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Health Insurance, Pensions, and Paid Leave: Access to Health Insurance at Small Firms in a Broader Benefits Context

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INTRODUCTION

Workers employed at small firms are substantially less likely to be offered health insurance than those at larger firms. Policymakers and researchers have long sought ways to increase access to employer insurance for workers at small firms but with little success. Most policy proposals and reforms—for example, the small group insurance reforms enacted by many states in the 1990s—have been directed specifically toward health insurance and based on the assumption that the firm-size "offer gap" in health insurance is caused by problems unique to such insurance. Yet there may be an even more fundamental issue. At small firms wages are lower and workers are less likely than those at large firms to be offered retirement plans, paid sick leave, paid vacations, paid holidays, and life insurance. In fact, they are less likely to be offered every benefit on the extensive list of benefits on which the National Compensation Survey collects data except year-end or holiday bonuses (U.S. Bureau of Labor Statistics, 2006). Therefore, it is important to consider health insurance in the broader context of benefits offered by small firms.

In this paper, we provide that context. We show how employer size affects the provision of several components of compensation—health insurance, retirement plan, and paid vacation. This analysis demonstrates the extent to which health insurance access represents a unique challenge for workers at small firms and to what extent it is part of more general compensation issues. We compare health insurance with these other two benefits to help identify what drives the disparities in health insurance by firm size.

There are three commonly cited explanations for variations in the provision of benefits according to firm size. First, if the per-worker administrative costs of a benefit decrease with firm size, larger firms will be more likely to provide that benefit. Second, if benefits are

demanded relatively elastically and if workers in smaller firms tend to receive lower total compensation, those workers will prefer a smaller share of that compensation in the form of benefits.[2] Third, smaller firms might be more susceptible to failures in insurance markets. For example, concerns about adverse selection might result in especially costly insurance premiums for the group. Small firms might be less likely to provide health insurance for any one of these reasons.

We find evidence that differences in offer rates for the three benefits persist even when we control for wages and household income, and that the gap between offer rates at smaller and larger firms is at least as large for retirement plans as for health insurance. We also find gaps—though somewhat smaller—in the offer rates of paid vacations between workers at smaller and larger firms. These findings, taken together, suggest that of the three aforementioned reasons, per capita administrative costs may be a significant driver of the disparities in offer rates across firm size, though it is also possible that workers in smaller firms differ from those in larger firms in their preferences for receiving compensation in the form of benefits. We argue that incremental reforms targeted at reducing administrative costs should be explored as a potentially effective strategy for improving small-firm workers' access to health insurance. In our conclusion, we discuss current policy proposals—such as Association Health Plans or plans that allow small private-sector firms to buy in to the Federal Employee Health Benefits Program—and the likelihood that such plans could reduce administrative costs.

[2] Similarly, the tax exclusion of employer-sponsored insurance provides a larger benefit to workers that face higher marginal tax rates. To the extent that workers in smaller firms have lower total compensation on average, they also likely face lower marginal tax rates than workers in larger firms and may be less likely to demand employer-sponsored insurance.

Previous Research

It is well documented that workers in small firms are significantly less likely to be offered health insurance. For example, data from the 2004 Medical Expenditure Panel Survey (MEPS) Insurance Component (IC) show that only 42 percent of establishments with fewer than 50 workers offer health insurance, in contrast to 96 percent of establishments with 50 or more workers (www.meps.ahrq.gov, 2007). Previous work (McLaughlin, 1993; Morrisey et al., 1994; Fronstin and Helman, 2000) has suggested that small firms are less likely to offer health insurance for a number of reasons including higher premiums, higher per capita administrative costs, and lack of demand by small-firm employees. Gabel and Pickreign (2004, p. 5) succinctly sum up the issues: "Burdened with inherently higher administrative costs, having fewer lives over which to spread the risk of catastrophic costs, and lacking the purchasing power of large firms to negotiate with insurers, small employers are doomed under current practices to separate but unequal status."

Research on the effect of premiums has focused on employers' price sensitivity, starting with the assumption that whatever the particular issues small firms face in the health insurance market, these issues show up as higher premiums. While some of these studies have also separately controlled for firm size or wage levels, they have emphasized responsiveness to premiums as the key question (Gruber and Lettau, 2004; Marquis and Long, 2001; Hadley and Reschovsky, 2002; Feldman et al., 1997). However, knowing that employers are responsive to premiums in offer decisions, as these studies find, does not tell us all we need to know about the underlying reasons for premium differences by firm size or the importance of barriers to insurance provision such as administrative costs or low demand by workers.

Another set of relevant studies analyzes the effect of state-level small-group reforms. Various reforms have tackled several possible problems that could affect whether a small firm offers health insurance if the key underlying issue is specifically one of insuring a small group: guaranteed issue, guaranteed renewal, portability, preexisting conditions, and rating restrictions, for example. These studies find little evidence that the reforms increased coverage as was intended. Two analyses find insignificant effects of the reforms on coverage (Monheit and Schone, 2003; Buchmueller and DiNardo, 2002), as does a third focusing specifically on the effects of purchasing alliances (Long and Marquis, 2001b). Another study (Simon, 2005) finds that small-group reforms could in some cases lead to no increases in coverage or even decreases if they also cause premiums to go up. However, another possibility is that the reforms did not address the primary causes of the problem for small firms and that there are even larger obstacles than the insurance market issues addressed by the reforms.

A few researchers have examined the relationship between a firm's provision of insurance and worker demand for it (Bundorf, 2002; Levy and DeLeire, 2003; Monheit and Vistnes, 1999). Worker demand may be related to several factors, including the affordability of the coverage, which may depend not only on the employee's contribution to the total premium and the perceived quality of coverage (e.g., plan type, deductibles, coinsurance, and covered benefits) but also on family income. Bundorf and Pauly (2006) use a variety of definitions of affordability and estimate that between one- and three-quarters of the uninsured cannot afford health insurance. Levy and DeLeire (2003) find that poorer households without health insurance tend to spend more on housing than similar households with insurance, suggesting that the high cost of necessities such as housing might make health insurance unaffordable. In more recent work, Monheit and Vistnes (2006) report that workers are less likely both to be offered and to

enroll in health insurance if they have weak preferences for health insurance (based on their answers to questions such as whether health insurance is worth the cost). For the most part, these studies do not address differences by firm size, although we do know from Levy (1998) that workers in small firms who are offered insurance often face higher premium contributions than their counterparts in larger firms and that among small businesses that offered coverage in 2003, nearly one-third provided less than a 50% subsidy for the cost of family coverage (KFF/HRET, 2003).

In this paper, we focus on offer-rates by workers' wage, income, or compensation levels. Low-wage workers are employed disproportionately by small firms and are at particular risk of being uninsured. A number of studies using several different data sources have demonstrated that low-wage workers are much less likely to have access to employer-provided health insurance than higher-wage workers. Using the 1999 Current Population Survey, Garrett and colleagues (2001) document that only 66 percent of workers earning less than $7 per hour worked at firms that offered employer insurance as compared to 94 percent of workers earning $15 per hour or more. Low-wage workers were also substantially less likely to be eligible for an employer plan, further widening the gap in access. Collins and colleagues (2003), using data from the Commonwealth Fund 2001 Health Insurance Survey, find that 53 percent of workers earning less than $10 per hour were eligible for an employer plan while 87 percent of those earning $15 or more per hour were eligible. This gap, along with differences in take-up and access to insurance from other sources, translates into a much higher rate of uninsurance for low-wage workers: 27 percent as compared to 4 percent for those earning $15 per hour or more. Employer data show similar patterns (Long and Marquis, 2001a; Glied et al., 2003).

Thus the lower average wage paid by small firms represents another possible reason for the disparity in offer rates between smaller and larger firms. However, studies focusing on the relationship between firm size and health insurance offering have tended not to emphasize that low levels of compensation might be a large part of the explanation. Yet the existing research linking wage and income to lack of access to employer insurance suggests that low wages, not firm "smallness" per se, may indeed explain the offer gap between small and large firms, in which case a policy emphasis on small-firm problems is misplaced. This view is supported by evidence that the offer rate for high-wage small firms is very similar to that of large firms (Lee, 2002), suggesting that the offer gap may be driven by wages rather than firm size. However, several studies of the link between health insurance access and wages leave unanswered some questions about small firms and health insurance, suggesting that the explanation for the firm-size offer gap is complex. For example, Glied and colleagues (2003) show that even after controlling for levels of average payroll per employee (their measure of wages or income), both firm size and establishment size have strong and significant effects on establishment offer rates. Establishments with 500-999 employees had over 11 times greater odds than those with fewer than 25 workers of offering health insurance, controlling for average payroll, unionization, industry, percent of workforce that is temporary, and percent of workforce that is female. Similarly, Garrett and colleagues (2001) show independent effects of both wage level and firm size. They document strong wage effects on access to employer insurance but also find that, holding wage levels constant, workers at larger firms are still more likely to have access to insurance.

