The Value of Employer-Sponsored Child Care to Employees

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This article uses the contingent valuation method for calculating the value of employer-sponsored child care to employees. Like many environmental amenities, there may be a nonuse or existence value of working for a company that offers employer-sponsored child care (ESCC), as well as a use value to parents who have children in the center. We test this hypothesis using data from three firms, two of which have on-site child care. Our findings indicate that price is a determinant of willingness to pay for the continued existence or establishment of an on-site center. We find evidence of the existence value, even for employees without young children, and a greater valuation among recent hires than among longer-term employees.

WITH THE SLOWING GROWTH OF THE U.S. POPULATION OVER THE LAST 25 YEARS, much of the growth in the U.S. labor market has come from an increase in women's labor force participation and, in recent years, from a dramatic increase in the labor force participation of women with young children. The increased participation of women with young children is also expected to be a substantial part of growth in the labor force over the next 20 years. This trend has resulted in an increasingly greater demand for child care and an increased level of work/family conflict for U.S. families with young children. All indications are that these side effects of increasing women's labor force participation also will continue in the near future.

Firms in the 1990s faced an inherently tighter labor market than they had in the past because of changing demographics in the United States and the

strong economy. To satisfy their labor needs, firms strove to entice those not in the labor force to enter. Among the groups consciously targeted by firms have been the elderly and women with young children. In terms of the latter group, one strategy used by a small but growing number of firms is to provide employer-sponsored child care (ESCC) as part of a firm's menu of employee benefits. Not only can ESCC act as a direct incentive for women to enter the labor market, but it also has the potential to attract and retain fathers of young children who seek to facilitate their wives' employment or who are single parents. In 1978, the U.S. Department of Labor identified 105 ESCC programs among U.S. companies. Since then, this number has increased dramatically. A 1998 survey found approximately 8000 firms with on-site centers (McIntyre 2000).

Employers offering direct child care benefits report positive impacts of child care programs on their workers' performance, as well as reductions in turnover, absenteeism, and recruitment costs. In addition, a large percentage of the potential benefits to employers consists of savings in wage costs that reflect the value of the ESCC to employees. This is not often mentioned in firms' public rhetoric, but we expect that it is a substantial part of the benefit to firms. Measuring the benefits of ESCC programs for employers is challenging given the complex interaction among working conditions, productivity, compensation, and the makeup of one's labor force. As a result, even companies with ESCC programs have found it difficult to quantify the value of the child care benefit they are offering. Many other firms may be contemplating offering an ESCC but do not follow through because of the same difficulty in calculating the benefit versus the cost. Thus an estimate of the value of the benefits of an ESCC, either actual or potential, would be useful for firm decision making.

ESCC valuation is also important from a public-policy perspective. Child care has become a topic of intense public debate. In 1976, Congress enacted the Child Care Tax Credit, and since then, there has been a dramatic increase in federal spending through this program.[1] However, the Child Care Tax Credit is only one of a wide variety of government programs that subsidize child care expenditure [see Blau (2000) for a history of major government programs that subsidize child care]. Welfare reform has increased the pressure on states to coax low-income mothers into the labor market. Over the years, a number of proposals before Congress have involved tax breaks for companies offering ESCC programs.[2] This raises the question of why the

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[1] In 1999, the cost of the Child Care Tax Credit was estimated to be $2.8 billion (Blau 2000).

[2] There is currently no federal tax incentive for companies offering ESCCs, but several states give tax credits to employers for costs related to ESCCs.

government would need to encourage employers to do something that is in their interest. If firms were better able to measure the benefits of an ESCC, perhaps the tax incentive would not be necessary. On the other hand, one might argue that the externalities of a child receiving quality child care and the reduction of work/family conflict are large enough to justify government incentives in this area, whatever the value to firms.[3] Regardless of one's perspective on this issue, a better measure of the value of ESCC programs to firms would inform decisions about optimal levels of provision and of tax incentives.

This article offers a method for calculating the value of the ESCC benefit to employees within a firm. As argued below, the value of ESCC programs to employees is an important component of the total value of ESCC programs to employers. The method makes use of a vast body of literature on valuing nonmonetized commodities in the environmental field using contingent valuation. We argue that contingent-valuation techniques are appropriate to use for determining the value that employees place on ESCC. In fact, contingent valuation can be used to value any employee benefit. Like many environmental amenities, there may be a nonuse or existence value to employees of working for a company that offers an ESCC, as well as a use value to parents who have children enrolled in the center. We test this hypothesis using data collected from three firms, two that have on-site child care centers and one that does not. Our findings indicate that the offered price is a significant determinant of employees' votes on whether they would be willing to pay for the continued existence of the on-site center in the case of the firms that have a center or would be willing to pay part of the cost of running a center in the case of the firm that does not have a center. We find substantial evidence of a nonuse or existence value even for employees with no young children. The results also indicate a greater valuation among recent hires than among longer term employees, as expected.

This article proceeds as follows: The next section provides a framework for understanding why firms might choose to offer a benefit such as ESCC instead of offering a wage increase in order to entice mothers of young children who are not in the labor force into employment. The following section contains a brief discussion of the contingent-valuation methodology and how we use it for our specific case. The fourth section describes the study sites and the data. The fifth section discusses the estimated contingent-valuation equations for the three firms, and the final section describes the resulting willingness-to-pay estimates.

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[3] See Vandell and Wolfe (2000) for a full discussion of potential externalities of child care quality.

The Economics of ESCC

One of the most important questions in the economic theory of labor supply is the effect of an increase in the wage on labor force participation and on hours worked. While an increase in the offered wage is predicted to unambiguously increase labor force participation, its theoretical effect on hours worked given that one is employed is ambiguous. The higher wage increases the opportunity cost of leisure time and thus increases hours worked, but the higher wage also increases family income, some of which may be "spent" on increased leisure, resulting in fewer hours worked. The relative size of these opposing effects varies with the number of hours worked and with wage levels, with the opportunity cost of leisure effect dominating at lower hours worked and lower wages. Based on this theoretical prediction and strong empirical evidence, we usually expect the opportunity-cost effect of an increase in the wage to dominate for women with young children. Therefore, we expect that wage increases will increase labor force participation and hours worked for women with young children.

Child care costs that are incurred to facilitate an additional hour of employment act like a negative wage in terms of their effect on women's employment. Thus standard economic theory, when applied to the labor-supply decisions of women with young children, suggests that lowering the cost of child care encourages women to enter the labor market and work more hours if already employed.[4] A large set of empirical studies has found consistently that women with young children do respond negatively to higher costs of child care in deciding on the level of labor supply.[5]

If a potential worker's decision is affected by the cost of child care as both economic theory and previous empirical work predict, then employers may be able to entice a potential worker into the labor market by offering an ESCC to the extent that the ESCC reduces the cost of child care at the quality desired. Similarly, the potential reduction in child care costs from ESCC may attract and retain fathers of young children to a particular firm if their wives have entered the labor force because of access to ESCC through the husbands' employment. In addition, this strategy of offering child care subsidies may be preferred to simply offering a higher wage to attract mothers or fathers with young children. Beyond the savings on benefits over wages owing to employment taxes on wages but not on benefits, in the case of ESCCs, the firm also saves money because only some

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[4] See Connelly (1992) and Ribar (1992, 1995) for examples of this type of model.
[5] See Connelly and Kimmel (2003) for a recent review of this literature.

employees are eligible for the benefit.[6] Unless the firm is able to negotiate each salary individually (antidiscrimination laws make this illegal in certain circumstances), the firm would have to pay the higher wages to all new entrants and perhaps to all workers in the firm because pay scales would be bid up. The child care benefit, on the other hand, has the same predicted effect as higher wages, increasing the willingness of a potential worker to enter the labor market, but is paid only to those workers with young children. Thus, by offering a subsidy to child care costs, the firm limits the increase in effective wages to the target group of potential labor market entrants, women with young children, and helps to attract and retain fathers with young children to their firm without raising the wage for all new entrants. Of course, some workers who were already employed by the firm also will benefit from the child care subsidy, but the number who benefit directly is almost certainly less than if the firm used higher wages to attract new workers.

