed in the 7 to 18 months prior to the birth of their first child, the estimated effects in both the OLS and IV models were negative, implying reductions in the amount of child support

[28] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

paid with the imposition of this debt.[29,30] The interaction terms in the OLS models showed that fathers who were employed one to three quarters in the prebaseline year reduced their child support payments by $238 more in year 1 and by $202 more in year 2 for each $1,000 in typical birth costs than did fathers who were not working. The IV models suggest that these fathers (i.e., those who were employed one to three quarters in the prebaseline year) reduced payments by $268 in year 1 and by $234 in year 2 for each $1,000 in debt. In addition, the negative interactions were larger (across all model specifications) for fathers who worked all four quarters for a single employer or all four quarters with more than one employer (sequentially or concurrently) in the 7 to 18 months before the birth of their focal child. Focusing on the IV model results, the interaction terms showed that fathers who worked four quarters for a single employer paid $357 less in child support in year 1 and $374 less in year 2; fathers who worked four quarters with multiple employers paid $316 less in child support in year 1 and $312 less in year 2 for each $1,000 in debt (compared to fathers who were not employed in the 7 to 18 months before the birth of their focal child).[31]

Each of these sets of estimates of the moderating effects of child support debt on payments by working fathers were statistically significant (estimated with comparable levels of precision) and suggest substantively important negative effects of added debt on payment behavior. It is also important to note that computing total effects—adding the main effects of typical birth cost charges and prebaseline employment to the interactions between them—showed that employed fathers still continued to pay more in total child support than those without employment in the prebaseline year. Those working for a single employer all four quarters paid the most child support, with all fathers increasing the total amount that they paid in the second year (postbaseline).

Automatic wage withholding has made child support payments increasingly nondiscretionary for fathers working in the formal labor market. As discussed earlier, increased child support debt burdens may induce some fathers to work more hours in order to attain the same level of take-home pay, while the substitution effect may dominate for others with limited options for increasing work hours, such as those who are already engaged in regular, full-time work, leading them to reduce labor force participation. Other low-income fathers facing large debts and substantial wage withholding may simply become discouraged and leave formal employment.

Table 3 shows the estimates of the effects of child support debt on noncustodial fathers' formal earnings in the first and second years after baseline from OLS and IV models that parallel those in Table 2. In each of the models, the coefficient on typical birth costs or instrumented child support debt levels (the main effect) was positive, suggesting that the added debt increases fathers' formal earnings. At the same time, the interactions between birth costs charges and recent labor market attachment suggest negative moderating effects of child support debt on fathers'

[29] Child support distribution hierarchies mean that most child support collected would be distributed for current support before going to pay birth costs. Nonetheless, we also estimated a model in which we included payments toward birth costs in our measure of payments to verify that birth costs were associated with lower total payments, rather than simply with lower payments toward current support. Our results were qualitatively similar, with birth costs having a statistically significant negative effect on total payments in all four models.

[30] In an alternative specification, we excluded cases with zero child support paid. The estimated effects were larger but followed similar patterns.

[31] We also estimated specifications that distinguished those fathers who had one main employer all four quarters plus an additional employer from those fathers with multiple employers but with no main employer for all four quarters. As we did not obtain noticeably different results with this more complex specification, we do not present them here. They are available from the authors upon request.

earnings. Across the specifications (including the GLM model, not shown), these moderating effects were larger in the second year after baseline.

Focusing initially on the results in the second year after baseline for fathers working for a single employer all four quarters prior to the birth of their first child, the interaction with typical birth costs charges in the OLS model suggests that fathers' earnings were reduced by $613 for each $1,000 in typical birth costs (relative to fathers who were not employed in the 7 to 18 months before the birth of their focal child). This same coefficient estimate was $728 in the IV model, although it is not statistically significant due to the larger standard error (as is common in IV models). Fathers who were working all four quarters with more than one employer (sequentially or concurrently) in the 7 to 18 months before the birth of their first child had higher earnings than other fathers in the first and second years after baseline, but the moderating effects of each $1,000 in additional debt were also larger, negative, and statistically significant (in the OLS and IV model specifications). Specifically, the coefficients on the interaction terms in the OLS and IV models showed that the earnings of these fathers were reduced by $492 and $584, respectively, in the first year after baseline, and $722 and $851, respectively, in the second year after baseline for each $1,000 in typical birth costs or instrumented debt.[32] These net reductions in formal earnings were not only statistically significant but were also substantively important, representing up to approximately 3 percent of average prebaseline earnings (and 4 percent of median prebaseline earnings) for each additional $1,000 in debt. One possible interpretation of these results is that fathers working for more than one employer in the prebaseline period may reduce their extra work effort in response to this new tax on their earnings; that is, the substitution effect dominates.[33]

