The Small Firm Hypothesis and the Percent of U.S. Society without Health Insurance: An Investigation Using Alternative Means Tests

Cebula, Richard and Bopp, Anthony

Jacksonville University, James madison University

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By Richard J. Cebula and Anthony E. Bopp

Abstract

The objective of this study is to proffer and then empirically investigate for the U.S. what is being identified as the "small firms hypothesis," i.e., a hypothesis that the greater the percentage of firms that are "small," the greater the percentage of the population that will be without health insurance. This is based on the premises that smaller firms face bargaining-power, financial, and competitive constraints that tend to limit their ability to provide group health insurance benefits to their employees, with the result being that employees at smaller firms are relatively more likely than employees at larger firms to be without a health insurance fringe benefit. The empirical analysis in the study adopts the percentage of private firms with 20 or fewer employees as the measure of "small firms." A second objective of this study is to ascertain whether the strength (robustness) of the findings on behalf of the small firms hypothesis is sensitive to alternative measure(s) of family purchasing power or family economic status. Accordingly, eight different estimations are undertaken, each one adopting a different specification for measuring family economic status. The cross-section analysis provides strong empirical support for the "small firms hypothesis" across all of the specifications for family economic status. (JEL Code: I11)

Keywords: health insurance; small firms; bargaining power; financial capacity

Introduction

Although health economics in its myriad dimensions continues to attract increasing attention (Burke, Fournier & Prasad, 2007; David & Helmchen, 2007; Ellis & McGuire, 2007; Kan, 2007; Lindrooth, Bazzoli & Clement, 2007; Sen, 2007; Wagstaff, 2007), arguably the issue in U.S. healthcare that has received the greatest attention in recent years is that of health insurance coverage (Bharmal & Thomas, 2005; Cebula, 2006; Cooper & Schone, 1997; Cutler, 1994; Cutler & Gruber, 1996; Dushi & Honig, 2003; Frick & Bopp, 2005; Fronstin & Snider, 1996/97; Gruber, 2003; Harris & Keane, 1999; Holahan, Nichols, Blumberg & Shen, 2003; Kronick & Gilmer, 2002; deMeza, 1983; Newhouse, 1994; Nyman, 2003; Owings, 2007; Oxford Analytica, 2007; Reichman, Corman & Noonan, 2006; Swartz, 2001, 2003; Thurston, 1997, 1999). This issue has increasingly captured the interest of the popular press and political pundits as well as scholars across a variety of academic disciplines. Presumably, as argued in Dushi & Honig (2003, p. 252), at least part of this increased attention can be attributed to the fact that there has been a noticeable decline in health insurance coverage over the last quarter of a century. Indeed, over a decade ago, Cutler (1994, p. 20) had already observed that "About 15 percent of the population…are uninsured." More recently, Frick and Bopp (2005) express concern that 17 percent of the population was without health insurance in 2000. Even more recently, for the year 2003, Bharmal & Thomas (2005, p. 643) observe that the number of uninsured reached 43.6 million. Indeed, there are indications of a continuing upswing in the numbers of the medically uninsured in the U.S.

For example, as of January 24, 2007, it was being estimated that 47 million Americans were without health insurance (Owings, 2007).

This study seeks to provide insights into this issue by empirically investigating what is proffered here as the "small firms hypothesis," namely, that the greater the percentage of private sector firms that is "small," measured here by firms with 20 or fewer employees, the greater the aggregate percentage of the population *without* health insurance benefits, *ceteris paribus*. This specific dimension of the health insurance coverage issue has generally been ignored in the scholarly literature. Given (a) the limited ability of small firms to negotiate affordable group health insurance contracts with health insurance companies, (b) the typically relatively limited financial capacities of smaller firms to afford to pay the employer-responsibility component of group health insurance benefits for their employees, and (c) the reality that the relative cost of group health insurance is rising rapidly, it is expected that the ability of smaller firms to provide group health insurance benefits for employees will be limited relative to larger firms, i.e., firms that, due (a) to their larger numbers of employees, are more likely to have stronger negotiating positions (vis-à-vis health insurance companies) *and* (b)tend to have financially "deeper pockets."

