The Effect of Price Control Regulations on Firms’ Equity Values

Farshid Navissi, Robert G. Bowman and David M. Emanuel

We examine the relationship between firms’ equity values and the announcement of price control regulations. These announcements occurred three times in New Zealand over the period 1970–1972 and differed in their content. We have partitioned firms into two subsamples based upon how they were impacted by the regulations. We argue there were differential impacts of the announcements, which were conditional on the content of the announcements and their applicability to the classes of companies we examined. Our results provide strong evidence that equity values are negatively affected by price controls and positively affected when existing price controls are removed or relaxed. © 1999 Elsevier Science Inc.

Keywords: Regulation; Price control; New Zealand

JEL classification: G14, G18, G28

I. Introduction

This paper examines the impact of price control regulations on equity values of New Zealand listed public companies during a period when three sets of regulations were announced. In November 1970, a price freeze was imposed. In January 1971, a set of regulations was introduced by which some classes of companies were permitted to request price increases, and in February 1972, the initial 1971 scheme was replaced with a new regulation which expanded the classes of companies that could request increases.

Our results, across all tests, indicate a significant impact of price control regulation. We show that there is a negative share price effect when a regulation imposes price controls and a positive share price effect when a regulation relaxes controls which are already in place. We also provide evidence that the effect can be large.

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At first consideration, it seems obvious that price control regulation would impact on the profitability and cash flows of firms and, therefore, would impact upon the equity value of those firms. The magnitude of the impact would depend upon investors’ prior perceptions about the likelihood of regulation being introduced, the regulatory status of a company prior to the introduction of new regulations being introduced, and the costs imposed by the regulations. Nonetheless, the impact on equity values may not be as strong as it first appears. Furthermore, attempts to empirically investigate the effects of price control regulations are hampered by a number of methodological problems.

There are a variety of reasons or means whereby a firm may not be adversely affected by price controls. Firms may be able to pass the revenue impact on to employees and suppliers through wage and price adjustments. Of course, this response to price control is sometimes an objective of the regulations. Alternatively, the impact of price controls might be negligible if firms are able to circumvent the regulation. A binding price control regulation, which provides no opportunity for firms to increase their prices, may be mitigated by reducing the quality of products. Firms which are able to compensate for restrictions on prices with offsetting adjustments to factors of production may have no impact on their equity values. Finally, price controls are imposed domestically, so to the extent a firm is engaged in export selling, the impact of the control will be limited.

On the other hand, if a price control regulation provides some flexibility and allows firms to apply for price increases (e.g., based on increases in allowable costs), firms may be able to relax the regulatory constraints by using variation in accounting techniques. Firms may be able to manage their accounting so as to report higher allowable costs, and hence lower profit, which increases the probability of obtaining price increases. Evidence in the financial accounting literature suggests that the enforcement of regulatory constraints through accounting data provides incentives for firms to manage accounting data to relax the regulatory constraints. Watts and Zimmerman (1978) have discussed these incentives in depth. Jarrell (1979) provided evidence supporting this behavior for U. S. electric utilities subject to rate of return regulations. Relaxing binding regulatory constraints with discretionary accounting procedures has also been documented in Jones (1991), Boynton et al. (1992) and Cahan (1992).

Even if price controls impact upon equity values, it may be difficult to document a significant effect because of methodological difficulties. First, price controls may impact upon such a breadth of firms that it is difficult to disentangle the impact of the regulation from other events taking place in the market. Second, the regulations may be anticipated, so that the impact on security prices is gradual and cannot be isolated empirically.

The impact of price control regulations can be investigated at many levels. Several studies have examined the macroeconomic effects of price and wages controls [for example, Gordon (1973); deMenil (1974); Box and Tiao (1975); McGuire (1976); Feige and Pearce (1976); Heymann (1987)]. The evidence in this literature is mixed as to the impact of the regulations. There are also articles which evaluate the impact of macroeconomic news on financial markets. Recently, Ederington and Lee (1996) have shown that scheduled macroeconomic news releases in the United States result in significant and virtually instantaneous equity market reactions. Then, there have been studies of the equity value effects of regulation [see, for example, Smith et al. (1986); Allen and Wilhelm (1988); Millon-Cornett and Tehranian (1989); Fields et al. (1990); Bosch and Lee (1994)] and the threat of regulation [see, for example, Bowen et al. (1983); Dowdell et al. (1992)]. There are, however, few studies, which have looked at the equity value impact of price control regulations.
Ruback (1982) studied the effect of U. S. price controls by examining the impact of discretionary regulatory decisions on the equity values of individual firms. “The analysis of price increase decisions provides weak evidence that these Price Commission decisions had an impact on equity values,” he concluded [Ruback (1982, p. 83)].

