Costs, Use and Outcomes

Employer-Sponsored Insurance, Health Care Cost Growth, and the Economic Performance of U.S. Industries

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Objective. To estimate the effect of growth in health care costs that outpaces gross domestic product (GDP) growth (“excess” growth in health care costs) on employment, gross output, and value added to GDP of U.S. industries.

Study Setting. We analyzed data from 38 U.S. industries for the period 1987–2005. All data are publicly available from various government agencies.

Study Design. We estimated bivariate and multivariate regressions. To develop the regression models, we assumed that rapid growth in health care costs has a larger effect on economic performance for industries where large percentages of workers receive employer-sponsored health insurance (ESI). We used the estimated regression coefficients to simulate economic outcomes under alternative scenarios of health care cost inflation.

Results. Faster growth in health care costs had greater adverse effects on economic outcomes for industries with larger percentages of workers who had ESI. We found that a 10 percent increase in excess growth in health care costs would have resulted in 120,803 fewer jobs, US\$28,022 million in lost gross output, and US\$14,082 million in lost value added in 2005. These declines represent 0.17 to 0.18 percent of employment, gross output, and value added in 2005.

Conclusion. Excess growth in health care costs is adversely affecting the economic performance of U.S. industries.

Key Words. Health care costs, economy, employment, industry, employer-sponsored health insurance

The rate of growth in health care costs in the United States has outpaced the growth rate in the gross domestic product (GDP) for many years. Correspondingly, the share of GDP accounted for by health care spending increased from 4.5 percent in 1940, to 12.2 percent in 1990, to 16.0 percent in 2005, when health care spending totaled nearly US\$2 trillion, or US\$6,697 per capita (Catlin et al. 2007).

Recently, concern has intensified that continued rapid growth in health care costs, and especially in the share of GDP devoted to health care, may harm the U.S. economy. Private businesses are especially vulnerable to health care cost growth because about three-fifths of all Americans have employer-sponsored health insurance (ESI) (Kaiser Commission on Medicaid and the Uninsured 2007). Many observers argue that rapidly rising health insurance premiums exert pressure on employers to increase total employee compensation, as employers cannot easily reduce wages to *completely* offset premium increases. For some employers, explicit contracts (e.g., with unions) may preclude wage cuts or even require wage increases. Other employers may be prevented from reducing wages by implicit norms, a desire to avoid damaging working morale, or competition for workers with unionized firms.

Upward pressure on total compensation, in turn, may force employers to reduce health benefits, cut employment, and raise prices, which in turn may lead to lower output and profits (Cutler and Madrian 1998; Baicker and Chandra 2005; Sommers 2005). Studies have found that rising health insurance premiums reduce workers' probability of being employed, although workers' hours may rise or fall depending on the strategies chosen by different employers (Cutler and Madrian 1998; Baicker and Chandra 2005). Anecdotal evidence is consistent with adverse employment effects as well, as government data, industry surveys, and interviews with employers indicate that many businesses are reluctant to hire full-time employees because health insurance has become one of their fastest-growing costs (Downey 2004; Porter 2004; Harper 2007).

However, the view that rapidly rising health care costs harm the U.S. economy is not without dissenters (Reinhardt 1989). Traditional economic models predict that rising health care costs are *completely* offset by a decline in wages, leaving total compensation, output, prices, and profits unchanged. Under this view, rising health care costs merely affect the composition of total compensation. Some economists also argue that rising health care costs could have a positive effect on some sectors of the economy. For example, Pauly (2003) has argued that rising health care spending naturally results in rapid growth in the health care and related sectors, and in employment and incomes

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for workers in those sectors. Consistent with this perspective, the Bureau of Labor Statistics (BLS 2006) reported that employment in the health care sector, which includes related industries such as pharmaceuticals and health insurance, grew by 21 percent between 1998 and 2006, whereas employment across all sectors grew by only 6 percent. Finally, in the long run increased spending on health care could affect the U.S. economy by improving health and productivity of U.S. workers (Cutler, Rosen, and Vijan 2006).

Reliable evidence on the economic impact of rapid growth in health care costs is essential to inform policy debates. To date, however, the available evidence is limited to the effects of rising health insurance premiums on workers' probability and conditions of employment; no empirical study has directly assessed the impact of increasing health care costs on the economic performance of U.S. industries, and especially on outcomes beyond employment. This study aims to fill this gap by using national data for a 19-year period, from 1987 through 2005, to estimate the effect of growth in health care costs that is in excess of GDP growth on three important economic outcomes—employment, gross output, and value added to GDP—across 38 industries within the U.S. economy.