Taken as a whole, the results of our analysis suggest that the effects of large additions to child support debt burdens (through birth costs charges) on noncustodial fathers' future earnings and payment of current support will depend importantly on fathers' ability to meet or offset these new payment obligations with increased labor force participation. Perhaps of paramount concern for policymakers is the finding that fathers with stronger labor market attachment prior to birth cost assessments are likely to reduce their earnings and current child support payments the most in the face of higher debt burdens. Clearly, many families may be negatively affected by these fathers' responses to increasing child support debt.

### Sensitivity Tests Results

Tables D1 and E1 present the key coefficient estimates from two alternative model specifications for the primary analysis of the relationships between the instrumented values of debt and interactions of debt with fathers' employment histories and the outcomes of fathers' child support payments and earnings in the two subsequent years (respectively).[34] The first alternative specification shown in each of these appendices (Model A1) is the second Stata ivregress procedure discussed above,

[32] In an alternative specification, we excluded cases with zero earnings. The estimated effects were larger but again followed similar patterns.

[33] Because child support debt might be expected to discourage all formal employment, as a sensitivity test, we also estimated probit models of any employment in the first or second year. The results again suggested a significant effect of debt on employment, in both years, whether estimated using OLS or a two-stage model with predicted debt.

[34] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

which addresses the issue of over-identifying restrictions. The second specification (Model A2) is a standard two-stage model that predicts total child support debt with typical birth cost charges as the instrument in the first-stage model (but not the interactions with measures of fathers' employment histories) and includes the same controls as the other model specifications. Predicted debt levels from this first-stage estimation were then entered into the second-stage outcome models to assess the relationship between debt and the outcomes of interest. Although the literature on IV methods suggests a potential forbidden regression problem with Model A2 (Wooldridge, 2002), we found that across these two alternative specifications and the main modeling approaches shown in Tables 2 and 3, the coefficient estimates were very close. There were no differences in the direction of the estimates, and differences in magnitude are minute for both fathers' child support payments (Table D1) and their earnings (Table E1).[35]

We also tested the sensitivity of the IV results estimated via two-stage least squares (the second set of analyses shown in both Tables 2 and 3) by estimating the models via limited-information maximum likelihood and generalized method of moments. The results were again largely consistent with the main IV results in terms of both the magnitude and direction of the coefficient estimates. In addition, we conducted a diagnostic test of our assumption that the main explanatory variable, typical birth charges, was an effective instrument (i.e., uncorrelated with fathers' individual characteristics) by randomly assigning a county and month to each father and reestimating the IV models. The results support our use of typical birth costs (that vary by county and over time) in modeling the effects of debt on fathers' child support payments and earnings. More information on these specification tests and the results is available from the authors upon request.

Among the additional robustness checks we implemented, we conducted analyses that included squared or logarithm forms of control variables, such as the father's age and earnings, instead of indicator variables as in the base models. There were negligible differences in the results with these alternative variable forms. We also examined the influence of outliers in the data. About 1 percent of the sample fathers had made child support payments over $7,000 in the first year after baseline (and a slightly larger proportion of the fathers had made such payments in the second year after baseline). Analyses that excluded these fathers from the sample produced little difference in the results. As noted in Appendix A, we also confirmed that the results are robust to exclusion of outliers for fathers' earnings.[36]

Another potential concern is that the levels of child support orders may affect fathers' outcomes, but our main analyses do not include child support orders as controls. A sensitivity analysis that included the absolute amounts of child support orders as controls likewise produced results largely consistent with the base results shown in Tables 2 and 3.

