The Effects of Offering Health Plan Choice within Employment-Based Purchasing Groups

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Preliminary Draft

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October 2002

Abstract: Over the last two decades, employers have increasingly offered workers a choice of health plans. Yet, relatively little is known about the effects of this trend on consumers. The availability of choice has the potentially beneficial effects of lowering the cost and increasing the quality of health care through greater competition among health plans as well as allowing consumers to enroll in the type of coverage that most closely matches their preferences. On the other hand, concerns about the potential for adverse selection within employment-based purchasing in response to the availability of choice exist. In this paper, I examine the effects of offering choice in employment-based purchasing groups on access to and the cost of employer-sponsored coverage. I hypothesize that the introduction of managed care, HMOs specifically, facilitated the offering of choice within employment-based purchasing groups. I then use geographic variation in the availability of HMOs in the 1990s as an instrument for offering health plan choice. I find that greater availability of choice was associated with sizable reductions in the premiums of employer-sponsored coverage and modest increases in the proportion of workers covered by the plans offered by employers. However, most of the premium reductions were due to a major shift from family to single coverage within employment-based purchasing groups.

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Over the last two decades, employers have increasingly offered workers a choice of health plans. From 1977 and 1998, the percent of employees offered more than one plan by their employer grew from 18% to 66% (Gabel 1999). Two explanations for the decision of employers to offer a choice among plans have been advanced in the literature. Employers offering a choice of plans may be implementing a managed competition approach to benefit design. Under managed competition, employers offer multiple plans with standardized benefits and require workers to pay the incremental premium for more expensive plans out-of-pocket. The objective is to create incentives for workers to make cost-effective enrollment decisions, which, in turn, encourages plans to increase the quality and lower the cost of the health care they provide (Enthoven and Kronick 1989).

The prevalence of health plan choice within employment-based purchasing groups, however, is not consistent with the widespread adoption of a managed competition approach to benefit design by employers. By examining the extent to which employers offer a choice of plans, require employees to pay the incremental premium associated with more expensive coverage, and provide quality information to employees, Long and Marquis (1998) found that in 1997 relatively few employers had adopted the managed competition model of benefit design. Approximately 28% of employees offered a choice among plans faced an equal dollar employer contribution and only one-quarter of the largest employers offering a choice of plans provided employees with quality information (Long and Marquis 1998). Levy (1997) finds that only one-sixth of employee contributions to health plan premiums can be explained by a managed competition approach to setting employee premium contributions using establishment level data from 1993.

An alternative explanation for the decision of employers to offer a choice among plans is that they are responding to heterogeneity among individuals within the firm in their preferences for health insurance (Goldstein and Pauly 1976). The hypothesis underlying this work is that employers minimize compensation costs by offering workers their optimal combination of cash wages and fringe benefits (Summers 1989). For employers hiring workers with varying preferences for health insurance, this implies that optimal compensation for the workforce requires offering multiple health plans, with each being the preferred choice of a subgroup of employees. Theoretical studies examining employer health benefit choices when employees vary in their preferences for coverage have demonstrated the tradeoffs employers may make between the costs of greater customization and their incentives to offer employees plans that more closely match individual preferences (Goldstein and Pauly 1976; Danzon 1989; Bundorf 2000). In this model, the existence of plan choice in employment-based purchasing groups is driven by heterogeneity in employee preferences for health insurance rather than a strategy to foster competition among plans.

Recent studies have provided some empirical evidence supporting the role of employee preferences in influencing employer health benefit choices. Variation in worker demographic characteristics is positively associated with whether employers offer a choice of plans to workers and the extent of variation in the plans offered (Moran, Chernew et al. 2001; Bundorf 2002). Using tax prices as a measure of worker preferences, Gruber and Lettau (2000) find that both the median and the dispersion of tax prices within the firm explain the decision to offer coverage and the dollar value of coverage offered, although high income workers appear to have a disproportionate influence on the employer's choice. Levy (1997) and Dranove, Spier et al. (2000) find evidence suggesting the use of employee premium contributions is driven by within-

firm variation in health insurance preferences. While these studies suggest that workforce composition is a determinant of employer choices, none provide strong evidence of a particular model of aggregation of employee preferences or explain a large proportion of employer purchasing behavior.

Relatively few studies have examined the implications of offering a choice of plans within employment-based purchasing groups. Those that do have tended to examine the managed competition approach to benefit design. In particular, Vistnes, Cooper et al. (2000) examine the assumption that competition among plans for enrollees within an employment-based purchasing group is necessary to generate gains from competition. In their theoretical work, they propose that competition among plans to be offered by an employer is equally or may be even more effective in lowering premiums. In their empirical work, they find that premiums decline when employers offer additional plans and make a fixed dollar contribution to the plan premium. However, premiums rise when employers offer additional plans and pay the entire premium contribution.

Cutler and Reber (1998), however, provide evidence that requiring workers within a group to pay the full marginal cost of more expensive plans may lead to adverse selection within employment-based groups. They examine the effects of the switch to a managed competition style fixed premium contribution within a single employment-based purchasing group and find that gains from competition in the form of reduced premiums were offset by losses due to adverse selection. In fact, the more generous PPO plan experienced an adverse selection "death spiral" which resulted in its elimination within 3 years of the introduction of the policy. The results suggest that offering plans that are differentially attractive to different risk types, in

combination with a fixed employer premium contribution, will likely trigger significant adverse selection in insurance coverage [1].

Taken together, these studies suggest that while employers may benefit from the competitive effects of health plan choice by shifting the cost of more expensive plans to employees in the form of higher employer premium contributions, moving too aggressively in that direction may induce significant adverse selection within a group. Partial subsidization may be necessary to maintain the stability of a multiple-choice arrangement. Perhaps due at least in part to these difficulties, relatively few employers have adopted the managed competition approach to benefit design.

Although they do not explicitly examine the effects of offering a choice of plans, Feldman, Dowd et al. (1993) question even the competitive benefits of offering health plan choice. Their results suggest that offering an HMO raises the average premium per covered worker for both single and family coverage relative to offering only a fee-for-service plan. They find that, not only were HMOs more costly than FFS plans, offering an HMO with a FFS plan increased the premium of the FFS plan, resulting in overall increases in the cost of employer-sponsored coverage. The study, however, was based on data from 239 Minnesota firms in 1986, suggesting that results are unlikely to be generalizable either to the nation as a whole or the current managed care environment. In addition, it is unlikely that the authors were able to adequately control for endogeneity in the decision to offer an HMO, potentially biasing the results.

While these studies provide important insight into the potential challenges facing employers in offering choice among plans, their results are somewhat at odds with overall trends

[1] A "pure" managed competition approach would require standardized benefits to reduce incentives for selection based on risk type.

in the market. While traditional FFS plans have been nearly eliminated from the market, PPOs, another less restrictive type of coverage, have co-existed and even thrived along with HMOs. Chernew and Frick (1999) demonstrate that the potential effects on equilibria of introducing a managed care type of product in the market are ambiguous by modeling managed care as adding a third dimension, "managedness" to the premium and cost sharing product space. They find that in cases where an equilibrium existed in the two-dimension product space, the introduction of managed care may result in no equilibrium. On the other hand, managed care may generate an equilibrium in cases in which one did not exist in the two-dimensional analysis by allowing low-risk consumers an additional mechanism to distinguish themselves from high-risk consumers.

In addition, while significant evidence of biased selection based on health risk by plans exists, with HMOs generally experiencing favorable selection, it is important to note that risk segmentation across health plans does not necessarily signal the existence of adverse selection (Pauly 1984). Preferences for health plans may be correlated with health risk, resulting in risk segmentation even in the absence of imperfect information. Based on this observation, Feldman and Dowd (2000) propose that managed care may be an efficient mechanism to segment risks, allowing low risk consumers to purchase full coverage at a price closer to the actuarially fair premium, although others have argued that the actions taken by plans to attract low risk consumers are inefficient (Newhouse 1996).

Arguably, enrollment in HMOs in a firm offering a choice of plans may signal the existence of adverse selection if the workers enrolled in these types of plans would have preferred a more generous plans. However, studies examining enrollee satisfaction have found higher satisfaction among HMO enrollees with a choice among plans than those without a choice

at the time of enrollment (Ullman, Hill et al. 1997; Gawande, Blendon et al. 1998). This provides evidence more consistent with the hypothesis of employers offering choice in response to employee preferences than to generate competitive effects.

In summary, relatively little is known about the effects on consumers of the trend toward greater prevalence of choice among health plans. The availability of choice has the potentially beneficial effects of lowering the cost and increasing the quality of health care through greater competition as well as allowing consumers to enroll in the type of coverage that most closely matches their preferences. On the other hand, concerns about the potential for adverse selection within employment-based purchasing in response to the availability of choice exist. In this paper, I examine the effects of offering choice in employment-based purchasing groups on access to and the cost of employer-sponsored coverage. I hypothesize that the introduction of managed care, HMOs specifically, facilitated the offering of choice within employment-based purchasing groups. I then use geographic variation in the availability of HMOs in the 1990s as an instrument for offering health plan choice. I find that greater availability of choice was associated with sizable reductions in the premiums of employer-sponsored coverage and modest increases in the proportion of workers covered by the plans offered by employers. However, most of the premium reductions were due to a major shift from family to single coverage within employment-based purchasing groups.

