THE MARKET AND THE ESTIMATORS: FORECASTING THE COST OF MEDICARE CATASTROPHIC COVERAGE

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ABSTRACT

As part of the process of enacting the Medicare Catastrophic Coverage Act (MCCA) in 1988, both the Congressional Budget Office (CBO) and the Department of Health and Human Services (HHS) developed estimates of the cost of the pharmaceutical component of the proposal. These estimates varied substantially. For some benefit years, cost estimates differed by a factor of more than two.

This paper uses data from the stock market to measure how market participants gauged the likely consequences of the MCCA and to compare the market estimate with those of the CBO and HHS estimators. We examine the market response to key events linked to passage and repeal of the MCCA for brand name and generic pharmaceutical producers. We find that on event days associated with passage of the MCCA, generic pharmaceutical firms had positive and significant excess stock market returns. On early event days associated with passage, brand name producers had smaller positive returns and on later days, brand name producers had small negative returns. On event days associated with repeal of the MCCA, brand name producers had small positive excess returns and generic producers had zero or small negative returns.

The effect of the MCCA on the stock price of pharmaceutical firms would depend on the elasticity of demand for pharmaceuticals. Differences in assumptions about this elasticity were a key component of the differences between CBO and HHS estimates. Using the market returns to evaluate these elasticities, we find that market participants shared the CBO's view that demand responses to the legislation would be small. We also find that the market anticipated that the MCCA would strongly favor generic manufacturers.

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In an era of tight public budgets, the success of health care policy proposals depends critically on projections of their cost. The 1988-1989 passage and repeal of the Medicare Catastrophic Coverage Act (MCCA) is an instance of a policy that both lived and died by its cost estimates. In June 1988, when the MCCA was initially enacted, the Congressional Budget Office (CBO) estimated its four-year total cost at $5.7 billion. This estimate implied that the program would be self-funding based on maximum premiums for high-income Medicare beneficiaries of $1050 per person. One year later, while seniors complained about the high premiums, CBO revised its four-year total cost estimate upward, to $11.8 billion, nearly double the original figure (CBO, 1989). The Department of Health and Human Services released similarly high estimates. These higher estimates implied that the premiums included in the original legislation would fall substantially short of outlays by 1992 and that the program would not be self-funding in the long run. The CBO estimates doomed efforts to save the legislation by reducing premium levels (Rovner, 1989). In December 1989, the legislation was repealed.

Budget estimators tally the anticipated increase in expenditures generated by a coverage expansion and the likely success of proposed cost controls based on experimental or non-experimental observations of the responsiveness of health consumers and producers to policy changes. Unfortunately, these data are rarely fully dispositive and reasonable analysts can easily disagree about the consequences of a reform (Bilheimer and Reischauer, 1995). In the case of the MCCA, key data on the responsiveness of consumers to the pharmaceutical package incorporated in the legislation simply did not (and do not) exist. Data on pharmaceutical spending by elderly Americans only became available after the legislation passed. Given this lack of critical information, it is not surprising that estimates of spending varied so much.

This paper uses a method from finance economics called the "event study" method to assess the accuracy of alternative estimates of the cost of the drug insurance component of the MCCA. This method relies on data from the capital markets to examine the economic effect of regulatory changes and legislative initiatives on publicly traded companies (e.g., Binder, 1985; Schwert, 1981). It is readily applicable to the drug insurance component of the MCCA because

almost all firms in the industry are publicly traded. Furthermore, according to analysts in the International Trade Commission, U.S. firms account for about 2/3 of U.S. pharmaceutical sales, so most of the effect of any legislative change will be reflected in U.S. stock prices (personal communication, David Michels, International Trade Commission).

According to the efficient markets hypothesis, a central theorem of financial economics, at every point in time prices of publicly traded stocks reflect all available information. Capital market participants have very strong financial incentives to collect and analyze information that affects the future performance of traded stocks. Policy changes that affect the future discounted cash flow of publicly traded companies should, thus, be incorporated into the equity share price as soon as market participants become aware of the policy change. The event study method exploits this ability of the stock market to incorporate information into stock prices by using price movements to assess the consequences of policy changes.