The study provides a framework that considers the impact that small firms exercise on the availability of group health insurance to employees. Furthermore, this study empirically also investigates the impact on the percentage of the population without health insurance of such factors as: average household size; unions; the percentage of the population age 65 and above; the cost of housing; and smoking. To test the strength of the small firms hypothesis, eight alternative estimates are provided, each of which adopts a different specification for family purchasing power or economic status. In all cases, it is found that the greater the percentage of firms with 20 or fewer firms, the greater the percentage of the population *without* health insurance.

Pertinent Recent Studies

Before providing the framework for and empirical results of the present study, it is relevant to review some recently published literature on health insurance coverage. We begin with a very pertinent observation by Swartz (2003, p. 283), who observes that a majority of those without health insurance "…cannot afford to purchase…[it]…unless it is heavily subsidized." Swartz (2003, p. 283) elaborates that "Most [such people] do not have access to employer-sponsored coverage and so must purchase…insurance in the non-group market…," where it is usually twice as costly as employer-provided group health insurance. Swartz (2003, p. 283) also argues that to an extensive degree higher health insurance premiums charged in the non-group market, as well as denial of health insurance coverage, both "…reflect market failure due to asymmetric information." For example, health insurance companies clearly cannot know so much about an individual's health status, his or her propensity to seek medical care, or his or her family health history as the individual does. According to Swartz (2003, p. 283) due to "…this asymmetry, it is impossible…to set premiums that accurately reflect the nonrandom portion of health-care costs for different individuals." Swartz (2003, p. 286) argues compellingly that "The non-group health-insurance markets…need…government to spread the costs of extremely high-cost people." Swartz (2003, p. 286) contends the "…rationale for government covering the worst risks exists: it will permit…non-group

markets to operate more efficiently and reduce the lack of affordable coverage for many people."

In a study by Dushi & Honig (2003), the focus is somewhat different. In particular, in Table 1 of their study, Dushi & Honig (2003, p. 253) provide evidence on gender differences in the propensity to purchase group health insurance when the latter is available. Their data reveal that females in the labor force tend to have a lower overall "take-up" rate than males in terms of health insurance purchases: 73 percent of the time for females versus 88 percent of the time for males. Dushi & Honig (2003) argue that some portion of this male-female take-up disparity is attributable to married women opting to rely on a spouse's health insurance plan. This male-female take-up disparity notwithstanding, when an employer-provided group health insurance plan *is* available, nearly three-fourths of the time women *do* nevertheless take advantage of the option.

In a study by Thurston (1999, p. 683), the focus is on the finding that the proportion "…of Americans who are insured through employment-based health plans has experienced a steady decline for…years." Thurston (1999, pp. 683-4) expands the conventional labor supply model to integrate the "realities" of health insurance benefits. Within the context of this model, Thurston (1999, pp. 685-6) finds that "…when the relative price of the health benefit is rising, a decrease in employment-based health insurance is consistent with rational worker and employer behaviour and is to be expected."

The study by Newhouse (1994) focuses on the propensity of the elderly to purchase health insurance. Newhouse (1994) makes the observation that most of the U.S. population age 65 and older are covered by Medicare. Newhouse (1994) also stresses that (by age 65) as one's age increases, quite naturally so too do the incidence and seriousness of health problems. Given the limitations involved with coverage in the Medicare system, Newhouse (1994, p.7) observes that many elderly persons regard Medicare as inadequate protection to accommodate their needs. Arguably, it is because of the latter consideration that Newhouse (1997, p.7) finds that "…over 80 percent of the Medicare beneficiaries…had some form of supplemental health insurance…"

The empirical study by Frick and Bopp (2005) is concerned with the issue that 15 to 20 percent of the population does not have health insurance. Frick and Bopp (2005) stress that the classic utility-insurance model makes it clear that having an extremely low income can very seriously restrict the ability of family units to afford health insurance. Naturally, the Frick and Bopp (2005) study not only focuses on the effects of poverty on health insurance purchases but also on other factors. Working with pooled cross-sectional/time-series data, the empirical estimation process reveals, among other things, that: the percent of the population *without* health insurance is directly related to the percent of the population whose income lies below the poverty level, the percent of the population that is female, and the percent of the population with only a high school diploma, with the first of these three variables being the most dominant factor.

