'When Unions Mattered': Assessing the Impact of Strikes on Financial Markets: 1925-1937

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WHEN UNIONS "MATTERED": THE IMPACT OF STRIKES ON FINANCIAL MARKETS, 1925–1937

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This examination of the Stock Market's responsiveness to strikes looks specifically at strike actions that labor historians generally view as the major ones occurring in the United States in the years 1925–37. The authors find that strikes had large, negative effects on industry stock value. Longer strikes, violent strikes, strikes in which unions "won," industry-wide strikes, strikes that led to union recognition, and strikes that led to large wage increases were associated with larger negative share price reactions than were other strikes. Much of the "news" generated by the typical strike seems to have been registered by the Stock Market very early in the strike. However, there were also some fairly large stock price reactions to news that could be fully revealed only at the end of a strike.

This paper is an examination of the impact of important strikes on industry stock returns at a time when unions were rapidly evolving. We focus on the economic consequences of strikes during the interwar period as reflected in the behavior of the stock market. Our point of departure is the identification of strikes that, in contrast with most present-day strikes, were primarily an attempt by workers to change the "terms of trade" between workers and their employers. Using standard event-study methods, we evaluate the effect of various important strike characteristics on broad industry-level measures of equity prices. While several studies (for example, Becker and Olson 1986; Neumann 1980; Kramer and Vasconcellos 1996; Persons 1995) have investigated the link between strikes and stock prices, they have focused on a much more recent period—one for which data are publicly available—and the strikes they have examined arguably had a much smaller impact on the structure of industrial relations than did the strikes in our sample.

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Given our focus on strikes, our paper is directly related to two literatures. In one (see Neumann and Reder 1984), the effect of strikes on industry-wide output is measured using industry-wide measures such as inventories and shipments. In another, the lost value associated with strikes is measured using data on market valuation (see, for example, Ruback and Zimmerman 1984). This literature is closely related to the "event study" literature in finance and has focused exclusively on using stock market returns from individual firms. At its most basic level, our approach is a combination of these two approaches. Like the firm-level studies, our study uses information from the capital markets; unlike that literature, but in common with the literature on the "industry-wide" effect of strikes, our study focuses on broadly defined industrial aggregates.

Our study, therefore, begins with the premise that the extent of union effects is potentially easier to detect when changes in unionization are large and important than when they are modest. Toward that end, we focus on the period between the two World Wars, an important time for the U.S. labor movement. After witnessing a prodigious and rapid increase in membership at the end of the nineteenth century, American unionism experienced a decline of almost equal magnitude in the period leading up to the first World War. The ferocity of business and government hostility to the attempt to organize American workers left little doubt about the importance of the struggle. As we will argue below, this period and the period leading up to World War II provide a unique time to investigate the impact of strikes on firms.

Analytical Framework

At first glance, it might be surprising to find any effect of strike activity on *industry-wide* stock prices. The first puzzle involves why strikes should have any effect on the returns of individual firms. In the context of an infinitely long-lived firm, and when strikes have no effect on the terms of trade, the change in the value of discounted earnings streams would be quite small. Given the considerable evidence that the measured change in market values of firms resulting from strikes is not negligible (for example, Becker and Olson 1986; Neumann 1980; Ruback and Zimmerman 1984), however, we follow the earlier literature and assume that it is meaningful to investigate the presence of such an effect.

Once we turn our attention away from the single firm and consider the entire industry, we must consider the effect of union bargains on non—unionized firms or those not immediately party to the contract negotiations.[1] One's *a priori* view of the sign and magnitude of these indirect effects depends on the mechanism by which unions (in this historical context) raise wages. If a "successful" strike is one resulting in a one-time "permanent" change in the share of the surplus going to workers, the strike's effect on the value of the firm will be proportional to the change in profits going to the firm. The effect on industrial activity at large will be small to the extent that the strike's effects are limited exclusively to the struck firm and the firm's share of output is small.

To prepare the way for our empirical analysis, consider the extreme case in which wage bargains reached by unions accrue to all workers in an industry.[2] Again for simplicity, we assume a constant real rate of interest r. Before the strike, the industry faces a probability π of a one-time permanent change in firm value due to the union calling a strike and winning.[3] If we denote earnings in a given time period by D and the percentage change in the share going to the firm by $-\delta$, the value of the firm prior to the strike decision is

[1] See Lazear (1983) for some of the subtleties involved.

[2] The presentation could be made more realistic by considering a finite time horizon or the possibility of future union wins or losses, but this would merely complicate the expressions without contributing additional insight.

[3] $1 - \pi$, then, is the probability that the union does not call a strike or calls one and loses.

$$(1)\qquad E[V_0] = \pi\int_0^{\infty} e^{-rt}D(1-\delta)\,dt + (1-\pi)\int_0^{\infty} e^{-rt}D\,dt$$

If the union strikes and wins, the value of the firm is merely

$$(2)\qquad V_{\text{union strikes and wins}} = \int_0^{\infty} e^{-rt}D(1-\delta)\,dt$$

The percentage change in the value of the firm (or log difference) when the union wins is then given by

$$(3)\qquad \text{Percent change in the value of the firm} = \log(E[V_0]) - \log(V_{\text{union strikes and wins}}) = \log\left(\frac{1-\delta\pi}{1-\delta}\right) \approx (1-\pi)\delta$$

This expression has a simple interpretation. The percentage change in the value of the firm when the union strikes and wins an important fight is equal to the product of the probability that the union loses or does not strike at all $(1-\pi)$ and the fraction of earnings that flow away from shareholders toward workers (δ). If firms completely anticipated a union strike and victory ($\pi = 1$) and this information were already incorporated into the value of the firm, a strike would have no effect on excess returns.