II. Theoretical Framework

A. Simple Model of Employer's Decision to Offer a Choice of Plans

The analysis is based on a model of an employer choosing a set of health benefits with the objective of minimizing total compensation costs when workers in a firm have heterogeneous

preferences for health insurance. The model is based on two important assumptions. First, employees bear the full incidence of health insurance premiums in the form of lower cash wages. This is supported by empirical evidence of wage offsets based on average, but not individual, characteristics (Gruber 1994; Pauly and Herring 1999; Sheiner 1999). Second, variation exists among workers in their preferences for health insurance and imperfect sorting of workers among firms based on these preferences exist. This is also likely to be true. Individuals vary in income, risk aversion, and preferences for a style of care, all of which may affect their preferences for health insurance coverage. In addition, the matching of workers to jobs is likely to be influenced by factors other than health insurance preferences.

In order to motivate the analysis of the effects of health plan choice, I present a simple theoretical model of the decision of an employer to offer a choice of plans. I first define the benchmark quantity of health insurance for a worker in order to compare the effects of the role of the employer on health insurance quantities. Assume a worker of type i maximizes utility, which is function of money (m) and health insurance (k), by allocating his or her total compensation between taxable cash wages (w) and health insurance. Let $\left(\overset{*}{w}^{i}, \overset{*}{k}^{i} \right)$ be the allocation between cash wages and health insurance that satisfies this condition for a worker of type i. In this analysis, this quantity is defined as the employee's benchmark quantity – the quantity the employee would have chosen in the absence of the employer as the purchaser.[2]

For an individual employee, the employer's cost minimizing allocation of compensation between cash wages and health insurance is the employees' optimal allocation (Summers 1989).

[2] It is worthwhile to note that the employee's benchmark quantity is not the optimal quantity. By reducing the price of health insurance relative to cash wages, the tax treatment of health benefits creates incentives for workers to purchase greater amounts of health insurance than they would have otherwise. Thus, the tax treatment of employer-sponsored coverage creates welfare loss through the distortion of the quantity of coverage purchased by the employee. In addition, this excessive amount of coverage has second order effects on the quantity of health services consumed by employees due to the existence of moral hazard in health insurance (Pauly 1986).

Thus, in a firm comprised of workers with homogeneous preferences for health insurance, an employer minimizing total compensation costs will offer a single plan, the most preferred plan of workers in the firm. More likely than the case of perfect sorting, however, is within firm heterogeneity in preferences for coverage. Goldstein and Pauly (1976) consider the case of a cost-minimizing firm choosing a single level of coverage to offer two types of workers. They assume the firm must hire a fixed quantity of workers of two different skill types due to production requirements and that preferences for health insurance are perfectly correlated within, but differ between, worker skill types.

The employer's problem is as follows:

$$\underset{w^A, w^B, k}{Min}\ C = L^A(w^A + pk) + L^B(w^B + pk)$$

such that

$$U^A[w^A(1-t^A), k] \geq \overline{U}^A \text{ and}$$

$$U^B[w^B(1-t^B), k] \geq \overline{U}^B$$

where L^i is the number of workers of type i and $\overline{U^i} = U^i\left(w^{i*}, k^{i*}\right)$. The reservation utility of a worker of type i is based on the assumption that the worker is able to obtain his or her benchmark wage and health insurance compensation package from an alternative employer. Solving the employer's problem produces the following condition defining the single level of coverage chosen by the firm.

$$L^A\left(p - \frac{U_k^A}{U_m^A(1-t^A)}\right) = -L^B\left(p - \frac{U_k^B}{U_m^B(1-t^B)}\right) \qquad (2)$$

In equation (2), the firm equates the cost of deviations from the optimal level of health insurance for each type of worker. The cost to the firm of increasing a unit of coverage is the per unit

premium less the corresponding wage differential for each type of worker which is necessary to maintain the worker's reservation utility level. Assuming type A workers have stronger preferences for health insurance than type B workers, the single level of coverage chosen by the firm will be less than the benchmark level for these workers. Because the marginal utility of health insurance relative to wages for type A workers is greater than the marginal cost of health insurance, an increase in the level of coverage would result in a decrease in cash wages necessary to retain workers of type A that is greater than the price of the incremental unit of health insurance. For the type B workers, the firm offers a quantity of health insurance that is greater than the worker's benchmark quantity, and the value workers place on the incremental units is less than their marginal cost. Thus, increasing the amount of health insurance provided is costly to the firm in the sense that it would be less costly to compensate these workers in the form of additional cash wages.

Danzon (1989) quantifies the cost to the employer of heterogeneity in worker preferences when the firm offers only one plan:

$$L^B \int_{k}^{\hat{k}} \left[pk - \frac{U_k^B}{(1-t^B)U_m^B} \right] dk + L^A \int_{\hat{k}}^{k^{*A}} \left[\frac{U_k^A}{(1-t^A)U_m^A} - pk \right] dk + F_1 \qquad (4)$$

where $\hat{k}$ is the solution to the firm's one plan cost minimization problem and F_1 is the fixed cost of offering a single plan. The employer could reduce heterogeneity costs by offering workers of each type their benchmark wage and health insurance compensation package. However, offering multiple plans is also costly for the firm. These costs are in the form of increased loading resulting from fewer workers enrolled in each plan and the fixed costs of administering multiple plans. In deciding between offering one or two plans to a workforce made up of two types of workers, the firm's decision rule can be expressed as follows:

The firm offers two plans if:

$$\frac{L^B}{L^A+L^B}\int_{k^{*B}}^{\hat{k}}\left[pk(1-t)-\frac{U_k^B}{U_{w^B}^B}\right]dk+\frac{L^A}{L^A+L^B}\int_{\hat{k}}^{k^{*A}}\left[\frac{U_k^A}{U_{w^B}^A}-pk(1-t)\right]dk>\frac{F_2-F_1}{L^A+L^B} \qquad (5)$$

where F_2 is the fixed cost of offering multiple plans.

Thus, the firm compares the cost, in the form of incremental wages, of not providing each type of worker with his or her benchmark level of coverage to the incremental cost of offering two plans. The decision to offer a choice of plans is a function of worker preferences for coverage, the number of workers overall and the number of workers of each type, the per unit price of health insurance.

In this model of employer behavior, employee premium contributions are necessary to induce workers to self-select into particular types of plans. The favorable tax treatment of employer-sponsored coverage is contingent upon satisfying certain non-discrimination requirements which are intended to prevent discrimination in the provision of fringe benefits in favor of highly compensated employees. While the specifics of the non-discrimination requirements vary by the funding and structure of the employer's health benefit plan, in general, they require that all plans offered by an employer are offered to all workers in the firm with the exceptions of employees under the age of 25, part-time and seasonal workers, workers with less than 3 years of service, workers covered by a collective bargaining plan, and non-resident aliens. Thus, in a multiple-choice setting, employers may adopt employee contributions to create incentives for workers to enroll in less expensive plans. However, in many cases, employee premium contributions are not considered tax-exempt compensation. As a result, employers have incentives to minimize the size of these contributions. Bundorf (2000) finds that the differential tax treatment of employee and employer premium contributions, combined with the

non-discrimination rule, creates incentives for employers to reduce the extent of differentiation between plans offered and reduces the extent to which offering multiple plans reduces total compensation costs when workers have heterogeneous preferences for coverage.

Employers may also use employee contributions to create incentives for workers to opt-out of the coverage offered by the employer (Dranove, Spier et al. 2000). In the model of the employer minimizing total compensation costs, this would be the case when a subset of workers in the firm has particularly weak preferences for coverage. For example, employees with access to coverage through a working spouse or public programs may have particularly weak preferences for coverage. In addition, workers who are part of low-income families may have weaker preferences for coverage than other workers in the firm.

B. The Effects of Offering a Choice of Plans

In this model, employers make health benefit choices with the objective of minimizing total compensation costs for a given set of workers where total compensation costs are the sum of cash wages and health insurance premiums:

$$T_i = \sum_L w_l + L^c * \overline{K} \qquad (6)$$

where L represents the number of employees in the firm, L^c is the number of workers covered by health insurance, w_l is the cash wage received by employee l when the employer offers health insurance, and $\overline{K}$ is the average premium paid by the employer for health insurance. The employer offers a choice of plans if $T^{n>1} < T^{n=1}$ where n is the number of plans offered, and the primary empirical prediction of the effects of offering a choice of plans is that it will reduce total compensation costs.