Finally, a study by Cebula (2006) investigates the percent of the population without *health* insurance in the year 2000. Several empirical estimates are provided. The most unique finding in the study is that the percent of the population *without* health insurance is directly related to the percent of the population that is either self employed or independent contractors. Interestingly, the study also finds that the percent of the population *without* health insurance is inversely related to median family income and the

percent of the population age 65 or older, with the latter finding being consistent with Newhouse (1994).

The Framework of the Study

The framework adopted in this study focuses on the affordability (AFFORD) of health insurance and the access (ACCESS) to (availability of) health insurance as the context within which to *explain the percent of the population without health insurance* (PCTWOUT). In particular, the context is the following:

$$PCTWOUT = f(AFFORD, ACCESS),\ f_{AFFORD} < 0,\ f_{ACCESS} < 0 \qquad (1)$$

Within this framework, the household is treated as a utility-maximizing decision-making unit, with maximum utility being pursued subject to a variety of real world constraints, including a broadly interpreted budget constraint. Pursuit of utility-maximization for the household naturally reflects economic, demographic, health-related, and institutional dimensions and considerations.

Consistent with the most basic objective of this study, there is a focus on small firms and the issue of health insurance coverage. Arguably, the ability or inability of firms to provide their employees group health insurance depends upon a number of factors, including in many cases firm size. A part of the central hypothesis examined in this study is that when negotiating with health insurance companies, small firms may lack the bargaining power necessary (because of their limited numbers of employees) to secure a functionally useful and effectively affordable (to them *and* to their employees) group health insurance plan; therefore, the greater the percentage of firms that are categorized as "small," the greater the proportion of the population that can be expected to be *without* health insurance, *ceteris paribus*. In addition, for the most part, small firms have limited financial resources with which to subsidize group health insurance. This would seem especially true in the prevailing globally competitive economy, where many smaller domestic firms struggle to compete for their very economic survival against larger domestic firms on the one hand and perhaps even against low-labor-cost foreign firms on the other hand. In this context, many small firms have insufficient profit margins to underwrite group health insurance for their employees. Moreover, this limited ability of small firms to provide employment-based health insurance may be especially likely in view of "…the rising relative price of privately-insured health services…" (Thurston, 1999, p. 685). Accordingly, for these various reasons, it is hypothesized here that *the greater the percentage of firms in a state that is categorized as "small" (SMFIRMS), the lower the availability of group health insurance and thus the greater the percentage of the aggregate population in that state* ***without*** *health insurance (PCTWOUT), ceteris paribus*. This is referred to in the present study as the "small firms hypothesis." For the purposes of this study, "small" refers to firms with 20 or fewer employees.

Next, it is observed that arguably the most fundamental economic consideration relative to the population's having health insurance is that of purchasing power, which essentially involves resources with which to make purchases. Clearly, household income is one reasonable variable that can be used to reflect family resources. Indeed, Cebula (2006) finds median family income to positively and significantly influence the purchasing of health insurance. Accordingly, it is expected that the higher the household

family income, the *lower* the percentage of the population *without* health insurance, *ceteris paribus*. It should be noted that in separate estimations, alternative measures of family economic status or purchasing power are considered in the analysis as well, namely, the unemployment rate (UNEMPL) and the poverty rate (POVERTY). These two variables are further discussed later on in the text; indeed, a measure of the overall cost of housing (COH) also will be considered later on in the text.

Once a family possesses a given set of financial resources with which to make purchases, including that of health insurance, other factors enter the decision-making process. For example, whatever a household's income may be, the size of the household in terms of the number of persons in the household is pertinent. Clearly, the larger the number of family members and other parties residing within a household, the more thinly the household's financial resources will be stretched and the more costly will be the household's insurance premium and related costs, *ceteris paribus*. It reasonably follows that the greater the family size (FAMSIZE), the lower the probability of the family's being able to afford health insurance, *ceteris paribus*.