The analysis is completely symmetric for the case in which the union does not strike or strikes and loses. In this case, the magnitude of the measured effect of union losses on stock prices will be largest when the probability firms attach to a union loss is small. The measured effect of a union loss on stock returns will be small whenever a union defeat is likely. Put differently, the revision to stock prices depends not only on the direct effect of the union loss (or other event) on the firm's "bottom line" (δ) but also on how surprising the event is (π).

We focus on the relationship between strikes and industry stock prices during the period between the World Wars because this is a time viewed as very important in labor history by labor historians and other informed observers. Nevertheless, it is interesting to compare our results with those of studies using data from a much more recent time period. Several such studies are noteworthy. Becker and Olson (1986), in a comprehensive study of the impact of strikes on individual firm stock prices from 1962 to 1982, found that the average large strike was associated with a 4.1% decline in stock prices.[4] Persons (1995) found that the share price reaction to struck automobile producers and steel suppliers was around 1.6% on the days around the strike. Neumann (1980) found a share price reaction of about 0.5% on the day of an announced strike for a sample of firms struck in the late 1960s and mid-1970s.[5] Using Canadian data, Nelson et al. (1994) studied 124 strikes between January 1983 and July 1989 and found a loss in stock price of about 1% for the 5-day window around the strike.[6] Although each of these studies used a different time period, sample of strikes, and event window, they all suggest a negative share price reaction of between 1% and 4% around the start of the strike.

A goal of our work is to assess the impact of strikes on industry stock prices during the interwar period. As a practical matter, the most straightforward way to do so would be merely to examine industry stock returns before and after the strike and then attribute the entire stock price change to the effects of the strike. The problem with such a comparison is that it implicitly assumes that *had the strike not occurred,* industry returns after the strike ended would have been exactly equal to industry returns just before the strike—an assumption that is justifiable only in the improbable case that general economy-wide conditions were

[4]The Center for Research in Security Prices (CRSP) at the University of Chicago only published daily stock prices after 1962. All of the previous studies concentrated on years after this date.

[5]Neumann (1980) went on to suggest that the stock market seems to have predicted the occurrence of strikes quite well during this period.

[6]Also see Kramer and Vasconcellos (1996), Davidson et al. (1988), and Ruback and Zimmerman (1984) for related studies.

unchanging during the strike period. A more realistic analysis generates an assessment of the movement of stock prices that *would have occurred in the absence of the strike.* This *counterfactual* can then be compared to the actual behavior of stock prices to generate an estimate of the strike's effect.

One approach to making such a comparison, and the one we use in this paper, is often referred to as "the event study method." It has been widely used in industrial relations research, including, for example, Becker and Olson (1986) and Abowd, Milkovich, and Hannon (1990). As the technical aspects of the method we employ are carefully described in Brown and Warner (1985), Campbell, Lo, and MacKinlay (1997), Fama et al. (1969), and MacKinlay (1997), we will describe the basic ideas only briefly.

We begin by concentrating on the effect of a strike around the strike's start. Cumulative average excess returns are calculated using the simple method outlined below. Let t index time in trading months, let s indicate the "event month" (the month of the start of the strike), and let i indicate industries. First the industry monthly stock return, R_{it}, is regressed on R_{mt}, the average market return for month t, which we also collected from the Cowles (1938) data. This regression,

$$R_{it} = \alpha_i + \beta_i R_{mt} + \eta_{it}, \tag{5}$$

is estimated for a period[7] from month $s-24$ to month $s-12$. The coefficients from this regression, as well as the values of R_{mt} during the strike period, allow us to generate an estimate—$\hat{R}_{it}$—of what would have happened had the strike not occurred, where

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt}, \tag{6}$$

and where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are OLS estimates of the parameters in equation (5) and $\hat{R}_{it}$ is merely the predicted return. Our reason for estimating this regression using data for a period preceding the strike is to avoid potential contamination of our counterfactual by expectations of a strike.

With our estimates of the counterfactual in hand, the next step is to compute the following for each month around the event date:

$$ER_{it} = R_{it} - \hat{R}_{it}, \tag{7}$$

where ER_{it} (usually called the "excess return") for each industry i for each month t is merely the difference between the actual return R_{it} and the predicted return $\hat{R}_{it}$. In the absence of a strike, the average of ER_{it} should clearly equal zero.

The excess returns calculated for each month around the start of a strike are used to form the average excess returns for each strike. These are easily computed by averaging the monthly excess returns for each strike. We also compute "cumulative" excess returns by adding monthly excess returns for various intervals (called event "windows") around the date of the strike. Cumulative average excess returns are merely the average of these cumulative excess returns across all strikes.