The effects on the components of total compensation, however, may vary. On net, the reduction in total compensation could be due to either a reduction in total cash wages or a

reduction in total health insurance premiums or both. However, either component of total compensation could increase if the corresponding reductions in the other component were larger. For example, the average premium may increase for an employer offering a choice of plans rather than a single plan due to an increase in the generosity of coverage on average, if a more and less generous plan are offered, but a greater proportion of employees enroll in the more generous coverage. In addition, increases in the loading resulting from smaller numbers of workers enrolled in each plans could drive increases in average premiums. After controlling for loading and effects on utilization, however, differential selection should have no effect on average premiums. In the case that average premiums rise, however, the value that employees place on the new coverage must exceed the cost of providing it and the corresponding wage adjustment could be made. If premiums decrease on average, through a shift in enrollment to a lower cost plan, for example, in equilibrium, cash wages are likely to increase. However, the increase in cash wages would have to be less than the decrease in premiums to create incentives for employers to offer the new benefit. In either situation, the proportion of workers covered by the employer should be non-decreasing.

C. The Effects of the Availability of HMOs on the decision to offer a choice among plans

In the model of employer behavior, the introduction and growth of managed care, and HMOs specifically, can be considered as an increase in the extent of plan differentiation in the market. Managed care may increase the likelihood that employers offer a choice among plans by creating a better product for a subset of consumers within a firms or reducing the cost of inducing workers to self-select into differing levels of coverage. Consumers are likely to have differing preferences on the extent to which they value health insurance benefits in this managed form. Whether the availability of a new product increases the likelihood of an employer offering

a choice of plans, however, depends on the extent to which consumers vary in the value they place on HMOs or managed care. If workers within a firm similarly place high value on the managed care plans, employers are likely to replace their existing coverage with the new produce, rather than offering a choice of plans. If workers similarly like dislike the managed care plan, the employer is unlikely to switch. If variation exists among workers within the firm in the value they place on this coverage, the employer is likely to offer a choice of plans.

III. Empirical Methods

A. Empirical Model

Estimation is based on the following empirical model:

$$T_i = a + b_1 C_i + b_2 X_i + e_i \qquad (7)$$

where C_i is an indicator of whether the employer offers workers a choice of plans (n>1) and X_i is a vector of variables which are controls for other exogenous determinants of firm level compensation. This empirical framework can also be used to examine the individual components of total compensation:

$$\overline{W}_i = a + b_1 C_i + b_2 X_i + e_i$$

$$\overline{K}_i = a + b_1 C_i + b_2 X_i + e_i$$

$$P_i = a + b_1 C_i + b_2 X_i + e_i$$

where $\overline{W}_i$ is average cash wage, $\overline{K}_i$ is the average premium, and $P_i = L^c / L$ is the proportion of workers covered by the employer . The effects of choice on cash wages and average premiums cannot be signed a priori based on the theoretical model so the average effect of choice on these variables is an empirical question. However, firms offering a choice of plans should cover a greater or equal proportion of workers than if they offered a single plan. Thus, the sign of the

coefficient on the choice indicator in the model of the proportion of employees covered is hypothesized to be positive.

A concern in estimating this model is that employers offering a choice of plans may vary systematically from those not offering choice based on unobservable characteristics. For example, employers offering a choice of plans may be "good" employers who offer more generous benefits along many dimensions. In addition, the decision to offer a choice of plans may be endogenous with respect to the dependent variables measuring total compensation. For example, firms with high average premiums under a traditional plan may be more likely to adopt a choice of plans than those with low average premiums. For these reasons, I use instrumental variables to generate exogenous variation in the propensity of employers to offer a choice of plans to workers. The instrument used in this analysis is an indicator of the availability of an HMO in the employer's country. The identifying assumption is that the availability of managed care lowers the cost to the employer of offering a choice among plans. The instrument is discussed in greater detail in section B.

B. Data

The primary data source for this analysis is the 1993 Robert Wood Johnson Foundation (RWJF) Employer Health Insurance Survey (Long and Marquis 1997). The survey includes establishment level data for 22,890 public and private employers in ten states in 1993. The primary advantages of the survey are that it was conducted at the establishment rather than the firm level, reducing the measurement error associated with a geographically based instrument, and during a time of rapid managed care penetration. Survey respondents provided information about the establishment and its workers and relatively detailed information about the health insurance plans offered Descriptive statistics and more information on sampling methods and

survey design can be found in Cantor, Long et al. (1995). I exclude 1,101 public establishments and those reporting health insurance is negotiated by union contract because these types of establishments may follow an alternative model of decision-making. I also exclude 57 observations due to inconsistencies between the plan and establishment level file regarding the number of workers covered by the employers health plans.

The study sample is restricted establishments with greater than 25 employees and those that offer health insurance to workers. Establishment size is strongly correlated with both the probability of offering health insurance and the probability of offering a choice among plans (Figure 1). These differences suggest that the effect of the availability of HMOs on the decision to offer a choice of plans may differ based on establishment size. Preliminary testing using multivariate linear probability models revealed that the availability of an HMO in the county of the employer did not have a statistically significant effect on the probability of offering a choice of plans, conditional on offering health insurance, for establishments with 25 or fewer workers. However, the availability of HMOs did have a positive effect on the probability of offering health insurance for these smaller employers, particularly for those with 10 or less employees. These results suggest that the decision to offer a choice of plans, and particularly the role of HMO availability in facilitating choice, is most relevant for employers with greater than 25 workers. In addition, including the smallest firms results in changes in the underlying set of firms offering health insurance. I eliminate 7,299 establishments not offering health insurance and 9,669 establishments with 25 or less employees. Of the remaining 4,764 establishments I exclude 238 for missing or invalid data for key study variables, primarily industry and state identifiers. 4,526 observations remained in the study sample.

Dependent Variables

The focus of the empirical work in this analysis is variables describing the health benefits offered by employers, including health insurance premiums and coverage rates.

Average premium: the average of the premium for plans provided by the employer, weighted by the proportion of workers enrolled in each plan and the proportions enrolled in single and family coverage.

Average employer contribution: the average of the employer contribution to the premium for plans provided by the employer, weighted by the proportion of workers enrolled in each plan and the proportions enrolled in single and family coverage.

Average employee contribution: the average of the employer contribution to the premium for plans provided by the employer, weighted by the proportion of workers enrolled in each plan and the proportions enrolled in single and family coverage.

Average single premium: the average of the premium for plans provided by the employer, weighted by the proportion of workers enrolled in each plan and the proportions enrolled in single and family coverage.

Proportion covered: the proportion of employees covered by the plans offered by the employer.

Proportion family coverage: the proportion of employees covered enrolled in family coverage.

Full contribution –single coverage: Indicator of whether the employer fully contributes for single coverage for at least one plan.

Full contribution-family coverage: Indicator of whether the employer fully contributes for family coverage for at least one plan.

Summary statistics for dependent variables are presented in table 1.

Although cash wage compensation is an important component of the theoretical analysis, the establishment level survey does provide adequate data to test hypothesis regarding cash wage

compensation. The survey does provide information on the distribution of worker wages based on four broad categories. However, in establishments offering health insurance, over 40% of workers fall into the highest wage category, making it unlikely that this variable will allow me to capture small effects on the wage distribution. Another candidate variable is total annual payroll combined with total annual labor hours. However, the median value of payroll per hour for establishments in the sample is over $200, suggesting major issues with the reported values. In addition, it is difficult to control for individual characteristics that are likely to be important in determining compensation using a firm level survey. As a result, measures of total and cash wage compensation are not analyzed in this paper.

Independent Variables

The study variable of primary interest is the indicator of whether the establishment offers a choice among health plans. The models also include a set of exogenous firm and market characteristics to control for other factors that contribute to differences across establishments in employee compensation. Establishment controls include establishment size (categorical indicators 1-10, 11-25, 26-50, 51-100, 101-250, and >250 employees), whether the establishment is part of a larger nationwide organization (to control for economies of scale in the purchase of health insurance and employee compensation), for-profit status, and the distribution of the workforce by age and sex. The survey collects information on the proportion of workers falling into three age categories: <25 years, 25-54 years, and 55 and older by sex. The omitted category is male aged 25-54. Using these variables, I also construct a measure of heterogeneity in preferences for coverage among workers in the firm based on their predicted health expenditures. The heterogeneity measure is an estimate of the coefficient of variation of predicted health

expenditures (Bundorf 2000). In some models, I include the wage distribution of workers in the firm to control for differences in demand for coverage across establishments. However, these variables are likely to be endogenous so I exclude them from most specifications. Market controls include the county population, the county per capita income, the HCFA wage index and characteristics of the medical market including percent of county discharges that were financed by Medicaid and the number of inpatient-hospitals in the county offering residency programs. All models also include state (10) and industry (9) fixed effects. Descriptive Statistics are presented in Table 2.

Instrumental Variables

As discussed earlier, the effect of choice in the empirical model is likely to be biased by differences in unobserved characteristics between establishments offering and those not offering a choice of plans as well as the endogeneity of choice in the empirical model. I address this issue by instrumenting for the propensity of employers to offer a choice of plans with an indicator of whether an HMO is available in the county of the establishment. I hypothesize that the availability of an HMO creates an alternative coverage choice, which allows employers to more effectively segment workers based on preferences for health care and health insurance than variations in cost sharing in a traditional indemnity plan. One potential weakness of this strategy is that demand for HMOs differs across counties and the availability of managed care plans represents differences in the average demand across firms in the county rather than random variation in HMO location choices. The year of the data used in the analysis addresses this issue somewhat. Managed care penetration was increasingly rapidly during this period. In 1991, 69% of countries had at least one HMO serving the country (Table 3). By 1996, this had grown to 93%. I hypothesize that the rapid entry during these years was conducted with a certain degree

of randomness with respect to employee demand for health insurance. Managed care organizations were not able to accurately assess systematic differences across markets in employee preferences for coverage and instead made decisions based on factors such as market size and per capita income. In line with this hypothesis, I estimate an additional set of models restricting my analysis to markets in which an HMO had entered by 1996, suggesting that the market was ultimately attractive to HMOs.