The lower total wage bill is potentially one of the most important benefits that a firm would expect to gain through an ESCC, although it is not the benefit that firms publicize. (Firms tend to talk about happier employees and better cared for children with the inevitable picture of the company president surrounded by a darling group of happy toddlers.) To calculate the value of the savings in wages, we must know how much higher are the wages the firm would have had to offer to the marginal workers and by how much other wages would have been bid up as a result of these higher wage offers. To estimate the former, one must know the value the marginal employee receives from the child care benefit. Although it is tempting, it is incorrect simply to use the cost of the employer subsidy as a proxy for the value to the employee (Samulari and Manser 1989). Some employees may value the ESCC more than the subsidy if, for example, the firm's endorsement of the child care center gives them a greater sense of trust about their child's well-being. Other employees may value it less than the subsidy if, for example, they could have used a relative or a friend to provide lower-cost child care than the full cost of the ESCC or if they do not have young children.

A full accounting of employer benefits of offering ESCC would include the value of the benefit to the marginal worker multiplied by either the total number of employees if we assume that an across-the-board pay increase would have been needed or the total number of entry-level employees if we assume that only entry-level wages would have had to increase to accomplish

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[6] In this way, ESCC is very different from other employee benefits such as health insurance or disability insurance because those benefits apply to almost all employees.

the goal of hiring new employees.[7] For forwarding-looking firms and workers in a competitive market, across-the-board increases would be the more realistic assumption; thus this is what we use in our calculations below. Added to this would be the cost savings accrued to the firm from other positive effects of the benefit, such as increased worker productivity through improved worker morale, reduced absenteeism, lower turnover rates, and savings in recruitment costs. Thus, while the value that the employee places on ESCC is not the only source of cost savings for the firm from offering an ESCC program, it is at least theoretically an important part of the story. In our empirical work we estimate the value of the ESCC program to a marginal worker (defined here as an employee who has been employed less than 2 years). We leave the full calculation of firm savings and costs to future analyses.

While the firm's main concern may be focused on new hires, from the employees' perspective, both new hires and long-term employees have the potential to gain from the offering of a new benefit. Firms also may be interested in this information because it is indicative of the level of externalities, both positive and negative, that would be generated by the benefit. In addition, employee valuation of the benefit may give the firm some indication of the potential for accruing other cost savings listed earlier, such as the reduction in absenteeism and lower turnover rates. One might conjecture that employees who, as a group, value a benefit highly may be less likely to leave the firm for employment elsewhere. Thus we argue that there is interest in calculating the value of the ESCC program to all employees, not just to marginal employees. The methodology for calculating that value is discussed briefly in the next section.

The Value of ESCC to Employees: Using the Contingent Valuation Methodology

We propose to estimate the value of ESCC to employees using the contingent-valuation methodology (CVM). The contingent-valuation approach has

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[7] An alternative way of calculating the wage savings to the firm would be to sum individual employee values of the ESCC. In a perfectly competitive labor market, where each worker is paid the value of his or her marginal revenue product, the value of the employer-provided benefit to the worker results in a direct wage savings to the firm, equal in amount to the employee's valuation of the benefit (Summers 1989). However, if firms offer compensation through a broadly known wage structure in which all workers in the same category receive the same wages and in which a hierarchical wage scale is maintained, then workers' wages will not be discounted by their *own* valuation of the ESCC.

its origins in welfare economics.[8] The concept of compensating or equivalent surplus was developed to represent the amount of money necessary to equate an individual's indirect utility across two states—one with more of some commodity or benefit and one with less. When the commodity in question is a typical private good, traded in a market, one can derive an estimate of this monetary valuation simply by observing purchasing behavior and prices. However, if the commodity is a public good, it is not possible to derive such revealed preference estimates. Contingent valuation is a technique that allows the derivation of this dollar value in the absence of market-generated information. Herein lies its appeal within the context of environmental economics and, more generally, in the area of welfare economics.[9] Indeed, as Sen (1977:339–40) has noted, ". . . once we give up the assumption that observing choices is the only source of data on welfare, a whole new world opens up, liberating us from the informational shackles of the traditional approach."

A child care benefit offered as part of one's employment compensation package is clearly not a pure public good (i.e., there is usually some rationing with not enough slots for all employee children, and there is always some user payment). However, neither is it a pure private good. We cannot simply observe the market price of an employer-sponsored on-site child care center. While we can observe a market price for center-based care offered outside the firm, our previous research shows that parents respond quite differently in their choice of child care depending on the availability of on-site child care (Connelly, DeGraff, and Willis 2004a,b). Instead, the child care benefit must be viewed as collectively provided, not traded within a typical market context, not paid for in full at an observed price, and competing in the consumer's utility function with nonmarket substitutes such as care by relatives. These characteristics render it highly suitable for analysis using contingent valuation.

The empirical application of CVM involves eliciting through a survey instrument responses to direct questions about individuals' monetary valuation of a particular good. Examples of CVM questions include, "How much would you be willing to pay to eliminate groundwater contamination in your area?" or "Would you allow the placement of a toxic waste dump in your neighborhood in return for a payment of $500?" The former is an example of an open-ended CVM question, whereas the latter is an example

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[8] See, for example, Arrow et al. (1993), Freeman (1993), Herriges and Kling (1999), Mitchell and Carson (1989), and O'Connor and Spash (1999) for more detailed discussion of the economic theory underlying the contingent-valuation methodology.

[9] See Cavalluzzo (1991) and Gerking et al. (1988) for examples of the CVM applied to labor market issues.

of a closed-ended question in which the respondent simply replies "Yes" or "No."

While the use of contingent valuation certainly has its critics, it is considered by many to be a powerful tool if applied within the appropriate context and if the survey instrument is well designed.[10] There is extensive literature evaluating alternative CVM approaches in terms of the statistical properties of the estimated results. For a detailed discussion of that literature and of how the survey instrument used here was designed and implemented to reduce potential biases, see Connelly, DeGraff, and Willis (2004a,b). Briefly, one such bias—hypothetical bias—may arise precisely because of the hypothetical nature of CVM questions. The application of CVM to the valuation of ESCC is less likely to be subject to this form of bias than are many other scenarios in which CVM is commonly applied because the good in question in our research, a form of child care, is familiar to almost all respondents. In addition, we chose a closed-ended format, which creates a scenario that is more similar to a real market setting and thus generally is viewed as being less susceptible to hypothetical bias than are opened-ended questions (Kealy and Turner 1993; Freeman 1993). To further reduce bias, the compensation mechanism for the hypothetical payment should be familiar to respondents. We offer a payroll deduction of a specified amount per pay period because most employees are used to thinking in these terms, and in fact, other benefits, such as health insurance, are copaid through payroll deductions.

Two other forms of bias often discussed in the CVM literature are *strategic bias* and *starting-point bias*. Strategic bias arises if respondents believe it is in their interest to misrepresent their true valuation of the good. Starting-point bias arises when responses are influenced by the values presented. Among the alternative closed-ended CVM elicitation techniques, a referendum-style question format, as used here, generally is regarded as being less prone to these two types of bias because the respondent has only a single opportunity to influence the outcome (Freeman 1993; Mitchell and Carson 1989). A closed-ended referendum question presents the respondent with a one-time choice between an increase (decrease) in the benefit and a specified dollar amount, with the majority response or "vote" hypothetically being applied to all. Different dollar amounts are offered across respondents to derive a distribution of valuations.

After careful consideration of the pros and cons of alternative methodologies presented by the CVM literature and on-site pretesting, we decided

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[10] In particular, see Hausman (1993) or Diamond and Hausman (1994) for a critical perspective on contingent valuation. Also see Hanemann (1994) for a review and rebuttal of criticisms of the technique.

TABLE 1

CV Bid Distribution for On-Site Child Care

	Action			Bell			Central		
Bid statistics									
Mean	14.27			11.03			13.46		
Standard deviation	14.48			10.96			11.32		
Minimum	2			2			2		
Maximum	60			60			60		

Bid Distribution and Response	Action			Bell			Central		
	n	Percent of Total	Percent Yes	n	Percent of Total	Percent Yes	n	Percent of Total	Percent Yes
$1–10	197	61.76	49.24	152	72.38	57.24	258	64.02	45.74
$11–20	62	19.44	43.55	31	14.76	29.03	81	20.10	40.74
$20+	60	18.81	21.67	27	12.86	18.52	64	15.88	23.44
Total*	319	100	42.99	210	100	48.36	403	100	40.99

*The sample sizes vary slightly across tables owing to missing data for selected variables.

to use a referendum-style, closed-ended format "willingness to pay" measure in which the outcome of the vote hypothetically applies to all employees. The actual text of our question appears in the Appendix with the firm-specific language eliminated for confidentiality reasons. The focal point of the question is as follows: "Would you VOTE YES to a payroll deduction of $_ per 2-week pay period in order to keep the child care center open?" The amount of money that hypothetically would be collected in the payroll deduction was determined in advance by the investigators, read aloud with the question, and was different for different respondents, creating the needed variation in "price."