The precise statistic used to assess whether average excess returns or cumulative excess returns are "statistically significant" are discussed in Campbell, Lo, and MacKinlay (1997). These tests proceed by observing, as noted previously, that average excess returns and cumulative average excess returns should be zero in the absence of "news" that permanently alters the value of the firm. The extent to which these returns differ from zero is evidence in support of the hypothesis that the events we have identified provided important news.

Another issue is the definition and timing of the event. In the typical event study, where excess returns over a period of a few *days* are being evaluated, defining the timing of the event is critically important and often very difficult. Researchers must be able to carefully identify when participants in capital markets first became aware of news. We are not as concerned with this issue, since our periods are measured in months. Other implications of the timing are discussed below.

[7]We tried other prediction periods with no meaningful effect on the results.

Historical Context

As mentioned in the introduction, the interwar period is a particularly interesting one for an investigation of this kind. The state policy vis-a-vis unionism was either nonexistent or hostile during most of the sample period. Moreover, it is clear that most participants firmly believed that the outcome of the battle between capital and labor was of great significance and the immediate stakes were enormous. For example, in the decades leading up to our sample period the Industrial Workers of the World began as "the last important national organization to challenge the philosophy of business unionism … [but by the end of World War I had become] a tiny organization whose status as a labor union was questionable" (Rees 1977). Moreover, it is quite clear (particularly for years before 1934) that "unions existed in a predominantly non-institutionalized setting. Union recognition, collective bargaining and labor-management contractual agreements were not yet legal and, in fact, much of the conflict between labor and capital was over the right to organize" (Rubin 1986). At the same time, the government's attempts to avert strikes that might damage wartime production and other concerns led to the passage of the Clayton Act. The Clayton Act abolished the legal framework that had most limited union organizing—the principle that unions violated the Sherman Anti-Trust Act by acting as a "restraint on trade."[8] As a consequence, the interwar period was arguably the crucible that set the terms of trade under which unions would be tolerated by business and the government after World War II. As such, it is an ideal context in which to study the impact of strikes on stock prices.

In addition, unlike in the post–World War II period, the role of the state in providing income support (sometimes viewed as an "alternative" to unionism) was rather small. Moreover, the institutional features that were to mark postwar industrial relations, such as "pattern bargaining," were forged in part during this critical period. The formation of industrial relations schools reflected a perception that collective bargaining was a relatively permanent phenomenon. In contrast, during the interwar period the view of collective bargaining as "normal" or "inevitable" was not widespread. The absence of such a view was reflected in the nature of the strikes, which generally were driven by debates over fundamental aspects of workplace relations.

Data

The two main data sources for this paper are the information on the specific strikes and industry financial data. The first set of data come from Filippelli (1990), a history of significant strikes from the relevant time period. The stock price data are from a Yale University report (Cowles 1938). In each case, collecting the data required going through the sources by hand (or using scanning technology along with Optical Character Recognition [OCR] software).

We investigated a broad set of possible sources of data on strikes from this particularly important period in labor history, including, for example, Peterson (1938). However, only one that we were able to locate, Filippelli (1990), offered us the exact relevant dates associated with each strike, which are crucial to the event study method we employ. In *Labor Conflict in the United States: An Encyclopedia,* a host of contributors provide detailed accounts of various important strikes during the time period in question. Obviously, we only focus attention on a certain select set of strikes. Filippelli, the editor of the collection, examined a total of 254 strikes that occurred over a very long time period—the strikes "that appear in all standard labor histories," he claimed, and that represent, he hoped, "all of the conflicts that labor histo-

[8] In practice, of course, the Clayton Act was not a panacea for American trade unionism. Indeed, in the first 24 years after its passage, more cases of antitrust violations were brought against labor than in the 24 preceding years. See Fisher (1940).

rians have agreed are pivotal in American history" (p. xii). In part due to limitations of our financial market data, we examine only 36 strikes occurring over the time period we consider.

Importantly, this same source also provides us with a wealth of other valuable information about each strike that allows us to create another set of variables, including the duration of each strike, the industry involved in the strike, whether the union was recognized by the struck firm as a result of the strike, whether the union was new or established,[9] the number of strikers involved, whether there was violence during the strike, whether wages increased, decreased, or stayed the same after the strike, and who was the eventual "winner" of the strike (union or management).

Simple statistics for each of the strikes are contained in Table 1. Obviously, some of the data in this table, such as the strike's start date and the number of strikers involved, are based on purely "objective" criteria and are therefore easily culled from the strike narratives. Other data, such as whether the union or firm "won," are more subjective. We discuss these subjective measures below.

The first strike in our sample started in January 1925 and the last one started in May 1937.[10] The strikes occurred in 17 different industries. The average strike duration was 5.5 months. Violence was mentioned in the narratives in just over half of the strikes. Wages decreased in only a handful of cases, stayed the same in about half, and increased in just over a third of strikes. Following Card and Olson (1995), we also attempted to identify the "winner" of each strike.[11]

To situate our sample in the universe of all strikes that occurred during this period, we present some information from Griffin (1939), who included a much larger set of strikes in his analysis of strikes from 1880 to 1937. Figure 1 (which was generated using data from the Griffin study) reveals that for the period 1925–37 (the period we analyze), the median annual percentage of strikes that were "successes" (from the perspective of the unions) was 35%; of "failures," 33.4%; and of compromises, 30.7%. Given the consistency with our estimates, we conclude that the strikes in our sample, apart from their greater "importance," are not radically different from the broader sample of strikes.