C. Model estimation

All models are estimated using either ordinary least squares or two stage least squares. The first stage models are linear probability models, which will produce consistent estimates using two stage least squares (Heckman 1978). All models were tested for the presence of heteroskedasticity related to firm size. In most models, the test rejected the hypothesis of homoskedasticity. As a result, robust standard errors are calculated for all models presented.

IV. Results

Thirty-seven percent of establishments in the study sample offered a choice of plans (Table 1). Average health insurance premiums were higher in firms offering a choice of plans ($257) than those offering a single plan ($245). Employers offering a choice of plans, however, also made larger contributions to the plan premium ($177) than those offering a single plan ($164), with the result that average employee contributions were similar between the two types of firms. The average premium assuming all employees were enrolled in single coverage was also similar between the two types of firms. Both the proportion of employees covered (0.71 vs 0.60) and the proportion of enrollees with family coverage (0.47 vs 0.45) were higher in establishments offering a choice of plans. Establishments offering a choice of plans were also

more likely to offer a both a single and family coverage requiring no employee premium contribution. In most cases, these results are consistent with a "better jobs" story. Employers offering a choice of plans offer more generous benefits in general. The exception to this is the result for the average premium assuming single coverage for all enrollees. Interpreting this as a measure of average generosity, I find no difference between employers offering a choice and those not offering a choice of plans.

A higher proportion of establishments in counties in which an HMO was available in 1993 (0.40) offer a choice of plans than in counties in which no HMO was available (0.13) (Table 2). Further restricting the set of establishments without an HMO available in their county in 1993 to those in which an HMO had entered by 1996 reduces the sample size by 150 establishments but has little effect on the proportion of establishments offering a choice of plans. Comparing the characteristics in of establishments in columns 2 and 3 of table 2, we find that differences exist in the characteristics of establishments for which HMOs were and were not available in 1993. Establishments in counties with HMOs in 1993 were larger and had a greater proportion of high-wage workers relative to those in counties without HMOs. The results also suggest that HMOs were more likely to enter large, high income counties with more academic medical centers and higher wages earlier than other types of counties. Restricting the sample to establishments in counties in which an HMO ultimately entered by 1996 has little effect on reducing these differences in observable characteristics. Both establishment and market characteristics display little difference between columns 3 and 4. While the availability of an HMO in the county of an establishment appears to facilitate the offer of multiple plans, the timing of HMO entry into counties also appears to be correlated with observable market characteristics. Excluding the set of counties to those in which an HMO had entered by 1996 has

little impact on reducing the differences in the observable characteristics. In addition, making this exclusion reduces the number of establishments in the sample with not HMO available in 1993, raising issues of adequate sample size. However, the restriction may control for unobservable differences in demand for medical care across counties that are uncorrelated with these observable characteristics. As a result, I present results for models with both the full and the restricted set of counties.

In the first stage regression, the indicator of whether an HMO is available in the establishment's county has a large, positive and statistically significant effect on the probability of offering a choice among plans (Table 4). In the full sample, the availability of an HMO in the country of the establishment increases the likelihood of offering a choice of plans by 14.0 percentage points in the full sample (Table 4-Column 3) and 15 percentage points in the subsample based on the future availability of an HMO in the establishment's county (Table 4-Column 6). I also estimate the models including controls for the wage distribution of workers in the firm. Although these variables are endogenous in the theoretical model, they also potentially control for variation across establishments in demand for health insurance. Including these variables, however, has virtually no effect on the magnitude or statistical significance of the effect of HMO availability, reducing concerns of omitted variables measuring worker demand for coverage. As anticipated, establishment size has a strong effect on the probability of offering a choice of plans. Establishments with more employees and establishments that are part of a larger firm are more likely to offer a choice among plans. Variation in workers preferences for coverage as proxied by variation in expected health expenditures is also highly positively correlated with the decision to offer a choice of plans as expected. A higher proportion of female employees aged 25-54 relative to the proportion of male employees in the same age group is also

associated with a greater likelihood of offering a choice among plans. For-profit establishments are less likely to offer a choice of plans.

The results of the models for average premium suggest that offering a choice of plans reduced the average premium for employer-sponsored coverage. However, the primary mechanism for the reduction was an associated shift from family to single coverage. The point estimates of the effect of offering a choice of plans using OLS are small and not statistically significants (Table 5, Models 1-3). The effect of choice on average premium in the instrumented model, however, is large, negative and statistically significant (Table 5, Models 4 and 6). In these models, offering a choice of plans reduces the average premium for employer-sponsored coverage by $85 to $100. Although this seems implausibly large at first glance, the results from Models 5 and 6 suggest that most of the effect was driven by a shift from family to single coverage. Controlling for the proportion of employees enrolled in family coverage, the magnitude of the effect of choice declines substantially and becomes statistically insignificant at conventional levels. In Models 5 and 6, the proportion of workers enrolled in an HMO does not have a statistically significant effect on the average premium within an employer-sponsored group.

Tables 6 and 7 examine the allocation of these premium reductions between employee and employer premium contributions. In general, the differences between the models estimated using OLS and those estimated using IV are the same as those for the models of average premiums. OLS results reveal a small statistically insignificant effect of choice on both employee and employer premium contributions. Using IV to estimate the effect of offering choice on employee and employer premium contributions, I find larger reductions in both. However, the effect is only statistically significant in the model of the employer contribution

using the full sample. Comparing the magnitude of the decline in contributions in the employee and employer premium contribution models with those of the average premium model, I find that between 65 and 75% of the decline in premiums was in the form of declining employer contributions. The remainder was passed on to employees in the form of lower premium contributions.

In table 8, I isolate the effects of changes in plan types from changes in coverage by calculating average premiums assuming all employees covered by the plan chose single coverage. Using OLS, I find the offering a choice of plans was associated with a small reduction in premiums, about $5 (Table 8 – Models 1 and 2). Much of the reduction can be explained by a shift to HMO enrollment. (Model 3). Estimates using instrumental variables, however, are larger. Using the full sample, offering choice reduces the average premium for single coverage by $42. Controlling for the proportion enrolled in an HMO has little effect on the estimate. Although these seems implausibly large given the average in the data for the average premium assuming single coverage is $143, it is important to consider that these estimates do not control for differences in the generosity of the plans offered.

In Table 9, I find evidence suggesting that offering a choice of plans increased the proportion of workers in a firm covered by health insurance. Using OLS, an employer offering a choice of plans increases the proportion of workers covered by 5 percentage points. This is true even after controlling for the wage distribution of workers. Using IV, the estimates are of similar magnitude and direction, but imprecisely estimated. Despite the lack of statistical significance in the instrumented models, I believe these estimates generally suggest that offering choice was associated with a small increase in coverage rates.

Although offering choice was associated with small increases in the proportion of employees covered, IV estimates suggest that it was also associated with a significant shift from single to family coverage within the firm. Using OLS, offering a choice is associated with a 2 percentage point increase in the proportion of covered workers enrolled in family coverage (Table 10 – Models 1 and 2). However, IV estimates suggest significant, approximately 20 percentage point, declines in the proportion of workers enrolled in family coverage. Table 11 suggests a possible mechanism for the dramatic declines. The dependent variables in this analysis are whether the employer contributes fully to a single coverage and a family coverage plan. Using OLS, employers offering a choice of plans were 8 percentage points more likely to fully contribute to at least one single coverage plan (Table 11- Model 1) and 4 percentage points more likely to fully contribute to a family coverage plan (Table 11- Model 4). However, using instrumental variables, the magnitude of the effect of choice on the probability of offering the full contribution single plan was much higher – over 20 percentage points, while the effect of offering a choice of plans on the probability of offering family coverage with no employee contribution was negative – between 1 and 4 percentage points. The IV estimates, however, were imprecisely estimated and thus can only be considered suggestive.

V. Conclusion

The prevalence of health plan choice within employment-based purchasing groups has increased over the last two decades. The results of this paper suggest that this development has had mixed effects on the welfare of consumers. The results provide some evidence that average plan premiums have declined in response to the availability of choice. In addition, the proportion of workers in the firm covered by the plans offered by the employer has increased

somewhat. In this analysis, the lower average premiums could have been driven by changes in the benefits covered by plans, changes in utilization conditional on coverage, or competitive effects. The effects of these changes in premiums on the welfare of consumers is dependent on the extent to which they value the differences in coverage as well as the extent of any corresponding changes in cash wages. In general, increases in the proportion of workers covered through their employer would have positive welfare implications.