The Medicare Catastrophic Coverage Act and its Repeal

Prescription pharmaceutical spending accounts for about 5 cents of each health dollar. While pharmaceutical spending is a small component of overall health expenditures, it has been growing much more rapidly than other health spending. During the 1980s, the average annual real per capita growth rate of pharmaceutical spending was almost 5.5 percent (Levit et al., 1994).

Rising pharmaceutical costs were of particular concern to the elderly in 1987, both because they used a disproportionate share of all pharmaceuticals, and because only about 40 percent of the elderly had insurance for prescription drugs (through private plans or Medicaid), since Medicare does not cover pharmaceutical costs. For those who did not have insurance, pharmaceutical costs were a significant and growing expense. Those over 65 represent 30 percent of the market for prescription drugs. Pharmaceutical spending among Medicare beneficiaries increased at an average annual rate of 14.4% between 1980 and 1987 (CBO, 1989). The MCCA passed in 1988 and repealed in 1989, sought, in part, to expand Medicare coverage to include pharmaceuticals.

The genesis of the MCCA had nothing to do with pharmaceutical coverage. In 1986, President Ronald Reagan's Secretary of Health and Human Services, Otis Bowen, proposed an

expansion of Medicare to cover the catastrophic expenses of the elderly and disabled. The plan was to be financed through a supplemental premium. Initially, the plan simply consisted of a cap on the out-of-pocket expenses associated with Medicare deductibles and co-insurance and did not envision any expansion of the scope of Medicare coverage.

While Medicare deductibles and coinsurance costs could pose a significant burden to those with long hospital stays, few Medicare beneficiaries could expect to incur such expenses. Once the plan went to Capitol Hill, Democrats and Republicans competed to sweeten it with benefits that would appeal to a larger constituency among the elderly. Over the following year, the bill was expanded to include more politically salient benefits: better Medicaid protection for nursing home costs and coverage for pharmaceutical drugs.

In July 1987, the House passed a version of a bill including pharmaceutical benefits. In October 1987, just a few days after the stock market crash, the Senate passed a different version. Meanwhile, President Reagan threatened that he would veto a bill that included such benefits and initial passage of the legislation was accompanied by "a palpable lack of enthusiasm among Democrats and harsh partisan rhetoric from Republicans" (Rovner, 1987c).

In March 1988, a House-Senate conference committee worked to develop an acceptable compromise bill. Conferees debated provisions concerning cost-containment for pharmaceuticals and financing provisions in the face of increasing lobbying efforts (Rovner, 1988a and b). Throughout the debate, Congress remained adamant that the plan neither add to the deficit nor require a general increase in taxes. All expansions were to be funded through supplemental premiums paid by the elderly themselves. Ultimately, this financing structure was to prove the plan's undoing. Bowen's initial proposal had called for a monthly supplemental premium of $4.92 that would be paid by all Medicare beneficiaries. The expanded package passed by Congress would require a much higher premium.

Almost immediately after its passage, the Medicare Catastrophic Coverage Act encountered a barrage of criticism, primarily aimed at the costly supplemental premium. A range of attempts to reduce the premium failed. By mid-1989, pressure to repeal the Act had become overwhelming. In

August 1989, a group of elderly demonstrators marched on Washington, throwing eggs at House Ways and Means Committee Chairman Dan Rostenkowski's car. Finally, in October, 1989, the House voted to repeal the Act. The Senate followed a month later. In December, President Bush signed the repeal of the Medicare Catastrophic Coverage Act. It had been in effect only a little over a year.

Estimates of the Cost of the Prescription Drug Benefit

The prescription drug benefit signed into law by the President in 1988 was designed to protect beneficiaries with unusually high prescription expenses. In 1991, Medicare would cover 50% of the cost of prescription expenses above a deductible of $600. In 1992, Medicare would cover 60% of the cost of expenses over $652. In 1993, and all subsequent years, Medicare would cover 80% of the cost of drugs above a deductible. The deductible would be set each year at a level such that 16.8% of Medicare beneficiaries could be expected to exceed it.