Our stock price data come from Cowles's *Common-Stock Indexes: 1871–1937* (1938). This book contains several series for common stocks by industry by month over a relatively long time period. One distinguishing characteristic of the book is the tremendous amount of effort and meticulous attention to detail that went into its description of the data and industries. Included are indexes on dividend payments, price-earnings ratios, earnings, stock prices, and stock prices including cash dividends. For each industry, we scanned in the stock prices, including cash dividends, for each month from 1906 to 1937 (although this paper only examines strikes that occurred during the period 1925–37). Because of a four-month gap in the information during World War I, we are left with 380 months of data for each industry. Since we collected information on 69 industries, this gives us

[9]We define an "established" or "old" union by first identifying the name of the union from accounts in Filippelli (1990) and a variety of other sources (Gifford 1999; Reynolds and Killingsworth 1944; Fink 1977) to identify the date the union was established. Unions older than three years were defined as established. Our results are robust with respect to different definitions of "established."

[10]Later strikes are covered in the Filippelli (1990) volume, but our stock price data (described below) end at the conclusion of 1937.

[11]We identified the union as the winner in 53% of the strikes. Obviously it is not always easy to identify the "winner" of a strike. We determined the winner based on our subjective evaluation of the Filippelli narratives. In 10% of the cases, the winner of the strike is not clear (see Table 1). Our results are insensitive to our treatment of the ambiguous cases. Below, we further investigate the strikes that led to union recognition, often one of the key goals of the strikers.

Table 1. Sample Statistics for the Strikes.

Industry	*Start Date of Strike*	*Strike Duration (months)*	*Number of Strikers*	*Violence during Strike?*	*Recognition Strike?*	*Wages Incr., Decr., or Same*	*Winner*
Coal	Nov. 1925	5	500	No	No	Decreased	Unclear
	Apr. 1927	15	200,000	Yes	No	Same	Mgt.
	Apr. 1931	1	200	Yes	No	Same	Mgt.
	Jul. 1932	11	—	Yes	No	Decreased	Mgt.
	Aug. 1933	3	2,000	No	No	Same	Mgt.
Misc. Services	May 1934	3	3000	Yes	No	Increased	Union
	May 1935	3	20,000	Yes	No	Increased	Union
Shipping	May 1934	2	1,000	Yes	No	Increased	Union
	Jan. 1936	12	30,000	No	No	Increased	Unclear
Mining	May 1935	1	—	Yes	No	Same	Mgt.
Steel & Iron	May 1937	2	40,000	Yes	No	Same	Mgt.
Electrical Equipment	Feb. 1934	4	3,600	Yes	Yes	Increased	Union
Household Products	—	—	1,000	No	Yes	Decreased	Mgt.
Auto Tires, Rubber	June 1934	1	1,100	No	Yes	Increased	Union
	Jan. 1936	2	14,000	No	Yes	Same	Union
Food Products	Jan. 1930	0	5,000	Yes	No	Same	Mgt.
	Nov. 1932	2	400	Yes	No	Decreased	Mgt.
	May 1932	50	1,500	No	No	Same	Mgt.
	Jan. 1933	0	5,000	Yes	No	Same	Mgt.
	Sep. 1935	1	—	Yes	No	Increased	Union
	May 1936	—	35,000	Yes	No	Same	Mgt.
	May 1937	0	2,000	Yes	Yes	Same	Mgt.
Paper	Nov. 1934	4	36	No	No	Same	Union
	—	—	600	No	No	Same	Union
	Feb. 1936	9	36	No	No	Increased	Union
Textiles	Jan. 1925	23	16,000	Yes	Yes	Same	Union
	Apr. 1928	6	27,000	Yes	Yes	Decreased	Union
	Apr. 1929	5	1,000	Yes	No	Same	Mgt.
	July 1934	2	—	Yes	No	Same	Unclear
	Oct. 1936	5	3,700	No	No	Same	Mgt.
Tobacco	Nov. 1931	1	10,000	No	No	Same	Union
General Motors	Sep. 1933	2	5,000	No	No	Increased	Unclear
	Nov. 1936	—	—	No	No	—	—
	Dec. 1936	2	47,000	Yes	Yes	Same	Union
	—	—	7,600	No	Yes	Increased	Union
Autos, non-GM	Jan. 1933	1	12,000	No	No	Increased	Union
	—	—	24,000	No	No	Same	Union
	—	—	2,000	Yes	Yes	Same	Union
Meat Packing	Sep. 1933	—	—	Yes	Yes	Increased	Union
Radio, Phonograph	May 1936	2	6,000	Yes	Yes	Increased	Union
Air Transport	Feb. 1932	3	36	No	No	Increased	Union

Source: This information was gathered from narratives in Filippelli (1990).

26,220 industry/months of data.[12] It is also worth noting that we do not have complete information on security prices for all industries for the entire time period. One example is absence of stock prices for automobiles and trucks, which, as of the late 19th century, had not yet been invented. Figure 2 displays the average stock price over time using these data. The dramatic

[12]The scanning technology, along with Optical Character Recognition (OCR) software, worked remarkably well. We hand-checked *each* observation and found that only about 4% were in error.

increase up to the great crash of 1929 is clear from the figure, as is the subsequent increase.