DATA AND METHODS

Conceptual Framework and Analytic Strategy

The extent to which growth in health care costs that exceeds GDP growth affects employment, output, and value added to GDP in different industries within the U.S. economy depends on how much pressure to increase total employee compensation each industry experiences as a result of this growth. Industries where health care benefits are a larger share of compensation necessarily experience the greatest pressure to increase total compensation when health care costs increase rapidly. Therefore, rapid growth in health care costs is expected to have a larger effect on economic performance for industries where large percentages of workers receive ESI as a fringe benefit. As described in detail below, our analyses exploited variation across industries in the percentage of workers with ESI to estimate the impact of health care cost growth that exceeds GDP growth on the three study outcomes.

Data Sources

The analyses covered the 19-year period from 1987 through 2005. We obtained yearly data, by industry, on employment (thousands of workers), gross

output (millions of dollars), value added to GDP (millions of dollars), and labor productivity (output in thousands of dollars per worker) from the Annual Industry Accounts of the Bureau of Economic Analysis (1987–2005). Information on the percentage of workers with ESI, by industry, for the years 1986–2004 was obtained from the March Supplement of the Current Population Survey (United States Census Bureau and Bureau of Labor Statistics 1987–1989). In addition, we obtained yearly data on the percentage of employed workers in each economic sector who were union members from the Labor Force Statistics based on the Current Population Survey (United States Census Bureau and Bureau of Labor Statistics 1987–2005), and yearly data on total health care costs and health care costs as a proportion of GDP from the National Health Expenditures Accounts of the Centers for Medicare and Medicaid Services (1987–2005). The classification of industries changed in 1998 from Standard Industrial Classification (SIC) (Office of Management and Budget [OMB] 1987) codes to North American Industry Classification System (NAICS) codes (OMB 1987, 1997). Thus, we matched industry codes from the SIC (1987–1997 data) with those from the NAICS (1998–2005 data) using definitions that were consistent across the two time periods. Twelve industries in the NAICS that could not be matched to corresponding industries in the SIC were excluded from the analyses, and the health care industry was excluded as well because we anticipated that it would behave differently from other industries. Therefore, the final analyses included 38 industries from the following five sectors: manufacturing; finance and services; wholesale and retail trade; transportation, communications, and utilities; and agriculture, mining, and construction. The 38 industries were representative of all industry types and accounted for 61.5 percent of employment (68,151,000 workers) and 70.7 percent of GDP in 1987. Of the excluded industries, the largest was health care, which accounted for 10.9 percent of GDP in 1987.

Statistical Analysis

The goal of our analyses was to assess whether the effect on economic performance of growth in health care costs that exceeds GDP growth was greater for industries where a larger percentage of workers had ESI. We used the percentage of workers with ESI, lagged by 1 year relative to the economic performance data, as the measure of the degree to which various industries would be affected by health care cost growth. We used lagged values of ESI rather than contemporaneous values because contemporaneous values might be influenced by the level of health care cost inflation in the same year. For

example, firms might respond to rising health care costs by dropping insurance coverage, thereby reducing the percentage of workers with ESI. This reverse causation could bias our results.

Our measure of the “excess” growth in health care costs (i.e., of the degree to which growth in health care costs exceeded the increase in GDP) was calculated as the ratio of total health care costs to GDP in a particular year divided by the same ratio in the preceding year, less one. This measure has a value of zero when health care costs and GDP increase at the same rate from 1 year to the next, whereas a value greater than (less than) zero means that health care costs grew faster (slower) than GDP. Further, for the rates of increase in health care costs and GDP observed in our study, the value of the measure very closely approximates the percent change in health care costs from one year to the next minus the percent change in GDP.

We conducted bivariate analyses in which we plotted the percent change in employment, gross output, and value added to GDP over the entire 19-year study period (1987–2005), for each industry, against the industry’s percentage of workers with ESI in 1986 (a 1-year lag relative to the first year of the study period).