Information on the distribution of prices used is provided in Table 1. Table 1 summarizes the bid distribution for each firm and bid response according to bid category. Two points to note are the relatively wide range of the bid structure and the decreasing percentage of "Yes" responses as the bid range increases. The wide range of the bid structure is a product of the survey design and our pretesting and is important for creating the needed variation for multivariate analysis. The aggregate response pattern is important because it is consistent with price theory and rational expectations, providing evidence in support of the approach and the validity of the data. It is also interesting to note that the overall percentage of "Yes" votes for Central Products, the firm without an on-site child care center, is highly similar in magnitude to that for Allied Industries. This is important because it suggests that the responses at the two firms with on-site centers are not driven by unusual characteristics particular to those centers. Bell

Manufacturing employees voted "Yes" somewhat more frequently, which is consistent with the fact that the bid distribution at Bell is more highly concentrated at the lower end of the distribution.

The "price" inserted in the CVM question by the interviewer is used as an explanatory variable in the estimation of a probit model of the probability of answering "Yes" to the referendum question. Other covariates include basic socioeconomic and demographic characteristics of the respondent and a control for the order in which the CVM question was asked in the survey. The specification of the probit model is discussed in full below.

Once the parameters of the probit model have been estimated, we calculate the price elasticity of the child care benefit for each individual by simulating a 1 percent increase in the price. We have reported the mean elasticity for different populations of employees: all workers, newly hired workers, workers with children, and workers with children already enrolled in the on-site center (for the two firms that had on-site centers at the time of the survey). In addition, for each respondent we solve for the value of willingness to pay (WTP) that leads to indifference between the benefit and the payment offer. In other words, the WTP is the price that would cause the respondent to be indifferent between answering "Yes" and answering "No." The indifference WTP can be thought of as an estimate of the value of the child care benefit to the respondent. After calculating the value of the child care benefit for each respondent, we compare the average valuation of the benefit across groups of workers in each of the three firms. The value of the child care benefit to workers not using the ESCC program and to workers without young children provides estimates of two alternative concepts of the existence value of the benefit. The value to workers with young children can be considered the sum of the direct-use value and the existence value. The value of the benefit to recent hires can be thought of as the value to the marginal worker. We also compare the valuation across the two firms that currently have ESCC programs and the one that does not have an ESCC program. These comparisons are reported below.

Data and Context

The three firms whose employees were interviewed produce essentially the same products with the same technology and are all located within a relatively small geographic area in a midsized city in the Southeast of the United States. The industry can best be characterized as light manufacturing, with most of the work force having a high school education or less. The majority of nonmanagerial workers in the industry are women, although

there are specific steps of the production process where male workers are concentrated. Most of the production workers are paid by the piece. In recent years, many firms in the industry experimented with team-based production for the most labor-intensive phases of the production process in an effort to become more efficient. The size of the teams was small, usually two or three. Qualitative evidence from our interviews suggests that, overall, both workers and managers were satisfied with this approach, and most firms continued to use it in some situations.

The majority of U.S. firms in the industry are concentrated in this region, although the industry faces growing competition from the international market. The industry also faces increasing pressure from the wholesale buyers of its products as consumer demand and the nature of the retail market change. In addition, the labor market in the area is fairly competitive. Real hourly wages for production workers in this industry and state increased gradually but steadily during the 1990s from about $8.20 to about $9.30. These average real wages were consistently higher than those for the comparable industry classification nationally but lower than those for the broader manufacturing classification both nationally and statewide. Unemployment rates in the state tend to be lower than at the national level, with those in this region of the state lower still. For example, in 1998 the national unemployment rate was 4.5 percent, the unemployment rate in the state was 3.5 percent, and in the Standard Metropolitan Statistical Area (SMSA) where the industry is concentrated the unemployment rate was estimated to be 2.7 percent (U.S. Bureau of Labor Statistics 2002). These forces and others have combined to create a sense of a struggle to survive in the industry; firms are always looking for innovations that will help them to meet their demand for labor and maintain or strengthen their competitive position in the global market. Such innovations have taken many forms, including the adoption of new technology, restructuring of work times, and considering alternative packages of employee benefits.

There are approximately 60 firms in this industry in our study area, and the industry is one of the primary employers in the region. Only 2 of the 60 firms have on-site child care, both of which are included in the study. Firms in the industry range in size from a maximum of about 800 employees to fewer than 50. All three firms studied here are larger than the average firm in the industry in this region, with Action Industries having a workforce of about 600, Bell Manufacturing having about 300 employees, and Central Products having about 640 employees.[11] Action Industries and Central

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[11] As you have probably guessed, these are fictitious names used to preserve the confidentiality of the firms and their employees.

Products are family-held companies. Bell Manufacturing had gone public recently at the time of our interviews, although the child care center had been established before this. Each company offers a modest set of benefits that includes a 401k retirement plan and health insurance. None of the workers at any of these firms receives paid sick leave. There was paid vacation time at each firm, but it was not flexible. Instead, the companies shut down for a company-wide vacation, typically 2 weeks a year, and workers receive their average earnings for those 2 weeks. Action also offers flextime and a subsidized fitness center and cafeteria. Bell offers slightly discounted participation in community center fitness programs. Central has a subsidized cafeteria, short-term disability insurance, and some flexibility in the scheduling of work hours. These benefits packages, except for the child care center, are similar to those available at other large companies in the industry. The smaller firms generally have less generous 401k matching and lower-quality health insurance plans. Because most workers get paid "by the piece" and piece rates vary even within the firm from one product to another, it is difficult to conduct an exact comparison of wages. However, workers and management alike reported that their perception was that wages were very similar across firms in this industry. One human resources officer complained that workers would leave his company for another for a very small difference in wages.

Because the three firms are located in the same geographic area, employees with young children face the same market options for child care (e.g., large day-care centers, individuals who run small child care facilities in their homes, and professional in-home care providers). Parents, however, differ substantially in their access to low- or zero-priced care by relatives and in their eligibility for state government child care subsidy. In addition, of course, those working for Action Industries or Bell Manufacturing have an on-site center available to them.

Information about the ESCC program at each firm was obtained from interviews with the directors of the child care centers and the human resources officers, from company literature about the centers, and from direct observation of each center. The on-site child care center at Action Industries opened in 1979 and had about 80 children enrolled at the time of the survey.[12] The owner of the company told us that he had two motivations in opening the center. One was to try to attract women employees in a very tight labor market. The other was to retain his human resources

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[12] The unemployment rate in the state for 1978 was 4.3 percent and for 1979 was 4.8 percent compared with 6.1 and 5.8 percent nationally, again suggesting a relatively tight local labor market (U.S. Bureau of Labor Statistics 2002).

officer, a young woman in whom he had a lot of confidence and who had several young children. He admits that it was a fairly impulsive decision, not one subject to detailed cost-benefit analyses.

Action's child care center charged a set rate per preschool child (ages 6 weeks through 5 years) for full-time care during the work week, with some discounting for multiple children—$47.50 per week for the first child, $86.50 per week for two children, and $112.00 per week for three children. Part-time care during the work week also was available. The center was open to employee children, stepchildren, or grandchildren. Its hours of operation were from 6:00 A.M. to 6:00 P.M., Monday through Friday, and it subsequently offered Saturday hours as well. In addition to providing part-time or full-time care for preschool children, it also offered after-school and "snow day" care for children aged 6 to 13. There are several indicators of a relatively high quality of care at Action Industries compared with other center-based care in the area. For example, the ratio of children to care providers is lower for each age group than required by state regulations, and the child care providers are paid at a higher rate than average for the area. There was a waiting list for the children of 10 employees for the on-site center at Action at the time of the survey. Parent fees do not fully cover the costs of the child care center. Action Industries estimates that it subsidizes almost 50 percent of the total cost of the center, which at the time of the survey was a subsidy of about $130,000 per year.

The Bell Manufacturing child care center opened in 1989 and had 60 children under age 6 enrolled at the time of the survey.[13] There was some sense among administrators with whom we spoke that the rationale for opening the center was to better compete with Action Industries for workers. It also charged a set rate per preschool child of $49 for full-time care with a 5 percent discount for the second and third children. Saturday care also was available at the time of the survey. Its hours of operation were Monday through Friday, 5:45 A.M. to 5:30 P.M., and also on Saturday while a shift was working. Like the Action Industries center, the Bell Manufacturing center is a high-quality center based on staff education and lower child-staff ratios than required by law. Child care providers are full-time employees of the company, receiving higher pay than other providers in the area and full Bell Manufacturing benefits. At Bell, there was a waiting list for the children of three employees at the time of the survey. Bell reported subsidizing the center at about the same percentage rate as Action, or by as much as $100,000 per year at the time of the survey.