Empirical Results

In many traditional financial event studies, it is transparent how one dates an "event." The same is not true for all strikes in our sample. In principle, the appropriate date is the date at which most of the "information" in the strike is incorporated. If the financial markets are forward-looking, and most of the information is revealed at the beginning of the strike, then the date of the strike announcement is most relevant. Table 2 presents our estimates of cumulative average excess industry stock returns for various windows relative to the strike announcement date. In Table 3, we concentrate on estimates of the cumulative average excess industry stock returns relative to the strike ending date.

We suspect that certain types of news provoke one reaction from financial markets at the start of the strike and a different one at the end.[13] Two examples may help explain this. The number of strikers is known at the start of the strike, so we expect this variable to affect prices at the start of the strike. Since this information is already known at the strike's beginning, no doubt it is already incorporated into stock prices by the end, and therefore has less of an effect at that juncture. On the other hand, we have also recorded information on whether wages went up, went down, or stayed the same. However, this is clearly only known for sure at the end of the strike (although markets may have an educated guess at the strike's onset as to what will happen to wages by strike's end) and, therefore, we expect a larger share price reaction to wage changes at the end of the strike. We will discuss share price changes around the start of the strike (Table 2),

[13]We are grateful to an anonymous referee for this suggestion.

around the end of the strike (Table 3), and including information from both the start and the end (Table 4).

Each column of Table 2 reports results based on a different event window: month 0 (simply the excess return during the strike start month, averaged over all strikes), month 0 to month +1 (the sum of the excess returns over the two-month period from the month of the strike announcement through the month after the announcement, averaged over all strikes), month –1 to month 0, month –1 to month +1, month –2 to month +2, and month –3 to month +3. In principle, results from all windows should be roughly the same. If the frequency of our stock price information were daily, we could date strike announcements perfectly, and if the transmission of "news" and the markets' reaction to it are both quick, we would expect the shortest window to be the most appropriate window. However, given the frequency of the stock data and our *a priori* expectations concerning the speed of transmission of economic news from strikes during the interwar period, our preferred results are those that use the windows from $t = -1$ to 1 month. For completeness, we also report results for other wider windows.

The first row of the table summarizes the information for all strikes. For example, the number –0.030 in the fourth column represents the cumulative average excess returns over the three months (–1, 0, and 1 relative to the strike start date) averaged over all strikes in the sample. This means that industry stock prices dropped by about 3% around the time of the start of the strike. The second pair of rows in the table compares union wins to union losses. That is, it repeats the same analysis but simply computes cumulative average excess returns separately for the sample of strikes that are defined as "won" or "lost" by the union (see below). Subsequent sets of rows report results contrasting "violent" strikes and nonviolent ones; strikes in which wages went up with strikes in which they went down or remained the same; strikes involving many strikers (more than the median of 3,700) with those involving few strikers; short strikes (lasting less than the median of 2 months) with longer ones; strikes that resulted in recognition of the union by the firm with those that did not; industry-wide strikes with strikes of less scope; and strikes by an established union (defined above) with other strikes.

The evidence from the table is generally consistent with the view that the financial markets viewed these strikes as important. If they had not, then excess share prices obviously would not have changed around the time of news about the strikes. In general, the results are economically significant and different from zero at conventional levels of statistical significance. For example, the point estimates in the row labeled "union win" indicate losses to the firm of about 7% for our preferred specification (month –1 to month +1) and are statistically different from zero. In contrast, union losses led to generally quite small stock price changes (–1%) that were not distinguishable from zero at conventional levels of significance. Note that given our earlier discussion, it is interesting that the share price reaction to a union win (which is not fully known until the strike is over) is reasonably large at the start of the strike. Perhaps financial markets could, to some degree, predict the outcome even at the start of the strike.[14]

[14]We discuss what happens around the end of the strike below.

Table 2. Cumulative Average Abnormal Industry Stock Returns for Strikes in the 1920s and 1930s, Where Event Is Defined as Start of Strike. (T-Statistics in Parentheses)