## CONCLUSIONS

In this study, we found evidence that higher debt burdens have both a statistically significant and a substantively important negative effect on both formal earnings and child support payments. Because child support debt can be the result of low

[35] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at http://www3.interscience.wiley.com/cgi-bin/jhome/34787.

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earnings and the failure to pay support, establishing the direction of causality has been difficult. By exploiting an exogenous source of variation in birth charges, which contributes to substantial differences in debt burdens early in the child support payment experience, we were able to more confidently identify the effects of debt on child support paid and on formal earnings. We used variation in the birth costs over time and across counties in Wisconsin to identify the effect of child support debt. Most low-income mothers have birth costs covered by Medicaid, and counties routinely pursue efforts to recover these costs from noncustodial fathers. Of nonmarital births identified in the CSE system, 91 percent were covered by Medicaid, and of these cases, 87 percent had an order to repay birth costs. Moreover, about 70 percent of all child support debt is estimated to be owed by fathers with no formal earnings or earnings below $10,000 per year (Sorensen, Sousa, & Schaner, 2007). This suggests that low-income families are an appropriate focus for an analysis of the implications of child support debt, and that our results provide broadly relevant new evidence on the potential (unintended) consequence of public policies for the employment and earnings of noncustodial fathers of low-income children.

We also acknowledge a number of limitations of our analysis. Our data were from a single state and a particular historical period. While other cross-state analyses of related issues suggest fairly consistent patterns of child support debt across Wisconsin and other states (see e.g., Kim, Cancian, & Meyer, 2012), concerns about generalizability are warranted. And while administrative data were essential to this analysis, they were also limited. Of particular concern is that we are unable to address potentially important questions about informal employment and informal child support among the fathers in our study. Notwithstanding these limitations, we have confidence in our estimates that take advantage of these detailed longitudinal administrative data and of a natural experiment resulting from substantial county variation in birth cost assessments to provide new evidence on the effects of child support debt on fathers' child support payments and earnings.

Ironically, the same feature (birth charges being unrelated to fathers' characteristics) that makes birth costs an excellent instrument for identifying the causal effects of debt burdens also makes it a problematic public policy. In 2000, the congressionally mandated Medical Support Working Group recommended that CSE agencies be precluded from attempting to recover Medicaid-covered birth costs from noncustodial parents (Medical Child Support Working Group, U.S. Department of Labor & U.S. Department of Health and Human Services, 2000, Recommendation 20). And in an amicus brief of the Center for Family Policy and Practice (2001), an argument was made that the practice of charging fathers for birth costs goes against the intent of Congress to encourage mothers to obtain appropriate health care during and following pregnancy, without concern for the implications for noncustodial parents and their future ability to pay child support. As such, very few states currently act to recover Medicaid birth costs, and the Deficit Reduction Act did not include this policy among the many aspects of the CSE addressed. In addition, other recent bills have included provisions to eliminate Medicaid birth cost recovery, in part because this policy has not factored in the father's ability to pay. In 2006, Wisconsin Act 304 reduced birth cost assessments for low-income fathers, limiting the amount of recovery to one half the actual and reasonable costs of the pregnancy and birth (Wisconsin Legislative Reference Bureau, 2006).[37] The elimination of birth cost assessments was also an important provision of the Responsible Fatherhood and

[37] The act was not retroactive, and did not affect the cases included in our analysis, all of which were ordered to pay birth costs in 2003 or earlier.

Healthy Families Act, co-sponsored in 2007 by then-Senator Obama, and was again proposed as part of President Obama's 2012 budget.

Our interest, however, is less in the policy of birth costs per se than in contributing to the understanding of the potential consequences of public policies for the employment, earnings, and child support contributions of disadvantaged fathers. Growing child support debt has implications for the functioning of the child support system and the well-being of custodial and noncustodial parents and their families. In the current fiscal climate, many child support agencies are facing growing pressure to implement or maintain policies that offset government costs, as reductions in staff and other resources ensue. It is estimated, for example, that in the short run, abandoning the current policy for recovering birth costs would cost the Wisconsin child support and Medicaid programs over $20 million per year.[38] A 2009 statement of the National Governors Association likewise noted that "while governors recognize that the ideal goal of the child support program may be to improve a family's economic security, making drastic changes to the child support system without considering the financial stability of the program will not lead to better outcomes for the families and children served."