It is hypothesized that the purchase of health insurance coverage is an increasing function of union membership (UNION), *ceteris paribus*, presumably in part because the existence of unions and their collective bargaining power allegedly has tended to raise the availability of group health insurance plans (Dushi & Honig, 2003; Swartz 2003, Cebula, 2006). Indeed, historically, the provision of group health insurance has been a common component of labor union-management contract negotiations (Cebula, 2006). In theory, then, the *higher* the percentage of the labor force in a state that is unionized, the *lower* the degree to which the population in the state will *fail* to have health insurance, *ceteris paribus*. The strength of this hypothesis is increased by the aforementioned arguments found in Swartz (2003, p. 283), who observes that many households "…cannot afford to purchase health insurance unless it is heavily subsidized." Presumably, this subsidy more often comes in the form of employer-provided group health insurance when there is a labor union present (Dushi & Honig, 2003; Swartz, 2003; Cebula, 2006).

Next, there is the issue of age. As a reflection of the findings in Newhouse (1994), in this study the proportion of the population age 65 or over (AGE65&OVER) is expressly considered (controlled for). Recall the aforementioned arguments and data in Newhouse (1994) to the effect that, despite very widespread coverage under Medicare within this age group, most of the people in this age bracket choose to purchase some form of supplementary health insurance because they regard Medicare as inadequate medical protection. Accordingly, in this study, it is hypothesized that the *greater* the percentage of a state's total population that is age 65 or over, the smaller the percentage of that state's total population that is *without* health insurance *per se*, *ceteris paribus*.

Finally, an additional factor that is integrated into the analysis to provide further insights into the availability and/or affordability of health insurance is the risk-factor variable SMOKER (a measure of the percentage of the population classified as "smokers"). Profit-seeking, risk-averting health insurance companies logically would either refuse health insurance to potential clients who are smokers (limiting availability directly) or impose higher premiums and other financial burdens on them (decreasing affordability). In either case, the higher SMOKER, the higher the PCTWOUT, *ceteris paribus*.

Empirical Findings

Based on the eclectic framework provided above, the percentage of a state's total population that is *without* health insurance coverage, PCTWOUT, is *initially* modeled, as:
PCTWOUT = f(HHINC, FAMSIZE, UNION, SMFIRMS, AGE65&OVER, SMOKER),
$f_{HHINC} < 0$, $f_{FAMSIZE} > 0$, $f_{UNION} < 0$, $f_{SMFIRMS} > 0$, $f_{AGE65\&OVER} < 0$, $f_{SMOKER} > 0$ (2)

The actual reduced-from equation to be *initially* estimated is given by the following:

$$PCTWOUT_j = a_0 + a_1\, HHINC_j + a_2\, FAMSIZE_j + a_3\, UNION_j + a_4\, SMFIRMS_j + a_5\, AGE65\&OVER_j + a_6\, SMOKER_j + u \quad (3)$$

The definitions of these variables, followed by the respective data sources, are:
$PCTWOUT_j$ = the percentage of the total population in state j without health insurance coverage, 2004 (U.S. Census Bureau, 2007, Table 145);
HHINCj = average household income per family unit in state j, 2000-2003 (U.S. Census Bureau, 2005, Table 667; 2006, Table 662; 2007; Table 661);
FAMSIZEj = average number of persons per household in state j, 2000 (U.S. Census Bureau, 2002, Table 53);
$UNION_j$ = the percentage of the labor force in state j that was unionized, 2003 (U.S. Census Bureau, 2007, Table 631);
SMFIRMSj = the percentage of all private firms in state j with 20 employees or less, 2000 (U.S. Census Bureau, 2006, Table 744);
AGE65&OVERj = the percentage of the population in state j in 2000 that was age 65 and older (U.S. Census Bureau, 2002, Table 21); and
SMOKERj =the percentage of the total population in state j who were smokers, 2000, where "smokers" are defined as those who are currently smoking every day or some days and who have reported smoking at least 100 cigarettes during their lifetime (U.S. Census Bureau, 2002, Table 185).
The study uses cross-section state-level data, with Washington, D.C. excluded from the study. Descriptive statistics are provided in Table 1.