Our research contributes to the literature on the impact of regulation on firm equity values by overcoming both of these difficulties. We were able to overcome the first problem because we compared the differential impact of price control regulations across sample firms. For each of the three regulatory events, and across the three events, we partitioned our sample based upon either their different pre-regulation price control status or the impact of the regulation upon their price control status. We then tested for a differential share price reaction while controlling for other variables which may potentially explain differences in the identified groups. We were also able to overcome the second problem. There was discussion in the media prior to each of the three regulations; however, in each case the content of the official pronouncement contained a substantial element of surprise. This allowed us to focus the event study upon periods of a few weeks. The combination of these two features provided us with a strong research design.

The results strongly support the intuitive notion that the imposition of price controls has serious negative effects on the value of firms, which are impacted by the price controls.

The paper is organized as follows. In the next section, we provide a description of the price controls which were introduced and implemented in New Zealand over the period 1970–1972. Section III gives details of the hypotheses, Section IV provides the methodology, and Section V summarizes the results. Section VI contains a brief summary.

II. Regulatory Intervention–Background

The legislation which permitted the introduction of the price control regulations in the early 1970s was the Control of Prices Act 1947. That act established a Price Tribunal which had power to “fix prices of goods and services (p. 450),” “to investigate complaints about the prices of any goods and services (p. 450),” and “to maintain a survey of the prices of goods and services and to take such steps as are in its view necessary to prevent profiteering or exploitation of the public (p. 450).” With the passage of time, the Tribunal delegated most of these tasks to the Department of Industries and Commerce.

The following two decades saw a substantial decrease in the range of goods which were subject to price control, so that by 1970, only forty products were still subject to control. For those products, application needed to be made to the Tribunal for a price increase, and any approvals were reflected in regulations tabled in the New Zealand parliament. Goods included in this group were cigarettes and tobacco, eggs, sugar, wire, wheat, fertilizer, agricultural chemicals, steel, and pharmaceutical drugs.

The late 1960s was a period of high inflation in New Zealand. In early 1970, an early warning system was introduced, whereby manufacturers of some goods not subject to control were expected to notify the Tribunal of forthcoming price increases. Goods falling under this classification included soft drinks, beer, biscuits, breakfast cereal foods, canned fruit and vegetables, cement and timber. A review of the media during this period indicates that discussions of the impact of inflation, and of ways of controlling inflation, were common. Employers and employees evidently agreed that early action by government to control the economic situation was desirable.

In early November 1970, a number of ministers disclosed that the government was considering possible economic measures, and that measures would be introduced sooner
rather than later. One report stated that “the time could well be appropriate for a price and wage freeze. Many observers in the business world as well as in consumer circles are coming to look more and more favourably upon this idea (p. 3).”

**The November 1970 Price Freeze**

On November 15, 1970, the New Zealand government announced a two-month price freeze. This initial price freeze (IPF) was to give the government time to develop and introduce a mandatory price justification scheme (PJS). The new scheme would “cover all significant items that it was practical to administer, as well as items already subject to the voluntary early warning system (p. 1).” Under the mandatory scheme “any manufacturer seeking to increase prices will make application to the Department of Industries and Commerce on a prescribed form and show that the price increases sought are fully justified . . . (p. 2)” No direct wage controls were introduced.

**February 1971 Price Justification Scheme**

The PJS was announced on January 15, 1971, to come into force from February 15. In essence, it extended the two-month freeze to three months. The PJS consisted of three schedules. The First Schedule contained the types of goods for which manufacturers could apply for price increases. The Second Schedule contained the types of goods for which manufacturers could not apply for price increases. The Third Schedule contained a list of allowable costs and submission forms for price increases to be used by manufacturers of First Schedule goods. Clause 3 of the PJS (which was issued by the Price Tribunal as *Price Order No. 2154*) stated:

> Any manufacturer or packer of any goods specified in the First Schedule hereto may apply to the Tribunal . . . for a new maximum price at which the particular goods may be sold by the manufacturer or packer making the application. (The New Zealand Gazett, January 1971, p. 68).