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[13] The unemployment rate in the state for 1988 was 3.6 percent and for 1989 was 3.5 percent compared with 5.5 and 5.3 percent nationally (U.S. Bureau of Labor Statistics 2002).

The third firm, Central Products, does not have a child care center. As discussed earlier, among the companies in the area, Central's benefits package is more generous than average but is similar to that of Action and Bell. At the time of our survey (and still today), Central Products was not interested in sponsoring a child care center. The human resources officer at Central indicated that he felt very confident that the firm's benefits dollars were better spent elsewhere. Central Products, therefore, serves as an ideal comparison case to firms with on-site centers for the analysis of the value of an on-site center.

Data collection took place during 1996, 1997, and 1998, with the employees of one firm interviewed each summer. Interviews with individual employees were conducted in person at each firm on company time, during a concentrated 3- to 5-day period, during all three work shifts and drawing from each department. This interview strategy was selected in order to maximize participation given budget and time constraints while achieving a high degree of representativeness of workers. We interviewed approximately 60 percent of the Action Industries workforce, 75 percent of the Bell Manufacturing workforce, and 65 percent of the Central Products workforce.

The survey instrument was highly comparable across firms, with some tailoring by site to take into account firm-specific characteristics and with slight changes made from one firm to the next in order to benefit from insights gained at the previous summer's firm. Each survey collected detailed socioeconomic and demographic information about the employee, the employee's spouse or partner (if applicable), and the employee's household.

While employees of all three firms face similar child care markets and participate in the same labor market, the demographic profiles of employees differ substantially across firms. All else equal, we would have expected that Action and Bell would employ more parents of young children because, according to our model, one of the purposes of the ESCC program is to entice marginal labor market participants into the work force. Looking at Table 2, Action and Bell do not seem to have employees with more and younger children than Central Products. However, all else is not equal. Consider the race/ethnic differences of the employees of the three firms. Twenty-one percent of the employees at Central Products are Hmong. The Hmong are recent immigrants to this area of the southeastern United States. As a group, they are characterized by very early marriage and very high fertility even among second-generation Hmong. Connelly, DeGraff, and Willis (2004a) discussed the substantial differences between child care arrangements used by Hmong and non-Hmong parents. In brief, no Hmong employee in our sample used any child care arrangement other than relative

TABLE 2

CHARACTERISTICS OF EMPLOYEES IN THE THREE FIRMS

	Action	Bell	Central
Percent voting "Yes" for on-site child care	42.4	49.2	40.5
Mean number of children less than 6	0.45	0.29	0.40
Percent with kids younger than 6 and who have relatives in the area	12.5	11.6	15.0
Mean number of children 6 to 18	0.65	0.52	0.62
Mean hours worked per week	40.5	45.4	41.7
Percent college graduates	7.1	3.5	2.0
Category of worker			
Percent hourly office workers and salaried	27.2	22.6	17.0
Percent hourly production workers	32.4	37.2	37.2
Percent piece workers	40.4	40.2	45.8
Percent first shift	67.6	84.4	59.5
Marital status			
Percent married, widowed	69.3	62.8	62.4
Percent divorced	14.7	16.6	18.3
Percent never married	16.0	20.6	19.3
Mean age	35.7	38.1	37.0
Percent male	19.6	25.1	32.1
Race/ethnicity			
Percent white	83.7	80.4	70.7
Percent Hispanic	0.0	4.5	0.0
Percent African-American	4.5	15.1	5.9
Percent Hmong	9.9	0.0	21.4
Percent other (other Asian at Central)	1.9	0.0	2.0
Mean years with the firm	5.4	7.6	5.8
Mean years lived in area as a percent of age	86.1	77.9	62.1
Miles from home to work	11.5	9.0	14.6
Number of employees surveyed	312	199	393

care. The large number of Hmong at Central Products may indeed indicate that workers who do not value ESCC (at least for their own use) might be more likely to choose a company with a nice array of other benefits but no ESCC. However, Action also has a substantial number of Hmong employees. Comparing the samples across firms excluding the Hmong, Action employees have, on average, 0.36 children younger than age 6, Bell employees have 0.29, and Central employees have 0.22. This supports the hypothesis that Action and Bell have been more successful at recruiting and retaining non-Hmong employees with young children who might use the ESCC program. It also means that because of the substantial differences across firms, our analysis is done separately by firm.

One weakness of the data is relatively small sample sizes for multivariate analysis and the fact that only three firms in one industry and one local labor market are represented. While we recognize this limitation and

therefore are cautious in interpretation of the results, we believe that the unique features of the data are of sufficient interest to outweigh this drawback. In addition, the inclusion of a "control" group, without ESCC, helps to assess whether the results are driven by unusual characteristics particular to the two centers. The method we use for the valuation of ESCC, and of benefits more generally, might be adopted by a single firm interested in optimizing benefit dollars. In addition, it seems impossible to study on-site child care except through a case study approach because the incidence of the on-site center option is still so low in the general population.[14]

The presence in our sample of a large number of Hmong employees, who in some ways are not representative of American workers, also may be seen by some as a weakness. However, one cannot be too selective about firms in a case study of this type given that most firms would be unwilling to allow a team of researchers access to their employees during working hours at the expense of the firm. It is quite a challenge to gain access to three sufficiently large firms in the same industry and same geographic location consistent with an experimental design of "treatment and control." The results of the analysis, we believe, are of general interest in a number of different areas, including the economics of child care and benefits more generally, work-family conflict, and human resources management.

Empirical Analysis of the CVM Questions

Using the employees' responses "Would you vote for . . . ? Yes or No" as the dependent variable and the price read by the interviewer as an independent variable, we estimate a multivariate probit equation for each firm separately. Descriptive statistics for the dependent variable and the explanatory variables are provided in Table 2. The probit results are shown in Table 3. The results indicate that the "price" of the benefit consistently has a significant negative effect on the probability that the employee votes "Yes." Recall that voting "Yes" is voting to pay an amount per pay period to have an on-site center. The price elasticities across the three firms are reported in Table 4 and show a limited sensitivity of voting probabilities to the price. Statistical tests for differences across firms find that Action employees have a lower mean price elasticity (in absolute value) than either Bell or Central employees. The difference between the average values for Bell and Central

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[14] Other studies of ESCC also have used a modified case study approach. See, for example, Lehrer, Santero, and Mohan-Neill (1991) and Youngblood and Chambers-Cook (1984).

TABLE 3

MARGINAL EFFECTS ON PROBABILITY OF VOTING "YES" TO MAINTAIN (OR PROVIDE) ON-SITE CHILD CARE

	Action	Bell	Central
Contingent valuation "price" for on-site child care	−0.0100 (0.0025)	−0.0193 (0.0048)	−0.0144 (0.0031)
Number of children younger than 6	−0.0470 (0.0601)	−0.0472 (0.0891)	0.0364 (0.0516)
Kids less younger 6 times relatives in area	0.0055 (0.1187)	−0.1938 (0.1230)	0.0530 (0.1033)
Number of children 6 to 18	−0.0286 (0.0330)	−0.0445 (0.0497)	−0.0668 (0.0282)
Hours worked per week	0.0105 (0.0087)	−0.0100 (0.0092)	−0.0082 (0.0063)
College graduate	0.2228 (0.1402)	0.2850 (0.2029)	0.1745 (0.2031)
Hourly production worker	−0.1350 (0.0910)	−0.1354 (0.1058)	0.0254 (0.0807)
Piece worker	−0.2129 (0.0838)	0.0004 (0.1059)	−0.0772 (0.0799)
Works first shift	0.0502 (0.0743)	−0.0274 (0.1175)	−0.0750 (0.0652)
Divorced	−0.1553 (0.0833)	0.0811 (0.1075)	0.0757 (0.0720)
Never married	0.0172 (0.0969)	0.0213 (0.1179)	−0.0023 (0.0816)
Age	−0.0039 (0.0035)	−0.0006 (0.0050)	−0.0054 (0.0028)
Male	−0.2128 (0.0815)	0.1073 (0.1116)	−0.0931 (0.0681)
Hispanic	NA	0.1261 (0.2031)	NA
African American	0.1767 (0.1472)	0.1620 (0.1117)	−0.0795 (0.1109)
Hmong	−0.0651 (0.1245)	NA	−0.2867 (0.0701)
Other (other Asian at Cental Products)	−0.0395 (0.2278)	NA	−0.0966 (0.1678)
Years with firm	−0.0151 (0.0070)	−0.0042 (0.0051)	−0.0110 (0.0041)
Proportion of years lived in area	−0.0069 (0.0143)	0.0349 (0.0456)	−0.0369 (0.0448)
Miles from home to work	0.0045 (0.0037)	0.0006 (0.0055)	0.0008 (0.0007)
CV question not first	−0.0986 (0.0638)	−0.1901 (0.0764)	−0.1586 (0.0532)
n	312	199	393
Log likelihood	−186.032	−117.64	−224.74
Chi-squared	54.23	40.55	80.93

NOTES: Standard errors are in parentheses.

is not statistically significant.[15] This result is maintained if we limit our analysis to non-Hmong employees.