The larger, and arguably more surprising, result of this study is that offering a choice of health plans was associated with a significant shift from family to single coverage within employment-based purchasing groups. This result was evident when using the availability of an HMO in an employer's market as an instrument for the decision of an employer to offer a choice of health plans. This result consistently emerged through a range of models using differing independent variables. In addition, these results are generally consistent with data showing the declines in employer-sponsored coverage were driven primarily by reductions in dependent rather than own name coverage.

This suggests that gains in employee coverage may have been significantly offset by losses in dependent coverage. The welfare implications of this effect depend on the extent to which dependents had access to coverage from alternative sources. If declines in dependent coverage were primarily targeted to dual-working families who were potentially enrolled in multiple, potentially excessive, coverage, then this may have had positive welfare implications. If those who lost dependent coverage were able to find it from an alternative employer or public source, the changes represent a transfer rather than an inefficiency. However, for those who lost coverage and went uninsured, the change was ultimately welfare reducing.

Finally, it is important to note that these changes in the prevalence of family coverage may not have been a direct result of offering health plan choice, but rather driven by underlying changes in the health care market that coincided with or even drove the diffusion of managed care. For example, rising health care costs may have created pressure for employers to reduce health benefit costs. This may have been accomplished by two strategies, a shift to managed care and a reduction in contributions to dependents.

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Figure 1: Employer Health Plan Offerings by Establishment Size

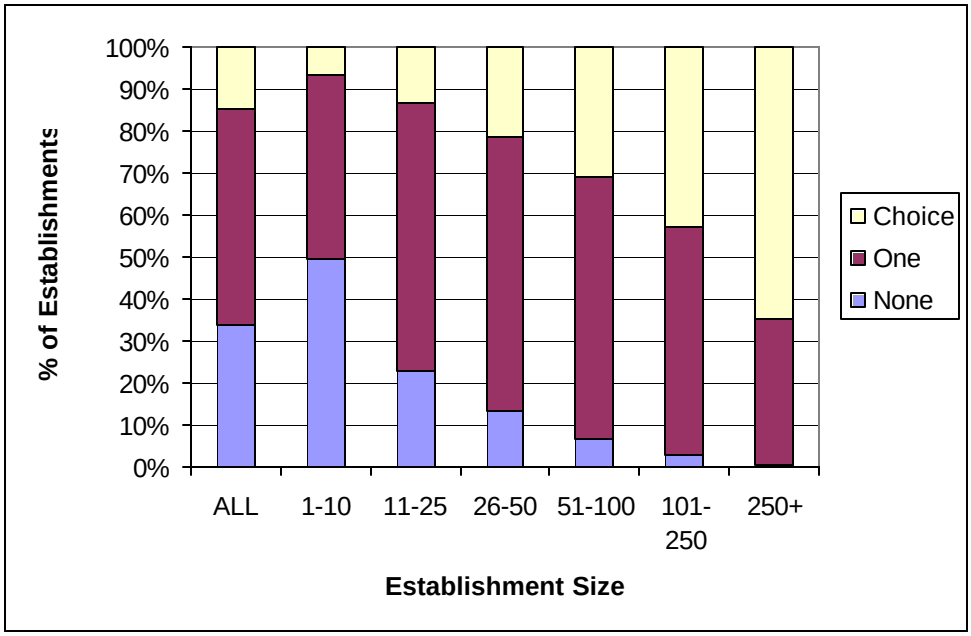

Table 1: Dependent Variables by Offer of Choice

	All		No Choice		Choice		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Average Premium	249.18	103.24	244.71	109.00	256.89	92.02	***
Average Employer Contribution	168.83	99.48	164.04	103.49	177.07	91.61	***
Average Employee Contribution	80.36	71.21	80.67	76.53	79.81	61.00	
Average Employer Share of Premium	0.67	0.24	0.66	0.25	0.68	0.21	**
Average Premium-Single Coverage	143.03	54.85	143.46	60.01	142.29	44.60	
Proportion of Employees Covered	0.64	0.30	0.60	0.31	0.71	0.27	***
Proportion of Enrollees with Family Coverage	0.46	0.25	0.45	0.26	0.47	0.22	***
Offer HMO	0.35	0.48	0.16	0.36	0.69	0.46	***
No Contribution Single Coverage	0.41	0.49	0.38	0.49	0.46	0.50	***
No Contribution Family Coverage	0.15	0.36	0.13	0.34	0.18	0.39	***
N	4526		2863		1663		
%			0.63		0.37		

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2: Independent Variables

	(1)		(2)		(3)		(4)	
	All		HMO Available in 1993		HMO Not Available in 1993		HMO Not Available in 1993 & Available in 1996	
	n=4,526		n=3,969		n=557		n=407	
Variable	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Choice	0.37	0.48	0.40	0.49	0.13	0.34	0.13	0.34
Proportion Family Coverage	0.46	0.25	0.45	0.25	0.50	0.27	0.50	0.26
Proportion HMO	0.24	0.38	0.27	0.39	0.03	0.15	0.03	0.17
26-50 employees	0.40	0.49	0.40	0.49	0.43	0.50	0.43	0.50
51-100 employees	0.26	0.44	0.26	0.44	0.29	0.45	0.29	0.45
101-250 employees	0.21	0.41	0.22	0.41	0.20	0.40	0.20	0.40
250+ employees	0.12	0.33	0.13	0.34	0.08	0.27	0.09	0.28
Part of a Larger Firm	0.55	0.50	0.56	0.50	0.49	0.50	0.48	0.50
For Profit	0.84	0.37	0.85	0.36	0.78	0.42	0.79	0.41
% Wage < $10,000	11.92	22.68	11.26	22.27	16.66	24.91	16.43	25.62
% Wage $10-14,000	22.62	24.29	22.11	24.33	26.25	23.73	24.40	23.71
% Wage $14-20,000	23.43	21.41	23.57	21.48	22.37	20.89	22.59	21.49
% Wage > $20,000	42.07	33.90	43.09	34.02	34.74	32.08	36.58	33.17
Health Expenditure Variation	0.37	0.10	0.37	0.10	0.36	0.10	0.36	0.10
% Male <25 years	0.12	0.15	0.12	0.15	0.13	0.15	0.13	0.15
% Male 25-54	0.37	0.25	0.37	0.25	0.33	0.26	0.34	0.26
% Male >55	0.04	0.06	0.05	0.06	0.04	0.06	0.04	0.06
% Female <25 years	0.11	0.13	0.11	0.13	0.12	0.14	0.12	0.14
% Female 25-54	0.32	0.23	0.32	0.23	0.33	0.24	0.33	0.25
% Female >55	0.04	0.06	0.04	0.06	0.05	0.07	0.04	0.07
County Population 10,000s	46.75	51.16	52.72	51.91	4.27	2.74	4.46	2.83
County Per Capita Income 1,000s	21.41	6.88	22.03	7.04	16.95	2.91	16.68	3.16
County per capita Medicaid discharges	18.27	11.92	18.47	12.41	16.85	7.41	16.42	6.79
Teaching Hospitals	2.89	3.64	3.21	3.76	0.57	0.83	0.44	0.72
HMO available in County in 1999	0.88	0.33	1.00	0.00	0.00	0.00	0.00	0.00
CMS wage index	96.43	15.39	98.73	14.77	80.04	7.98	79.66	7.93

Table 3: Diffusion of Managed Care, 1991-1996

	Average Number of HMOs serving a County	Any HMO serving a County
1991	2.10	0.60
1992	2.40	0.69
1993	2.63	0.72
1994	3.26	0.82
1995	3.61	0.88
1996	4.46	0.93

Data Source: Interstudy Directories (1991-1996)

Table 4: Effect of HMO Availability on Offer of Health Plan Choice

	Full Sample		HMO Available in 1996	
	Model 1	Model 2	Model 3	Model 4
HMO Available in County-93	0.141***	0.141***	0.150***	0.150***
	[0.020]	[0.020]	[0.021]	[0.021]
% Wage < $10,000		-0.001***		-0.001***
		[0.000]		[0.000]
% Wage $10-14,000		-0.001***		-0.001***
		[0.000]		[0.000]
% Wage $14-20,000		0.000	0.000	-0.001
		[0.000]	[0.000]	[0.000]
51-100 employees	0.079***	0.080***	0.082***	0.083***
	[0.016]	[0.016]	[0.017]	[0.017]
101-250 employees	0.170***	0.170***	0.169***	0.170***
	[0.019]	[0.019]	[0.019]	[0.019]
250+ employees	0.336***	0.331***	0.339***	0.333***
	[0.023]	[0.023]	[0.023]	[0.023]
Part of a larger firm	0.121***	0.120***	0.121***	0.121***
	[0.014]	[0.014]	[0.014]	[0.014]
For Profit	-0.039*	-0.042*	-0.043*	-0.046*
	[0.023]	[0.023]	[0.024]	[0.024]
Health Expenditure Variation	0.177**	0.169**	0.174**	0.164**
	[0.081]	[0.081]	[0.082]	[0.082]
% Male <25 years	-0.012	0.01	-0.015	0.008
	[0.052]	[0.053]	[0.053]	[0.053]
% Male >55	0.194	0.199	0.161	0.169
	[0.121]	[0.123]	[0.123]	[0.125]
% Female <25 years	0.013	0.052	-0.005	0.038
	[0.056]	[0.058]	[0.057]	[0.058]
% Female 25-54	0.079*	0.088**	0.085**	0.095**
	[0.042]	[0.042]	[0.043]	[0.043]
% Female >55	0.067	0.095	0.088	0.118
	[0.123]	[0.123]	[0.127]	[0.127]
County Population 10,000s	0.000	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
County Per Capita Income 1,000s	0.003	0.002	0.003	0.002
	[0.002]	[0.002]	[0.002]	[0.002]
County per capita Medicaid discharges	-0.004***	-0.004***	-0.004***	-0.004***
	[0.001]	[0.001]	[0.001]	[0.001]
Teaching Hospitals	0.014**	0.014**	0.014**	0.015**
	[0.006]	[0.006]	[0.006]	[0.006]
CMS wage index	0.000	0.000	0.000	0.000
	[0.001]	[0.001]	[0.001]	[0.001]
	[0.033]	[0.033]	[0.033]	[0.033]
Constant	-0.026	0.017	-0.017	0.025
	[0.078]	[0.079]	[0.079]	[0.080]
Observations	4526	4526	4376	4376
R-squared	0.16	0.16	0.16	0.16