Table 1. Descriptive Statistics

Variable	Mean	Standard Deviation
PCTWOUT	15.7	3.65
HHINC	42,518.73	6,310.14
FAMSIZE	2.56	0.1338
UNION	13.702	5.7887
SMFIRMS	86.114	1.5092
AGE65&OVER	12.561	1.9818
SMOKER	22.8068	3.9017
POVERTY	11.0796	2.8667
UNEMPL	5.3864	1.0628
COH	100.7	15.64

Column (a) in Table 2 provides the results of the OLS estimate of equation (3), after adopting the White (1980) heteroskedasticity correct (which is adopted in *all* of the estimations in the study). Terms shown in parentheses are t-statistics. As shown in column (a), all six of the estimated coefficients exhibit the expected signs, with four statistically significant at the one percent level, one significant at beyond the five percent level, and one significant at only the ten percent level. The coefficient of determination is 0.58, so that this model explains nearly than three fifths of the variation in the dependent variable, whereas the F-statistic (8.59) is significant at beyond the one percent level.

The estimated coefficient on the FAMSIZE variable is positive, as hypothesized, and significant at the one percent level. Thus, there is strong evidence that larger family size raises the percent of the population without health insurance, possibly a reflection of diminished affordability of health insurance for larger families (where there are "more mouths to feed" and in all likelihood higher health insurance costs). The estimated coefficient on the UNION variable is negative, as hypothesized, and significant at beyond the two percent level. This finding provides evidence that the greater the percentage of the population that is unionized, the greater the access to and affordability of health insurance (Swartz, 2003; Dushi & Honig, 2003). The estimated coefficient on the AGE65&OVER variable is negative and significant at the one percent level. This finding reflects that fact that within this age bracket, there is a high degree to which supplemental health insurance (to Medicare) is purchased (Newhouse, 1994; Cebula, 2006). The coefficient on the risk variable SMOKER is positive and significant at the one percent level. Thus, this finding implies that, as hypothesized, smokers face higher health insurance premiums and other higher health insurance costs and/or more limited access to health insurance, all of which of course should act to raise PCTWOUT. Next, the estimated coefficient on HHINC is negative, as hypothesized, but significant at only the ten percent level. Thus, there is only weak evidence that higher household income results in a lower percentage of the population without health insurance. As will be shown in the two other (alternative) estimates in this study, however, other measures of household purchasing power can be statistically significant determinants of PCTWOUT.

Finally, and from the viewpoint of this study, most relevantly, the coefficient on the SMFIRMS variable is positive and significant at the one percent level, providing strong evidence that the greater the percentage of firms that is "small," i.e., have 20 or fewer employees, the lower the availability of affordable group health insurance for employees and hence the higher the PCTWOUT. In other words, it appears that, as opposed to larger firms, the limited bargaining power of smaller firms (vis-à-vis health insurance companies) combined with the limited financial resources typical of smaller firms and the fact that the relative price of the health benefit is rising tends to restrict the of ability of many small firms to provide practical group health insurance for their employees. Accordingly, the greater the percentage of firms in the economy that is classified as "small," the greater the percentage of the population without health insurance. The small firms hypothesis receives strong empirical support in this estimate.

To test the robustness and consistency of this finding, *initially* three additional (alternative) estimates similar to the basic model in equation (3) were undertaken. These estimates are provided in columns (b), (c), and (d) of Table 2. The estimate in column (b) parallels the model in equation (3) and column (a) except that the average household income (HHINC) variable has been replaced by the variable POVERTY. The latter