	Months Relative to Strike Announcement Date					
	t = 0	*t = 0 to 1*	*t = –1 to 0*	*t = –1 to 1*	*t = –2 to 2*	*t = –3 to 3*
All Strikes	–0.011	–0.024	–0.017	–0.030	–0.013	–0.015
	(1.070)	(1.580)	(1.172)	(1.635)	(0.539)	(0.559)
Union Win	–0.020	–0.050	–0.038	–0.068	–0.038	–0.020
	(1.034)	(1.845)	(1.418)	(2.067)	(0.891)	(0.390)
Union Loss	–0.004	–0.004	–0.007	–0.008	0.007	–0.016
	(0.312)	(0.218)	(0.475)	(0.373)	(0.255)	(0.536)
Yes Violence	–0.019	–0.025	–0.033	–0.040	–0.049	–0.049
	(1.616)	(1.455)	(2.037)	(1.909)	(1.855)	(1.588)
No Violence	0.001	–0.021	0.008	–0.014	0.044	0.038
	(0.059)	(0.775)	(0.307)	(0.415)	(1.031)	(0.736)
Wages Down	0.037	0.092	0.032	0.087	0.128	0.095
	(1.916)	(2.096)	(1.159)	(1.814)	(2.264)	(1.478)
Wages Same	–0.014	–0.038	–0.027	–0.050	–0.052	–0.061
	(1.094)	(2.066)	(1.430)	(2.222)	(1.763)	(1.750)
Wages Up	–0.016	–0.031	–0.014	–0.029	0.016	0.040
	(0.804)	(1.085)	(0.473)	(0.807)	(0.344)	(0.732)
Many Strikers[a]	–0.013	–0.016	–0.005	–0.008	–0.015	–0.022
	(1.068)	(0.949)	(0.324)	(0.417)	(0.575)	(0.716)
Few Strikers	–0.012	–0.041	–0.026	–0.056	–0.005	0.008
	(0.674)	(1.636)	(1.037)	(1.792)	(0.123)	(0.160)
Short Strike[b]	–0.000	–0.004	–0.006	–0.010	0.047	0.045
	(0.001)	(0.172)	(0.268)	(0.352)	(1.242)	(1.009)
Long Strike	–0.019	–0.036	–0.024	–0.041	–0.048	–0.052
	(1.435)	(1.920)	(1.285)	(1.786)	(1.661)	(1.494)
Recognition	–0.037	–0.061	–0.041	–0.065	–0.088	–0.091
	(1.642)	(1.933)	(1.292)	(1.683)	(1.764)	(1.535)
Not Recognition	–0.001	–0.010	–0.008	–0.016	0.017	0.014
	(0.088)	(0.546)	(0.484)	(0.787)	(0.643)	(0.448)
Industry-Wide	–0.021	–0.040	–0.051	–0.070	–0.109	–0.125
	(0.650)	(0.871)	(1.125)	(1.254)	(1.515)	(1.461)
Not Industry-Wide	–0.010	–0.022	–0.014	–0.026	–0.004	–0.005
	(0.931)	(1.403)	(0.908)	(1.358)	(0.151)	(0.188)
New Union[c]	–0.002	–0.015	–0.008	–0.021	0.059	0.057
	(0.080)	(0.487)	(0.247)	(0.553)	(1.179)	(0.963)
Old Union	–0.011	–0.016	–0.019	–0.024	–0.049	–0.059
	(0.909)	(0.829)	(1.157)	(1.088)	(1.747)	(1.817)

Note: For description of the strikes, see Table 1.
[a]Above the median of 3,700 strikers.
[b]Below the median of 2 months.
[c]Less than 3 years old.

More arresting, perhaps, is that when wages fell in response to the strike, the estimated positive impact on the value of the industry was roughly 9% using our preferred window width, and statistically different from zero. In contrast, when wages remained the same or increased (a tiny fraction of our total observations), our point estimates indicate that the value of the industry fell between 3% and 5%, although our estimates for the cases of "wages up" are imprecise. The same issue of timing holds here as well. We discuss the reaction at the end of the strike below.

It is also interesting to note that strikes leading to the recognition of the union by the firm appear to have had a much larger negative share price reaction than strikes that did not lead to the recognition of a union. (Compare, for example, –0.065 to –0.016, in the month –1 to month +1 window in Table 2.) Also, as expected, strikes that involved an entire industry had a much larger negative effect (albeit an imprecisely estimated one) on industry stock prices than strikes involving a single firm (or a small number of firms).

Strikes that involved new versus established unions are the subject of the last two rows of Table 2. It appears that, on average, strikes by established unions led to larger negative industry share price reactions. Although these estimates are not precise, they are consistent with the view that more established unions have more power against management than do new unions.

The only apparently anomalous results for the start of the strike are those for the number of strikers: our point estimates for the effect on stock prices are larger in magnitude for small strikes (–5.6%) than for large strikes (–0.8%). This is less anomalous than meets the eye, however, since it is explicable by our mechanism for choosing strikes. If size is only one aspect of "importance," then strikes with fewer strikers that made it to the list had to be more important in other dimensions. The results for other window widths are generally insignificantly different from the results for our preferred window widths, and are generally less precise.

Table 3 repeats the analysis summarized in Table 2, except that windows are calculated around the end date of the strike. In general, the results are uniformly less precise and insignificantly different from zero at conventional levels of significance. One possible reason for this is that the end of the strike may be difficult to identify correctly, especially in those cases where management is defined as the winner. This is consistent with the view that most of the "news" in strikes occurs at the beginning of the strike, and also agrees with other research. However, as we noted above, it is reasonable to expect that some of the information about the strike, such as who "won" and whether wages increased, would not be fully revealed until the end of the strike.

It turns out that the wage changes are perfectly in line with this idea.[15] From the "wages up," "wages down," and "wages same" section of Table 3, it is clear that this information had a larger effect around the strike ending date (where it was more likely to be fully revealed). In fact, the share price reaction to "wages down" was approximately +13%. The other piece of information that we expected to have a larger impact at the end of the strike than at the beginning is who "won" the strike. For some reason, our empirical findings do not support this idea. In addition, it is interesting to note what happened to overall stock prices around strike start times and strike end times. The initial news of a strike tended to send stock prices down (row 1 of Table 2), as clearly this was a signal of some disruption of business. On the other hand, the overall stock price reaction to strike ends was positive (row 1 of Table 3), which suggests that investors were happy that the strike was over and that firms could get back to business.