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
All models include industry and state fixed effects

Table 5: Effect of Choice on Average Premiums

	OLS			IV			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Offers Choice	4.096	3.107	1.424	-100.089**	-54.603	-84.566**	-36.561
	[3.343]	[3.336]	[2.902]	[42.979]	[49.015]	[42.848]	[49.890]
% with family coverage			230.454***		237.574***		235.359***
			[6.122]		[8.966]		[9.349]
% enrolled in HMO			-15.730***		2.74		-2.971
			[3.440]		[16.525]		[16.667]
% Wage < $10,000		-0.158*					
		[0.081]					
% Wage $10-14,000		-0.429***					
		[0.063]					
% Wage $14-20,000		-0.184**					
		[0.078]					
51-100 employees	-7.087*	-6.626*	-6.632**	1.158	-2.346	-0.688	-4.233
	[3.711]	[3.705]	[3.021]	[5.289]	[4.783]	[5.318]	[4.908]
101-250 employees	0.729	1.507	-3.282	18.690**	5.509	16.118*	2.881
	[4.151]	[4.124]	[3.500]	[8.633]	[8.307]	[8.561]	[8.362]
250+ employees	13.864**	12.808**	2.244	49.110***	20.414	44.478***	14.612
	[5.709]	[5.699]	[5.022]	[15.784]	[16.590]	[15.806]	[16.891]
Part of a larger firm	20.627***	20.406***	7.885***	33.377***	15.127**	32.798***	13.025*
	[3.230]	[3.214]	[2.717]	[6.308]	[6.900]	[6.329]	[7.023]
For Profit	-12.187**	-12.793***	-18.181***	-16.173***	-19.640***	-15.433***	-18.366***
	[4.987]	[4.956]	[3.986]	[5.696]	[4.310]	[5.681]	[4.325]
Health Expenditure Variation	27.058	25.212	14.454	45.702**	23.829	41.487*	19.172
	[19.187]	[19.136]	[15.952]	[22.312]	[18.460]	[22.242]	[18.585]
% Male <25 years	-42.002***	-35.547***	-18.151*	-43.534***	-18.823*	-43.800***	-18.907*
	[12.567]	[12.571]	[10.215]	[13.388]	[10.387]	[13.267]	[10.323]
% Male >55	62.904**	62.612**	43.893**	83.086***	52.697**	75.661**	47.703**
	[26.841]	[26.143]	[21.531]	[30.510]	[23.731]	[29.954]	[23.320]
% Female <25 years	-42.499***	-31.046**	-12.215	-41.194***	-11.712	-47.080***	-14.019
	[12.110]	[12.126]	[9.844]	[13.464]	[10.339]	[13.357]	[10.428]
% Female 25-54	2.019	6.278	24.595***	9.752	28.103***	11.083	27.978***
	[9.831]	[9.779]	[8.254]	[11.288]	[9.072]	[11.436]	[9.338]
% Female >55	-43.765*	-28.812	2.505	-38.121	6.036	-31.826	6.243
	[25.280]	[24.995]	[19.997]	[28.215]	[21.342]	[28.472]	[21.753]
County Population 10,000s	0.03	0.018	0.039	0.052	0.047	0.036	0.044
	[0.091]	[0.091]	[0.078]	[0.100]	[0.081]	[0.099]	[0.080]
County Per Capita Income 1,000s	0.436	0.264	0.870**	0.625	1.048**	0.5	0.943**
	[0.462]	[0.462]	[0.394]	[0.502]	[0.429]	[0.496]	[0.431]
County per capita Medicaid discharges	0.409	0.410*	-0.027	-0.034	-0.201	0.003	-0.129
	[0.248]	[0.248]	[0.205]	[0.326]	[0.257]	[0.327]	[0.260]
Teaching Hospitals	-2.023	-1.908	-0.516	-0.251	0.151	-0.3	-0.053
	[1.422]	[1.415]	[1.210]	[1.746]	[1.387]	[1.716]	[1.366]
CMS wage index	0.475**	0.448**	0.595***	0.595***	0.601***	0.644***	0.617***
	[0.196]	[0.197]	[0.171]	[0.219]	[0.177]	[0.217]	[0.177]
Constant	177.620***	194.603***	73.462***	178.168***	66.714***	173.284***	66.918***
	[18.211]	[18.532]	[15.199]	[19.680]	[16.588]	[19.506]	[16.432]
Observations	4526	4526	4526	4526	4526	4376	4376
R-squared	0.06	0.07	0.35		0.29		0.32

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

all models include state and industry fixed effects

Table 6: Effect of Choice on Average Employer Premium Contributions

	OLS			IV			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Offers Choice	0.665	-0.468	1.924	-73.763*	-24.921	-55.34	-0.968
	[3.168]	[3.154]	[2.971]	[39.136]	[48.828]	[38.766]	[49.524]
% with family coverage			156.245***		159.656***		155.327***
			[6.622]		[9.197]		[9.478]
% enrolled in HMO			-25.283***		-16.433		-24.227
			[3.631]		[16.394]		[16.484]
% Wage < $10,000		-0.182**					
		[0.077]					
% Wage $10-14,000		-0.484***					
		[0.059]					
% Wage $14-20,000		-0.292***					
		[0.074]					
51-100 employees	-5.385	-4.975	-5.199	0.506	-3.145	-1.215	-5.191
	[3.550]	[3.536]	[3.217]	[4.897]	[4.946]	[4.900]	[5.073]
101-250 employees	1.851	2.707	-0.835	14.682*	3.377	11.746	-0.009
	[3.905]	[3.867]	[3.616]	[7.942]	[8.505]	[7.879]	[8.599]
250+ employees	18.424***	17.207***	9.812**	43.603***	18.519	38.478***	11.512
	[5.148]	[5.127]	[4.758]	[14.560]	[16.784]	[14.522]	[17.100]
Part of a larger firm	21.517***	21.205***	11.894***	30.625***	15.364**	28.884***	12.070*
	[3.017]	[2.994]	[2.806]	[5.639]	[6.737]	[5.634]	[6.864]
For Profit	-27.697***	-28.519***	-32.311***	-30.544***	-33.011***	-29.270***	-31.351***
	[4.927]	[4.871]	[4.429]	[5.320]	[4.562]	[5.304]	[4.635]
Health Expenditure Variation	19.179	16.621	10.275	32.498	14.767	28.33	9.775
	[18.878]	[18.926]	[17.411]	[20.852]	[19.289]	[20.792]	[19.563]
% Male <25 years	-34.107***	-26.823**	-17.439	-35.201***	-17.761	-36.028***	-18.485
	[12.028]	[12.015]	[11.321]	[12.425]	[11.305]	[12.324]	[11.377]
% Male >55	55.656**	54.879**	43.287*	70.074**	47.506*	63.880**	43.304*
	[27.871]	[27.368]	[25.110]	[27.968]	[25.565]	[28.237]	[26.277]
% Female <25 years	-44.130***	-31.825***	-22.762**	-43.198***	-22.521**	-48.856***	-25.557**
	[11.918]	[11.963]	[10.824]	[12.633]	[10.921]	[12.524]	[11.104]
% Female 25-54	-8.244	-3.635	7.868	-2.719	9.55	-2.557	8.301
	[9.611]	[9.564]	[8.839]	[10.601]	[9.512]	[10.790]	[9.911]
% Female >55	-55.612**	-38.777	-23.693	-51.581**	-22	-48.423*	-23.633
	[23.892]	[23.650]	[20.806]	[25.387]	[21.115]	[25.643]	[21.861]
County Population 10,000s	-0.011	-0.027	-0.002	0.004	0.001	-0.006	-0.001
	[0.085]	[0.085]	[0.079]	[0.091]	[0.081]	[0.089]	[0.081]
County Per Capita Income 1,000s	0.014	-0.194	0.254	0.149	0.339	0.057	0.234
	[0.489]	[0.487]	[0.446]	[0.506]	[0.465]	[0.502]	[0.470]
County per capita Medicaid discharges	0.266	0.263	-0.077	-0.05	-0.16	-0.004	-0.088
	[0.244]	[0.243]	[0.221]	[0.303]	[0.263]	[0.303]	[0.267]
Teaching Hospitals	-0.857	-0.712	0.367	0.408	0.687	0.233	0.408
	[1.333]	[1.326]	[1.232]	[1.569]	[1.361]	[1.540]	[1.352]
CMS wage index	0.885***	0.858***	1.010***	0.971***	1.013***	0.980***	1.010***
	[0.194]	[0.195]	[0.183]	[0.210]	[0.184]	[0.209]	[0.186]
Constant	79.294***	100.721***	11.609	79.686***	8.376	77.840***	11.928
	[17.547]	[17.868]	[16.118]	[18.279]	[17.455]	[18.153]	[17.475]
Observations	4526	4526	4526	4526	4526	4376	4376
R-squared	0.08	0.09	0.23		0.22	0.02	0.23