Clause 4 stated:

> Where the manufacturer or packer has made an application under clause 3 of this order and the Price Tribunal has not within a period of 21 days after the receipt of the application notified the applicant in writing of any objection it may have thereto the manufacturer or packer may, on the expiry of that period, charge the new price fixed by the Tribunal for the purposes of this order. (The New Zealand Gazett, January 1971, p. 68).

So the central focus of the price regulations was manufacturers. Wholesalers and retailers were covered in Part II of the Price Order. In clause 4, the maximum selling price was set so as not to exceed “the amount of into-store cost of those goods . . . increased by the margin of profit. . .which the wholesaler or retailer was normally incorporating . . .” Wholesalers and retailers did not have to apply for price increases and could maintain their margins. Manufacturers however had to apply for price increases, and then were only able to recover certain classes of allowable costs. The media reflect a general belief that the price freeze may have led to a lowering of profits for manufacturers, as they would have had to absorb increased costs. As a result, they were expected to quickly take advantage of the opportunity to request price increases.\(^1\)

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\(^1\) Records as to actual price increase applications were destroyed after ten years and were therefore not available. Our conversations with people involved in the process at the time indicated that most manufacturers did apply for price increases, and that there were very few requests which were not allowed (i.e., they were not objected to by the Price Tribunal within the required 21 days).
March 1972 Stabilization of Prices Regulation

In March 1972, the Price Tribunal issued the Stabilization of Prices Regulation (SPR). Manufactured (and other) items were partitioned into two categories. Category A included all items from the First and Second Schedules of the PJS. Category B covered all other goods and services. Manufacturers of such items did not have to apply for price increases but were constrained through the provisions of clauses 5–8 as to the extent of price increases. Category A items were covered by clause 4, which stated that “No manufacturer, packer, importer, wholesaler, retailer, or other trader or seller or supplier shall sell goods at a price higher than the base price unless...an increase is authorized by the appropriate pricing authority.” Manufacturers of Category A items could thus apply for price increases if they had incurred increases in allowable costs. Thus, manufacturers of PJS First Schedule goods could continue to apply for price increases, and manufacturers of PJS Second Schedule goods could now (for the first time) apply for price increases.

The initial price freeze, and the treatment of Second Schedule companies by the PJS order, can be interpreted as binding regulations, in that price increases were not permitted. The other regulations were flexible, in the sense that price increases were allowable provided the company making the application followed certain rules. Clearly, under the flexible regulations, at least part of increased costs were eligible for recovery. Further, there were no standards set as to how companies should apply for permission to increase prices, and applications were approved unless the Tribunal took positive action against the application within 21 days. This process presented applicants with opportunities to enhance their applications through the way in which accounting information was presented to the government officials who had responsibility for supervising the regulations.

III. Data, Event Times, and Hypotheses

Data and Event Times

This study used firms’ security returns to examine the differential impact of the price control regulations around the time the regulations were announced. Three separate event periods were identified.

<table>
<thead>
<tr>
<th>Event</th>
<th>Event Date</th>
<th>Event Window</th>
</tr>
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<tbody>
<tr>
<td>IPF</td>
<td>November 15, 1970</td>
<td>October 9, 1970–November 20, 1970</td>
</tr>
<tr>
<td>SPR</td>
<td>March 28, 1972</td>
<td>March 12, 1972–April 9, 1972</td>
</tr>
</tbody>
</table>

For each event, we reviewed all media discussion around the event to determine the extent of anticipation. The object was to keep the event window as short as possible, while at the same time including as much as possible of the reaction to the event within the event window. We believe the event windows chosen are the best trade off of these conflicting objectives and are sufficiently wide so as to overcome problems associated with the misspecification of event dates.

The Official Record of the Stock Exchanges of New Zealand was used to identify listed companies involved in manufacture and their major activities. The main activity of each firm was compared with the types of goods reported on the appropriate schedules of the PJS. If the main activity of a firm was as a manufacturer of a First Schedule good, it was classified as a member of the First Schedule group of companies. Relatively few problems
were encountered in identifying companies with the appropriate schedules in this way. During this period, New Zealand companies had limited diversification, so the mapping from a good on the schedule to a firm was seldom ambiguous. As indicated above, we concentrated on manufacturing companies, as these were the focus of the regulators’ intentions. This process resulted in identifying 119 companies for the 1970 and 1971 event times, and 109 companies for the 1972 event.