Additionally, we estimated multivariate linear regression models using industry and year as the unit of observation. (Thus, the model estimates were based on 722 total observations, corresponding to data on 38 industries over 19 years.) The dependent variables in the models were employment, gross output, and value added to GDP, logarithmically transformed to make highly skewed distributions more nearly symmetrical. The key independent variable in the models was the interaction of the logarithm of the ratio of total health care costs to GDP and the industry’s 1-year lagged percentage of workers with ESI. Covariates included the 1-year lagged percentage of workers with ESI in the industry, which may influence the health, morale, and retention of the workforce (Institute of Medicine 2003); labor productivity in the industry; and the level of unionization across 11 industry groups. These covariates are expected to influence economic outcomes. Covariates also included industry-fixed effects (i.e., an indicator variable for each industry) to control for unmeasured industry characteristics that do not vary over time, and sector-specific year-fixed effects (i.e., an indicator variable for each year and sector) to control for differences over time in the economic performance of different sectors that were unrelated to the effects of health care cost growth. Such differences could arise from differences across sectors in, for example, product innovation, labor outsourcing, competition from emerging markets, timing of business cycles, and susceptibility to energy costs.

Of note, because we included industry-fixed effects in the models, this specification is exactly equivalent to an alternative specification where we regress the percent change from 1 year to the next in employment, gross output, or value added to GDP on the interaction of the “excess” growth in health care costs, as defined earlier, and the industry’s 1 year lagged percentage of workers with ESI. Thus, a negative coefficient on the key independent variable in our models would imply that industries with a larger percentage of workers who had ESI experienced a larger decline (or smaller increase) in the outcome of interest when the growth in health care costs outpaced the increase in GDP to a greater degree. This is the result we would expect if faster growth in health care costs has an adverse effect on economic outcomes.

All regression models were estimated with robust standard errors to account for possible heteroskedasticity and clustering in the data (White 1980). A p value of .05 or less was chosen as the criterion for statistical significance in all analyses.

RESULTS

Descriptive Data

The mean percentage of workers with ESI during the study period ranged from 24.7 to 82.1 percent across the 38 industries included in the study. Additionally, the average annual percentage change in employment, gross output, and value added ranged from -6.3 to 6.1 percent, -1.4 to 8.2 percent, and -0.8 to 8.5 percent, respectively, across industries (Table 1). Health care costs as a fraction of GDP grew from 10.9 percent in 1987 to 16.0 percent in 2005. The annual growth in health care costs exceeded the annual increase in GDP by an average of 2.2 percentage points over the 19-year period of the study, with a range from -0.7 to 6.0 percentage points.

Bivariate Analyses

The bivariate analyses found that industries with a larger percentage of workers who had ESI in 1986 had worse economic performance than other industries during the 19-year study period (see Figure 1). Specifically, industries with a larger percentage of workers who had ESI in 1986 had significantly lower growth in employment (slope = -0.05 , $p < .01$), gross output (slope = -0.02 , $p < .01$), and value added to GDP (slope = -0.03 , $p < .01$) over time.

Table 1: Mean Percentage of Workers with ESI during the Study Period (1986–2004), by Economic Sector and Industry

<i>Sector/Industry</i>	<i>Average, One-Period Lagged % of Workers with ESI during 1987–2005</i>
I. Agriculture, construction, and mining	
Agriculture, forestry, and fishing	24.7
Construction	38.9
Mining, except oil and gas	72.9
Oil and gas extraction	72.9
II. Manufacturing	
Chemical products	76.7
Electronic and other electric equipment	75.4
Fabricated metal products	70.6
Food and beverage and tobacco products	68.0
Furniture and fixtures	60.8
Machinery	75.6
Miscellaneous manufacturing	52.4
Motor vehicles and equipment	80.5
Nonmetallic mineral products	70.2
Other transportation equipment	77.8
Paper products	76.7
Petroleum and coal products	79.3
Plastics and rubber products	70.1
Primary metals	79.9
Textiles, apparel, and leather	56.7
Wood products	55.1
III. Communication and transportation	
Air transportation	61.2
Communications	76.1
Motion pictures	31.0
Rail transportation	61.2
Transit and ground passenger transportation	61.2
Trucking and warehousing	61.2
Utilities	82.1
Water transportation	61.2
IV. Wholesale and retail trade	
Retail trade	31.6
Wholesale trade	59.3
V. Services	
Accommodation	46.7
Amusement and recreation services	31.0
Depository and nondepository institutions	67.6
Educational services	60.1
Insurance carriers and related activities	55.4
Legal services	52.1
Other services	48.7
Real estate	51.5