We next analyze these relationships in greater detail, looking at health insurance disparities by firm size in the context of total worker compensation, including not only wages but also retirement plans and paid vacation.

DATA AND MEASURES

The primary data source we use for this analysis is the Household Component (HC) of the 1997-2003 Medical Expenditure Panel Surveys (MEPS), fielded each year since 1996 by the Agency for Healthcare Research and Quality. The MEPS-HC sample is drawn from respondents to the National Health Interview Survey, which provides a nationally representative sample of the noninstitutionalized civilian population of the United States. The MEPS contains individual and household-level data on demographic characteristics, income, employment, and health insurance coverage. The survey uses an overlapping panel design consisting of five rounds of interviews and follows households over a 2.5-year period.

The MEPS includes several employment and compensation measures, including respondents' wage rate for their current main job. Surveyors top-coded all wage rates above the 99th percentile and then recoded these to the maximum reported value (99th percentile). Based on the empirical wage distribution, we created a categorical variable with break points at the 10th, 20th, 30th, 40th, and 50th percentiles.[3] In addition to wages, the MEPS also asks workers about employer-provided benefits. From this information we defined a set of binary indicator variables that correspond to whether a worker has (a) an offer of health insurance through his or her employer, (b) a retirement plan, and (c) paid vacation as part of total compensation.

[3] The wage category breaks are as follows (rounded to 0.05): 10th percentile—$6.75; 20th percentile—$8.00; 30th percentile—$9.50; 40th percentile—$11.00; median—$12.85. All wage rates are expressed in 2003 dollars.

The MEPS contains two variables relating to firm size: number of employees and a binary indicator for whether the firm has more than one location. Three binary indicator variables for the number of employees measure different sizes of small firms: whether the establishment has 10 or fewer workers, 25 or fewer workers, or 50 or fewer workers. Other employment characteristics include the worker's job tenure measured in years, whether the worker is a member of a union, and a set of binary indicators for industry category. Finally, as a way to capture local labor market conditions, we also include the unemployment rate for the county in which the worker resides (www.bls.gov, 2006).

In addition to the compensation and employment variables, we include a set of measures to capture a worker's demographic and human capital attributes. These measures include age, age squared, education, education squared, race, sex, marital status, household income, and household income squared. Because there may be variation in the provision of benefits geographically and over time, we also include a set of geographic region dummies (Northeast, Midwest, South, West [excluded]) and a set of year indicator variables (2003 excluded) to control for these effects.[4]

Our study population is restricted to individuals who are between the ages of 18 and 64 who are employed during round 1 of the MEPS survey, not self-employed, and not full-time students. After removing observations with incomplete information on employment and benefits, we have 25,920 workers, of which 24,217 are employed full-time, which we define as working

[4] We considered several additional measures in our empirical analyses. These included the number of HMOs operating in the worker's county of residence as a way to control for the supply side of the health insurance market (InterStudy, 2006); state-level measures to capture mandates for inpatient mastectomy, infertility treatment, and mental health parity coverage (Health Policy Tracking Services, 2004); and a set of indicator variables to measure state-level, small-group reforms (e.g., guaranteed issue, premium rating bands, etc.). Since none of these measures were large in magnitude and/or significant in our results, we opted to report a more parsimonious model specification. The set of results that include these measures is available by request.

25 or more hours per week.[5] Table 1 reports descriptive statistics for both the overall and full-time worker samples.

METHODS

I. Establishment Size, Health Insurance, and Other Compensation

We first present some descriptive analyses in order to demonstrate the circumstances under which workers are offered health insurance. In particular, we use the MEPS-HC to document that workers in small establishments are less likely than those at larger establishments not only to be offered health insurance but also to be paid high wages, given retirement plans, and granted paid vacation benefits.

Next, we determine the extent to which the difference in health insurance offer rates between small and larger establishments can be explained solely by wage differences based on establishment size. To do this, we calculate and graph the probability of health insurance offers by establishment size conditioning on wage levels. To the extent that this difference exists in the wage category, the health insurance offering gap is not merely the result of workers at smaller establishments receiving lower wages.

Finally, to explore whether firms tend to offer a whole set of benefits or none at all, we graph the probability that workers will be offered health insurance conditional on their being offered other benefits (e.g., retirement plans, paid vacation).

[5] In the next section, we restrict our estimation sample to full-time workers. As reported in Buchmueller and Lettau (1999), health insurance appears to be the only benefit with a truly quasi-fixed cost, implying that the cost per hour

2. Why Small Firms Are Less Likely to Offer Health Insurance

In the second part of our analysis, we explore possible reasons why the provision of health insurance benefits might vary with firm size. We suggest three leading explanations. First, workers at small firms have lower wages on average and so are less able to afford health insurance. Second, a firm that decides to offer a health insurance plan incurs administrative costs, which are likely to be even higher if the firm offers a choice of plans. For example, employers are likely to incur costs associated with shopping for a plan, enrolling and "disenrolling" employees, and collecting employee contributions toward the premium. If the per-worker administrative costs of a benefit decrease with firm size, larger firms will be more likely to provide that benefit. Finally, smaller firms might be more susceptible to failures in insurance markets, and therefore insurance may be unreasonably costly or even unavailable. Thus, small firms might be less likely to provide health insurance because of workers' lower compensation rates, differences in administrative costs, or differing degrees of insurance market failure.

Our approach to distinguishing the relative importance of these three explanations is to use variation in the provision of different types of benefits across workers at firms of different sizes and of different average total compensation levels. In our analysis, we estimate the models in a multiple regression framework using linear probability models to estimate the probability that a worker is offered a particular benefit. Let

$$B_{ij} = X_{ij}\beta + \gamma Small_{ij} + \sum_{k=1}^{5} \delta_k Wage_{ij}^{k} + \varepsilon_{ij}, \qquad (1)$$

where B_{ij} is an indicator of whether worker i in establishment j is offered a particular benefit (health insurance, retirement benefits, or paid vacation), X_i is a vector of the worker's

worked is greater for part-time employees than for full-time employees. By restricting the analysis to full-time workers, we avoid picking up differences in different benefits along this dimension.

demographic and local labor market characteristics, $Small_{ij}$ is a binary indicator variable for whether the worker is in a small establishment, and $Wage_{ij}^{k}$ is an indicator for whether the worker receives a wage in the k^{th} decile of the distribution of wages.[6] These models allow us to control for demographic and labor market variables when estimating differences (described below) by establishment size and when making comparisons between benefits.

Our first step is to determine whether small firms are less likely to offer benefits because they are small (and therefore more likely to be susceptible to insurance market problems or to have higher administrative costs) or because small firms tend to provide lower total compensation on average. To do this, we estimate separate regressions for each benefit (health insurance, retirement, and paid vacation), controlling for demographic and human capital variables, region, union, industry, and year indicators, with a dummy variable for small establishment. We compare this to similar regressions that also include dummy variables for the worker's wage decile and a polynomial in household income. We expect the five wage decile dummies (for the 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, and 5^{th} deciles, relative to the omitted category of "above the median") and household income to account for differences in worker demand for benefits due to differences in total compensation levels.[7,8]

By using the categorical dummy variables based on wage deciles, we avoid picking up any compensating differentials for fringe benefits that might offset such effects if we used the worker's wage itself. A comparison of the small-firm effect for health insurance (as well as the other benefits) offer rates in the regressions that include and exclude the wage decile variables

[6] The omitted category is "above the median." In some specifications below, we extend this empirical model to include multiple definitions of small establishment.
[7] We note that some workers have the good fortune to be in "good" jobs that both pay well and offer benefits.
[8] In a robustness check of our model specification (described below), we use a constructed measure of total compensation as an alternative to wage deciles. This measure uses both reported wages and imputed values of fringe benefits from the U.S. National Compensation Survey, Employer Costs for Employee Compensation Summary.

indicates both (a) the extent to which commonly used estimates of this effect are actually due to lower compensation levels and (b) how large the independent effect of size remains after controlling for compensation level.

Our second step is to determine whether insurance market failure resulting from small group size can explain the difference in the likelihood that workers in small and larger firms will be offered health insurance. In these analyses, we control for the effects of income and wages, as discussed above, to capture workers' demand for health insurance. Any remaining difference in offering by firm size likely results from influences unrelated to total compensation. What might explain this difference? One possibility, as Monheit and Schone (2003, p. 238) have noted, is that "[s]mall groups may be unable to establish a sufficiently large and stable risk pool to absorb the costs of expensive, low probability medical events." The result of this lack of access to a large risk pool may be that small firms either are unable to offer insurance or can offer it only at much higher premiums than otherwise comparable larger firms.