At the same time, and perhaps of greatest concern, there is a growing recognition that child support policy may unintentionally contribute to discouraging formal employment among disadvantaged fathers, making efforts to recover government costs potentially counterproductive. Our results suggest that higher debt burdens, in themselves, substantially reduce both formal earnings and child support payments for some of the fathers and families that are already most likely to struggle in securing steady employment and coping with economic disadvantage. Given recent discouraging trends in men's employment and earnings—with 20 percent aged 25 to 54 not working, 35 percent of those without a high school diploma out of the labor force, and over 30 percent of young black men ages 16 to 24 unemployed—this is a very serious unintended consequence of public policy (Leonhardt, 2011; Sum et al., 2011).

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## APPENDIX A: SAMPLE CONSTRUCTION

We drew our sample from a pool of 14,303 legally established fathers and court-ordered payers who met the following criteria: (a) the father's first child support order was established after September 30, 1997, in one of the 23 counties for which we developed information on typical birth costs (see Appendix B); (b) the child for whom the father's first child support order was established (focal child[39]) lived with his or her mother, was born after September 30, 1997, (when administrative data on birth costs is available) and before the second quarter of 2004 (to allow us to potentially observe outcomes two years postbaseline), and had his or her birth costs covered by Medicaid. We constructed the final sample via the following steps:

1. We restricted the sample to 12,290 fathers who were charged birth costs by eliminating 1,912 fathers who owed no birth costs, 82 fathers with missing birth costs data, and 19 fathers for whom we could not match birth costs to an individual child.
2. Of the remaining 12,290 father–child pairs, we eliminated one case in which the county issuing the father's first child support order was different from the county to which the father owed birth costs.
3. Of the 12,289 remaining father–child pairs, we eliminated 201 fathers who owed birth costs associated with any other children before they owed the focal child's birth costs.
4. Of the remaining 12,088 father–child pairs, we eliminated 14 fathers with unknown birth dates, 11 fathers with an unknown date of paternity establishment, 10 fathers whose focal child's child support order was oddly established prior to the child's birth, 119 fathers whose birth costs were assessed prior to paternity establishment, and 154 fathers with missing or incorrect Social Security numbers (and consequently no earnings information).
5. Of the remaining 11,780 father–child pairs, we eliminated 109 cases whose baseline events (birth costs assessed and first child support order put in place) occurred after the first quarter of 2004, in order to have information on child support payments and earnings for two years after the baseline.
6. Of the remaining 11,671 father–child pairs, we eliminated nine fathers with extreme (above the $100,000) yearly earnings either in the year prior to baseline or any of the two years after the baseline. (We checked robustness by including these nine cases, and the results did not change substantially.)
7. Of the remaining 11,662 father–child pairs, we selected 11,446 fathers who owed birth costs during a month in which we observed typical costs or could infer costs from the typical birth charge in adjacent months within the county (see step 3, Appendix B).
8. Of the remaining 11,446 father–child pairs, we eliminated 68 fathers under age 17 at baseline.
9. Of the remaining 11,378 father–child pairs, we eliminated 1,149 cases in which birth costs were not determined until after two years following the child's birth and 1,832 cases in which the dates of fathers' first child support order and the assessment of birth charges were more than three months apart.
10. Of the remaining 8,397 father–child pairs, we eliminated 134 cases in which the fathers' birth charges were corrected and set to zero (presumably a data error or a result of fathers' private insurance covering the birth costs).

[39] We excluded 1.7 percent of the legally established fathers whose first child support order was associated with more than one child or who had a second child support order for a different child in the same month as the first child support order.