Figure 1: Average Annual Percent Change in Employment, Gross Output, and Value Added (1987–2005) versus Percentage of Workers with ESI in 1986, for 38 Study Industries

Multivariate Analyses

The multivariate analyses found that faster growth in health care costs had greater adverse effects on economic outcomes for industries with larger percentages of workers with ESI as we hypothesized (see Table 2). Other findings of the multivariate analyses included a positive main effect of the percentage of workers with ESI on economic outcomes, which reflect reduced worker turnover or absenteeism resulting from insurance coverage or unmeasured attributes of industries with high rates of ESI (Institute of Medicine 2003). Other findings also included a negative effect of unionization on economic outcomes or mixed effect of worker productivity. Specifically, higher labor productivity was associated with slower growth in employment, which probably reflects greater adoption of technology and mechanization, with the resulting substitution of capital for labor, in industries with rapid productivity growth. Labor productivity had the expected positive effects on gross output and value added to GDP.

To make the findings of the multivariate analyses easier to understand, we developed simulations that used the estimated regression coefficients to predict what economic outcomes would have been in 2005 under two alternate scenarios: (1) “excess” growth in health care costs of 2.2 percentage points from 2004 to 2005 (i.e., the mean value observed in the data), and (2) “excess” growth in health care costs of 2.42 percentage points from 2004 to 2005 (i.e., a 10 percent increase in “excess” growth relative to the observed mean). We report the aggregate predicted impact of higher “excess” growth in health care costs across all 38 industries as well as the predicted impact for three representative industries—retail trade, air transportation, and motor vehicles—that employed a sizable fraction of the U.S. workforce but varied substantially in the percentage of workers with ESI (see Table 1).

The simulation analysis found that a 10 percent increase in “excess” growth in health care costs, from 2.2 to 2.42 percentage points, would have resulted in 120,803 fewer jobs, US\$28,022 million in lost gross output, and US\$14,082 million in lost value added across the 38 study industries in 2005. These declines represent 0.17, 0.18, and 0.16 percent, respectively, of aggregate employment, gross output, and value added in 2005.

The effects of higher “excess” growth in health care costs differed across industries depending on the percentage of workers who had ESI. For example, a 10 percent increase in “excess” growth in health care costs, relative to status

Table 2: Multivariate Regression Results: Effects of Excess Growth in Health Care Costs on Employment, Gross Output, and Value Added to GDP

<i>Independent Variable</i>	<i>Outcome</i>		
	<i>Logarithm of Employment</i>	<i>Logarithm of Gross Output</i>	<i>Logarithm of Value Added to GDP</i>
Lagged percentage of workers with ESI $\times$ logarithm of ratio of health care costs to GDP	− 0.016**	− 0.016**	− 0.016**
Lagged percentage of workers with ESI	0.042**	0.044**	0.044**
Unionization	− 0.027**	− 0.026**	− 0.025**
Labor productivity	− 0.001**	0.001**	0.001**
Constant	7.557**	12.336**	11.501**
Observations	722	722	722
Number of industries	38	38	38

Table entries are regression coefficients. All models additionally control for industry-fixed effects, year-fixed effects, and sector-year interactions (see text).

** $p < .01$.

quo, would have reduced employment in 2005 by 0.13 percent (20,930 jobs), 0.20 percent (1000 jobs), and 0.24 percent (2,600 jobs) in the retail trade, air transportation, and motor vehicle industries, respectively. Similarly, a 10 percent increase in “excess” growth in health care costs would have reduced value added in 2005 by 0.13 percent (US\$1,094 million), 0.20 percent (US\$82 million), and 0.24 percent (US\$226 million) in the retail trade, air transportation, and motor vehicle industries, respectively.

An Indirect Test for Residual Industry-Level Confounding

As described earlier, our multivariate analyses attempted to control for measured and unmeasured factors other than health care cost growth that could influence economic outcomes in different industries. Measured factors included labor productivity and unionization, and we captured unmeasured factors through sector-specific year-fixed effects. Nonetheless, we were concerned that unmeasured factors at the level of industries, rather than sectors, might have led to a residual spurious correlation between economic performance and the percentage of workers who had ESI across industries. This could occur, for example, if industries within the same sector differed in product innovation or labor outsourcing, and if these differences were correlated with differences in the percentage of workers with ESI.