To determine the importance of insurance market failures, we compare the differences in the likelihood that workers in small and larger firms will be offered health insurance with the differences in their likelihood of receiving a retirement plan. The logic behind this comparison is that a retirement plan is a benefit unlikely to be affected by insurance market failures. If insurance market failures are important in explaining the difference between the health insurance offering rates between small and larger firms, and if fixed administrative costs are similar for retirement plans and health insurance, then the firm-size difference in offering rates should be larger for health insurance than for retirement plans.

For exact identification of the effect of insurance market issues in causing the firm-size gap in health insurance, we would need to make the overly strong assumption that the decline in

per capita administrative costs as the number of employees increases is exactly the same for health insurance and retirement plans.[9] While we do not argue that this strong assumption is justified, we argue that any empirical similarities in the propensity of workers to be offered health insurance and retirement plans by establishment size is evidence against a primary role for market failures specific to *insurance* markets in explaining the health insurance "offer gap." Certainly, insurance problems represent a class of issues affecting health insurance but not retirement plans. If those problems are the major cause of the difference in health insurance offers between small and larger firms, we would expect to see larger differences in health insurance than for retirement plans by establishment size once we control for income, wages, and a variety of demographic and human capital variables (as well as allowing for different overall levels of demand and costs of supply for the two benefits through the intercepts). These comparisons will provide evidence of the extent to which insurance is a greater problem for small firms than other fringe benefits that also carry substantial administrative costs.

Our final step is to determine whether differences in administrative costs might explain the differences in health insurance by establishment size. To do this, we compare the difference in the probability that workers in small versus larger firms will receive a benefit (paid vacation) that has much lower administrative costs relative to health insurance and retirement plans. This comparison is useful in helping to provide bounds on the importance of administrative costs for the health insurance offer gap. The identifying assumption in this case is that there are relatively low administrative costs associated with administering paid vacation and much more substantial costs (but no additional insurance market costs) to offering retirement benefits.

[9] We pursued several avenues for obtaining direct evidence on employer costs associated with administering fringe benefits. These efforts included interviews with human resources managers and benefits consultants as well as searches for published summary statistics. But despite our efforts, we were unable to obtain detailed information on

Laying out the model more formally:

$$[\Pr(HI_i = 1 | Small\ Firm, X_i) - \Pr(HI_i = 1 | Big\ Firm, X_i)] - [\Pr(Retirement\ Plan_i = 1 | Small\ Firm, X_i) - \Pr(Retirement\ Plan_i = 1 | BigFirm, X_i)], \quad (2)$$

where *i* subscripts the individual worker, HI_i represents whether the individual is offered health insurance by the employer, and X_i is a set of individual worker characteristics such as education, age, race, gender, region of residence, wage, and household income. Again, if insurance market failures are important in explaining the difference in offering rates by firm size and if fixed administrative costs are similar for retirement plans and health insurance, then the offer gap between small and large firms should be larger for health insurance than for retirement plans. These comparisons will provide evidence on the extent to which insurance is a greater problem for small firms than other fringe benefits that also carry substantial administrative costs.

We estimate a similar equation when determining whether the firm-size offer gap can be explained by differences in administrative costs by comparing the difference for paid vacation and retirement plans. Thus, by using information on several types of benefits that share particular attributes (e.g., high administrative costs or insurance provision) and a difference-in-difference econometric approach, we identify the relative importance of administrative costs, worker demand, and insurance market failures for explaining the gap in health insurance provision between large and small firms, under the strongest version of our assumptions. More cautiously, we are able to provide guidance on the relative magnitude of these effects and on the relative importance of these explanations of why workers at small establishments are significantly less likely to be offered health insurance.

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administrative costs for the various benefits, due to either lack of availability or the proprietary nature of the information.

RESULTS

I. Establishment Size, Health Insurance, and Other Compensation

We begin by documenting patterns of health insurance offers by establishment size and across the wage distribution.[10] In Figure 1, we illustrate the relationship between establishment size and health insurance, based on the MEPS data. There is a steep gradient, with approximately 50 percent of workers at the smallest establishments (2-10 employees) offered health insurance and with that percentage rising to over 90 percent for workers at establishments that employ 100 or more.

However, as Figure 2 illustrates, low-wage workers are also much less likely than higher-wage workers to be offered insurance. The increase across the wage distribution in the percentage of workers offered employer health insurance is even more pronounced than the increase across the establishment size distribution, with only 30% of workers in the lowest wage decile being offered insurance through the employer and 90% of workers above the median wage having an offer.

The patterns depicted in Figures 1 and 2 are, in fact, at least somewhat related since wage levels are positively correlated with establishment size: the probability of working at a very small establishment is almost 2.5 times as great for a worker in the first wage decile than for a worker with a wage above the median; the probability of working at a large establishment (with more than 100 workers) is more than three times greater for a worker with a wage above the median than for a worker earning a wage in the first decile. Figure 3 shows how workers of different wage levels are distributed across establishments of different sizes.

[10] All empirical analyses use MEPS sampling weights that are adjusted for the complex sampling design. Data are weighted to represent 76 million workers. This number is smaller than what is reported in national estimates, since we excluded those workers who had missing information, as well as workers who did not meet the age, education,

To begin to sort out the separate effects of wage or compensation levels from establishment size on employer-offered health insurance, we stratify by wage category (each wage decile below the median and for all workers above the median) and graph offer rates by establishment size separately by wage category. These results are displayed in Figure 4. There is a substantial establishment size gradient in each wage category. For example, workers in the lowest decile are 42 points more likely to be offered employer insurance if they work at an establishment of 100 workers or more than if they work at an establishment with fewer than 10 employees. However, the differences between the wage categories are also striking. Workers at the smallest establishments who earn above the median wage are more likely to be offered health insurance than those who earn wages in the 1st and 2nd deciles at the largest firms. The MEPS data show both a strong effect of establishment size given the wage level and a strong effect of the wage level given the establishment size.

Figure 5 plots the percentage of workers offered paid vacation, health insurance, and retirement plans by establishment size. All three benefits are more likely to be offered at larger establishments. The probability of receiving each of the three benefits increases with establishment size, though the gradient is somewhat lower for paid vacation than for the other two benefits. This finding suggests that insurance market issues may not be the driving force behind low health insurance offer rates at small firms.

Figures 6 through 9 suggest that the gap in health insurance offer rates between workers at smaller and larger firms appears to be driven by some factor in common across benefits. This pattern can be seen in both the distribution of health insurance offer rates conditional upon being

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and self-employment criteria imposed above. In the regression analyses in the next section, the associated full-time worker population is 73 million workers.

offered a retirement plan or a paid vacation and in the joint distributions between being offered health insurance and being offered only one of the other benefits.

In Figure 6 we display, by establishment size, the fraction of workers who are offered health insurance conditional on being offered retirement benefits. We also plot again the unconditional health insurance offer rate for comparison. There is only a small firm-size gradient for health insurance among workers who are offered retirement benefits. If problems specifically related to insurance were driving the health insurance offer gap for small firms, we would expect to see a size effect whether or not retirement benefits were offered. These graphs indicate, however, that virtually all of the firm-size effect occurs among workers who are not offered retirement benefits.

In Figure 7, we display the corresponding relationships for health insurance and paid vacation benefits. While there continues to be some firm-size gradient for health insurance when we condition upon being offered paid vacation, the increase with establishment size in the conditional offer rate is less than for the unconditional health insurance offer rate. We suggest that it is possible that health insurance offer rates increase with firm size whether or not workers are offered paid vacation and that this increase could be due to higher administrative costs for health insurance (relative to the administrative costs for paid vacation) that are lower per worker as establishment size increases. We test this more formally below.

The next two figures plot the joint distributions of health insurance and retirement (Figure 8) and of health insurance and paid vacation (Figure 9). Both figures indicate that to a large extent provision of health insurance moves in tandem with retirement and with paid vacation. The most striking aspect of these graphs is that the main movement across the size distribution is from the provision of neither benefit at small establishments to the provision of

both at larger establishments. There is a small upward trend at the smallest establishments in the probability of offering health insurance without the other benefit but that movement is dwarfed by the increased proportion of workers offered both benefits as establishment size increases. These patterns support the proposition that health insurance is not alone in its relationship with establishment size and suggests that, as we look for reasons for the disparities in offer rates by firm size, we should seek a common explanation for firm-size differences.