Hypotheses
Hypotheses were developed with respect to the initial price freeze and the two subsequent regulations. The important structure of the hypotheses is the expectation that these events would have different impacts on manufacturing companies depending upon the regulation and the prior regulatory status of each company. For each event, we partitioned the sample into two groups, depending upon either the price control imposed by the regulation or the firm’s prior regulatory status. We then analyzed the differential effect of each event on the two groups.

The November 1970 announcement of the IPF was a binding constraint affecting all companies. Some very preliminary details of the form of anticipated regulation were announced at that time, but no mention was made of which companies would be eligible for price increases or on what basis they would be permitted to apply. Prior to the IPF, approximately forty products were subject to price control. Thirty companies in our study were manufacturers of these products and, thus, were in this prior control category. The introduction of a price freeze may have limited impact on a company whose products are already subject to some form of price control. Hence, for the purposes of the first hypothesis, we have two groups of companies: those which were already subject to price control and those which were not. We argue that the equity value impact of the IPF, as represented by share price movements around the chosen event time, will be more negative for the companies which were previously under no price control than for those which were already under some control. For firms which were already subject to price control, the IPF was a continuation of an existing regulation, but it had a potentially positive implication in that the IPF indicated that release from price control might be forthcoming. The companies which had not been subject to prior control were now subject to temporary price control, with some probability that the controls would continue for an appreciable time. The first hypothesis, presented in its alternate form, is:  

\[ H_1: \text{The equity returns of companies not previously subject to price control will be less than the returns of companies previously subject to price control, during the period around the announcement of the November 1970 price freeze.} \]

The 1971 PJS was important in that it identified companies (or more accurately, the goods those companies produced) which either could or could not apply for price increases, depending on which schedule of the PJS contained the goods. First Schedule companies were faced with a flexible regulation and Second Schedule companies with a binding one. The costs imposed by price control on First Schedule companies were less, as the companies could potentially recover some or all of any additional costs incurred, and they could approach the task of applying for price increases opportunistically. We expect the impact of the PJS to be more negative for Second Schedule companies than for First Schedule companies. The second alternative hypothesis is:  

\[ H_2: \text{The equity returns of Second Schedule companies will be less than the returns of First Schedule companies during the period around the release of the PJS in 1971.} \]
The March 1972 SPR provided firms from both the 1971 PJS First and Second Schedules with opportunities to apply for price increases. These goods then all became part of what was known as Category A. The orientation of the SPR was to retailers and wholesalers, as well as manufacturers. All companies involved with Category A goods had to apply for any increases over what was defined in the regulation as the base price. In essence, the 1971 First Schedule companies could continue to apply for price increases (albeit under a slightly different regime), and the 1971 Second Schedule companies could apply for the first time. We expect the impact of the SPR to be less favorable for First Schedule companies than for Second Schedule companies. The third alternative hypothesis is:

\[ H_3: \text{The equity returns of First Schedule companies will be less than the returns of Second Schedule companies during the period around the release of the SPR in 1972.} \]

The set of three regulatory events resulted in all companies in our sample being in the common position of being permitted to apply for price increases. Prior to the IPF however, thirty companies in the sample were subject to price control. Therefore, spanning the events, these companies became subject to less restrictive controls. The other companies, who had initially been subject to no price control, became subject to a relatively low level of monitoring control of their pricing. Again, we were able to differentiate the impact of the set of these three events on companies in the sample. We expect the impact of the set of events to be more negative for companies which had not been subject to prior price control than for the companies which had been subject to prior control. The fourth alternative hypothesis is:

\[ H_4: \text{The equity returns of companies not initially subject to price control will be less than the returns of companies initially subject to price control, cumulated over the three periods of regulatory action.} \]

IV. Methodology

For each event, and across the three events, we partitioned each sample into two subsamples, based upon how the firms were hypothesized to be affected by a regulation. We then tested the hypotheses by investigating the differential price responses to the regulatory events. Market adjusted returns\(^2\) to equity surrounding the release of each regulation were used to estimate the impact of the regulations. Market adjusted return for firm \(i\) in an event time was computed as:

\[
R_{i,n} = \frac{\left(\frac{P_{i,t+1} - P_{i,t}}{P_{i,t}}\right)}{\left(\frac{M_{t+1} - M_t}{M_t}\right)} - \left\{\frac{M_{t+1} - M_t}{M_t}\right\}
\]

where

- \(R_i\) = market adjusted return for firm \(i\) in event time \(n\);
- \(P_i\) = dividend adjusted security price for firm \(i\);
- \(M\) = market index;
- \(n = \) November 1970, January 1971, March 1972 or the cumulative period;
- \(t = \) beginning of even time \(n\);
- \(t + 1 = \) end of event time \(n\).