To address this concern, we conducted an indirect test for residual industry-level confounding using data on employment for 1987 through 2005 from 16 different industries in Canada, chosen because their definitions closely matched the definitions of the corresponding U.S. industries (Statistics Canada 1987–2005). Thus, we plotted the percent change in employment over the 19-year study period, for each Canadian industry, against the percentage of workers with ESI in 1986 in the corresponding U.S. industry. (Data on gross output and value added were unavailable for Canada.) The reasoning behind this indirect test was that employment in Canadian industries cannot be influenced by the percentage of workers who have ESI in the United States, because in Canada universal health insurance coverage is publicly financed. However, we would expect unmeasured factors at the level of industries, such as product innovation or labor outsourcing, to affect Canadian employers in the same way as they affect U.S. employers. Thus, a finding of a negative relationship between the percent change in employment in Canada and the percent of workers with ESI in the United States would suggest that unmeasured factors at the industry level could be responsible for the findings we have presented thus far.

The results of the indirect test are shown in Figure 2. When we confined the analysis of employment in the United States to the 16 industries that matched the Canadian industries, we found a negative relationship between the percentage of workers with ESI during 1986 and the percent change in employment over the 19-year study period (slope = -0.05 , $p < .01$) (Figure 2), similar to findings for the United States using all 38 industries (Figure 1). In striking contrast, there was no significant relationship between the percentage of workers with ESI during 1986 across U.S. industries and the percent change in employment in the Canadian industries (slope = 0.003 , $p = .74$) (Figure 2). Multivariate regression analyses of employment in the United States and Canada using the 16 matched industries yielded similar results (data not shown).

Sensitivity Analyses

We performed several sensitivity analyses to assess the robustness of our results. First, we considered the possibility that our analyses might be biased due to a mechanical relationship between our measure of excess growth health

Figure 2: Average Annual Percent Change in Employment in the United States versus Canadian Industries (1987–2005) against Percentage of U.S. Workers with ESI in 1986, for 16 Study Industries

care costs and economy-wide economic outcomes.¹ The year-fixed effects are expected to address this source of bias. Nonetheless, we repeated our analyses using two alternative measures of the growth in health care costs that do not have any mechanical relationship to GDP: the increase in per capita health care costs and the increase in the BLS medical care price index. Our findings were unchanged from those of the main analyses (see Tables S1 and S2). Second, we were concerned that a single year's lagged value of ESI might be a noisy measure of the degree to which different industries are affected by health care cost growth. Thus, we repeated our analyses using a 3-year lagged moving average of the percentage of workers with ESI, rather than a single year's lagged value, to measure the degree to which various industries would be affected by health care cost growth. The findings of these analyses were unchanged as well (see Table S3).

COMMENT

To our knowledge, this is the first study to obtain empirical evidence regarding the effects on aggregate economic outcomes of "excess" growth in health care costs (i.e., of health care cost growth that outpaces the rate of increase in GDP). Our empirical strategy was based on the notion that rapid growth in health care costs is likely to have a greater effect on economic performance for industries where large percentages of workers receive ESI. The economic outcomes we examined—employment, gross output, and value added to GDP—are key indicators of the nation's economic well-being.

The findings of our study indicate that "excess" growth in health care costs has adverse effects on economic outcomes in the United States, and that these effects are greater for industries where high percentages of workers have ESI. In our view, it is very unlikely that these findings are due to confounding. Our multivariate regression analyses controlled for measured and unmeasured factors other than health care cost growth that could influence economic outcomes in different economic sectors and industries. Further, the results of our indirect test using Canadian data provided additional evidence against the possibility that residual industry-level confounding explains the study's findings.² We used the percentage of workers with ESI, lagged by 1 year relative to the economic data, as the measure of the degree to which industries would be affected by health care cost growth in order to minimize concerns about reverse causation. In practice, however, the percentage of workers with ESI in each industry did not change very much over the study period. For heavily unionized industries, this finding probably reflects labor contracts firms made

with workers that are difficult to change. For nonunionized industries, this finding is less likely to reflect explicit contracts, but it may nonetheless capture tradition and implicit expectations held by new and established workers alike.

The quantitative estimates from our simulation analyses—that is, the 120,803 jobs, US\$28,022 million in gross output, and US\$14,082 million in value added that would have been lost in 2005 as a result of a 10 percent increase in “excess” growth in health care costs—must be interpreted with caution. These estimates capture the potential magnitude of the adverse effects of rapid health care cost inflation, but in the real economy it is likely that these effects would be mitigated by economy-wide, cross-industry phenomena whereby reductions in employment or output in industries with high percentages of workers who have ESI are partially compensated by gains in other industries with low percentages of workers who have ESI. The degree to which this happens is likely to depend on the ease with which workers can move across industries. Even if this is the case, however, it implies that rapidly rising health care costs promote redistribution of workers from jobs with ESI to jobs without ESI.