2. Why Small Firms Are Less Likely to Offer Health Insurance

Our main results, reported in Table 2, correspond to the empirical model described in equation (1). The table reports estimates from three linear probability models for a worker offered health insurance, a retirement plan, and paid vacation. In addition to a control for whether the establishment has 10 or fewer workers, we include a set of controls indicating the worker's wage decile (1^{st}, 2^{nd}, 3^{rd}, 4^{th}, or 5^{th}, compared with the omitted category of above the median wage). Additionally, we include a polynomial in household income and controls for a wide array of worker characteristics, industry, the local unemployment rate, and a set of geographic region and year dummy variables.

The results indicate, first, that not all of the gap in the offering rates of health insurance between workers in smaller and larger establishments can be attributed to differences in the wages or incomes of workers at these two types of firms. Support for this conclusion comes from the fact that, after controlling for wages and income, workers at establishments with 10 or fewer workers are still 21 percentage points less likely than those at larger establishments to be offered health insurance. Moreover, comparing the relative magnitudes of the effect of being in a small firm between the baseline specification in Table 2 and the specification reported in the second

column of Table 2, which is identical to the baseline except for the exclusion of the wage and household income measures, we find that while the size effects are smaller in the specification with wage decile controls, a significant and substantial size effect remains. Specifically, we find that the estimates differ by only .026, a roughly 10% difference.

In addition to the significant firm-size effect, we also see substantial effects of the worker's wage level *itself* on the probability of being offered employer insurance. Workers in the 1st wage decile are 40 points less likely to be offered insurance than workers with a wage above the median; workers in the 2nd decile, 30 points less likely; and workers in the 3rd decile, 20 points less likely. Although wage levels explain only a small portion of the firm-size effect, the very strong independent association between wage levels and health insurance is clearly a central aspect of the compensation context in which access to employer health insurance must be understood.

In summary, the results on the effects of compensation indicate, first, that not all of the gap in the offering rates of health insurance between workers in smaller and larger establishments can be attributed to differences in the wages or incomes of these two types of workers. Thus, the difference in the offering rates of health insurance by employer size is not merely a total compensation income issue. Nonetheless, wage and income effects themselves are quite large and highlight the extent to which low-wage workers at firms of all sizes lack access to employer health insurance. It is possible, however, that even controlling for total compensation, workers in smaller firms differ from those in larger firms in their preference for receiving compensation in the form of benefits.

The demographic and other control variables have the expected signs in each of the benefits regressions. Age and education increase the probability of being offered each benefit, as

does job tenure. A higher local unemployment rate is associated with a lower probability of being offered each benefit. Race and marital status are insignificant, but offer rates for each benefit are approximately 2 points higher for women. Being a union employee increases the probability of having both health insurance and retirement but, surprisingly, has a small negative effect on the probability of receiving paid vacation.

The difference in the rate at which workers are offered a retirement plan remains lower for workers at small establishments relative to workers at larger establishments after we control for wages, incomes, worker demographics, industry, and year. We find that workers at establishments with 10 or fewer workers are 21 percentage points less likely than their counterparts at larger establishments to be offered a retirement plan—almost exactly the same difference as for health insurance.

Because the differences in the rates of offering by establishment size are at least as large for retirement plans as for health insurance, it seems unlikely that issues specific to health insurance markets (e.g., small pooling, adverse selection) can explain why workers in smaller establishments are less likely to be offered health insurance. To reach this conclusion, we compare the coefficient on establishment size in the health insurance equation to that in the retirement benefit equation, and find that the coefficients on establishment size are almost identical for the two benefits.[11] Using different definitions of establishment size, we find slightly larger firm-size gaps for retirement benefits than for health insurance. In no case do we find a larger effect for health insurance as compared to retirement, which is what we would expect to find if insurance issues were the critical reason for the health insurance gap between large and small firms.

[11] In hypothesis tests, we find no significant difference between these coefficients in the baseline regression.

The difference in the rate at which workers are offered paid vacations is also lower for workers at small establishments, controlling for compensation, income, and other factors. Workers at establishments with 10 or fewer workers are more than 12 percentage points less likely than workers at larger establishments to be offered paid vacation. We argue that since the difference in offering rates for this benefit, which has relatively low fixed administrative costs, is much smaller (though still positive) than for either health insurance or for retirement plans, the fixed administrative costs of setting up and running either a health insurance or retirement plan likely are a primary reason why workers at smaller establishments are less likely to be offered these benefits. These differences in the effect of establishment size on the paid vacation versus retirement or health insurance equations are substantial and significant in all specifications, including the sensitivity checks described below.

We also performed several robustness checks. First, we evaluated the sensitivity of our results with respect to how we define a small firm. The model specification in Table 3 is equivalent to the baseline specification with the addition of an interaction term for whether the worker is at a small establishment and whether the firm has more than one location This modeling choice effectively creates three categories of firm size: firms with 10 or fewer employees, those with fewer than 10 employees and multiple locations, and those with more than 10 employees. Here it is possible to see a large distinction between the availability of health insurance offers between single- and multiple-location small firms. Specifically, we find that a worker in a multiple-location, small establishment is 7 points less likely to have an offer of health insurance relative to a worker in a large establishment, and a worker in a single-location, small establishment is 34 percentage points less likely to have an offer of health insurance. In

addition to observing large gaps in health insurance offers, we find similar size effects for retirement plans, and smaller differences with respect to the paid vacation benefit.

As a second check, we reestimated our baseline specification using two alternative definitions of small establishment: whether an establishment has 25 or fewer employees, or 50 or fewer employees (see Table 4). For example, we find that when comparing workers in establishments with 50 or fewer employees to those in larger establishments, these workers are still almost 13 percentage points less likely to have an offer of health insurance, 18 points less likely to have a retirement plan, and 8 points less likely to have a paid vacation benefit.[12] In these specifications, we find a larger size gap for retirement than for health insurance, reinforcing the conclusion that strictly insurance-related issues are not the primary driver of the small-firm health insurance gap since in no case do we find a larger gap for health insurance than retirement benefits.

Finally, we performed two checks of our method of controlling for compensation levels. Our primary concern was whether the coefficients on our wage decile dummies could be picking up not only demand-side compensation effects but also a compensating wage differential for the benefit. Although we used wage decile dummies rather than the wage variable itself to avoid this problem, it is possible that if there were a full compensating differential for health insurance then the provision of insurance would move a worker into a lower decile category. To test whether our results were robust to other ways of controlling for compensation we first included only a single binary indicator variable for whether a worker's wage was below the median, rather than using a set of wage deciles. We find that the size of the small-firm effect is unchanged by this way of accounting for a worker's wage. Our second strategy was to measure total compensation

by taking into account both wages and the value of fringe benefits offered to a worker. Unfortunately, the MEPS does not contain detailed information about the latter, and so we imputed average values of health insurance, retirement plans, and paid vacations using data from the 1997-2003 National Compensation Survey, Employer Costs of Employee Compensation Summary (http://www.bls.gov/ncs/ect/home.htm, 2007). After constructing an estimate of each worker's total compensation, we created a set of deciles and included the 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, and 5^{th} (values above the median total compensation are the excluded category) in the model specification. Our results from these models indicate that the effect of being a worker in a small establishment is slightly smaller than that reported in the baseline specification; however, the qualitative pattern of results does not change.

We acknowledge a number of study limitations. First, we are unable to directly assess how the administrative costs associated with health plans compare with those associated with retirement plans. Unfortunately, there are no data sources in the public domain that provide such information, but we do have some support for the idea that these costs are roughly similar based on anecdotal evidence from human resources managers. Second, we do not have any comprehensive information about the value of the benefits, and it is possible that patterns in the value of offered benefits by firm size may differ from those of the probability of being offered a particular benefit. Finally, it is possible that other characteristics of the workplace—such as co-worker characteristics and the age of the firm—may affect employees' access to health insurance as well as the other benefits (Carrington et al., 2002).

[12] We estimated other specification checks which incorporate both the alternative small firm definitions and the interaction term. In all cases our results are robust to these specification changes. These results are available upon

POLICY IMPLICATIONS AND CONCLUDING REMARKS

Policies for increasing access to health insurance for workers at small firms will be more successful if they are based on a more complete understanding of how health insurance fits into the broader context of compensation at small firms. We cite three potential reasons to explain the firm-size gap in health insurance offerings: lack of demand due to relatively low compensation or lack of affordability, insurance market failures, and administrative costs. By using comparisons among the offering rates for health insurance, retirement plans, and paid vacations, our results suggest, indirectly, that the fixed administrative costs of setting up and running a health insurance plan may be an important reason why workers at smaller establishments are less likely to be offered this benefit, while insurance market failures and compensation likely play a smaller role in explaining the small-firm offer gap. The compensation level itself does, however, have a very strong independent effect on offer rates and should also be carefully considered in policy debates.