Table 4 also reports a set of average elasticities calculated for different groups of employees from each firm. Looking at differences across groups of workers within firms, there is not a difference in elasticities of demand between newly hired (job tenure of 2 years or less) and longer-term employees at Action Industries and Bell Manufacturing, but at Central Products new hires are more price elastic. This statement holds for both the entire sample

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[15] The elasticities were calculated for each individual in the sample by calculating the percentage change in his or her probability of voting "Yes" caused by a simulated 1 percent change in the price offered. The table reports the mean elasticity for the individuals in that sample group. The statistical tests for significance across groups were standard *t* tests conducted as if the calculated individual elasticities were observed data.

TABLE 4

Elasticity of a "Yes" Vote with Respect to the "Price" of On-Site Care

	Action	Bell	Central
All employees	−0.165	−0.246	−0.235
Newly hired employees	−0.171 ⎤	−0.261 ⎤	−0.277 ⎤
Non-newly hired employees	−0.162 ⎦	−0.233 ⎦	* −0.194 ⎦ ***
Newly hired non-Hmong employees	−0.193 ⎤	−0.261 ⎤	−0.330 ⎤
Non-newly hired non-Hmong employees	−0.166 ⎦	−0.233 ⎦	* −0.209 ⎦ ***
Employees with kids under age 6	* −0.200 ⎤ **	−0.212 ⎤	−0.341 ⎤
Employees without kids under age 6	−0.148 ⎦	−0.257 ⎦	* −0.197 ⎦ ***
Employees who currently use on-site center	* −0.307 ⎤ ***	−0.211 ⎤	NA
Employees with young kids who currently do not use on-site center	−0.114 ⎦	−0.212 ⎦	NA

Note: Bracket indicates that a statistical test for difference was performed using pairwise *t*-test with unequal variance.
* Indicates that significant differences were found at the levels denoted below.
*Significantly different at 10 percent level.
**Significantly different at 5 percent level.
***Significantly different at 1 percent level.

of employees and the non-Hmong sample. This result may be due to the fact that the question about an on-site center is more hypothetical at Central, which does not have an on-site center.

There are statistically significant differences in the elasticities of employees with and without young children at Action and Central and between users of the on-site center and employees with young children who do not use the on-site center at Action. Employees with young children and employees whose children use the center are more elastic in their demand than are other employees. Recall that these elasticities come from the multivariate analysis, so age and education are controlled for in the calculation. Wages are not completely controlled for, but the regression does contain a variable indicating if someone is paid by the piece, hourly, or salaried, which, in these firms, is a good proxy for variations in wages. One explanation might be that a higher percentage of those without young children simply consider on-site child care irrelevant to them, so they vote "No" regardless of the price. Thus the elasticity is low not because they must have it but because they always buy zero. In contrast, some of those with young children may consider it a viable option for themselves at a lower price but not at a higher price. Thus their demand would be more elastic. Alternatively, the difference in elasticities may be the result of some self-consciousness on the part of parents with young children regarding imposing their choices on others as costs. We discuss this possibility in more detail below.

While our primary interest is the effect of price and the corresponding WTP estimates discussed in the next section, it is useful to briefly consider

the other results of the probit models. Other than price, few of the coefficients are statistically significant. For example, we expected that employees with young children would be more likely to vote "Yes," but the coefficients of that variable are insignificant for all three firms. Similarly, employees living closer to work might be more likely to vote "Yes" if child care near home is preferable, but the miles-to-home variable is also insignificant at all three firms. Our earlier work (Connelly, DeGraff, and Willis 2004a,b) supports the hypothesis that distance from home has a significant negative effect on use of the on-site centers. In addition, significant variables at one firm do not necessarily imply significance at all firms. One interesting finding is that at both Action Industries and Central Products, the length of time the respondent has been employed by the company is negatively correlated with a "Yes" vote. This implies that new employees value the benefit more highly, which is in keeping with our theory of firms seeking to attract marginal labor force participants. Because we have controlled for age, this result is not merely an age effect. Also, at both Action and Central, Hmong workers are significantly less likely to vote "Yes" (with a liberal interpretation of significance in the case of Action). We believe that this result is related to the Hmong's strong cultural beliefs against non-familial child care. Not only will the individual Hmong worker not use the center, but she knows that her Hmong friends and coworkers also will not use it.

We experimented with alternative specifications of the CVM probit equation with very little effect on the basic outcomes shown in Tables 3 and 4. For Bell Manufacturing and Central Products, we did have employee wage information and included wages as another independent variable. Comparison of coefficients with and without wages shows almost no change in the price elasticity and no change in which variables are or are not significant. For Central, the wage variable itself is significantly negative. For Bell, the wage variable is not significant.[16] We also experimented with including a control variable indicating whether the respondent is an on-site center user. As one might expect, center users are more likely to vote "Yes" for a general payroll deduction to save the on-site center, but the price elasticities were not much changed by the inclusion of this variable. Because this variable has the potential of introducing endogeneity bias, we calculate the WTP estimates based on the results without the center user variable.

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[16] Because all these respondents work for the same firm, our occupation dummy variables are capturing most of the wage differentials.

Willingness to Pay for an On-Site Center

Tables 5 and 6 present two ways to compare employee valuations of the child care benefit by selected characteristics. Table 5 calculates the mean WTP for the on-site center. This is an amount per biweekly paycheck and is above and beyond the user fee for the center.[17] The means for the full samples at Action Industries and Bell Manufacturing indicate that the average WTP (in nominal terms) for an on-site center is between $150 at Action and $225 a year at Bell. This is a fairly substantial amount given the small proportion of employees who benefit directly from the center, but it is in keeping with the rhetoric we heard on the factory floor that Action and Bell

TABLE 5

Mean Willingness to Pay for On-Site Center by Selected Characteristics, Biweekly Amount

		Action	Bell	Central
Full sample	Mean	$5.89	$8.53	$4.77
	SD	(19.88)	(19.93)	(21.34)
	n	324	204	397
Non-Hmong	Mean	$7.83	$8.53	$8.19
	SD	(19.95)	(19.93)	21.34
	n	291	204	311
		***		
Hmong	Mean	$−9.45		$−7.61
	SD	(10.51)	NA	16.21
	n	33		86
Voted "Yes"	Mean	$13.31	$12.46	$12.00
	SD	(19.22)	(9.19)	(13.68)
	n	134	98	159
		***	***	***
Voted "No"	Mean	$1.08	$4.88	$0.08
	SD	(18.10)	(26.08)	(24.04)
	n	179	103	236
With young kids	Mean	$5.60	$4.92	$8.63
	SD	(20.16)	(8.16)	(18.07)
	n	104	49	106
			**	**
Without young kids	Mean	$6.04	$9.67	$3.36
	SD	(19.79)	(22.30)	(22.28)
	n	220	155	291

[17] For each respondent, the willingness to pay (WTP) is the price that would make the respondent equally likely to vote "Yes" or "No."

TABLE 5 (cont.)