variable is defined as the average percent of the population in each state that was at or below the federally defined poverty level over the 1999-2001 period. The data for this variable were obtained from the U.S. Census Bureau (2001, Table 684; 2005, Table 688). It is expected that, *ceteris paribus*, the higher the percentage of the population that is at or below the poverty level, the greater the percentage of the population that *cannot* afford health insurance (Frick & Bopp (2005) and hence the greater the PCTWOUT. The estimate in column (c) parallels the model in equation (3) and column (a) except that the household income variable (HHINC) has been replaced in this case by the unemployment rate of the civilian labor force (UNEMPL) in year 2001. These data were obtained from the U.S. Census Bureau (2002, Table 565). It is expected that the higher the UNEMPL, *ceteris paribus*, the higher the PCTWOUT because unemployment reduces family unit purchasing power and hence the affordability of health insurance (as well as access to, in the case of group health insurance). Finally, the estimate in column (d) includes *all three* of these measures of household economic status, HHINC, POVERTY, and UNEMPL.

As shown in column (b), all six of the estimated coefficients exhibit the expected signs, with three being statistically significant at the one percent level and three being significant at the five percent level or beyond. The R^2 in column (b) is 0.66, so that this model explains roughly two-thirds of the variation in the dependent variable; the F-statistic is 12.23 and significant at far beyond the one percent level.

The estimated coefficient on the POVERTY variable is both positive and significant beyond the one percent level, as expected (Frick & Bopp). In this study, this variable appears to be a better measure of health insurance affordability than household income. Meanwhile, the results for the other estimated coefficients in column (b) are entirely consistent with those in column (a). Thus, it appears that PCTWOUT is an increasing function of not only POVERTY but also of FAMSIZE and SMOKER while being a decreasing function of UNION and AGE65&OVER. In addition, of course, there is the estimated coefficient for SMFIRMS, which is positive, as hypothesized, and significant at well beyond the one percent level. Thus, this alternative specification of the basic model also yields strong support for the small firms hypothesis.

In column(c) of Table 2, the OLS estimate yields results very similar to those in column (b). In this estimate, all six of the estimated coefficients exhibit the expected signs, with four significant at the one percent level and the remaining two significant at beyond the five percent level. Interestingly, the variable UNEMPL, which takes the place of POVERTY in column (b) and HHINC in column (a), is positive (as hypothesized) and significant at the four percent level. In any event, the estimated coefficient on the SMFIRMS variable is, once again, positive and statistically significant at the one percent level, whereas the remaining results are consistent with those in columns (a) and (b).

Finally, in column (d) of the Table, all three of the initial measures of the family's economic status are adopted *simultaneously*. Although the coefficients for the HHINC and UNEMPL variables are not significant (multicollinearity being a factor), the coefficient on the POVERTY variable is positively significant at the one percent level. The results are otherwise comparable to those in columns (a) through (c). Most importantly, the coefficient on the SMFIRMS variable is positive and statistically significant at the one percent level, attesting yet again to the resilience of this variable. Thus, all four of these specifications of the model provide strong empirical support for the "small firms hypothesis."

Table 2. OLS Estimations: Dependent Variable PCTWOUT

Variable/Estimate	Column (a)	Column (b)	Column (c)	Column(d)
Constant	-122.7	-100.3	-117.5	-104.72
HHINC	-0.00008	--------	--------	-0.00016
	(-1.75)			(-1.82)
FAMSIZE	+12.37	+9.345	+10.903	+8.09
	(+2.64)	(+2.11)	(+2.62)	(+2.05)
UNION	-0.183	-0.131	-0.244	-0.191
	(-2.52)	(-2.24)	(-3.30)	(-2.66)
SMFIRMS	+1.219	+0.985	+1.108	+0.943
	(+4.45)	(+3.51)	(+3.96)	(+3.57)
AGE65&OVER	-0.553	-0.624	-0.377	-0.501
	(-2.94)	(-3.05)	(-2.22)	(-2.49)
SMOKER	+0.562	+0.426	+0.54	+0.469
	(+2.76)	(+2.19)	(+2.84)	(+2.29)
POVERTY	--------	+0.469	--------	+0.64
		(+3.18)		(+2.95)
UNEMPL	--------	--------	+0.695	+0.189
			(+2.14)	(+0.47)
R^2	0.58	0.66	0.60	0.69
AdjR^2	0.51	0.61	0.54	0.62
F	8.59	12.23	9.25	9.62