Public policies seeking to improve access to health insurance for workers and their families either have focused on a single failure (e.g., pooling risk) or have been comprehensive (e.g., single payer). An incremental reform strategy focusing on a single factor has the potential to be effective, but only if it targets the factor that is driving the gap. Our findings suggest that reforms focusing on insurance market failures, such as small-group reforms aimed at pooling risk, are not likely to be effective with respect to increasing health insurance offer rates at small firms.

Our results suggest that administrative costs are a potentially significant factor driving the gap. What then does this suggest in terms of policy? Association Health Plans (AHPs) or Small Business Health Plans have been proposed for small firms in order to both improve risk pooling

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request.

and reduce administrative costs but it is not yet clear whether they do, in fact, reduce administrative costs. It is possible that this policy might lead to higher administrative costs if there are coordination issues both within the firm and between the firm and the association. In fact, the Congressional Budget Office (2000) has concluded that AHPs would do little to reduce administrative costs and improve health insurance access. Moreover, the recent experience of California's health insurance purchasing pool, PacAdvantage, which closed at the end of 2006 due to the withdrawal of insurers, also suggests that these groups may face other serious obstacles and no compelling cost advantage, depending on how they are structured and the environment in which they operate.

Another strategy that might reduce administrative costs is the proposal to allow small firms to buy in to the Federal Employee Health Benefits Plan (FEHBP). While reducing administrative costs may not be the driving force behind this proposal, it is possible that administrative cost reductions could result; however, again, there is no evidence yet that this is the case (and it might increase the administrative costs of the FEHBP). Such a plan may also face other hurdles, such as adverse selection, that could offset possible savings in terms of lower administrative costs. Whether or not administrative costs would be reduced almost certainly depends on the particulars of the structure of such a plan. Our results suggest that lowering administrative costs should be considered as a way to increase the rate at which smaller firms offer health insurance. However, because it is unclear which, if any, policies might be effective at reducing the administrative costs faced by smaller firms in the provision of health and other benefits, more research is needed to determine how best to reduce these costs. Proposals such as the FEHBP buy-in should be specifically evaluated in terms of the extent to which they would

reduce the administrative costs faced by small firms in offering health insurance plans to their employees.

Of course, a portion of the higher per-worker administrative costs borne by small firms is not reflected in their premiums but rather is the result of increased human resource department functions as, for example, the firm shops for the benefit, coordinates the benefit with employees, and integrates the benefit with the payroll. These costs might represent a firm's hiring of a human resource specialist or an entrepreneur's time. It is unclear what, if any, policies might reduce the higher per-worker administrative costs for small firms as at least a portion of these costs are an inherent feature of being a small firm.

Also, while our results do not indicate that relatively low levels of compensation for workers at small firms explain the difference in offerings between small and large firms, we do find that low wage levels are associated with a much lower likelihood of being offered health insurance. If the wage effects are due to lower demand by low-wage employees, we can use these estimates to assess how large an increase in compensation would be required to substantially increase that demand. We find that wage increases would have to very large to prompt a significant response. Consider a typical small-firm worker with wages in the first decile and a predicted probability of a health insurance offer of 0.20. To increase that probability by approximately 30 points to 50%, our estimates imply that the worker would need to move from the 1st to the 4th decile of the wage distribution, with a corresponding wage increase of about 60%.[13] To the extent that tax subsidies or credits in the employer-based system mimic this increase in compensation, these subsidies would have to be very large relative to workers' wage rates to have a substantial effect, a finding in keeping with previous studies of insurance take-up.

[13] The wage decile threshold for the first wage decile is $6.75, and for the 4th decile is $11.00.

This makes these policies unlikely to be an efficient way in which to expand coverage access, despite the strong connection between wage levels and offer rates.

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Table 1.
Descriptive Statistics

	All workers		Full-time workers	
Variable	Mean	Linearized SE	Mean	Linearized SE
Offer health insurance	0.768	0.003	0.807	0.004
Retirement plan	0.592	0.005	0.616	0.005
Paid vacation	0.764	0.003	0.813	0.004
Establishment size ≤ 10	0.196	0.003	0.188	0.003
Establishment size ≤ 25	0.341	0.004	0.336	0.005
Establishment size ≤ 50	0.474	0.004	0.467	0.005
Firm has more than 1 location	0.674	0.004	0.691	0.005
Hourly wage rate ($)	17.06	0.138	17.55	0.146
Age (years)	39.02	0.094	39.06	0.109
Education (years)	13.28	0.031	13.14	0.031
White	0.824	0.006	0.835	0.006
Black	0.124	0.006	0.113	0.006
Other race	0.052	0.005	0.052	0.005
Female	0.486	0.002	0.423	0.003
Married	0.571	0.005	0.575	0.006
Household income ($1000s)	62.516	0.555	63.088	0.609
Northeast	0.188	0.012	0.179	0.012
Midwest	0.237	0.014	0.24	0.014
South	0.353	0.019	0.358	0.019
West	0.222	0.019	0.223	0.02
Union employee	0.143	0.004	0.141	0.004
Job tenure (years)	7.068	0.083	7.425	0.094
Agriculture	0.004	0.0005	0.004	0.0005
Mining	0.005	0.001	0.006	0.001
Construction	0.073	0.002	0.073	0.002
Manufacturing	0.201	0.005	0.211	0.005
Transportation and communications	0.092	0.002	0.093	0.002
Sales	0.201	0.003	0.197	0.004
Finance and insurance	0.081	0.003	0.085	0.003
Repair services	0.06	0.002	0.057	0.002
Personal services	0.035	0.002	0.033	0.002
Entertainment and recreation	0.038	0.002	0.035	0.002
Professional services	0.13	0.003	0.126	0.004
Unknown industry	0.002	0.0004	0.0008	0.0002
County-level unemployment rate	4.948	0.071	4.939	0.072

Source: Authors' calculations from the MEPS-HC, 1997 - 2003.

Table 2.
The Relationship Between Establishment Size and Benefit Offering: Baseline Models

	Offer of Health Insurance		Offer of Health Insurance		Retirement Plan		Paid Vacation	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Establishment size ≤10	-0.2361***	0.0083	-0.2101***	0.0081	-0.2081***	0.0095	-0.1215***	0.0088
1st Wage decile	--	--	-0.3988***	0.0168	-0.3496***	0.0151	-0.3926***	0.0176
2nd Wage decile	--	--	-0.3046***	0.0151	-0.3050***	0.0152	-0.2524***	0.0155
3rd Wage decile	--	--	-0.1992***	0.0132	-0.2424***	0.0150	-0.1749***	0.0141
4th Wage decile	--	--	-0.0859***	0.0117	-0.1967***	0.0121	-0.0738***	0.0116
5th Wage decile	--	--	-0.0411***	0.0101	-0.1016***	0.0132	-0.0202**	0.0099
R^2	0.257		0.3206		0.3534		0.2366	

Note: Models also controlled for age, age squared, years of education, years of education squared, household income, household income squared, race, sex, marital status, union status, job tenure, job tenure squared, county unemployment rate, and sets of industry, region, and year indicator variables. *** p<.01, ** p<.05, * p<.10

Source: Authors' calculations from the MEPS-IC.

Table 3.

The Relationship Between Establishment Size and Benefit Offering: Controlling for Firms' Having More than 1 Location

	Offer of Health Insurance		Retirement Plan		Paid Vacation	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Establishment size ≤ 10	-0.3448***	0.0130	-0.3237***	0.0107	-0.1962***	0.0122
Estab. size ≤ 10 * > 1 location	0.2766***	0.0157	0.2374***	0.0147	0.1513***	0.0143
1st Wage decile	-0.3842***	0.0169	-0.3371***	0.0148	-0.3866***	0.0176
2nd Wage decile	-0.3029***	0.0146	-0.3036***	0.0148	-0.2523***	0.0154
3rd Wage decile	-0.1937***	0.0134	-0.2377***	0.0151	-0.1724***	0.0142
4th Wage decile	-0.0824***	0.0113	-0.1937***	0.0119	-0.0733***	0.0116
5th Wage decile	-0.0365***	0.0098	-0.0977***	0.0132	-0.0183*	0.0098
R^2	0.3429		0.3642		0.2448	

Note: Models also controlled for age, age squared, years of education, years of education squared, household income, household income squared, race, sex, marital status, union status, job tenure, job tenure squared, county unemployment rate, and sets of industry, region, and year indicator variables. *** p<.01, ** p<.05, * p<.10

Source: Authors' calculations from the MEPS-IC.