Initially, the prescription benefit incorporated limited cost-containment provisions. The plan passed by the House Ways and Means committee called for the HHS Secretary to take steps to keep program costs in line. Energy and Commerce passed a plan that would raise deductibles if costs rose. The Bill passed by the Conference Committee included some provisions to substitute generic drugs for brand-name prescriptions, but no other explicit cost-containment measures.

Budget estimators were very uncertain about the cost of the benefit. That cost would depend on 5 key variables: (a) the percentage of Medicare beneficiaries with private supplemental prescription drug coverage (some of whom might drop coverage after the new benefit took effect), (b) average annual pharmaceutical spending among Medicare beneficiaries without such coverage, (c) the average future rate of increase in pharmaceutical spending by Medicare beneficiaries, (d) the effectiveness of the cost containment provisions in the legislation, and (e) the extent to which the new insurance benefit would lead to increased utilization of prescription drugs.

In 1987, the most recent data available to budget estimators on the first three key variables dated back to the 1980 National Medical Care Utilization and Expenditure Survey. In 1989, data from the 1987 National Medical Care Expenditure Survey became available. Differences between

these two data sources account for most of the difference between the 1988 and 1989 CBO estimates of the cost of the program. The rate of increase in pharmaceutical spending between 1980 and 1987 was about 40% higher than the rate CBO had projected based on 1980 data. CBO consequently revised upward its estimate of average annual spending and its projection of future cost growth. Forecasts of future spending growth are always subject to considerable dispute. The Health Care Financing Administration projected future growth in pharmaceutical spending at 8% per year, about 50% less than CBO's revised figure.

Limited data on the effectiveness of generic substitution were available from private insurance plans and the Medicaid program. Budget estimators guessed that these cost containment provisions would reduce outlays for multiple source drugs by 17% and reduce total outlays by 10%, or $400 million per year when the plan was fully implemented (CBO, 1989).

Estimators never had direct evidence on the extent to which the new benefit would affect utilization. While considerable experimental and non-experimental evidence existed on consumer responsiveness to changes in coinsurance and deductible levels for medical and hospital services, evidence on responsiveness to pharmaceutical insurance was sparse. This lack of data stemmed from the interrelationship between pharmaceutical spending and spending on physician visits.

Prior research on the responsiveness of pharmaceutical spending to insurance-induced price changes had examined situations in which the change in insurance affected both the price of drugs and the price of physician visits (Leibowitz et al., 1985). These studies found that increases in insurance coverage led to increases in the use of drugs. Since the use of drugs is highly correlated with physician visits, however, it is not clear whether these increases in drug use were a consequence of improved pharmaceutical insurance or an indirect effect of increased insurance for physician visits. The MCCA proposed to cover pharmaceuticals above a substantial deductible without affecting coverage for physician visits. None of the data then available addressed the issue of the elasticity of consumer demand in this situation.

Uncertainty about these key variables led to substantial differences in estimates of the benefits' cost. CBO's preliminary estimate of the cost of a generous prescription pharmaceutical

benefit was that it would add just $3.60 a month to the Medicare premium in 1989 (Rovner, 1987a). The Administration's estimators at HCFA, by contrast, estimated the 1989 premium cost for this benefit at $22.00. CBO figured the cost of the original House Ways and Means Committee proposal for 1989 at $750 million - HCFA guessed $6.4 billion. The differences narrowed in published estimates, but remained substantial. Table 1 lists the CBO initial and revised estimates and the HCFA estimate of the annual cost of the drug benefit in 1991, 1992, and 1993.

While the revised CBO estimate and the HCFA estimate are close, they differ substantially in their components. In particular, CBO projected faster aggregate growth in future pharmaceutical spending (regardless of the drug benefit) than did HCFA. HCFA anticipated much greater responsiveness to the pharmaceutical benefit than did CBO. The combination of CBO's growth rate assumption and HCFA's responsiveness assumption would have generated an estimate of program cost 20% greater than CBO's final figure. Conversely, the combination of CBO's responsiveness assumption and HCFA's projection of future cost growth would have generated an estimate of program cost 20% below CBO's final figure.