Of course, it could reasonably argued that the above model and results are limited insofar as they have omitted any consideration of geographic differentials in either the cost of living or the cost of housing. Clearly, there exist large interstate differentials in the cost of living and the cost of housing (Ashby, 2007), which in turn can create large interstate differentials in the purchasing power and economic status of residents. To account for this factor, the analysis now integrates the variable, COH_j, defined as the index of the overall cost of housing in state j in year 2001 for the average four-person family. Variable COH_j is an index with a mean value of approximately 100.00. The source for variable COH_j is ACCRA (2002). The choice of COH_j as the measure of interstate differentials in purchasing power is based on the findings and argument in Ashby (2007, p. 686), who shows that the cost of "…housing…is the main driver of cost-of-living differences between states." It is hypothesized in this study that the higher the COH, the higher the PCTWOUT, *ceteris paribus*, because a higher COH reduces the family unit's ability to afford to pay health insurance premiums.

The estimates provided in Table 3 parallel those in Table 2 except that the COH variable is now included in each of the four estimates in order to more adequately measure the economic status (purchasing power) of the families in each of the states.

Table 3. Estimates with Cost of Housing Index Included as Measure of Economic Status

Variable\Estimate	Column (a)	Column (b)	Column (c)	Column (d)
Constant	-117.1	-106.67	-128.8	-112.66
HHINC	-0.00021	-------	-------	+0.00001
	(-2.34)			(+0.10)
FAMSIZE	+10.44	+8.347	+10.9	+8.54
	(+2.59)	(+2.19)	(+2.69)	(+2.07)
UNION	-0.1799	-0.173	-0.268	-0.1698
	(-2.82)	(-2.94)	(-3.26)	(-2.63)
SMFIRMS	+1.225	+1.0396	+1.217	+1.098
	(+4.96)	(+4.57)	(+4.52)	(+4.50)
AGE65&OVER	-0.51	-0.528	-0.35	-0.561
	(-3.49)	(-3.38)	(-2.10)	(-2.97)
SMOKER	+0.474	+0.442	+0.59	+0.474
	(+2.30)	(+2.36)	(+2.81)	(+2.34)
POVERTY	-------	+0.471	-------	+0.528
		(+3.67)		(+2.58)
UNEMPL	-------	-------	+0.406	-0.312
			(+0.97)	(-0.67)
COH	+0.4956	+0.2992	+0.2086	+0.3552
	(+2.88)	(+2.34)	(+2.09)	(+2.15)
R^2	0.65	0.70	0.61	0.70
AdjR^2	0.58	0.64	0.54	0.62
F	9.57	11.87	8.09	8.87

In column (a) of Table 3, all seven of the estimated coefficients exhibit the expected signs and are significant at beyond the three percent level. Indeed, four are significant at beyond the one percent level. Unlike its counterpart coefficient in column (a) of Table 2 (which was significant at barely the ten percent level), the coefficient on the HHINC variable is now statistically significant at the 2.5 percent level, implying that the PCTWOUT is a decreasing function of HHINC. Furthermore, the coefficient on the COH variable is positive (as hypothesized) and significant at the one percent level, implying that the PCTWOUT is an increasing function of the cost of housing. This result makes sense since the higher the cost of housing, the more strapped the family budget and the less the degree to which a family can afford health insurance premiums. The other findings in column (a) of Table 3 are entirely consistent with those in column (a) of Table 2. Interestingly, the R^2 value (0.65 versus 0.58) and the adjusted R^2 value (0.58 versus 0.51) are higher in this estimate than in its counterpart in Table 2. The same is true of the F-statistic (9.57 versus 8.59). Overall, then it appears that the findings in column (a) of Table 3 are more robust than those in column (a) of Table 2. Finally, once again, there is strong evidence on behalf of the small firms hypothesis.