Table 4.
The Relationship Between Establishment Size and Benefit Offering: Alternative Definitions of "Small Establishment"

	Offer of Health Insurance		Retirement Plan		Paid Vacation	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Establishment size ≤25	-0.1608***	0.0065	-0.1948***	0.0083	-0.0869***	0.0070
Establishment size ≤50	-0.1274***	0.0059	-0.1759***	0.0076	-0.0816***	0.0062

Note: Models also controlled for indicators for wage decile, age, age squared, years of education, years of education squared, household income, household income squared, race, sex, marital status, union status, job tenure, job tenure squared, county unemployment rate, and sets of industry, region, and year indicator variables. *** p<.01, ** p<.05, * p<.10

Source: Authors' calculations from the MEPS-IC.

Figure 1.
Relationship Between Establishment Size and Health Insurance Offering

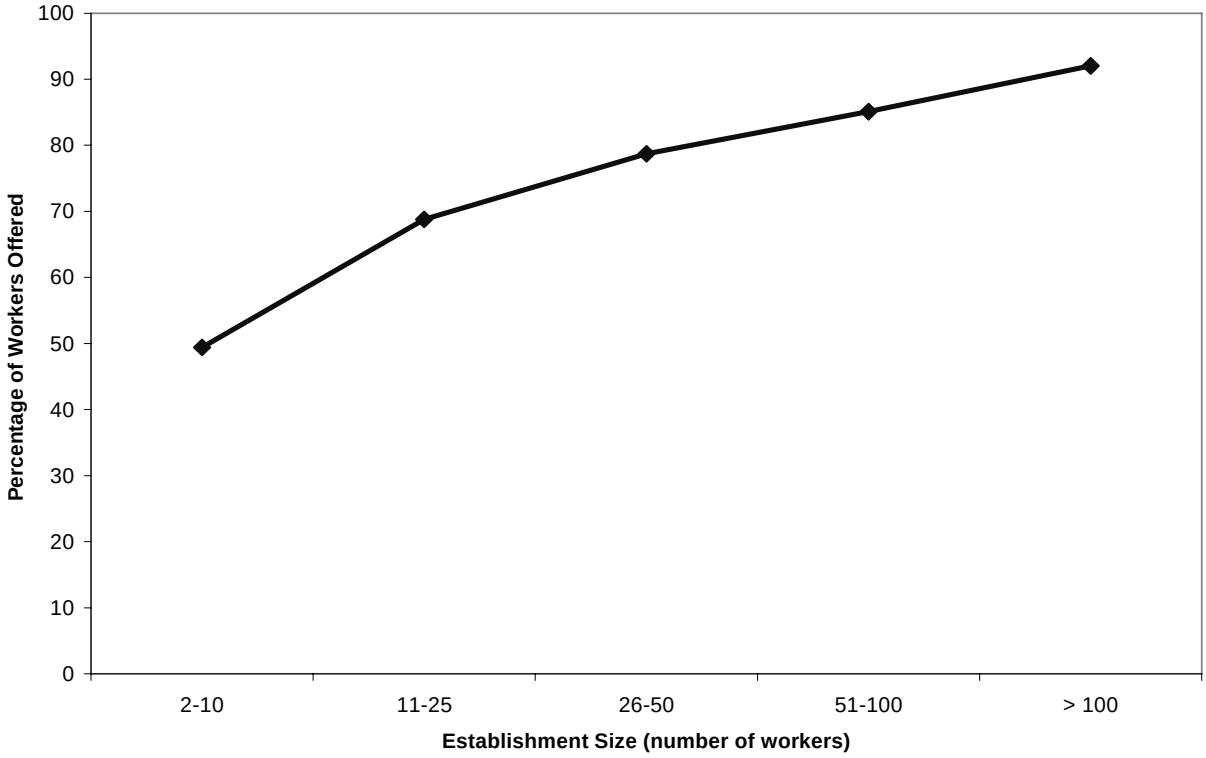

Figure 2.
Relationship Between Deciles of Workers' Wages and Health Insurance Offering