\(^2\) We used the Reserve Bank of New Zealand Share Price Index (broad-based and value-weighted). For purposes of testing the hypotheses, raw returns would yield the same results as using market-adjusted returns. The difference would be that with raw returns, the market return would be captured in the intercept of the model.
We used the market adjusted return as the dependent variable in a regression model to examine the differential impact of each price control regulation on firms’ equity values.

The focus of our research is to investigate whether the share price impact of the regulations was different for firms depending upon how a regulation altered the pricing constraints upon them. We have four hypotheses, each of which defines a partitioning of the sample of firms. We used a dichotomous independent variable to capture the partitioning. For each hypothesis (and, thus, for each regression), we defined REG as equal to 1 if we hypothesized that the regulation would have a relative negative effect on the firm. If the effect was expected to be relatively positive, or less negative, the variable was set to zero. Therefore, we expect that the coefficient on REG will be negative in each case.

To properly specify a model of returns, we need to control for possible differences in risk between firms and across the two subsamples. If the firms in the subsamples have different risk, that would be expected to impact upon the returns and could bias the results of our analysis. We did not use risk-adjusted returns because of the difficulties of estimating firm betas given the uncertainty of identifying and measuring the appropriate market index. The firms in the sample constitute a substantial part of the New Zealand stock market. Also, the regulations being studied may have systematically affected firms which are not in our sample, but would be in the market index.

We used an alternative approach to control for risk, which was motivated by the research of Fama and French (1992, 1996). We introduced independent variables which have been shown to capture cross-sectional variation in stock returns. To control for size, we used the log of market equity value. We used the ratio of book equity to market equity, the firm’s dividend yield, and its return on book equity, all of which have been shown to capture elements of risk. Each variable was measured for each firm, and for each event time, and used as an independent variable in the appropriate regression.

The model that we tested for each hypothesis is as follows:

$$
R_{i,n} = \beta_0 + \beta_1 \text{REG}_{i,n} + \beta_2 \text{LME}_{i,n} + \beta_3 \text{BM}_{i,n} + \beta_4 \text{DYLD}_{i,n} + \beta_5 \text{ROE}_{i,n} + \epsilon_{i,n}
$$

where

- $\text{REG}_{i,n} = 1$ for firms subject to the more severe price control from regulation $n$, and 0 otherwise;
- $\text{LME}_{i,n} =$ log of market equity for firm $i$ in event time $n$;
- $\text{BM}_{i,n} =$ book equity to market equity for firm $i$ in event time $n$;
- $\text{DYLD}_{i,n} =$ dividend yield for firm $i$ in event time $n$;
- $\text{ROE}_{i,n} =$ return on equity for firm $i$ in event time $n$;
- $\epsilon_{i,n} =$ error term for firm $i$ in event time $n$.

The intercept should capture the average market adjusted impact of the regulation for the firms in our sample which were less negatively affected. We expect that this impact will be consistent with the loosening or tightening of price control which resulted from the regulation. Unfortunately, the intercept will pick up average cross-sectional effects which are not explicitly modeled in equation (2). Therefore, we have no formal hypotheses for the intercepts. The focus of our research is on the REG variable. This dichotomous variable captures the impact of the price control regulation on the firms which were

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3 We also tested the model with the log of book value of equity. The book value and market value measures were highly colinear. The inclusion of the book value measure had no impact on the results reported here.
subject to the more severe price control from the regulation. The four control variables (LME, BM, DYLD and ROE) capture cross-sectional differences in returns between the two subsamples which are not related to the regulation. We have no expectation as to their importance in the regressions.

The four hypotheses were tested by the variable REG in equation (2). We set REG equal to 1 under the following (negative) conditions for each event (else, it is set equal to 0).

1. November 1970 IPF—firms which were not price-regulated prior to November 1970.
2. January 1971 PJS—firms which could not apply for price increases (Second Schedule firms).
3. March 1972 SPR—firms which could apply for price increases for the second time (First Schedule firms).
4. Cumulative Period—firms which were not price-regulated prior to November 1970.

For each regression we ran, our alternative hypothesis was that the coefficient of REG would be negative. The interpretation of this expected result would be that price controls impact negatively upon firms’ equity values.