In Table 4, we combine both windows—around the start of the strike and around the end of the strike. This is an appropriate summary if both the strike announcement and its conclusion contain significant economic news. Our estimates become somewhat more precise and the magnitude of the effects becomes much larger. For our preferred window widths, union wins lead to a decrease of roughly 3% in the value of the firm. For wage changes, our point estimates are quite large. Strikes that resulted in lower wages led to increases of 22% in the value of the firm, and strikes with no wage increases led to losses on the order of 7%. Likewise, short strikes led to an increase of roughly 7%, and our longer

[15]Again, we thank an anonymous referee for this suggestion.

Table 3. Cumulative Average Abnormal Industry Stock Returns for Strikes in the 1920s and 1930s, Where Event Is Defined as End of Strike. (T-Statistics in Parentheses)

	Months Relative to Strike Ending Date					
	t = 0	*t = 0 to 1*	*t = –1 to 0*	*t = –1 to 1*	*t = –2 to 2*	*t = –3 to 3*
All Strikes	–0.001	0.009	0.011	0.020	0.013	–0.007
	(0.061)	(0.589)	(0.725)	(1.107)	(0.565)	(0.238)
Union Win	–0.006	0.009	0.021	0.036	0.012	–0.051
	(0.310)	(0.353)	(0.781)	(1.104)	(0.285)	(0.991)
Union Loss	0.001	–0.000	–0.001	–0.001	0.006	0.016
	(0.055)	(0.012)	(0.036)	(0.070)	(0.225)	(0.501)
Yes Violence	–0.003	–0.011	–0.008	–0.016	–0.030	–0.057
	(0.276)	(0.700)	(0.462)	(0.786)	(1.129)	(1.813)
No Violence	0.003	0.040	0.039	0.076	0.080	0.070
	(0.169)	(1.432)	(1.413)	(2.223)	(1.817)	(1.303)
Wages Down	0.081	0.092	0.119	0.130	0.156	0.153
	(3.629)	(3.034)	(3.421)	(3.221)	(3.216)	(2.760)
Wages Same	–0.013	–0.014	–0.018	–0.020	–0.022	–0.016
	(0.962)	(0.778)	(0.994)	(0.892)	(0.749)	(0.464)
Wages Up	–0.011	0.013	0.016	0.040	0.016	–0.046
	(0.531)	(0.459)	(0.543)	(1.121)	(0.348)	(0.809)
Many Strikers[a]	–0.001	0.002	–0.008	–0.005	0.000	0.002
	(0.089)	(0.091)	(0.455)	(0.250)	(0.013)	(0.062)
Few Strikers	–0.014	0.003	0.009	0.025	0.009	–0.032
	(0.760)	(0.098)	(0.329)	(0.785)	(0.215)	(0.632)
Short Strike[b]	0.018	0.041	0.055	0.079	0.077	0.029
	(1.147)	(1.924)	(2.470)	(2.927)	(2.231)	(0.682)
Long Strike	–0.018	–0.022	–0.030	–0.035	–0.046	–0.040
	(1.243)	(1.099)	(1.510)	(1.413)	(1.433)	(1.037)
Recognition	–0.022	–0.023	–0.031	–0.033	–0.035	–0.085
	(1.084)	(0.814)	(1.101)	(0.939)	(0.782)	(1.591)
Not Recognition	0.007	0.021	0.027	0.040	0.032	0.023
	(0.597)	(1.197)	(1.517)	(1.873)	(1.144)	(0.679)
Industry-Wide	–0.046	–0.086	–0.071	–0.111	–0.153	–0.217
	(1.034)	(1.379)	(1.132)	(1.454)	(1.546)	(1.854)
Not Industry-Wide	0.004	0.018	0.019	0.033	0.030	0.014
	(0.364)	(1.214)	(1.250)	(1.800)	(1.251)	(0.492)
New Union[c]	0.024	0.085	0.084	0.144	0.131	0.069
	(0.986)	(2.453)	(2.396)	(3.387)	(2.360)	(1.011)
Old Union	–0.007	–0.016	–0.023	–0.032	–0.040	–0.063
	(0.528)	(0.866)	(1.178)	(1.365)	(1.309)	(1.739)

Note: For description of the strikes, see Table 1.
[a]Above the median of 3,700 strikers.
[b]Below the median of 2 months.
[c]Less than 3 years old.

strikes led to losses of about 8%. In addition, using our preferred window width (month –1 to month +1), recognition strikes appear to have led to losses of about 10% (non-recognition strikes led to small gains), industry-wide strikes resulted in losses on the order of 18%, and strikes by established unions had much larger negative share price reactions than strikes involving new unions.