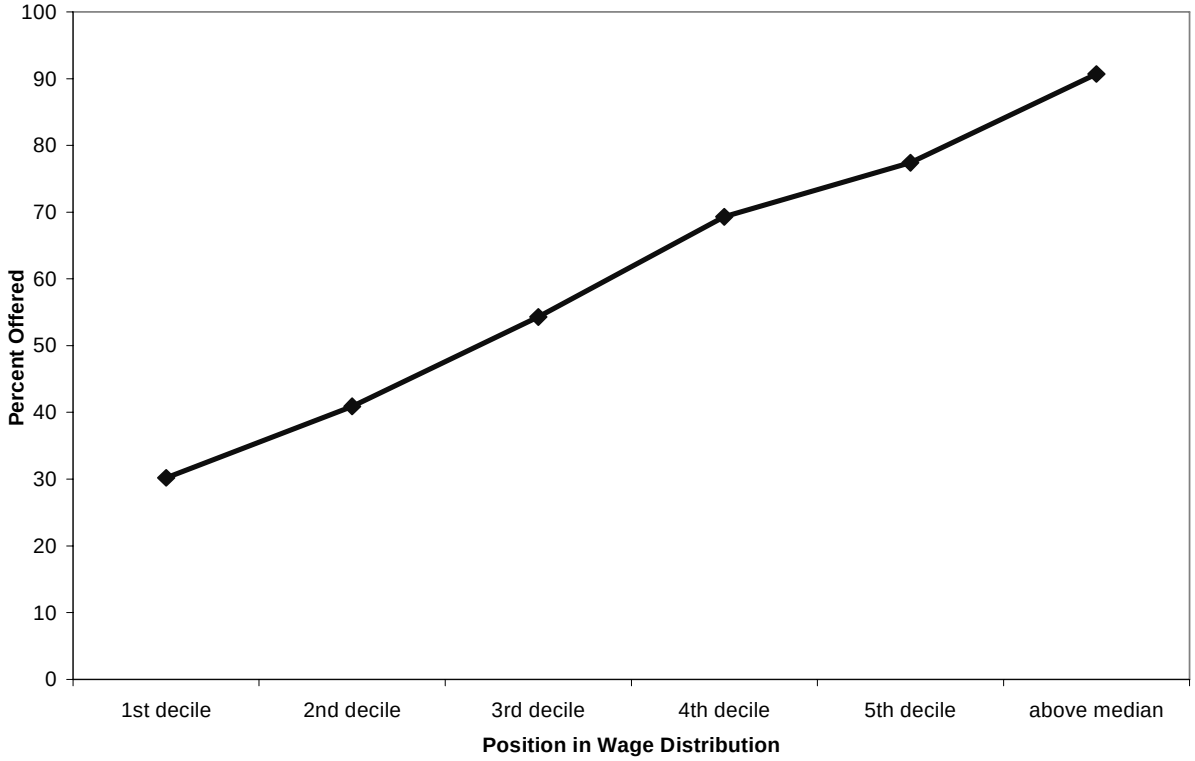

Figure 3.
Relationship Between Deciles of Workers' Wages and Firm Size

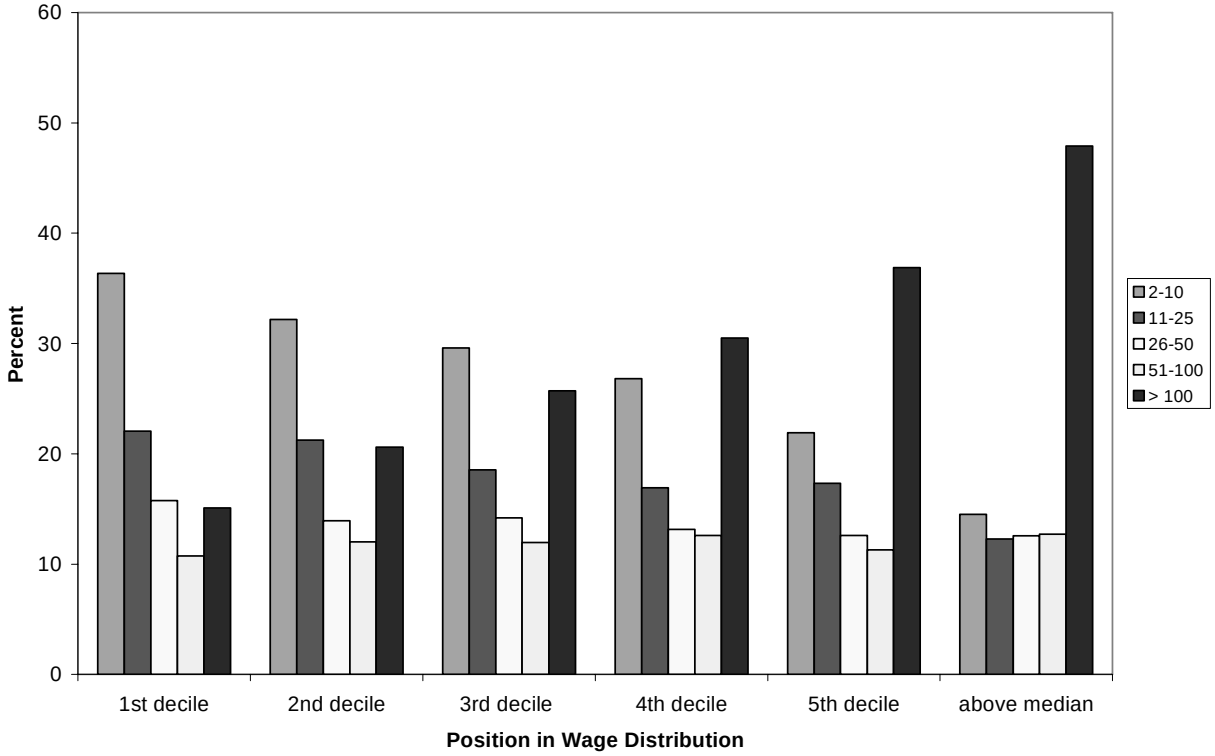

Figure 4.
Relationship Between Establishment Size and Health Insurance Offering by Wage Level

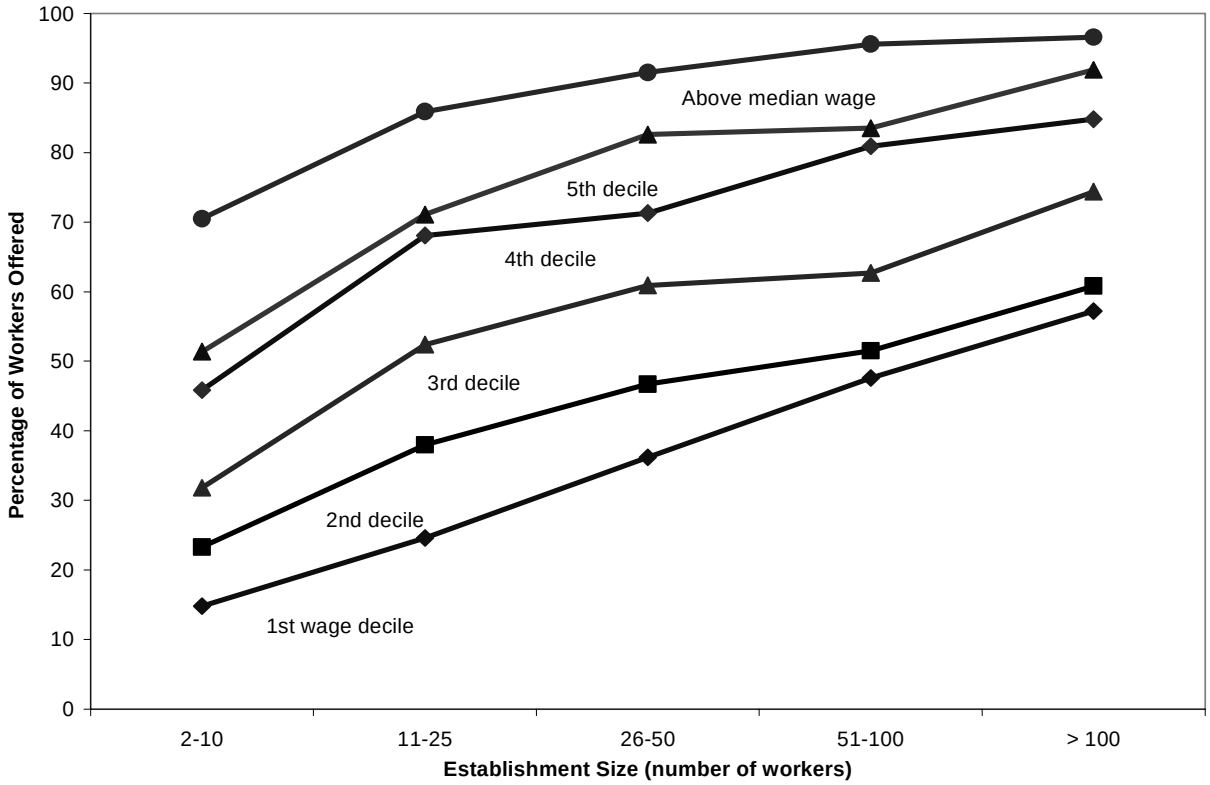

Figure 5.
Relationship Between Establishment Size and Paid Vacation, Health Insurance, and Retirement or Pension Benefits and

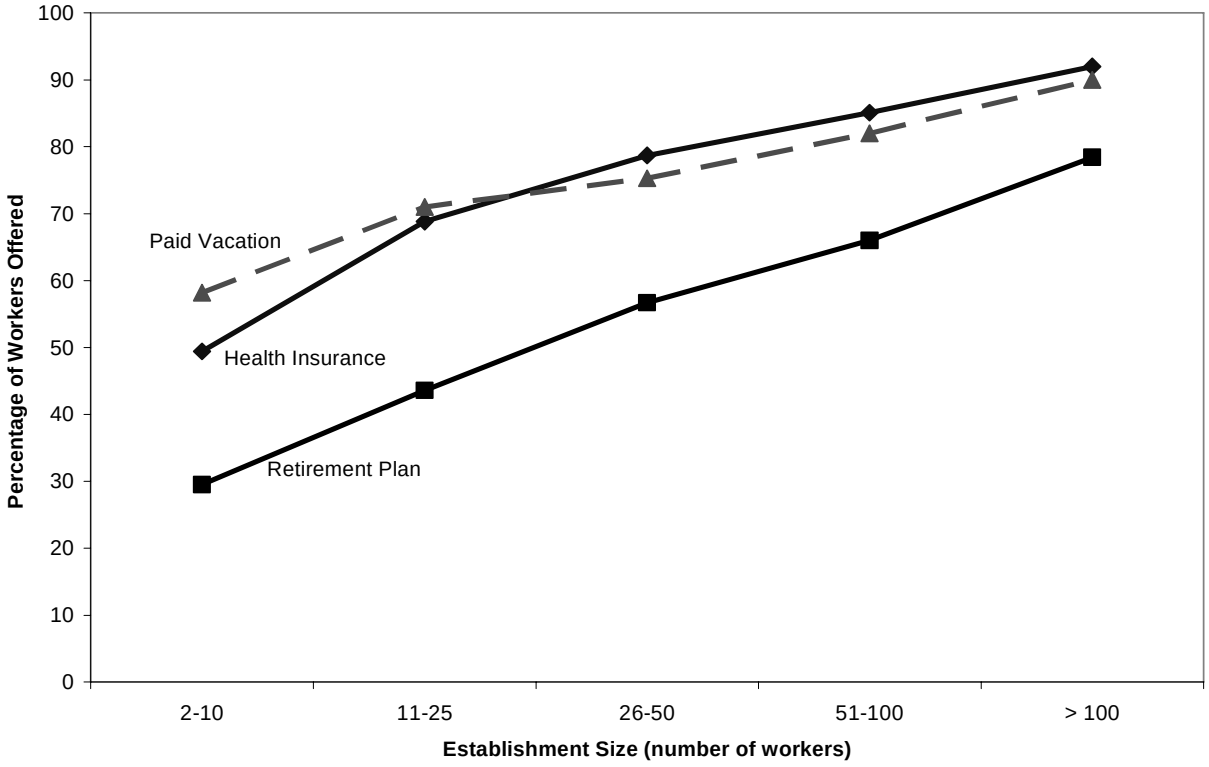

Figure 6.
Offer of Health Insurance, Conditional on Retirement Plan by Establishment Size