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects

Table 7: Effect of Choice on Average Employee Premium Contributions

	OLS			IV			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Offers Choice	3.43	3.575	-0.5	-26.326	-29.681	-29.226	-35.594
	[2.315]	[2.323]	[2.339]	[27.824]	[38.992]	[27.952]	[39.444]
% with family coverage			74.209***		77.918***		80.033***
			[5.462]		[7.105]		[7.368]
% enrolled in HMO			9.553***		19.173		21.257
			[2.725]		[13.236]		[13.273]
% Wage < $10,000		0.024					
		[0.058]					
% Wage $10-14,000		0.054					
		[0.047]					
% Wage $14-20,000		0.108**					
		[0.053]					
51-100 employees	-1.703	-1.651	-1.433	0.652	0.799	0.527	0.957
	[2.704]	[2.709]	[2.614]	[3.514]	[4.003]	[3.630]	[4.157]
101-250 employees	-1.122	-1.201	-2.447	4.008	2.132	4.371	2.891
	[2.983]	[2.980]	[2.884]	[5.687]	[6.805]	[5.702]	[6.841]
250+ employees	-4.56	-4.399	-7.568**	5.507	1.896	6	3.099
	[3.673]	[3.683]	[3.644]	[9.947]	[13.037]	[10.075]	[13.265]
Part of a larger firm	-0.89	-0.799	-4.009*	2.752	-0.237	3.914	0.955
	[2.264]	[2.268]	[2.188]	[4.084]	[5.532]	[4.169]	[5.661]
For Profit	15.510***	15.726***	14.130***	14.372***	13.370***	13.837***	12.986***
	[3.643]	[3.663]	[3.551]	[3.808]	[3.691]	[3.934]	[3.819]
Health Expenditure Variation	7.878	8.591	4.179	13.203	9.062	13.157	9.397
	[13.555]	[13.548]	[13.034]	[14.774]	[14.885]	[15.037]	[15.198]
% Male <25 years	-7.895	-8.724	-0.712	-8.333	-1.062	-7.772	-0.422
	[9.327]	[9.451]	[8.872]	[9.453]	[8.992]	[9.592]	[9.150]
% Male >55	7.248	7.733	0.606	13.012	5.192	11.781	4.399
	[19.565]	[19.687]	[18.960]	[21.538]	[20.986]	[21.947]	[21.430]
% Female <25 years	1.631	0.779	10.547	2.004	10.809	1.776	11.538
	[8.581]	[8.800]	[8.317]	[8.748]	[8.483]	[9.027]	[8.822]
% Female 25-54	10.263	9.913	16.726***	12.471*	18.554***	13.640*	19.677***
	[6.678]	[6.699]	[6.488]	[7.092]	[7.000]	[7.373]	[7.366]
% Female >55	11.848	9.965	26.197	13.459	28.036	16.596	29.877
	[18.354]	[18.401]	[18.097]	[18.831]	[18.689]	[19.591]	[19.581]
County Population 10,000s	0.041	0.045	0.042	0.048	0.046	0.041	0.044
	[0.067]	[0.067]	[0.064]	[0.068]	[0.065]	[0.069]	[0.066]
County Per Capita Income 1,000s	0.422	0.457	0.616**	0.476	0.709**	0.443	0.710**
	[0.299]	[0.300]	[0.298]	[0.311]	[0.330]	[0.317]	[0.341]
County per capita Medicaid discha	0.143	0.147	0.049	0.016	-0.041	0.007	-0.041
	[0.172]	[0.172]	[0.168]	[0.211]	[0.209]	[0.218]	[0.216]
Teaching Hospitals	-1.165	-1.196	-0.883	-0.659	-0.536	-0.533	-0.461
	[0.991]	[0.993]	[0.963]	[1.118]	[1.086]	[1.132]	[1.101]
CMS wage index	-0.410***	-0.410***	-0.416***	-0.376***	-0.412***	-0.336**	-0.393***
	[0.136]	[0.136]	[0.132]	[0.142]	[0.134]	[0.145]	[0.139]
Constant	98.325***	93.882***	61.852***	98.482***	58.338***	95.444***	54.991***
	[12.502]	[12.689]	[11.860]	[12.712]	[12.898]	[12.919]	[12.971]
Observations	4526	4526	4526	4526	4526	4376	4376
R-squared	0.03	0.03	0.09		0.06		0.05

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects

Table 8: Effect of Choice on Average Premiums - Single Coverage

	OLS			IV			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Offers Choice	-5.400***	-5.524***	-2.897	-41.538**	-42.388	-32.197	-28.601
	[1.811]	[1.808]	[1.899]	[20.998]	[30.709]	[20.795]	[30.307]
% enrolled in HMO			-11.918***		0.85		-3.528
			[2.398]		[10.099]		[9.865]
% Wage < $10,000		0.005					
		[0.041]					
% Wage $10-14,000		-0.077**					
		[0.036]					
% Wage $14-20,000		-0.031					
		[0.038]					
51-100 employees	-3.041	-2.974	-3.141	-0.181	-0.121	-0.882	-1.142
	[1.916]	[1.917]	[1.912]	[2.525]	[3.010]	[2.568]	[3.046]
101-250 employees	-2.238	-2.091	-2.211	3.992	4.106	2.645	2.167
	[2.243]	[2.240]	[2.234]	[4.196]	[5.324]	[4.160]	[5.239]
250+ employees	0.382	0.301	-0.216	12.607*	12.877	9.46	8.311
	[3.077]	[3.075]	[3.102]	[7.485]	[10.422]	[7.413]	[10.305]
Part of a larger firm	5.961***	5.905***	5.158***	10.383***	10.522**	9.126***	8.529*
	[1.742]	[1.745]	[1.748]	[3.109]	[4.513]	[3.082]	[4.464]
For Profit	-9.781***	-9.805***	-10.229***	-11.163***	-11.157***	-10.594***	-10.617***
	[2.727]	[2.734]	[2.703]	[2.908]	[2.903]	[2.925]	[2.888]
Health Expenditure Variation	7.665	7.502	7.372	14.132	14.273	11.8	11.193
	[9.238]	[9.262]	[9.293]	[10.408]	[11.046]	[10.321]	[10.903]
% Male <25 years	-16.977***	-16.316***	-16.571***	-17.509***	-17.547***	-16.570***	-16.393***
	[6.166]	[6.209]	[6.199]	[6.392]	[6.417]	[6.329]	[6.309]
% Male >55	32.565**	32.215**	32.989**	39.566**	39.666**	36.581**	36.244**
	[14.323]	[14.310]	[14.316]	[15.847]	[16.222]	[15.699]	[15.841]
% Female <25 years	-2.151	-0.996	-1.47	-1.699	-1.739	-2.754	-2.52
	[6.079]	[6.138]	[6.079]	[6.441]	[6.472]	[6.466]	[6.482]
% Female 25-54	14.666***	15.338***	15.323***	17.348***	17.351***	17.794***	17.747***
	[4.911]	[4.928]	[4.909]	[5.374]	[5.394]	[5.460]	[5.470]
% Female >55	18.448	21.005*	18.897	20.406	20.41	21.292	21.239
	[12.501]	[12.491]	[12.523]	[13.391]	[13.428]	[13.607]	[13.559]
County Population 10,000s	0.03	0.028	0.032	0.037	0.037	0.033	0.033
	[0.049]	[0.049]	[0.049]	[0.052]	[0.052]	[0.051]	[0.051]
County Per Capita Income 1,000s	0.488*	0.464*	0.444*	0.554**	0.558**	0.515*	0.497*
	[0.267]	[0.267]	[0.267]	[0.274]	[0.283]	[0.273]	[0.280]
County per capita Medicaid discharges	-0.001	-0.003	-0.04	-0.155	-0.155	-0.12	-0.12
	[0.126]	[0.126]	[0.125]	[0.152]	[0.153]	[0.154]	[0.153]
Teaching Hospitals	-0.643	-0.62	-0.477	-0.028	-0.029	-0.127	-0.125
	[0.738]	[0.739]	[0.729]	[0.837]	[0.838]	[0.824]	[0.815]
CMS wage index	0.329***	0.325***	0.365***	0.371***	0.369***	0.368***	0.375***
	[0.113]	[0.114]	[0.114]	[0.121]	[0.118]	[0.121]	[0.118]
Constant	106.573***	109.141***	108.964***	106.764***	106.597***	105.800***	106.479***
	[9.810]	[10.064]	[9.790]	[10.109]	[10.320]	[10.107]	[10.206]
Observations	4526	4526	4526	4526	4526	4376	4376
R-squared	0.07	0.07	0.08			0.02	0.03