V. Empirical Results

We report descriptive statistics on market adjusted returns in response to the November 1970 IPF, the January 1971 PJS, and the March 1972 SPR in Table 1. For the November 1970 event, there are 119 firms of which 30 firms are manufacturers of goods which were already subject to various price control regulations when the November 1970 price freeze regulation was announced. The mean market-adjusted return for these firms is positive (0.0176). It appears that the November 1970 price freeze regulation was good news for these previously price-controlled firms, as the Price Tribunal announced that firms would be able to apply for price increases in January 1971. The mean market adjusted return for

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<th></th>
<th>November 1970 IPF</th>
<th>January 1971 PJS</th>
<th>March 1972 SPR</th>
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<tbody>
<tr>
<td></td>
<td>Regulated prior to Nov 1970</td>
<td>Unregulated prior to Nov 1970</td>
<td>First Schedule Firms</td>
</tr>
<tr>
<td>Mean</td>
<td>0.0176</td>
<td>−0.0425</td>
<td>0.0073</td>
</tr>
<tr>
<td>Median</td>
<td>0.0070</td>
<td>−0.0353</td>
<td>0.0123</td>
</tr>
<tr>
<td>Std. dev.</td>
<td>0.0892</td>
<td>0.0918</td>
<td>0.0755</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>89</td>
<td>44</td>
</tr>
<tr>
<td>Min.</td>
<td>−0.1112</td>
<td>−0.4728</td>
<td>−0.2059</td>
</tr>
<tr>
<td>Q1</td>
<td>−0.0287</td>
<td>−0.0707</td>
<td>−0.0198</td>
</tr>
<tr>
<td>Q3</td>
<td>0.0494</td>
<td>0.0249</td>
<td>0.0328</td>
</tr>
<tr>
<td>Max.</td>
<td>0.3456</td>
<td>0.2772</td>
<td>0.1884</td>
</tr>
<tr>
<td>% pos/neg</td>
<td>53/47</td>
<td>31/69</td>
<td>64/36</td>
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manufacturers of unregulated goods is negative (−0.0425). This was expected, as these firms became subject to temporary price control and some possibility of subsequent controlled control.

As mentioned in the introduction, one reason why price control regulations may not have an impact on equity values is that firms may avoid much of the effect if they are able to adjust the quality of their products. Also, export-oriented firms may not be impacted. We identified those firms in industries where it appeared possible to adjust quality (13 firms in clothing, hosiery, textile and shoes) or which were in export-oriented industries (21 firms of which 12 were in the timber industry). The 34 firms which were involved in exporting or which could lower product quality were less affected by the November 1970 IPF than the 85 other firms by an average of nearly 4%. The difference was marginally significant and was somewhat more pronounced for the exporting firms.4

The January 1971 PJS had a mean positive (0.0073) effect on the 44 First Schedule firms. But the disqualification of Second Schedule firms to apply for price increases apparently came as a surprise to these 75 firms. The mean market-adjusted return for these firms is −0.0598. The March 1972 SPR allowed First Schedule firms to apply for price increases for the second time, while Second Schedule firms were freed from price controls and were allowed to apply for price increases for the first time. The mean market-adjusted return for the 40 First Schedule firms was positive (0.0212), while for the 69 Second Schedule firms it was even more positive (0.0322).5

Although the descriptive statistics are generally consistent with our expectations, they do not constitute an adequate test of our hypotheses.

Table 2 reports the results of the equation (2) regressions which tested our hypotheses on the three price control regulations. Looking across the three panels, we note that none of the four control variables was significant in any of the tests. We conclude that the partitioning into subsamples did not proxy for a partitioning on risk.6

The results from tests of the November 1970 IPF are reported in Table 2, panel A. The coefficient on REG (β1) was negative (−0.0556) and significant (p = 0.0008), indicating that this regulation had a significant differential impact on security prices of firms. Consistent with our hypothesis, the impact of the price control regulation was more negative on security prices of previously unregulated firms than on previously price-regulated firms.

In panel B, the test of the January 1971 PJS is reported. The coefficient on REG is again negative (−0.0279) and significant (p = 0.0507). Consistent with our hypothesis, the continuation of price control on Second Schedule firms significantly depressed equity values of those firms relative to firms which were released from price control.