		Action		Bell		Central	
On-site center user	Mean	$12.68 ⌉		$5.13 ⌉		NA	
	SD	(22.45)		(9.53)			
	n	51		22			
			***				
With young kids	Mean	$−0.52		$5.78		NA	
Not on-site center user	SD	(15.06)		(7.45)			
	n	57 ⌋		30 ⌋			
With young kids	Mean	$−0.87 ⌉		$1.11 ⌉		$11.04 ⌉	
With relative available	SD	(16.22)		(6.99)		(18.90)	
	n	40		25		60	
			***		***		
With young kids	Mean	$9.64		$8.88		$5.48	
Without relative	SD	(21.41)		(7.48)		(16.60)	
available	*n*	64 ⌋		24 ⌋		46 ⌋	
College graduate	Mean	$42.99 ⌉		$19.32 ⌉		$21.10 ⌉	
	SD	(16.93)		(7.87)		(10.55)	
	n	24		7		8	
			***		***		**
Not college graduate	Mean	$2.93		$8.14		$4.43	
	SD	(16.90)		(20.12)		(21.38)	
	n	300 ⌋		197 ⌋		389 ⌋	
New hire (employed	Mean	$9.92 ⌉		$12.36 ⌉		$7.79 ⌉	
2 years or less)	SD	(10.92)		(8.86)		(26.41)	
	n	106		97		197	
			***		***		***
Not new hire	Mean	$3.94		$5.06		$1.79	
	SD	(19.10)		(25.76)		(14.20)	
	n	218 ⌋		107 ⌋		200 ⌋	
First shift	Mean	$8.91 ⌉		$7.21 ⌉		$5.22 ⌉	
	SD	(21.22)		(21.19)		(14.91)	
	n	220		171		236	
			***		***		
Not first shift	Mean	$−0.49		$15.36		$4.11	
	SD	(14.87)		(8.64)		(28.29)	
	n	104 ⌋		33 ⌋		161 ⌋	
Hourly office	Mean	$23.42 ⌉		$13.87 ⌉		$8.18 ⌉	
or salaried	SD	(20.94)		(9.21)		(14.30)	
	n	90		46		67	
			***		***		
Hourly production	Mean	$−1.33		$5.87		$8.15 ⌉	
	SD	*** (15.26)		* (8.32)		*** (27.67)	
	n	105 ⌋		75 ⌋		147 ⌋	
							***
Piece worker	Mean	$−0.46		$7.97		$0.80	
	SD	(14.28)		(29.17)		(16.53)	
	n	129 ⌋		83 ⌋		183 ⌋	

NOTE: Brackets indicate that a statistical test for difference was performed using pairwise *t*-test with unequal variance.
* Indicates that significant differences were found at the levels denoted below.
*Significantly different at 10 percent level.
**Significantly different at 5 percent level.
***Significantly different at 1 percent level.

TABLE 6

Probability of Voting "Yes" at a Price Offer of $5 Biweekly, by Selected Characteristics

	Action	Bell	Central
Full sample	50.53	58.01	50.94
Non-Hmong	52.18 ⎤***	NA	55.50 ⎤***
Hmong	35.99 ⎦	NA	34.41 ⎦
With young kids	50.13 ⎤	49.75 ⎤***	55.35 ⎤***
Without young kids	50.72 ⎦	60.63 ⎦	49.33 ⎦
With young kids			
On-site center user	49.40 ⎤***	50.19 ⎤	NA
Not on-site center user	44.62 ⎦	51.33 ⎦	NA
Relative available	44.37 ⎤**	42.80 ⎤***	58.42 ⎤
No relative available	53.73 ⎦	56.98 ⎦	51.36 ⎦
College graduate	81.53 ⎤***	74.35 ⎤***	71.63 ⎤***
Not college graduate	48.05 ⎦	57.43 ⎦	50.51 ⎦
New hire (employed 2 years or less)	53.90 ⎤**	62.82 ⎤***	55.89 ⎤***
Not new hire	48.89 ⎦	53.66 ⎦	46.06 ⎦
First shift	53.30 ⎤***	56.12 ⎤***	50.88 ⎤
Not first shift	44.66 ⎦	67.85 ⎦	51.02 ⎦
Hourly adm. or salaried	66.19 ⎤	62.28 ⎤	54.56 ⎤
Hourly production	44.02 ⎟***	51.51 ⎟***	56.56 ⎟***
Piece worker	44.90 ⎦	59.87 ⎦	45.09 ⎦

Note: Bracket indicates that a statistical test for difference was performed using pairwise *t*-test with unequal variance except of job type, which was tested using a one-way analysis-of-variance test.
* Indicates that significant differences were found at the levels denoted below.
*Significantly different at 10 percent level.
**Significantly different at 5 percent level.
***Significantly different at 1 percent level.

employees believe that the child care center increased their companies' abilities to compete in a highly competitive market. However, lest we attribute it all to good public relations on the part of the personnel office, we find that employees at Central Products are also willing to pay, on average, about $125 a year to fund an on-site center at their plant.

Treating the WTP values as sample observations, we can test for statistical differences across firms.[18] In terms of the full sample means, we find that Bell employees are willing to pay significantly more to maintain the child care center than either Action or Central employees, controlling for changes in the cost of living over time. The difference between Action and Central is not statistically significant. This pattern led us to question whether the result was the effect of the strong Hmong presence at Action and Central.

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[18] By treating the WTP as sample values, we are ignoring the fact that the WTP value was calculated from the estimated coefficients of the probit model. Given the complicated nonlinear calculation formula for WTP, it is not possible to solve for the standard error of each WTP estimate.

Rows 2 and 3 of Table 5 compare the WTP of the Hmong and non-Hmong employees at Action and Central.[19] Comparing the non-Hmong sample WTP across the three firms, we find remarkably similar WTP (no significant differences). Given that for employees at one of the firms an on-site center was pure fiction whereas at the other firms it was a reality, the similarity of results is encouraging in terms of the ability of CVM questions to elicit meaningful responses to hypothetical situations.

Table 6 shows that at least 50 percent of employees at each of the three firms can be expected to vote "Yes" at a price of $5 per pay period (which corresponds to $130 per year) to have an on-site child care center. Bell employees are the most likely to vote "Yes" at a price of $5, with Action and Central employees voting almost identically.[20] The probability of voting "Yes" follows similar patterns to the mean WTP. These results are in keeping with a 1996 Gallup Poll that asked workers how they would respond if their employer asked them to contribute a percentage of their income toward an on-site child care center. Almost 60 percent said they would contribute, with little difference between those with and without children. In fact, 54 percent of the childless employees in that poll said they would contribute something (McIntyre 2000).

It is also interesting to note in Table 5 that the mean WTP for those who voted "Yes" is substantially larger than for those who voted "No" for each of the three firms. This is consistent with expectations and increases our confidence that respondents' answers to the CVM questions are meaningful. The remainder of Tables 5 and 6 highlight differences across selected groups of employees in their WTP and in their probability of voting "Yes." Based on our theoretical discussion, one of the categories of greatest interest is newly hired employees. Table 5 shows that new hires have a substantially higher average WTP than longer-term workers. At Action Industries, newly hired workers are willing to pay an average of about $10 per pay period to maintain the child care center compared with only about $4 for employees who have been with the company for more than 2 years. Bell Manufacturing and Central Products also show large differentials across these employees. It is instructive to consider how this compares with the firm providing the equivalent value to new employees directly through higher wages. If a $15 wage increase per pay period would be needed to achieve a

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[19] Recall that Bell had no Hmong employees at the time.

[20] Again, the differential presence of Hmong workers has an effect on full-sample means. Looking at row 2, which compares the means of the non-Hmong sample, Bell still has a significantly higher percentage who would vote "Yes" at $5 a pay period, but Central's proportion is significantly higher than Action's.

$10 increase in after-tax takehome pay (value to the worker), and if the wage increase had to be made across the board, an estimate of annual Action savings from the wage bill portion of the total benefits of having an on-site center would be about $234,000.[21]

This estimate of wage savings may even be low because of the presence of a substantial number of Hmong workers at Action. The mean WTP of Hmong employees (not shown) is negative at both Action and Central. Because many of the new hires are Hmong, we recalculate the mean WTP of non-Hmong new hires at Action to be $14.87 per pay period. Using this number as the marginal WTP, we derive a wage bill savings of about $351,000. Of course, the firm might choose instead to actively recruit Hmong workers. This strategy also involves costs, including perhaps higher premiums for health insurance given that Hmong fertility is so high. At the time of our visit, Central Products did seem to be actively recruiting Hmong, which is in keeping with its stance against a child care center. If we look at the WTP at Central of non-Hmong new hires, we find that it is $14.22, as compared with $7.79 for all new hires. The mean WTP of new hires at Bell, where there are no Hmong workers, is $12.36. This corresponds to an estimated wage bill savings of about $145,000 per year.

We had expected that employees with young children would have a significantly higher WTP than those without young children, but this is not the case at Action or Bell. We think that there are two explanations for this finding. The first is that the category of employees with young children is made up of two very different groups—users of the center and nonusers. Nonusers may be nonusers because they do not like the center, either from experience or in principle, or because they have relatives who are willing to care for their children at less cost to the family, or because they are on the waiting list for child care center slots.[22] Any of these groups have reason not to ascribe much value to the center. For example, one 27-year-old male employee at Bell Manufacturing explained that he had voted "No" because, "I don't like how they do child care [at the on-site center]. It is low-quality care." His wife also had worked at Bell, and they had used the center for 8 months. His wife then quit work to stay home with their young child. Another Bell employee, a 19-year-old woman with a 3-year-old child voted "No" because she did not think everyone should have to pay for the benefit. She said, "Some people are on the waiting list, so what's the point of making

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[21] $15 per pay period × 600 employees × 26 pay periods = $234,000. This methodology provides an upper bound estimate of wage bill savings because it assumes that the wage increase must be provided to all employees, not just to new hires.