These steps resulted in a final sample of 8,263 father–child pairs.[40]

## APPENDIX B: CONSTRUCTION OF TYPICAL BIRTH CHARGES

We were not aware of any systematic documentation of historical birth charges by county for this period in Wisconsin. Based on administrative records of charges in individual cases, we derived the typical birth costs charged in each county and month using the following procedure:

1. We coded individual birth charges in two 100 dollar increments. We identified the modal category as the "typical" birth charge for that county/month, in which the month refers to the month and year of the child's birth. This resulted in 1,367 county/month values (six years and three months for 23 counties for a total of 1,725 county/months, less 358 county/months with at most one birth charge observation, which included 240 county/months with no birth charge observations, 96 county/months with one birth charge observation, and 22 county/months with inconsistent birth charge observations).
2. If birth charge amounts other than the modal category were found for a given individual and county/month, we provisionally set a second "typical" birth charge for that county/month that was equal to the second most common category.
3. We smoothed the data as follows: If the first typical birth charge for a county/month deviated from the typical charge in *adjacent months*, while the charges in adjacent months were identical to one another, we set the typical charge for the current county/month to match that of adjacent months. (Adjacent months were defined as one month before and one after, two months before and one month after, or one month before and two months after.) If the first typical charge was altered, we set the second typical birth cost equal to the original charge (overriding any existing second charge). Note that 4.5 percent of a total of 1,367 county/month birth charges were altered in this process. In addition, out of the 358 county/months that were excluded in step 1 because of insufficient sample sizes or inconsistent patterns of birth charges, 144 county/months were newly given the first typical charge from the typical charge in adjacent months. This resulted in 1,502 county/months with the first typical birth charge.
4. We allowed a second typical birth cost in a given county/month if the value of the second typical charge was equal to the *first typical charge* in that county at some point in the previous or subsequent 12 months. This allowed for some cases to be assessed an "old" or "new" charge, possibly because of delays in assessment or because of uneven implementation of a new charge structure. Note that 231 county/months were given a second typical charge as a result.

For each individual father–child pair ($N = 8{,}263$), we set the typical birth cost to the first typical charge for the relevant county and month (or, if the absolute differences between individuals' actual birth charges and the first typical charge were more than \$150, to the closest of the two typical charges for the 206 county/months in which there were two options).

[40] Our baseline analyses were based on the final sample of 8,263 father–child pairs, but a number of sensitivity tests were implemented for different samples that include the fathers who were eliminated in steps 8 and 9 or fathers with zero birth charges (those eliminated in step 1). Our estimates based on the alternative samples were qualitatively consistent with our baseline results.

## APPENDIX C:

**Table C1.** First-stage models of child support debt at baseline and one year after baseline.

| | Father's debt (×1,000) at baseline | | Father's debt (×1,000) one year after baseline | |
|---|---|---|---|---|
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE |
| Intercept | 0.9114 | 7.3536 | 10.5845 | 18.7953 |
| Typical (county/month) birth costs × 1,000 | 0.7073*** | 0.0259 | 0.5294*** | 0.0662 |
| Interactions between employment during 7 to 18 months prior to birth of child and typical birth costs | | | | |
| Interaction: father has positive pre-earnings for one to three quarters × typical birth costs | 0.0416** | 0.0201 | 0.1526*** | 0.0513 |
| Interaction: father has positive pre-earnings all four quarters with only one employer × typical birth costs | −0.0026 | 0.0263 | 0.0762 | 0.0673 |
| Interaction: father has positive pre-earnings all four quarters with multiple employers × typical birth costs | 0.0369* | 0.0212 | 0.1648*** | 0.0543 |
| Father's employment during 7 to 18 months prior to birth of child (reference category: zero quarters of earnings) | | | | |
| One to three quarters of earnings | −0.0710 | 0.0485 | −0.3009** | 0.1240 |
| Four quarters of earnings with only one employer | −0.0053 | 0.0728 | −0.2630 | 0.1860 |
| Four quarters of earnings with multiple employers | −0.0703 | 0.0552 | −0.2866** | 0.1410 |
| Annual earnings of father 7 to 18 months prior to birth of child × 1,000 (conditional on some earnings) | −0.0115*** | 0.0029 | −0.0996*** | 0.0074 |
| Squared annual earnings of father 7 to 18 months prior to birth of child × 1,000,000 (conditional on some earnings) | 0.0002** | 0.0001 | 0.0013*** | 0.0002 |
| Time difference between the child's birth and birth cost assessment (reference category: within seven months) | | | | |
| Birth costs ordered 7 to 12 months following birth of child | −0.0299* | 0.0172 | 0.1202*** | 0.0441 |
| Birth costs ordered 12 to 24 months following birth of child | −0.0354* | 0.0202 | 0.1916*** | 0.0516 |
| Age of father at baseline (reference category: 17 to 19) | | | | |
| 20 to 21 | 0.0472** | 0.0240 | 0.0229 | 0.0614 |
| 22 to 24 | 0.0678*** | 0.0241 | 0.0816 | 0.0617 |
| 25 to 28 | 0.1047*** | 0.0274 | 0.0674 | 0.0701 |
| 29+ | 0.0527* | 0.0280 | −0.0327 | 0.0717 |
| Race of father (reference category: black) | | | | |
| White | −0.0449** | 0.0215 | −0.4840*** | 0.0549 |
| Others | 0.0644 | 0.0581 | −0.0578 | 0.1485 |
| Missing | −0.0543** | 0.0242 | −0.5734*** | 0.0619 |