CBO argued that pharmaceutical spending would not be very responsive to improved insurance above a high deductible if that insurance did not alter coverage for physician visits. About half of total prescription spending occurs above the deductible limit (CBO, 1989). CBO predicted that the pharmaceutical benefit would increase demand for pharmaceuticals above this level by 4 percent so that overall spending would increase by 2 percent. HCFA assumed that those who exceeded the deductible would increase their pharmaceutical spending by 30 percent, so that total spending would increase by 15 percent.

Table 1: Estimates of the Cost of the Medicare Catastrophic Coverage Act Prescription Benefit: Congressional Budget Office and Health Care Financing Administration (in billions)

	1991	1992	1993
CBO June 1988	0.8	1.6	2.5
CBO July 1989	1.6	3.7	4.3
HCFA	1.3	3.3	3.9

Source: CBO, 1989.

The MCCA and the Pharmaceutical Industry

The effect of the MCCA on the pharmaceutical industry would not necessarily parallel its effect on the Medicare program. In particular, if the MCCA simply changed the payer for pharmaceutical expenses from elderly individuals to the Medicare program, it would cost the Medicare program money, but would have no effect on the pharmaceutical industry. Alternatively, the MCCA could lead to an outward rotation in the demand curve for drugs. This might happen in two ways. First, at any given price, improved insurance through Medicare could lead seniors to demand more drugs. Second, some impoverished seniors who had been obtaining drugs free through public programs such as Medicaid or state drug plans, or through Medicare inpatient stays in hospitals, would now buy them directly. To the extent that public programs purchased drugs at a discount, this shift in payer would also lead to a shift in the demand curve for drugs from the perspective of the industry.

From the perspective of budget estimators, the effect on the industry is captured in the effect of the program on utilization, which depends on the elasticity of demand. If the elasticity of demand is zero, the program simply shifts funding from one payer to another and does not affect the industry. If the elasticity of demand is considerable, the program will have substantial effects on the pharmaceutical industry. If the marginal cost of producing drugs is small, the increase in industry cash flow will approximate the net increase in pharmaceutical spending.

From this perspective, the MCCA appears to be nothing but a boon to pharmaceutical companies. The industry, though, did not view the Act as a windfall. Instead, lobbyists actively sought to change, and eventually kill, the bill. They tried to gut the requirement to substitute generic drugs for brand-name prescriptions (Rovner, 1987b). Later, they opposed the House version because they feared it would give Congress an incentive to implement pharmaceutical price controls (Rovner, 1988).

While the MCCA was an enormous expansion of Medicare payments for pharmaceuticals, its consequences for overall pharmaceutical spending were less clear. Despite the extended market represented by the MCCA, many pharmaceutical manufacturers were less than enthralled with the final bill. The interest group that represented brand name manufacturers, the Pharmaceutical Manufacturer's Association, lobbied hard against passage. Pharmaceutical manufacturers were concerned that Medicare coverage of prescription drugs would lead to more general controls on pharmaceutical prices.

Data and Methods

The data used in this analyses are daily stock market returns on the New York Stock Exchange and AMEX exchange, obtained from the Center for Research in Security Prices at the University of Chicago (CRSP). Pharmaceutical firms were identified using the COMPUSTAT database, which identifies industry by standardized industrial classification codes. Information about firm characteristics was drawn from Moody's Industrial Company Reports.

We used a simple, dummy variable variation on the standard market model to estimate the effects of the events we consider. As originally formulated by Fama, Fisher, Jensen, and Roll (1969), the market model is a linear approximation of the capital asset pricing model. The change in a firm's security price on any given day (R_{ij}) depends on general market conditions on that day (M_j) and on the extent to which movements in the firm's stock price are correlated with the market's price (β). Once β has been measured, any difference between the beta-adjusted market return and the firm's return on a given day can be attributed to events that affect that firm but not the market.