[22] Both Action and Bell had waiting lists at the time of our survey.

them pay when they can't even get their children into the center." She was on the waiting list herself.

Consistent with this view, employees with young children at Central Products, who have no experience with on-site child care and therefore include no employees who have chosen not to use it, have a significantly larger mean WTP to have an on-site center than do those without young children. On the other hand, center users at Action and Bell can be expected to be deriving substantial benefits from the center at least equal to their out-of-pocket costs of approximately $50 per week. Because the WTP in Table 5 represents the value beyond user fees, the total benefit of the center for users can be estimated as the user cost plus the WTP to have a center, as indicated by the referendum vote. At Action, the estimated mean total value for an employee with one child at the day-care center is $2808 a year; for an employee with two children at the center, it is $4828 a year. At Bell, the estimated mean total value for an employee with one child at the center is $2683 a year and with two children is $5104 a year.

Finally, employees with young children at Action and Bell who report having relatives available to care for their child also reveal a much lower WTP than those without relatives available. Thus part of the explanation of the comparison of employees with and without young children can be attributed to substantial heterogeneity in the population of employees with young children. In a tight labor market, a firm may need to reach the woman who does not have a relative willing to care for her child because the one who has such a relative is probably already in the labor market. As one 32-year-old woman employee of Action Industries who had two children enrolled at the on-site center said in explaining why she voted "Yes," "If I didn't have day care, I couldn't work."

The second potential explanation for the lack of a higher WTP among employees with young children derives from comments we heard repeatedly in conjunction with our questions. Employees without young children talked about their friends and coworkers whom they see struggling with child care. Because the location of decision making is the individual firm, the voting was much less abstract than it usually is in the case of CVM measures of environmental amenities. In economic terminology, we might say that because the employees are friends or long-time acquaintances, they internalize some of the benefit's externalities. Examples of this "caring" among employees are easy to find in employee explanations of why they voted "Yes." While many of them come from older women who remember their own struggle with child care, they were not confined to this group. For example, a 20-year-old male employee, never married and with no children, voted "Yes" because it is "good for children to have a place to stay." A 17-year-old male

employee with no children voted "Yes" because, "I don't want my coworkers to lose day care." A 47-year-old female employee said that child care is "one of the better benefits—it is an enormous benefit for those with kids." Similarly, a 35-year-old female with one teenage child voted "Yes" because, "I realize how hard it is to get a baby sitter."

The internalization of externalities operates in the other direction as well. Users of the on-site center often were reluctant to burden their coworkers with extra costs, even though they themselves received benefits from the on-site center greater than their user costs. They knew, for example, that Sheila who worked in their unit was barely making it as the single mother of two teenage boys, and they were reluctant to burden her with their needs. A 40-year-old male employee with two children aged 6 and 4 said that he was not sure how to vote because, "It would help me but would hurt others who did not have kids." Similarly, a 30-year-old female employee with a 4-year-old enrolled in the Action child care center voted "No" because, "I don't think everyone should have to pay for it." Further probing of respondents indicated that almost all employees supported the payroll deduction if it only applied to users of the center. Repeatedly workers indicated to the interviewer that they were willing to pay themselves (even among those without young children) but were not willing to tax others. This caring behavior on the part of the voters also may explain the lack of differentials between those with and without children and especially the differentials that seem to go in the "wrong" direction.

Of course, not all responses were altruistic in their motivation. For example, some center users talked about the importance of the child care to themselves. A 30-year-old woman with one young child voted "Yes" because, "It is hard to find good day care." One 21-year-old woman with no children, a nonuser, said, "You never know. I might have a baby someday." Other nonusers voted "No," saying, "We paid when we had children."

Some workers cited concern for the company's well-being as the reason why they voted "Yes" to having an on-site center. If less absenteeism and higher productivity are correlated with the provision of on-site day care, and if all employees' jobs depend on their firm's productivity in light of the extremely competitive market in which these firms operate, then even nonusers receive a "use value" from the child care benefit. While a number of managers at all three firms cited this type of reason for their vote, this reasoning was not confined to managers. A 26-year-old man employed in shipping at Central Products voted "Yes," saying, "A day-care center could save the company in the long run." A 46-year-old woman manager at Central voted "Yes," saying, "It was worth it to keep the work force." A 50-year-old woman piece worker at Action Industries voted "Yes," saying,

TABLE 7

PERCENT VOTING "YES" OR "NO" FOR SELECTED REASONS

	Action	Bell	Central
Percent of full sample who voted "No" because they believed that not all employees should have to pay for the child care center	41.1 *n* = 321	44.6 *n* = 213	44.9 *n* = 405
Percent of on-site center users who voted "No" because they believed that not all employees should have to pay for the child care center	40.4 *n* = 52	33.3 *n* = 24	NA
Percent of full sample who voted "Yes" because they believed that the child care center was a benefit to all employees	14.3 *n* = 321	27.2 *n* = 213	22.2 *n* = 405
Percent of on-site center users who voted "Yes" because they believed that the child care center was a benefit to all employees	9.6 *n* = 52	20.8 *n* = 24	NA
Percent of sample 35 years old or younger who voted "Yes" because they believed that the child care center was a benefit to all employees	13.6 *n* = 147	32.5 *n* = 114	26.2 *n* = 191
Percent of sample over age 35 who voted "Yes" because they believed that the child care center was a benefit to all employees	14.1 *n* = 185	21.6 *n* = 102	19.0 *n* = 216

"It stops absenteeism," and a 30-year-old woman manager with children enrolled in the center voted "Yes," saying, "It is important beyond the cost. The center reduces turnover and increases productivity."

These quotations provide a sampling of respondents' thinking about their votes. We asked all respondents specifically why they voted the way they did, and Table 7 shows some of the results for that question. For example, in row 1 we see that at each firm, about 40 percent of the respondents voted "No" to the employee-wide payroll deduction because they thought that not everyone should be forced to pay for the child care center. While this might be seen as a denial of an existence value on the part of nonusers, we are hard put to assign that meaning to the result because 40 percent of the users of the Action Industries center and 33 percent of the users of the Bell Manufacturing center also give this reason for voting "No." Instead, we would argue that this represents evidence of workers internalizing the externality. Similarly, row 3 shows the percent who claim that they voted "Yes" because they felt the benefit was important to all. Fewer of the on-site center users were willing to vote "Yes" for this reason, although the difference is not statistically significant given the small sample of on-site users. Still, the on-site users seem to be unwilling to foist the support of the child care center on their fellow employees. In contrast, older employees who are much less likely to be present or future child care center users often were

willing to vote "Yes" because they felt that the benefit was important to all employees. At Bell and Central, the differences between the age groups was statistically significant at the 10 percent level with a two-tailed test.

Does caring behavior on the part of employees for their coworkers mean that this methodology for valuing an ESCC program is flawed? We think not because firms and employees benefit from the ESCC program and also from the benefit the ESCC program brings to others. Indeed, the results demonstrate that the expectation of on-site centers generating substantial existence value is a reasonable one. At Action and Bell, we find no evidence of substantial employee resentment of the on-site center, a concern raised by a recent popular book by Burkett (2000). Instead, we find evidence that about 50 percent of employees without young children (60 percent at Bell) would vote "Yes" to taxing themselves $5 per pay period to support an on-site center. Caring behavior, however, may bring into question the referendum style of asking the question under which the majority vote applies to all. In a context where survey respondents know each other fairly well, the referendum-style CVM question may underestimate the value of the benefit.[23] Further analysis of this issue in future research would be useful to the broader application of the CVM methodology.