**Table C1.** Continued.

| | Father's debt (×1,000) at baseline | | Father's debt (×1,000) one year after baseline | |
|---|---|---|---|---|
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE |
| Year of birth costs (reference category: between October 1997 and December 1998) | | | | |
| 1999 | 0.0571 | 0.0450 | 0.0774 | 0.1150 |
| 2000 | 0.0956 | 0.0666 | 0.0957 | 0.1703 |
| 2001 | 0.0916 | 0.0784 | 0.2513 | 0.2004 |
| 2002 | 0.1833* | 0.0977 | 0.2800 | 0.2497 |
| 2003 | 0.2114* | 0.1144 | 0.1893 | 0.2925 |
| County (reference category: Milwaukee) | | | | |
| County 2 | 0.0686 | 0.9686 | −0.5252 | 2.4758 |
| County 3 | −0.1316 | 0.3705 | 0.4863 | 0.9469 |
| County 4 | −0.1659 | 0.6490 | −0.6100 | 1.6588 |
| County 5 | −0.0523 | 1.2122 | −0.8429 | 3.0983 |
| County 6 | −0.5579 | 0.4913 | −0.5530 | 1.2558 |
| County 7 | −0.4163 | 0.8214 | −0.8439 | 2.0994 |
| County 8 | 0.0474 | 0.9210 | −1.0615 | 2.3539 |
| County 9 | −0.0528 | 1.2745 | 0.6285 | 3.2576 |
| County 10 | 0.4291 | 1.0130 | −0.2199 | 2.5891 |
| County 11 | −0.3737 | 1.1370 | −0.8657 | 2.9062 |
| County 12 | −0.3328 | 1.0393 | −0.7501 | 2.6563 |
| County 13 | 0.0882 | 1.2924 | −2.0137 | 3.3032 |
| County 14 | −0.1574 | 1.1007 | −2.0403 | 2.8134 |
| County 15 | 0.1856 | 1.2865 | −1.1655 | 3.2882 |
| County 16 | −0.6912 | 1.1629 | −2.5781 | 2.9724 |
| County 17 | −0.4360 | 1.3878 | −0.7587 | 3.5472 |
| County 18 | 0.0548 | 1.4128 | −1.4721 | 3.6110 |
| County 19 | −0.5398 | 1.7866 | −2.2208 | 4.5664 |
| County 20 | 0.2533 | 1.6204 | −1.7622 | 4.1416 |
| County 21 | −1.1715 | 1.3137 | −2.4334 | 3.3578 |
| County 22 | −0.7935 | 1.6421 | −3.4680 | 4.1972 |
| County 23 | −0.8160 | 1.6452 | −3.4344 | 4.2050 |
| Log of total employment in county during one to four full quarters prior to baseline | −0.1918 | 0.4592 | −0.7983 | 1.1736 |
| Employment share of agriculture and forestry during one to four full quarters prior to baseline | −1.6660 | 14.4618 | −18.2411 | 36.9634 |
| Employment share of mining during one to four full quarters prior to baseline | 43.1234 | 85.4809 | −223.8318 | 218.4836 |
| Employment share of construction during one to four full quarters prior to baseline | 1.6406 | 2.5113 | 2.3416 | 6.4187 |
| Employment share of manufacturing during one to four full quarters prior to baseline | 2.9359** | 1.4967 | 6.6674* | 3.8256 |
| Employment share of wholesale trade during one to four full quarters prior to baseline | 0.7237 | 2.0470 | 2.9062 | 5.2319 |