In the dummy variable formulation of this model, the event period is marked by a dummy variable (E) that is 1 during the period and 0 otherwise (reference here). We combine all firms for which we have data into a single analysis, allowing each firm to have its own beta and intercept, but constraining the return in the event period to be the same for all firms. We examine stock returns for a period beginning 180 days prior to the event day, to obtain estimates of each firm's beta. As discussed below, we consider both three day and 30 day event periods.

$$R_{ij} = \Sigma\alpha_i + \Sigma\beta_i M_j + E_j + \varepsilon_{ij}$$

The efficient markets hypothesis suggests that securities markets respond instantaneously to new information. Event study analysis examines the size of market responses to new information, thus it depends critically on the choice of dates under study. If the market anticipates an event, stock prices will adjust immediately, even if the event has not yet occurred. To minimize the effect of this type of information leakage, we consider three different key events associated with the passage of the MCCA and three different key events associated with the Act's Repeal.

We identify each event date by the first day that information about the event appeared in either the Wall Street Journal or the New York Times. In each case, this was the day following the event itself. If the event contained new information, prices would change as soon as market traders could act on that information, possibly before the event appeared in the press. We therefore examine stock price behavior within a narrow window surrounding the event (one trading day before the press article, the trading day on which the article appeared, and the following trading day) to capture the immediate effect of that information.

Table 2 describes each event, the date it appeared in the press, the number of pharmaceutical industry companies whose stocks traded that day, and the average price of these stocks on that day. In addition to the results reported here, we also examined responses to five widely reported other events leading up to passage of the legislation (the initial report of the House Ways and Means Committee, a second report of the House Ways and Means Committee, President Reagan's opposition to the proposed benefit, Senate approval of the initial legislation, and Senate passage of the conference report). The Senate's approval of the legislation occurred in the week of

the October 1987 stock market crash and market responses cannot be disentangled from the effects of that event. There were no statistically significant excess returns on any of the other event days for ether brand name or generic firms, and the magnitude of the estimated effects for each of these days was very small.

To further measure the effect of event leakages, we examine the returns of firms in the pharmaceutical industry both in the period immediately surrounding each event and in the 30 days that precede each event. If information about the prospects of the legislation leaks out of Congress slowly, market changes in the longer 30-day trading period up to and including the press day should reflect this gradual accumulation of information. Figure 1 shows the pattern of cumulative abnormal returns for the pharmaceutical industry throughout the period following introduction of the legislation. Key events related to the MCCA are marked with vertical lines. There is no evidence of a substantial increase in pharmaceutical industry prices during the period leading up to passage of the legislation. A large increase in the cumulative abnormal return occurred in January 1988, a period between House and Senate passage of the MCCA and formation of a conference committee to consider the bill. This large increase is attributable to a large merger in the industry on January 4, 1988 that was anticipated to lead to a further wave of mergers.

The bifurcated nature of the pharmaceutical industry allows us to sharpen our estimates of the effect of policy changes. Brand name pharmaceutical firms will benefit most from expansions in pharmaceutical insurance coverage. Such expansions will increase the utilization of pharmaceuticals and may reduce consumer incentives to seek less costly generic substitutes for brand name products. On the other hand, regulatory changes that encourage cost containment will benefit generic manufacturers, whose products produce similar medical effects at reduced cost.

In the analyses that follow, we examine both price changes in the pharmaceutical industry as a whole, and changes in the prices of shares of brand name and generic manufacturers separately. We also compare the price changes experienced by larger manufacturers, who produce and sell a wide range of products, to those of less-diversified smaller manufacturers, who are likely to have made smaller investments in brand name capital. We expect that cost controls would have more

negative effects on larger pharmaceutical companies than on smaller companies. We define large manufacturers as those with over $250 million in annual sales. We were able to identify the size and nature of most firms in the industry using Moody's Industrial Company Reports. Those firms for which information on size or nature of product was not available were not included in the sub-category regressions. We also excluded firms that produced both brand name and generic products from the brand name/generic firm comparisons.

Results

Column 2 of Table 3 describes the narrow 3-day window excess returns (relative to the market as a whole) for all pharmaceutical firms for each of the critical events leading up to the passage and repeal of the MCCA. Pharmaceutical firms experienced a 1.1% statistically significant average excess return on the three trading days including and following the House-Senate Conference Committee agreement on the MCCA. The industry experienced small and statistically insignificant returns on other days associated with the passage of the MCCA and on the days surrounding repeal of the MCCA.