Tables 5 and 6 also include selected additional comparisons relating to issues that often arise in discussions of on-site child care centers. Some studies of on-site centers have noted that such centers are so expensive that support staff and production staff cannot afford to use them unless the firm uses a sliding fee scale. This is not the case at Action and Bell because the on-site centers could not survive with managers' children only; there are not enough managers in this production industry for that to be the case. However, hourly administrative staff and salaried staff at all three firms do value the on-site center highly, substantially more so in most cases than do hourly production workers and piece-rate workers. Consistent with this, we also see in both Tables 5 and 6 that college graduates value the on-site center much more highly than do those with less education. This suggests that in keeping with the owner of Action Industries goal to retain his human resources

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[23] This relates to the discussion of "protest Nos" in the CVM literature, where, it is argued, some "No" votes represent a reaction to taxation in general and have no relationship to the particular commodity being valued. In our case, as opposed to arising out of an objection to government taxation, many "No" responses arose out of concern for coworkers. When such "No" responses are removed from the statistical analysis, as recommended by some in the standard case, the probit results regarding the significance and magnitude of the price effect are essentially unchanged. However, as expected, estimates of the mean WTP are larger with this sample exclusion. We present the results of the full sample both because of concern about the robustness of results when sample size is reduced and because of the conceptual difference between the scenario encountered here and that discussed in the literature.

office, on-site child care may be an attractive way to recruit and retain managers and other more highly educated workers.

Another concern in the literature on child care centers is the correspondence between the time of day of care and the time of day of employment. All three firms were running three shifts at the time of our interviews. Second- and third-shift workers are less likely to be able to use the on-site center and thus might be expected to value it less. This does seem to be the case at Action Industries and to a lesser extent at Central Products, but it is not the case at Bell Manufacturing. Our previous research (Connelly, DeGraff, and Willis 2004a) shows that users of the on-site centers at Action and Bell are predominantly, though not exclusively, first-shift workers. Thus the sizable valuation of the center by non-first-shift workers at Bell and the moderate valuation of a hypothetical center by such workers at Central provide further evidence of existence value.

Summary and Conclusions

We began this research because ESCC is an emerging choice available to parents of young children striving to reduce work-family conflict and for employers facing tight labor markets at the same time that they face increased price competition in the goods market. Despite its growing importance, very few researchers have studied ESCC, in part, because of its low incidence in the general population. There has been little systematic empirical analysis of the value of ESCC to firms or their employees. To fill this gap, we proposed a firm-based method of analysis that experimented with assessing the value of the ESCC benefit using the contingent-valuation technique.

To test this strategy, we use data collected from 925 employees at three firms in the same industry, 57 percent of whom work for a firm with an on-site child care center. The results strongly support the use of CVM models to estimate the value of the ESCC benefit to employees. For each firm, the price variable is significantly negative, indicating that employees could answer CVM questions consistently and rationally. The results also support our hypothesis, based on a framework for understanding the value of employee benefits to the firm, that newly hired workers would value the ESCC more highly than longer-term workers. In fact, non-Hmong new hires valued the ESCC at more than $14 per 2-week pay period at Action Industries and Central Products and at more than $12 at Bell Manufacturing compared with values of $5 or less for longer-term workers. If one takes the value to new hires as an estimate of cost saving to the firm in terms of wage increases avoided, the firms are saving between about one-half and

twice the cost of their reported subsidy to the on-site center. While this is an upper-bound estimate of the wage bill savings, it does not include the other expected cost savings to the firm of on-site child care arising from reduced turnover and absenteeism and increased worker productivity.

It was beyond the scope of this study to collect data to systematically study these additional components of the value of on-site child care; however, some of the qualitative evidence is relevant. In terms of productivity gains, many Action Industries and Bell Manufacturing workers, including nonusers, indicated that they felt that the on-site center helped the firm to maintain a competitive position in the industry. In addition, anecdotal evidence from interviews with workers and supervisors ascribes some reduction in absenteeism and tardiness to the regularity of center care. We also know from other studies that the breakdown of child care arrangements is a source of stress for many parents and leads to a number of lost work days per year (Floge 1985; Maume 1991; Meyers 1997). Whether overall turnover is reduced by the presence of an on-site center remains an important research question. Qualitative evidence from managers at Action and Bell suggests that the availability of ESCC was important to their own tenure at those firms and the tenure of some of their employees. Overall, our qualitative evidence suggests that both employees and firms also benefit from improved worker performance through a variety of mechanisms as a result of the provision of on-site child care.

In addition to the value new hires place on the benefit as indicated by the CVM estimates, we find a substantial existence value of ESCC, with little evidence of resentment from workers without young children. Finally, the estimates of existence value derived here are less likely to be subject to a variety of biasing effects that may arise in the estimation of the nonuse or existence value of environmental amenities (Connelly, DeGraff, and Willis 2004b). Overall, the results suggest that the CVM may provide a useful tool for the analysis of employer-provided benefits more generally.

Turning briefly to policy implications, given the substantial values of employer-sponsored on-site child care we find both for parents and all employees based on the contingent valuation estimates, combined with the qualitative evidence of enhanced worker performance, that the current level of ESCC may be suboptimal. Managers and human resources officers in the industry with whom we spoke talked about the difficulty they have in measuring the value of their own benefits packages. This difficulty, coupled with the asymmetry of costs in terms of employee reaction to taking away a benefit if cost reductions are needed in the future versus the cost of adding a benefit, leads most managers to shy away from experimentation with unconventional benefits. Thus it seems reasonable to believe that the

current level of ESCC provision in the United States is less than optimal for employers and even further removed from what would be optimal for society as a whole. Increasing government spending in this area would have substantial benefits given that only a marginal push is needed. Recall that the on-site child care at these firms was not provided to users for free. In fact, weekly costs were equal to the average cost of all paid care used by employees in the three firms, although it was somewhat less than center care from alternative providers. Thus we conclude that it is not necessary for the government to provide highly subsidized care but that attributes of availability, reliability, and convenience must be linked with high-quality care and moderate prices. Promoting on-site child care through providing strong tax incentives to firms should be one of a menu of ways to accomplish this goal.

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Appendix A

6.10C DO YOU UNDERSTAND WHAT I MEAN WHEN I SAY THAT THE NEXT FEW QUESTIONS ARE HYPOTHETICAL QUESTIONS?	__Yes __No
	REPEAT THE
INSTRUCTIONS *INTERVIEWER NOTES:* *USE THE WORD "PRETEND" OR "MAKE BELIEVE"* *IF NECESSARY.* *BE SURE THAT THE EMPLOYEE UNDERSTANDS THE* *HYPOTHETICAL NATURE OF THE QUESTION.*	*until they understand* *or indicate here_____* *that you have doubts.* *then continue.*

6.11C Do you know that normally, the <u>costs</u> of employee benefits are partly paid for by the company and partly paid for by the worker. When the costs of benefits go up, sometimes benefits change, and sometimes the cost to the workers goes up, sometimes a little bit of both happens.	
	__Yes, I knew __No, I didn't know
Did you know this?	__Knew somewhat

6.12C Okay, now we are going to ask you about some possible
imaginary changes in your benefits.
We will describe a possible change in your benefits and then we
will ask you to VOTE on whether or not you want it.
The way the voting works is like this:
THE MAJORITY RULES —
whatever the majority of workers vote for is what happens
for EVERYONE!

IF YOU VOTE "YES" —
this means everyone has to pay the NEW cost to keep a
benefit like it is.

IF YOU VOTE "NO"
that means the benefit will change in the way that I am going
to describe.

DO YOU UNDERSTAND HOW THE VOTING WORKS?

Imagine the company needs to cut costs.
One way to cut cost is to keep the benefits the same and have ALL employees pay some of the costs
that Action Industries currently pays.

This would be done through a payroll deduction, with ALL employees paying part of the costs.

So if the majority of employees **vote YES** to accept the new payroll deductions, **ALL employees will pay—
whether or not they use the benefits.**

Another way to cut costs would be to eliminate the benefits.

So, if the majority vote NO, there would be no new payroll deductions and the benefits will be
eliminated or changed as described in a few minutes.

6.13C
Now, here is the first hypothetical or imaginary situation, that
I want you to vote on.

One way to cut costs would be to eliminate the child care center.

OR to keep the center open ALL employees would pay some of   __Yes
the new costs that Action currently pays.   __No
This would be done through a payroll deduction, with ALL
employees paying part of the new cost.

Remember, if the majority of employees **vote YES** to accept the
new cost as a payroll deduction, ALL employees will pay—
whether or not they use the center.

In addition, users of the child care center would continue to
pay their current tuition per child per week and the child
care center would remain open.

If the majority vote NO, there would be no new payroll deduction
and the child care center **would shut down.** Now here's the vote:

**Would you VOTE YES to a payroll deduction of $_____
per two-week pay period in order to keep the child care center open?**

6.14C Can you tell me briefly why you answered Yes or No?	__Yes, benefit important to all __Yes, worth it __Yes, other Specify: _____ __No, too expensive __No, don't think everyone should pay __No, rather change some other aspect __No, other Specify: _____