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects

Table 9: Effect of Choice on % of Employees Covered

	OLS		IV	
	Model 1	Model 2	Model 3	Model 4
Offers Choice	0.054***	0.046***	0.047	0.081
	[0.008]	[0.008]	[0.095]	[0.095]
% Wage < $10,000		-0.003***		
		[0.000]		
% Wage $10-14,000		-0.002***		
		[0.000]		
% Wage $14-20,000		-0.001***		
		[0.000]		
51-100 employees	-0.012	-0.008	-0.011	-0.012
	[0.010]	[0.009]	[0.012]	[0.013]
101-250 employees	0.011	0.013	0.012	0.007
	[0.010]	[0.010]	[0.019]	[0.019]
250+ employees	0.039***	0.026**	0.041	0.03
	[0.012]	[0.012]	[0.034]	[0.035]
Part of a larger firm	0.046***	0.047***	0.047***	0.042***
	[0.008]	[0.008]	[0.014]	[0.014]
For Profit	0.011	0.002	0.01	0.013
	[0.013]	[0.012]	[0.013]	[0.014]
Health Expenditure Variation	0.115**	0.095*	0.116**	0.119**
	[0.055]	[0.051]	[0.058]	[0.058]
% Male <25 years	-0.252***	-0.184***	-0.252***	-0.245***
	[0.035]	[0.033]	[0.035]	[0.035]
% Male >55	0.049	0.075	0.05	0.027
	[0.074]	[0.067]	[0.075]	[0.075]
% Female <25 years	-0.390***	-0.265***	-0.389***	-0.393***
	[0.035]	[0.034]	[0.035]	[0.035]
% Female 25-54	-0.058**	-0.032	-0.057**	-0.058**
	[0.026]	[0.025]	[0.027]	[0.027]
% Female >55	-0.288***	-0.217***	-0.288***	-0.289***
	[0.077]	[0.076]	[0.077]	[0.079]
County Population 10,000s	0.000	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
County Per Capita Income 1,000s	0.006***	0.005***	0.006***	0.006***
	[0.001]	[0.001]	[0.001]	[0.001]
County per capita Medicaid discharges	-0.001*	-0.001	-0.001	-0.001
	[0.001]	[0.001]	[0.001]	[0.001]
Teaching Hospitals	0.008**	0.008**	0.008**	0.007*
	[0.004]	[0.003]	[0.004]	[0.004]
CMS wage index	-0.001	-0.001*	-0.001	-0.001
	[0.000]	[0.000]	[0.000]	[0.001]
Constant	0.570***	0.668***	0.570***	0.563***
	[0.047]	[0.047]	[0.047]	[0.047]
Observations	4526	4526	4526	4376
R-squared	0.29	0.35	0.29	0.29

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects

Table 10: Effect of Choice on Proportion of covered Employees Enrolled in Family Coverage

	OLS		IV	
	Model 1	Model 2	Model 4	Model 5
Offers Choice	0.026***	0.023***	-0.203**	-0.191*
	[0.008]	[0.008]	[0.104]	[0.103]
% Wage < $10,000		-0.001***		
		[0.000]		
% Wage $10-14,000		-0.001***		
		[0.000]		
% Wage $14-20,000		-0.001***		
		[0.000]		
51-100 employees	-0.003	-0.001	0.016	0.014
	[0.009]	[0.009]	[0.013]	[0.013]
101-250 employees	0.018*	0.020**	0.057***	0.055***
	[0.010]	[0.010]	[0.021]	[0.021]
250+ employees	0.047***	0.043***	0.124***	0.123***
	[0.011]	[0.011]	[0.037]	[0.037]
Part of a larger firm	0.051***	0.050***	0.079***	0.082***
	[0.008]	[0.008]	[0.015]	[0.015]
For Profit	0.023*	0.021*	0.015	0.012
	[0.013]	[0.012]	[0.014]	[0.014]
Health Expenditure Variation	0.053	0.046	0.094*	0.093*
	[0.048]	[0.048]	[0.054]	[0.055]
% Male <25 years	-0.101***	-0.078**	-0.105***	-0.105***
	[0.032]	[0.032]	[0.033]	[0.034]
% Male >55	0.085	0.087	0.129*	0.118*
	[0.061]	[0.059]	[0.069]	[0.068]
% Female <25 years	-0.128***	-0.086***	-0.125***	-0.140***
	[0.032]	[0.032]	[0.035]	[0.034]
% Female 25-54	-0.094***	-0.081***	-0.077***	-0.072***
	[0.023]	[0.023]	[0.027]	[0.027]
% Female >55	-0.198***	-0.155**	-0.186**	-0.162**
	[0.070]	[0.069]	[0.074]	[0.076]
County Population 10,000s	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
County Per Capita Income 1,000s	-0.002**	-0.003***	-0.002	-0.002*
	[0.001]	[0.001]	[0.001]	[0.001]
County per capita Medicaid discharges	0.002***	0.002***	0.001	0.001
	[0.001]	[0.001]	[0.001]	[0.001]
Teaching Hospitals	-0.006*	-0.005	-0.002	-0.001
	[0.003]	[0.003]	[0.004]	[0.004]
CMS wage index	0.0000	0.0000	0.0000	0.0000
	[0.000]	[0.000]	[0.001]	[0.001]
Constant	0.466***	0.520***	0.467***	0.454***
	[0.043]	[0.044]	[0.046]	[0.047]
Observations	4526	4526	4526	4376
R-squared	0.1	0.12		

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects

Table 11: Effect of Choice on Probability of Offering a Full Contribution Plan

	Single Coverage			Family Coverage		
	OLS	IV	IV	OLS	IV	IV
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Offers Choice	0.081***	0.262	0.216	0.044***	-0.052	-0.016
	[0.016]	[0.189]	[0.187]	[0.012]	[0.133]	[0.133]
size==4	-0.044**	-0.058**	-0.051**	-0.02	-0.013	-0.016
	[0.018]	[0.024]	[0.024]	[0.013]	[0.017]	[0.017]
size==5	-0.082***	-0.112***	-0.106***	-0.032**	-0.015	-0.023
	[0.020]	[0.039]	[0.038]	[0.014]	[0.027]	[0.027]
size==6	-0.101***	-0.162**	-0.148**	-0.001	0.032	0.017
	[0.025]	[0.069]	[0.069]	[0.019]	[0.050]	[0.050]
Part of a larger firm	-0.052***	-0.075***	-0.072***	-0.011	0.001	-0.006
	[0.015]	[0.028]	[0.028]	[0.011]	[0.019]	[0.019]
For Profit	-0.110***	-0.103***	-0.105***	-0.072***	-0.076***	-0.076***
	[0.025]	[0.027]	[0.027]	[0.020]	[0.020]	[0.021]
Health Expenditure Variation	0.085		0.075	-0.032	-0.015	-0.017
	[0.088]		[0.096]	[0.069]	[0.074]	[0.074]
% Male <25 years	-0.009	-0.006	0.001	-0.053	-0.054	-0.054
	[0.057]	[0.057]	[0.058]	[0.043]	[0.043]	[0.043]
% Male >55	0.132	0.119	0.121	0.024	0.042	0.034
	[0.126]	[0.135]	[0.134]	[0.103]	[0.106]	[0.107]
% Female <25 years	-0.126**	-0.133**	-0.135**	-0.053	-0.052	-0.063
	[0.059]	[0.059]	[0.061]	[0.044]	[0.044]	[0.045]
% Female 25-54	-0.007	-0.028	-0.015	-0.076**	-0.069*	-0.070*
	[0.046]	[0.045]	[0.050]	[0.035]	[0.037]	[0.038]
% Female >55	-0.284**	-0.291**	-0.320**	0.025	0.03	0.027
	[0.131]	[0.134]	[0.136]	[0.099]	[0.101]	[0.102]
County Population 10,000s	0	0	0	0.001***	0.001***	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
County Per Capita Income 1,000s	0.001	0.001	0.001	-0.002	-0.002	-0.002
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
County per capita Medicaid discharges	0.001	0.002	0.002	0.003***	0.002**	0.003**
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Teaching Hospitals	-0.001	-0.004	-0.004	-0.008*	-0.007	-0.008
	[0.006]	[0.007]	[0.007]	[0.005]	[0.005]	[0.005]
CMS wage index	0	0	0	0	0	0
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Constant	0.488***	0.506***	0.491***	0.133**	0.134**	0.145**
	[0.087]	[0.083]	[0.089]	[0.066]	[0.066]	[0.067]
Observations	4526	4526	4376	4526	4526	4376
R-squared	0.06	0.03	0.04	0.04	0.03	0.04

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
all models include state and industry fixed effects