One possible reason for the paucity of statistically significant returns is that the market anticipated the key events under study. We examined returns over the 30 day period preceding each event to evaluate this possibility. Average excess returns over the 30-day period are listed in column 3 of Table 2. For the events leading up to passage of the MCCA, the 30-day average returns are generally small and statistically insignificant. The 30-day average excess return preceding the first of the repeal-associated events is a statistically significant and positive 0.2%. This result is consistent with the strong mood in favor of repeal that preceded the House action.

This pattern of insignificant results may also be a consequence of differing market responses in different segments of the industry. To investigate this possibility, we examined the responses of firms in different industry sub-categories. The results for a 3-day window surrounding each event date are reported in Table 4.

The sub-category results suggest that the market expected the MCCA to expand the market, but also to lead to significant cost containment pressure. Small firms and generic producers had

larger positive responses to the initial passage of House legislation than did large and brand name firms. All categories of firms responded positively to the Conference Committee report on the MCCA, but the excess returns for small firms and for generic producers were greater than those for large firms and brand name producers. The additional information generated by the House passage of the conference report to negative returns for large firms and brand name firms, but additional positive returns for small firms and, particularly, for generic drug producers. Over the 9 event days (3 for each event) associated with passage of the MCCA, large firms and brand name firms gained an average of 0.2% per day. By contrast, small and generic firms gained about 5 times as much -- an average of 1.0% for small firms and generic drug producers.

Repeal of the MCCA led to the opposite pattern of excess returns. Large firms and brand name producers experienced net gains, while small firms and generic producers experienced net losses (although these were not statistically significant). The point estimates suggest that large firms gained an average of 0.1% each day over the 9 event day period while small firms lost an average of 0.3% each day. Brand name producers gained an average of 0.3% each day, while generic producers lost an average of 0.6% each day. Results over the 30-day window (not reported here) are slightly stronger. Large firms and brand name producers experienced statistically significant positive returns in the 30 days leading up to the House-Senate conference report and to the Senate vote.

In all, as the price data in Table 2 suggest, the pharmaceutical industry experienced net gains (relative to the market) over the entire period of the MCCA. These net gains, however, were distributed quite differently before and after repeal of the MCCA. The MCCA was associated with increases in the value of all pharmaceutical stocks -- brand name and generic, large and small -- but it increased the value of small and generic pharmaceutical stocks much more than those of large and brand name pharmaceutical stocks. Repeal of the MCCA increased the value of large and brand name pharmaceutical stocks but it diminished the value of small and generic stocks more. Since the bulk of the value of the industry is in large and brand name stocks, the net effect of the MCCA was a 0.5% daily excess increase in pharmaceutical stock prices and the net effect of its repeal was a daily 0.07% excess decrease in stock prices.

The Stock Market and the Estimators

How do these estimates compare to the predictions made by CBO and HCFA? The overall results suggest that the net effect of the MCCA was to increase the cash flow of pharmaceutical firms, implying that the market expected the MCCA to shift the pharmaceutical industry demand curve and that cost containment mechanisms would not entirely offset the expansion in insurance coverage. The market did not, however, expect pharmaceutical expenditures to increase very much.

Over the nine key event days surrounding passage of the Act, the price paid for pharmaceutical stocks increased 0.4% more (on average) than the price paid by the market as a whole. Under the extreme assumption that no responses on days other than these 9 affected pharmaceutical prices (which is consistent with the insignificant and often negative returns over the 30 day periods and over all other event days, and with the pattern in Figure 1), these average returns represent a 3.7% increase over the whole period. In 1988, the market valued the pharmaceutical industry at $136.7 billion dollars (Fortune, 1988). A 3.7% change in value, then, translates into an increase in the present value of expected cash flow of $5 billion. Assuming a (nominal) discount rate on earnings of 10 percent, annual (nominal) growth in pharmaceutical spending of 8 percent, a 3 year lag between passage and implementation of the legislation, and a 2 year partial implementation period this figure is equivalent to an annual net cash flow increase at full implementation of about $100 million. This figure incorporates any cost containment measures the market thought would accompany the bill. Nonetheless, it does not come near the $1.4 billion in additional pharmaceutical spending forecast by HCFA analysts. Furthermore, rather dramatic assumptions about cost growth would be needed to yield an estimate as high as the HCFA estimate.