**Table C1.** Continued.

| | Father's debt (×1,000) at baseline | | Father's debt (×1,000) one year after baseline | |
|---|---|---|---|---|
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE |
| Employment share of transportation, information and utilities during one to four full quarters prior to baseline | 3.1448 | 2.3596 | 11.2963* | 6.0309 |
| Employment share of retail sale during one to four full quarters prior to baseline | 3.9953** | 1.6201 | −0.0361 | 4.1409 |
| Employment share of finance, insurance, and real estate during one to four full quarters prior to baseline | 5.6790 | 4.5925 | −2.2161 | 11.7382 |
| Average weekly earnings of agriculture and forestry during one to four full quarters prior to baseline | −0.0006* | 0.0004 | 0.0004 | 0.0009 |
| Average weekly earnings of mining during one to four full quarters prior to baseline | 0.0003* | 0.0002 | 0.0014*** | 0.0005 |
| Average weekly earnings of construction during one to four full quarters prior to baseline | −0.0013** | 0.0007 | −0.0058*** | 0.0017 |
| Average weekly earnings of manufacturing during one to four full quarters prior to baseline | −0.0010 | 0.0006 | −0.0015 | 0.0017 |
| Average weekly earnings of wholesale trade during one to four full quarters prior to baseline | 0.0019*** | 0.0006 | 0.0039** | 0.0016 |
| Average weekly earnings of transportation, information, and utilities during one to four full quarters prior to baseline | 0.0013*** | 0.0004 | 0.0011 | 0.0009 |
| Average weekly earnings of retail sale during one to four full quarters prior to baseline | 0.0001 | 0.0008 | 0.0022 | 0.0022 |
| Average weekly earnings of finance, insurance, and real estate during one to four full quarters prior to baseline | −0.0002 | 0.0004 | 0.0008 | 0.0010 |
| Average weekly earnings of service during one to four full quarters prior to baseline | 0.0007 | 0.0011 | 0.0013 | 0.0029 |
| $R^2$ | 0.6361 | | 0.2220 | |

*Note:* Baseline is defined as the first full quarter after we observe both positive child support owed and order to pay birth costs.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

## APPENDIX D:

**Table D1.** Sensitivity tests: Two-stage models of effects of child support debt on child support paid in the first and second year after baseline with interactions.

| | Model A1: Alternative IV (second Stata ivregress procedure) predicting debt levels | | | | Model A2: Two-stage model (with predicted debt levels) | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's payments first year after baseline | | Father's payments second year after baseline | | Father's payments first year after baseline | | Father's payments second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Intercept | −8,787 | 16,057 | 393.99 | 17,612 | −16470 | 17173 | −34927* | 19607 |
| Typical (county/month) birth costs ×1,000, or predicted debt levels ×1,000 (at baseline and baseline +1 year) | 124.66 | 116.69 | 143.26 | 103.89 | 153.80* | 80.22 | 192.41** | 84.94 |
| Interactions between employment 7 to 18 months prior to birth of child and typical birth costs (or predicted debt levels) | | | | | | | | |
| Interaction: father has positive pre-earnings for one to three quarters × typical birth costs (or predicted debt levels) | −268.02*** | 50.25 | −235.25*** | 51.85 | −276.28*** | 56.75 | −236.86*** | 57.07 |
| Interaction: father has positive pre-earnings all four quarters with only one employer × typical birth costs (or predicted debt levels) | −349.64*** | 79.47 | −361.98*** | 82.49 | −337.35*** | 74.59 | −357.30*** | 75.03 |
| Interaction: father has positive pre-earnings all four quarters with multiple employers × typical birth costs (or predicted debt levels) | −315.75*** | 55.56 | −312.60*** | 58.14 | −311.45*** | 60.21 | −317.51*** | 60.61 |
| Father's employment 7 to 18 months prior to birth of child (reference category: zero quarters of earnings) | | | | | | | | |
| One to three quarters of earnings | 394.00*** | 101.71 | 342.52*** | 112.12 | 408.70*** | 140.94 | 345.82** | 141.76 |
| Four quarters of earnings with only one employer | 529.44*** | 180.39 | 672.10*** | 200.60 | 492.67** | 199.72 | 657.09*** | 200.94 |
| Four quarters of earnings with multiple employers | 369.91*** | 121.47 | 507.53*** | 136.22 | 351.37** | 156.58 | 512.39*** | 157.61 |
| $R^2$ | 0.275 | | 0.238 | | 0.278 | | 0.240 | |