We report the results for the March 1972 SPR in panel C. The SPR had a positive impact on security prices of both First and Second Schedule firms. The differential impact was negative but not significant. One possible explanation for this result is that the equity value benefit to Second Schedule firms of being released from price control was partially anticipated in prices before our event window. This possibility is made less likely however by the result on the intercept in this test. As we mentioned in the section above, the

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4 We are grateful to a referee for suggesting this test.
5 We lost ten firms from our original sample for lack of data.
6 In analysis not reported here, we ascertained that the risk control variables had no appreciable impact on the coefficient or significance of the dummy variable for regulatory effect. The set of variables did, however, have some impact on the constant term. This was most pronounced in the test of the SPR, reported in Table 2, panel C, where the constant term was increased by the inclusion of the control variables.
intercept in our model reflects the average impact of the regulation for the firms in our sample which were less negatively affected, in this instance the Second Schedule firms. This impact should be consistent with the loosening of price control which resulted from the SPR. The March 1972 SPR is the only case where the effect of the regulation seems unambiguous (and positive), as it freed all of the firms from price control. In panel C, we see that $\beta_0$ is positive (0.1941), but not significant. Our event window for this test is a period of only 28 days, yet the average (adjusted) increase in equity value for the Second Schedule firms was over 19%. As the differential effect of the SPR on First Schedule firms was trivially negative, the aggregate effect on these firms was also an increase of nearly 19% ($\beta_0 + \beta_1$).

An additional test of the impact of price control regulation focused on the sequential relationship of price changes. If the regulations caused the changes in equity values, we would expect a negative relationship (i.e., a reversal) between the reaction to the imposition of price control and its subsequent relaxation. To identify the cases where we

<table>
<thead>
<tr>
<th>Table 2. Differential Impact of the Price Control Regulations for Each of Three Events</th>
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<tbody>
<tr>
<td>Panel A: November 1970 IPF</td>
</tr>
<tr>
<td>Parameter estimate</td>
</tr>
<tr>
<td>0.0068</td>
</tr>
<tr>
<td>$t$ statistic (p value)</td>
</tr>
<tr>
<td>$F$ statistic = 3.230 $p$ value = 0.100</td>
</tr>
<tr>
<td>Adj. $R^2$ = 0.1050</td>
</tr>
<tr>
<td>Panel B: January 1971 PJS</td>
</tr>
<tr>
<td>Parameter estimate</td>
</tr>
<tr>
<td>$t$ statistic (p value)</td>
</tr>
<tr>
<td>$F$ statistic = 1.663 $p$ value = 0.1516</td>
</tr>
<tr>
<td>Adj. $R^2$ = 0.0337</td>
</tr>
<tr>
<td>Panel C: March 1972 SPR</td>
</tr>
<tr>
<td>Parameter estimate</td>
</tr>
<tr>
<td>$t$ statistic (p value)</td>
</tr>
<tr>
<td>$F$ statistic = 0.659 $p$ value = 0.6557</td>
</tr>
<tr>
<td>Adj. $R^2$ = -0.0195</td>
</tr>
</tbody>
</table>

The following regression model was used to examine the differential impact of each price control regulation on firms’ equity values:

$$R_i,n = \beta_0 + \beta_1 REG_{i,n} + \beta_2 LME_{i,n} + \beta_3 BM_{i,n} + \beta_4 DYLD_{i,n} + \beta_5 ROE_{i,n} + \epsilon_{i,n}$$

where

- $R_i,n$ = market adjusted return for firm $i$ in event time $n$;
- $REG_{i,n}$ = 1 for firms subject to the more severe price control from regulation $n$ and 0 otherwise;
- $LME_{i,n}$ = log of market equity for firm $i$ in event time $n$;
- $BM_{i,n}$ = book equity to market equity for firm $i$ in event time $n$;
- $DYLD_{i,n}$ = dividend yield for firm $i$ in event time $n$;
- $ROE_{i,n}$ = return on equity for firm $i$ in event time $n$;
- $n$ = November 1970; January 1971 or March 1972;
- $\epsilon_{i,n}$ = error term for firm $i$ in event time $n$. 