In column (b) of Table 3, all seven of the estimated coefficients exhibit the expected signs and are statistically significant at the four percent level or beyond. Indeed, all of the t-statistics in this column are larger than their counterparts in column (b) of Table 2. In addition, the estimated coefficient on the COH variable in Table 3 column (b)

is positive and significant at the 2.5 percent level, once again implying [as in column (a) of this Table] that the higher the cost of housing, the greater the percent of the population without health insurance. Of greater importance, there is yet further strong evidence in support of the small firms hypothesis.

In column (c) of Table 3, although the coefficient on the COH variable is positive and significant at the five percent level, the coefficient on the UNEMPL variable now fails [in contrast to column (c) in Table 2] to be significant at even the ten percent level. The latter finding may be attributable to at least some degree to the somewhat high correlation between UNEMPL and COH (+0.59). Aside from these two results, the findings in column (c) in both Tables 2 and 3 are not materially different from one another. Of particular interest is the finding that once again there is strong empirical support for the small firms hypothesis.

Finally, in column (d) of Table 4, the coefficients on HHINC and UNEMPL both fail to be significant at the ten percent level; however, the estimated coefficient on the COH variable is positive and significant at the five percent level. Otherwise, the results in column (d) of both Tables 2 and 3 are consistent with one another. Interestingly, given that the COH variable is both positive (as hypothesized) and statistically significant in all four of the estimates in Table 3, it would appear to be a potentially necessary variable to consider in order to avoid "omitted variable bias." This issue notwithstanding, in column (d) of Table 3, as in columns (a), (b), and (c), there is yet further strong empirical support for the small firms hypothesis, with the estimated coefficient on the variable SMFIRMS being positive and significant at far beyond the one percent level.

Conclusion

This study has provided a variety of findings in the search for explanations of the failure of so many Americans to have health insurance coverage. At least three of the variables found in this study have received very limited serious formal attention elsewhere in the scholarly literature. This is the case, for example, with respect to the risk variable SMOKER, as well as the generally ignored variables COH and SMFIRMS.

This study finds strong empirical evidence that the percent of the population without health insurance (PCTWOUT) is an increasing function of family size, the cost of housing (COH), and the percentage of the population that is classified as "smokers" (SMOKERS). In addition, the PCTWOUT appears to be a decreasing function of union membership and the percent of the population age 65 and older. The results for the impacts of the variables UNEMPL (the unemployment rate) and HHINC (average household income) are mixed but overall are not compelling, although this is truer in the case of UNEMPL than that of HHINC. When POVERTY is used in place of HHINC or the UNEMPL in the model, it exercises a positive and significant effect on the percentage of the population without health insurance, presumably indicating that affordability of health insurance (as measured by POVERTY) is critical to the purchase thereof (Swartz, 2003; Frick & Bopp, 2005). Indeed, POVERTY retains its positive and significant coefficient even in the two estimates where HHINC and UNEMPL are *both* also present.

Finally, and most relevant to the objective of this study, there is strong empirical evidence for the small firms hypothesis that the greater the percentage of firms having 20 or fewer employees (SMFIRMS), the greater the percentage of the population *without*

health insurance. The empirical results imply that under the umbrella of the small firms hypothesis, slightly in excess of one percent of the total population is without health insurance coverage. Since at least 15 percent of the population lacks health insurance, the small firms hypothesis identifies approximately 1/15th or roughly seven percent of the cause of the health insurance problem in the U.S.

There may exist reasonable public policy options to help alleviate this problem for *small firms and their employees*. Indeed, there may be potential tax-break policies that can be afforded smaller firms (as defined) that wish to provide group health insurance for their employees. For example, a system of federal income tax *credits* for small firms to partially or totally offset the *employer's* cost of providing employee group health insurance would seem to be one such option that may carry merit and feasibility. Of course, alternative policy choices exist, and cost-benefit analysis of all the feasible options should be undertaken in a general equilibrium context prior to any actual policy action. Before closing, it is perhaps worthy of note that Oxford Analytica (2007) observes that some state legislatures are experimenting with two ways to combat the rising number of uninsured. One of these experiments is referred to as "employer mandates," which would *require* employers to offer health insurance to their employees. Arguably, based on the findings provided in the present study, such a policy *could* represent a serious financial challenge for *small* firms (as defined here).

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