The results for sub-categories suggest that later developments in the bill did have significant implications for cost containment that favored generic producers. Brand-name manufacturers experienced statistically significant negative returns after the Senate passed the MCCA, while generic producers gained from each of the events leading up to passage. Brand name producers experienced total gains of just 2.4 percent over the 9 days leading up to passage of the bill, while generic producers gained nearly 9 percent. Brand name producers gained a further 2.4 percent over

the 9 days surrounding events leading up to repeal of the bill, while generic producers lost 5.2 percent of their value over those 9 days.

The market's response to MCCA suggests that the industry saw considerable scope for regulators to alter the structure of the industry. Generic producers account for about 25 percent of the value of the industry, but they received 80% percent of the increased return associated with the MCCA. Generic producers also lost ground when the MCCA was defeated, suggesting that the market expected regulators to act more quickly than private insurers or individual physicians in switching from brand name to generic pharmaceuticals.

Some of the effect of the MCCA would have been felt by foreign pharmaceutical manufacturers who were not traded on the New York exchanges (and do not appear in our data). As noted above, US manufacturers account for a substantial share of U.S. sales. Even if foreign producers accounted for as much as 2/3 of the US market, however, the stock market estimates would not have approached those of the CBO.

Conclusions

This study used stock market information to provide yet another estimate of the potential effects of the Medicare Catastrophic Coverage Act on the demand for pharmaceutical coverage. The results of our analysis suggest that the market response to MCCA legislation was generally quite weak. Analysts and investors did not anticipate that the MCCA would lead to windfall profits for pharmaceutical producers. They anticipated much more modest demand responses, closer to those predicted by the CBO than to those predicted by HCFA.

The market may provide useful information in understanding the effects of insurance. In principle, market analysts combine information gleaned from all available sources. Yet some caution is in order in accepting the word of the market in health economics. Health economists have long been puzzled by the strong opposition voiced by provider groups to the passage of Medicare and similar health insurance programs, programs that were ultimately very profitable for providers. The pharmaceutical industry's response to the MCCA is a similar example of a provider group resisting the extension of government insurance benefits. Providers may resist government

insurance because they are concerned about their autonomy. Alternatively, they may overestimate the government's regulatory strength while underestimating the effect of improved insurance on demand. In the case of the MCCA, investors concurred with the industry in anticipating that the government's regulatory response would strongly favor generic producers, and that the legislation would offer little benefit to large, brand-name producers. Perhaps the divergence of industry and HCFA estimates of demand elasticity occurred because HCFA estimators have better information about the limited capacities of government regulators.

Table 1

Key Events Associated with the Passage and Repeal of the MCCA

Event	Date	Firms	Average Price
House passes drug benefit	July 23, 1987	26	$54.90
Conference Committee Reports Out MCCA	May 26, 1988	25	$34.05
House Passes MCCA	June 3, 1988	25	$35.57
House Repeals MCCA	October 5, 1989	31	$39.24
Conference Committee Agrees to Repeal	November 18, 1989	31	$38.96
Senate Repeals MCCA	November 22, 1989	31	$39.65

Dates defined as those on which event was reported in the Wall Street Journal or New York Times.

Table 2

Average Daily Excess Returns to Pharmaceutical Industry Stocks

Event	3 – Day Window	30 - Day Window
House passes drug benefit	0.003	-0.005
	(0.002)	(0.006)
House Ways and Means Committee	0.011**	-0.001
Reports Out the MCCA	(0.003)	(0.0009)
House Passes MCCA	-0.000007	-0.008
	(0.003)	(0.0009)
House Repeals MCCA	-0.002	0.002*
	(0.003)	(0.001)
House/Senate Conference Agrees to	-0.002	-0.0007
Repeal MCCA	(0.003)	(0.001)
Senate Repeals MCCA	0.002	0.0002
	(0.003)	(0.001)

Regression coefficients from dummy variable model including separate beta and intercept for each firm.