Several limitations of our study deserve mention. First, our study was unable to assess the effects of “excess” growth in health care costs on the performance of the total U.S. economy. Although our findings suggest such effects, the economy-wide cross-industry phenomena described in the preceding paragraph preclude using our estimates to quantify them. In a related vein, our study was not designed to assess the economic impacts of alternative approaches to financing health insurance coverage. Nonetheless, our results clearly indicate that ESI hurts the economic performance of certain industries more than others, and leads to a redistribution of employment and outcome across industries. These distortions are an important element in any evaluation of ESI as a financing mechanism.

Second, our analyses excluded 12 industries in the NAICS that could not be matched to corresponding industries in the SIC. This is unlikely to be a major concern, however, since the industries in the study were representative of all sectors of the economy and accounted for a substantial portion of total employment and GDP throughout our study period. Third, our analyses also excluded health care and related sectors of the economy, which are likely to grow when health care costs are increasing rapidly. Last, rapid increases in health care costs are likely to differ in their implications for local economies across the United States depending on the concentration of specific industries in particular regions. Regional variation in the effects of health care cost growth on economic outcomes is an interesting and important area for future exploration.

Our findings do not imply that U.S. employers have not adopted diverse strategies to deal with the burden of rising health care costs, such as limiting wage increase or reducing health insurance benefits; rather they imply that such strategies have not completely offset the growing burden of health care costs. Indeed, some employers are renegotiating long-standing labor contracts to reduce their health insurance costs. For example, General Motors recently negotiated an arrangement with the United Auto Workers whereby the latter would assume responsibility for billions of dollars of retiree health care costs (Freeman and Ahrens 2007). Others are offering consumer-driven health plans with flexible spending accounts that expose employees to greater choice and greater financial burden, while lowering health care costs for the employer (Gabel et al., 2004; Buntin et al., 2006). Further, studies suggest that rising health insurance costs are the dominant explanation for falling rates of health insurance coverage over time (Kronick and Gilmer 1999; Glied and Stabile 2000; Chernew, Cutler, and Keenan 2005). Thus, in the long run some of the adverse economic effects of “excess” growth in health care costs might be mitigated by employers’ coping strategies but at the cost of higher numbers of uninsured and employees bearing more of the burden of rising health care costs.

NOTES

1. An anonymous reviewer was concerned that changes in health care costs as a share of GDP is inversely related by construction to general economic performance. Specifically, years of high GDP growth would also exhibit both low “excess” health care cost growth and large gains in economy-wide employment and output.
2. We underscore that our analyses of Canadian data were not designed to assess the relative merits or economic impacts of single-payer and employer-based insurance systems. Rather, these analyses were merely intended to rule out residual confounding from unmeasured factors as the source of our findings.

REFERENCES

- Baicker, K., and A. Chandra. 2005. *The Labor Market Effects of Rising Health Insurance Premiums*. National Bureau of Economic Research Working Paper 11160.
- Buntin, M. B., C. Damberg, A. Haviland, K. Kapur, N. Lurie, R. McDevitt, and M. S. Marquis. 2006. “Consumer-Directed Health Care: Early Evidence about Effects on Cost and Quality.” *Health Affairs (Millwood)* 25 (6): w516–30.
- Bureau of Economic Analysis (BEA). 1987-2005. “Annual Industry Accounts.” United States Department of Commerce. Available at <http://www.bea.gov/industry/>