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expected to observe significant reversals, note that the 1970 regulation did not have an unambiguously strong impact on the firms which had previously been regulated. Also, the 1972 regulation did not have a substantial effect on First Schedule firms. Therefore, to investigate the reversal, we computed the Pearson correlation coefficients between price changes for a set of subsamples and found the following:7

<table>
<thead>
<tr>
<th>Regulated prior to 1970:</th>
<th>N</th>
<th>Correlation</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Schedule, 1971 versus 1972</td>
<td>23</td>
<td>0.082</td>
<td>0.709</td>
</tr>
<tr>
<td>Unregulated prior to 1970:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Schedule, 1970 versus 1971</td>
<td>40</td>
<td>-0.246</td>
<td>0.126</td>
</tr>
<tr>
<td>Second Schedule, 1970 versus 1972</td>
<td>46</td>
<td>-0.402</td>
<td>0.006</td>
</tr>
<tr>
<td>Second Schedule, 1971 versus 1972</td>
<td>46</td>
<td>-0.009</td>
<td>0.952</td>
</tr>
</tbody>
</table>

Of the four possible reversals, we found one strongly significant and one marginally significant.

Our final hypothesis test is cumulative over the three regulations. Prior to the first price control regulation that we studied, some of the firms were already subject to price control while others were not. After the March 1972 SPR, all of the firms were free of price control. We hypothesized that the cumulative impact of the price control regulations would be more unfavorable for firms unregulated prior to November 1970 than for those regulated prior to November 1970. We tested whether there was a differential effect of the regulations on the two subsamples of firms. For this regression, the dependent variable, market-adjusted returns, is the sum of the market-adjusted returns for each firm in the three regulation-specific event periods. We report the results from comparison of cumulative returns across all events in Table 3.8

As hypothesized, the set of price control regulations had a differentially negative impact on those firms which had not been subject to price controls prior to November 1970. The differential effect was larger than for any of the price control regulations individually (−0.0794), and was significant (0.0156).

This result can also be interpreted positively with respect to the firms which were subject to price controls prior to the IPF. These firms’ equity values (adjusted for market and risk) increased by over 33% as a result of being released from price controls (although this result is not quite significant at conventional levels).

Returning to the firms which were not subject to price controls either prior to the IPF or after the SPR, the aggregate result is most interesting. In a narrow sense, these firms would seem to have been unaffected by the series of regulations. In a broader sense, they would have been affected by the changing expectations regarding the threat of price control. In 1970, there was a clear expectation that wage-price inflation had become a serious concern to the government and that regulatory actions were only a matter of form and time. Price controls were anticipated. After the SPR in March 1972, there was a general expectation that further price control regulation was unlikely, at least in the near to medium term. By considering both the coefficient on REG and the constant term, we see that the cumulative effect (adjusted for market and risk) of the set of regulations on

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7 We are grateful to a referee for suggesting this test.
8 As reported in footnote 2, ten firms in the original sample did not have data over the entire period. This last test had 27 firms in the prior price regulation subsample, and 82 in the previously uncontrolled subsample.
these firms' equity values ($\beta_0 + \beta_1$) is over 25%. Apparently, the threat of price control regulation alone has a significant impact on security prices and equity values.

Overall, our test results provide strong evidence that the information content of the price control regulations was captured in security prices at the announcement time of the regulations. Further, the impact of the price control regulations on firms' equity values depended upon the nature of the regulation and the price control status of the firm prior to the new regulation.

### VI. Summary

This study has examined the equity value impact of three sets of price control regulations released in November 1970, January 1971, and March 1972. For each regulation, and then across the three periods, we partitioned the firms into two subsamples based upon the expected impact of the regulation on each firm’s equity value. We then tested for a differential effect of the regulation on the two subsamples. The tests included a set of independent variables intended to capture cross-sectional differences. Our focus on the differential effect makes our tests unique in this literature and robust to alternative explanations of the observed behavior of security returns.

We found strong evidence that price control regulation has a significant negative impact on firms’ equity values. The negative effect was consistent across all four tests and significant in three of the four. Furthermore, we found that the threat of price control regulation can significantly affect security prices. One set of 82 firms in our sample was not subject to price control prior to the series of regulations which we studied and was also not subject to controls after the third regulation. In a sense, their status was ultimately unchanged by the regulations. Over the period however, there was a major shift in the...
threat of regulation (from high to low). These firms experienced an increase in market-
and risk-adjusted equity value of more than 25% over the three event windows.

There is some support in the literature for firms being able to circumvent the impact of
price control regulation. If this were the case, we would expect to find no significant effect
in this study. Our results clearly show that the impact of such regulations is not that easily
avoided. We do however show that firms which can most easily adjust the quality of their
products may be able to mitigate the impact.

We conclude that price control regulations and the threat of price control regulations
have significant implications for firms’ equity values.

References
Allen, P., and Wilhelm, W. August 1988. The impact of the 1980 Depository Institutions Dereg-