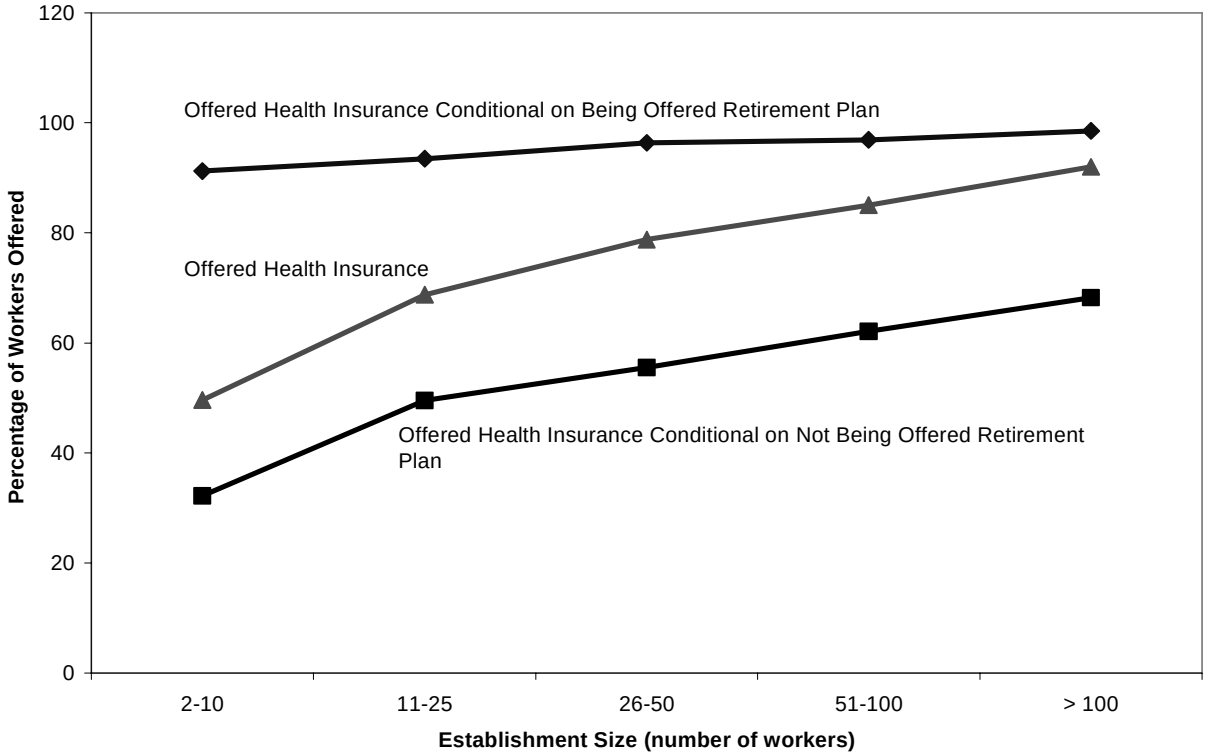

Figure 7.
Offer of Health Insurance, Conditional on Paid Vacation by Establishment Size

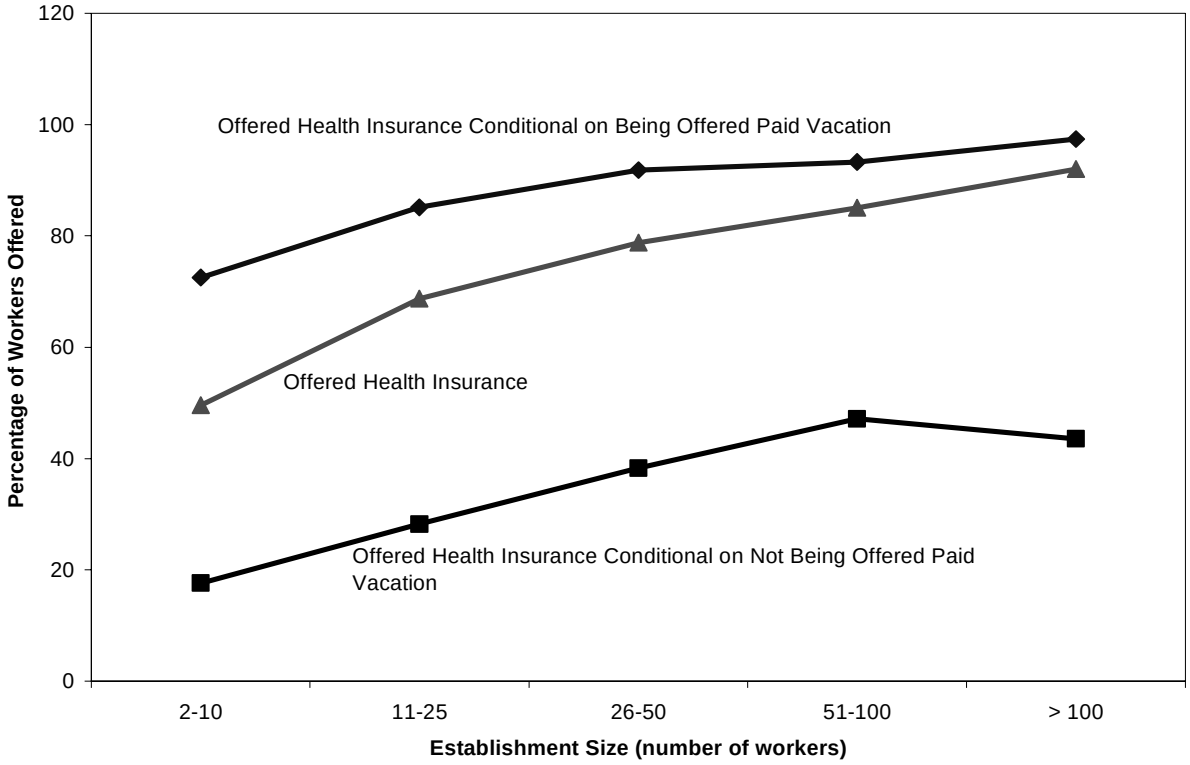

Figure 8.
Joint Distribution of Health Insurance and Retirement

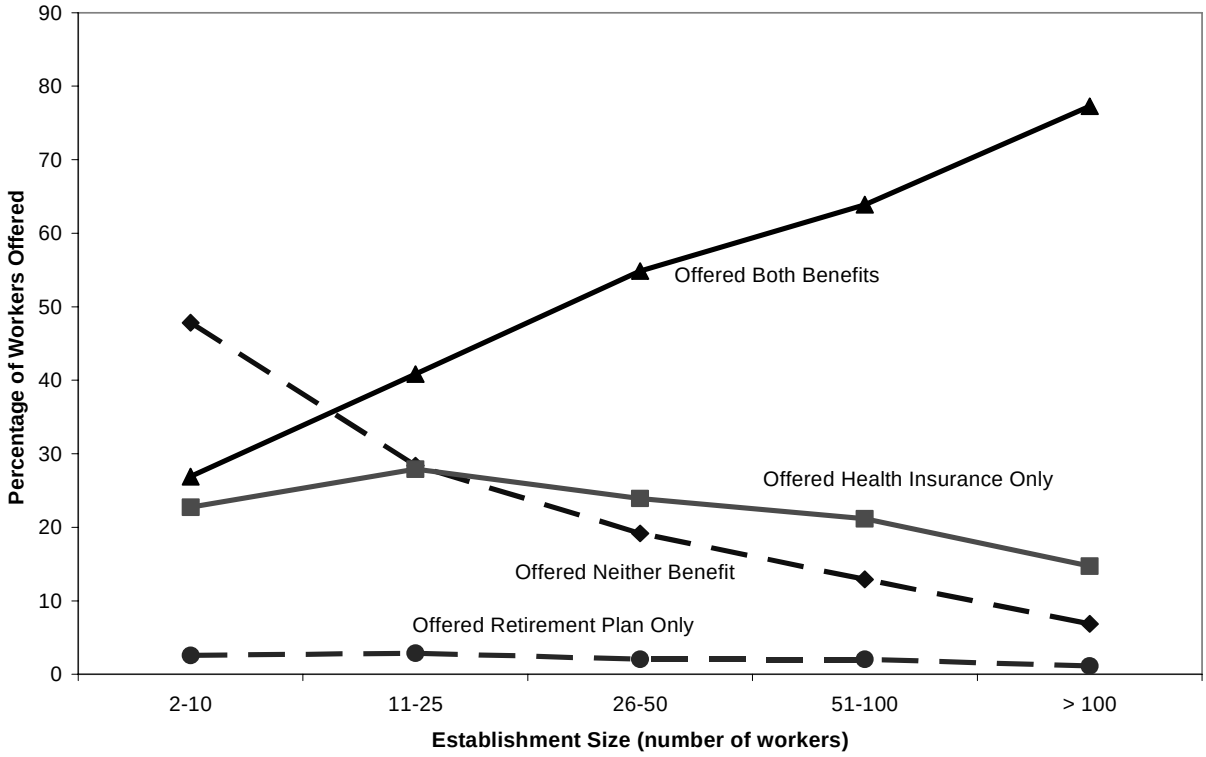

Figure 9.
Joint Distribution of Health Insurance and Paid Vacation