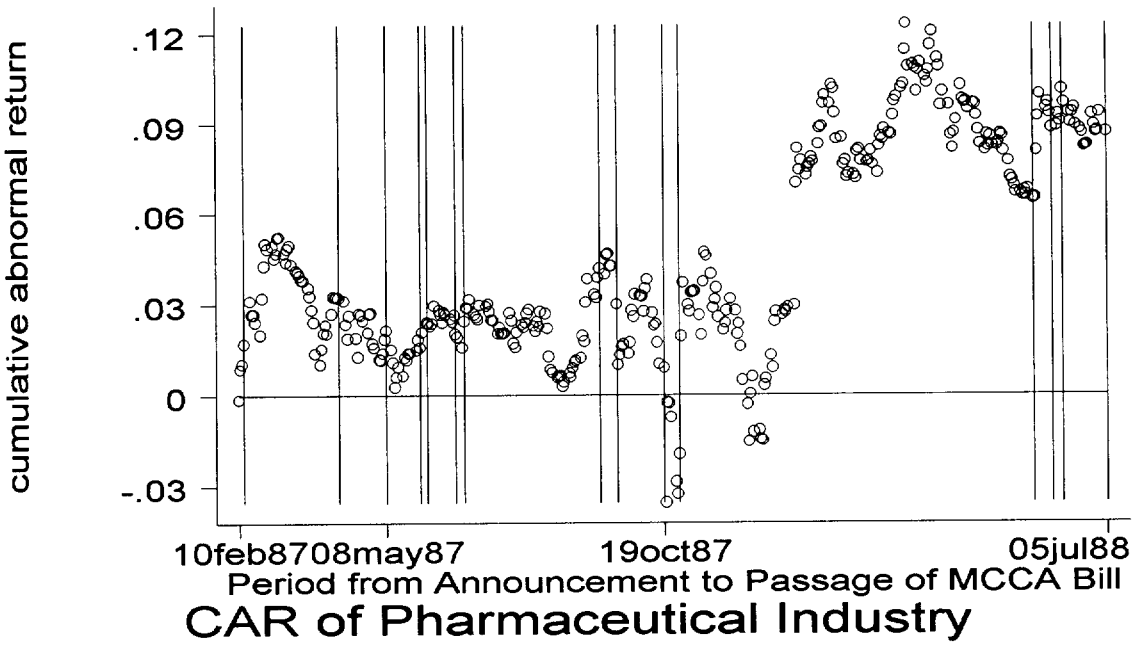
Table 3

Average 3- Day Daily Excess Returns to Sub-Categories of Pharmaceutical Industry Stocks

Event	Large Firms	Small Firms	Brand-Name Firms	Generic Firms
House Passes Drug Benefit	0.001	0.006	-0.001	0.008*
	(0.003)	(0.004)	(0.003)	(0.004)
Conference Committee	0.011**	0.015**	0.012**	0.017*
Reports Out the MCCA	(0.003)	(0.007)	(0.002)	(0.009)
House Passes MCCA	-0.005*	0.01	-0.003	0.003
	(0.003)	(0.007)	(0.002)	(0.009)
House Repeals MCCA	-0.0002	-0.003	-0.00007	-0.003
	(0.002)	(0.007)	(0.002)	(0.01)
House/Senate Conference	-0.001	-0.003	0.002	-0.01
Agrees to Repeal MCCA	(0.002)	(0.007)	(0.002)	(0.01)
Senate Repeals MCCA	0.004	-0.003	0.006**	-0.005
	(0.002)	(0.007)	(0.002)	(0.01)

Regression coefficients from dummy variable model including separate beta and intercept for each firm. Large firms defined as those with sales over $250 million. Number of firms: 13 for large firms (all analyses), 7 for small firms (MCCA), 12 for small firms (repeal), 11 for brand name firms (all analyses), 5 for generic firms (MCCA), 7 for generic firms (repeal).

Figure 1
vertical lines = event days



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