*Notes:* Also included in these models but not shown in this table were county dummies and county-level controls for average total employment, average earnings by industry, and industry employment shares. Baseline is defined as the first full quarter after we observe both positive child support owed and order to pay birth costs.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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## APPENDIX E:

**Table E1.** Sensitivity tests: Two-stage models of effects of child support debt on Father's earnings in the first and second year after baseline with interactions.

| | Model A1: Alternative IV (second Stata ivregress procedure) predicting debt levels | | | | Model A2: Two-stage model (with predicted debt levels) | | | |
|---|---|---|---|---|---|---|---|---|
| | Father's earnings first year after baseline | | Father's earnings second year after baseline | | Father's earnings first year after baseline | | Father's earnings second year after baseline | |
| $N = 8{,}263$ | Coefficient | SE | Coefficient | SE | Coefficient | SE | Coefficient | SE |
| Intercept | −102,662 | 90,843 | −28,072 | 104,481 | −53,839 | 83,797 | −244,989** | 107,823 |
| Typical (county/month) birth costs ×1,000, or predicted debt levels ×1,000 (at baseline and baseline +1 year) | 260.25 | 402.40 | 430.71 | 461.14 | 175.58 | 391.44 | 536.65 | 467.12 |
| Interactions between employment 7 to 18 months prior to birth of child and typical birth costs (or predicted debt levels) | | | | | | | | |
| Interaction: father has positive pre-earnings for one to three quarters × typical birth costs (or predicted debt levels) | −169.78 | 247.73 | −355.63 | 277.82 | −190.83 | 276.94 | −366.71 | 313.82 |
| Interaction: father has positive pre-earnings all four quarters with only one employer × typical birth costs (or predicted debt levels) | −459.24 | 446.11 | −683.86 | 491.05 | −426.26 | 363.96 | −682.16* | 412.60 |
| Interaction: father has positive pre-earnings all four quarters with multiple employers × typical birth costs (or predicted debt levels) | −628.93** | 293.62 | −882.58*** | 327.86 | −618.31** | 293.79 | −883.36*** | 333.33 |
| Father's employment 7 to 18 months prior to birth of child (reference category: zero quarters of earnings) | | | | | | | | |
| One to three quarters of earnings | 1,072.66* | 590.71 | 1,484.03** | 647.74 | 1,111.52 | 687.74 | 1,495.28 | 779.56 |
| Four quarters of earnings with only one employer | 1,213.37 | 1,192.89 | 2,156.39 | 1,331.24 | 1,150.47 | 974.60 | 2,118.77* | 1,105.02 |
| Four quarters of earnings with multiple employers | 1,384.58* | 765.03 | 2,538.01*** | 851.15 | 1,355.12* | 764.05 | 2,529.55*** | 866.76 |
| $R^2$ | 0.451 | | 0.393 | | 0.450 | | 0.393 | |

*Notes:* Also included in these models but not shown in this table were county dummies and county-level controls for average total employment, average earnings by industry, and industry employment shares. Baseline is defined as the first full quarter after we observe both positive child support owed and order to pay birth costs.

*Source*: Matched data from the Wisconsin child support enforcement system (KIDS) and Unemployment Insurance.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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