- Bureau of Labor Statistics (BLS). 2006. "Occupational Employment and Wages: 29-0000 Healthcare Practitioner and Technical Occupations (Major Group)." Available at <http://www.bls.gov/oes/current/oes290000.htm>
- Catlin, A., C. Cowan, S. Heffler, and B. Washington. 2007. "National Health Spending in 2005: The Slowdown Continues." *Health Affairs (Millwood)* 26 (1): 142-53.
- Centers for Medicare and Medicaid Services (CMS). 1987-2005. "National Health Expenditure Accounts." National Health Statistics Group, Office of the Actuary. Available at <http://www.cms.hhs.gov/nationalhealthexpenddata>
- Chernew, M., D. M. Cutler, and P. S. Keenan. 2005. "Increasing Health Insurance Costs and the Decline in Insurance Coverage." *Health Services Research* 40 (4): 1021-39.
- Cutler, D. M., and B. C. Madrian. 1998. "Labor Market Responses to Rising Health Insurance Costs: Evidence on Hours Worked." *RAND Journal of Economics* 29 (3): 509-30.
- Cutler, D. M., A. B. Rosen, and S. Vijan. 2006. "The Value of Medical Spending in the United States, 1960-2000." *New England Journal of Medicine* 355 (9): 920-7.
- Downey, K. 2004. "A Heftier Dose to Swallow: Rising Cost of Health Care in U.S. Gives Other Developed Countries an Edge in Keeping Jobs." *Washington Post*, March 6, 2004, E01.
- Freeman, S., and F. Ahrens. 2007. "GM, Union Agree on Contract to End Strike." *Washington Post*, September 27, 2007, A01.
- Gabel, J. R., H. Whitmore, T. Rice, and A. T. Lo Sasso. 2004. "Employers' Contradictory Views about Consumer-Driven Health Care: Results from a National Survey." *Health Affairs (Millwood)* Suppl Web Exclusives: W4:210-8. Available at <http://content.healthaffairs.org/cgi/content/full/hlthaff.w4.210v1/DC1>
- Glied, S., and M. Stabile. 2000. "Explaining the Decline in Health Insurance Coverage among Young Men." *Inquiry* 37 (3): 295-303.
- Harper, T. 2007. "Clinton Links Health Care, Jobs; New York Senator Says Canada's Universal System an 'Excuse' to Move Quality Jobs North of the Border." *Toronto Star*, Toronto. Available at <http://www.thestar.com/News/article/227337>
- Institute of Medicine. 2003. *Hidden Costs, Value Lost: Uninsurance in America*. Washington, DC: Institute of Medicine.
- Kaiser Commission on Medicaid and the Uninsured. 2007. "Health Insurance Coverage in America, 2006 Data Update."
- Kronick, R., and T. Gilmer. 1999. "Explaining the Decline in Health Insurance Coverage, 1979-1995." *Health Affairs (Millwood)* 18 (2): 30-47.
- Office of Management and Budget (OMB). 1987. "Standard Industrial Classification (SIC) Manual." Executive Office of the President. Washington, DC.
- Office of Management and Budget (OMB). 1997. "North American Industrial Classification System (NAICS): United States, 1997." Executive Office of the President. Washington, DC.
- Pauly, M. V. 2003. "Should We Be Worried about High Real Medical Spending Growth in the United States?" *Health Affairs (Millwood)* Suppl Web Exclusives: W3: 15-27. Available at <http://content.healthaffairs.org/cgi/content/short/hlthaff.w3.15v1>.

- Porter, E. 2004. "Rising Costs of Health Benefits Cited as Factor in Slump of Jobs". *The New York Times*. August 19, 2004.
- Reinhardt, U. E. 1989. "Health Care Spending and American Competitiveness." *Health Affairs (Millwood)* 8 (4): 5–21.
- Sommers, B. D. 2005. "Who Really Pays for Health Insurance? The Incidence of Employer-Provided Health Insurance with Sticky Nominal Wages." *International Journal of Health Care Finance and Economics* 5 (1): 89–118.
- Statistics Canada. 1987–2005. "Labor Force Survey Estimates (LFS) by North American Industrial Classification System (NAICS), Sex and Age Group, Annual (Table 282-0008)."
- United States Census Bureau and Bureau of Labor Statistics. 1987–1989. "Current Population Survey (CPS), Annual Social and Economic Supplement (March Supplement)." United States Department of Labor.
- United States Census Bureau and Bureau of Labor Statistics. 1987–2005. "Current Population Survey (CPS), Labor Force Statistics from the Current Population Survey." United States Department of Labor.
- White, H. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* 48 (4): 817–38.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Table S1: Results from Sensitivity Analysis I: Effects of Growth in Per Capita Health Care Costs on Employment, Gross Output, and Value Added to GDP.

Table S2: Results from Sensitivity Analysis II: Effects of Growth in Medical Care Prices on Employment, Gross Output, and Value Added to GDP.

Table S3: Results from Sensitivity Analysis III: Using Three-Year Lagged Moving of Percentage of Workers with ESI as a Measure of Burden of Growth in Health Care Costs.

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