As we discuss above, several papers (for example, Becker and Olson 1986; Neumann 1980; Persons 1995; and Nelson et al. 1994) have found a negative share price reaction

Table 4. Cumulative Average Abnormal Industry Stock Returns for Strikes in the 1920s and 1930s: Addition of Returns around Start of Strike and End of Strike. (T-Statistics in Parentheses)

	Months Relative to Strike Starting and Ending Date					
	t = 0	*t = 0 to 1*	*t = –1 to 0*	*t = –1 to 1*	*t = –2 to 2*	*t = –3 to 3*
All Strikes	–0.012	–0.015	–0.006	–0.010	0.000	–0.022
	(1.072)	(1.686)	(1.378)	(1.975)	(0.781)	(0.608)
Union Win	–0.026	–0.041	–0.017	–0.032	–0.026	–0.071
	(1.079)	(1.878)	(1.619)	(2.343)	(0.935)	(1.065)
Union Loss	–0.003	–0.004	–0.008	–0.009	0.013	0.000
	(0.317)	(0.218)	(0.476)	(0.380)	(0.340)	(0.734)
Yes Violence	–0.021	–0.036	–0.041	–0.056	–0.079	–0.106
	(1.639)	(1.615)	(2.089)	(2.064)	(2.172)	(2.410)
No Violence	0.004	0.019	0.047	0.062	0.124	0.108
	(0.179)	(1.629)	(1.446)	(2.261)	(2.089)	(1.496)
Wages Down	0.118	0.184	0.151	0.217	0.284	0.248
	(4.105)	(3.688)	(3.612)	(3.697)	(3.933)	(3.131)
Wages Same	–0.027	–0.052	–0.045	–0.070	–0.074	–0.077
	(1.457)	(2.208)	(1.742)	(2.394)	(1.916)	(1.810)
Wages Up	–0.027	–0.018	0.002	0.011	0.032	–0.006
	(0.964)	(1.178)	(0.720)	(1.381)	(2.262)	(0.085)
Many Strikers[a]	–0.014	–0.014	–0.013	–0.013	–0.015	–0.020
	(1.934)	(1.043)	(0.898)	(0.543)	(0.993)	(0.722)
Few Strikers	–0.026	–0.038	–0.017	–0.031	0.004	–0.024
	(0.680)	(1.639)	(1.132)	(1.809)	(0.124)	(0.172)
Short Strike[b]	0.018	0.037	0.049	0.069	0.124	0.074
	(0.760)	(0.198)	(0.424)	(0.860)	(1.260)	(1.191)
Long Strike	–0.037	–0.058	–0.054	–0.076	–0.094	–0.092
	(1.837)	(2.718)	(2.784)	(3.429)	(2.781)	(1.642)
Recognition	–0.059	–0.084	–0.072	–0.098	–0.123	–0.176
	(1.968)	(2.097)	(1.697)	(1.927)	(1.930)	(2.211)
Not Recognition	0.006	0.011	0.019	0.024	0.049	0.037
	(0.603)	(1.316)	(1.592)	(2.032)	(1.312)	(0.813)
Industry-Wide	–0.067	–0.126	–0.122	–0.181	–0.262	–0.342
	(1.221)	(1.631)	(1.596)	(1.920)	(2.165)	(2.360)
Not Industry-Wide	–0.006	–0.004	0.005	0.007	0.026	0.009
	(1.000)	(1.855)	(1.545)	(2.255)	(1.260)	(0.527)
New Union[c]	0.022	0.070	0.076	0.123	0.190	0.126
	(0.989)	(2.501)	(2.409)	(3.432)	(2.638)	(1.396)
Old Union	–0.018	–0.032	–0.042	–0.056	–0.089	–0.122
	(1.051)	(1.199)	(1.651)	(1.746)	(2.183)	(2.515)

Note: For description of the strikes, see Table 1.
[a]Above the median of 3,700 strikers.
[b]Below the median of 2 months.
[c]Less than 3 years old.

to strikes on the order of 1–4%. Our baseline reaction to stock prices (in row 1 of Table 2) is a loss of 3% of stock price for the three-month event-window (month –1 through month +1, our preferred specification). Despite this similarity, we should again point out some important differences between our study and the aforementioned studies.

First, our study concentrates on *monthly* returns; the others concentrate on *daily* returns. We argue that the decision to study monthly returns is more reasonable for our time period. This assumption would

most obviously present problems for more recent time periods; no doubt, markets react more quickly today than in the past.[16] Second, our focus is on *industries* and previous research has focused on share price reactions in *individual firms.* Finally, we use data from a period in which labor historians believe strikes were "pivotal in American history." In any event, our results suggest a relatively large share price reaction to strikes for entire industries, and these effects are larger than those found in the aforementioned studies except for Becker and Olson (1986), although, like the others, their focus was on the reactions of individual firms.

Given our concentration on industry returns, the magnitude of our estimates might be surprising, since we expect industry-wide reactions to strikes to be smaller than the effect on specific firms (as business moves from struck to nonstruck firms, for example). Moreover, our evidence is roughly consistent with that reported by Kramer and Vasconcellos (1996), who found effects on nonstruck firms that were statistically indistinguishable from those on struck firms from 1982 to 1990. On the other hand, given our focus on the seminal industrial relations strikes of the interwar period, our results are consistent with the views of historians and others who have singled out this period as one of unusual importance in the development of postwar industrial relations.

Concluding Comments

The primary aim of this work has been to investigate the effect of strikes on industry stock prices at a time when unions were rapidly evolving. In contrast to recent work on the subject that has used data from the recent past, we have examined a period of time when changes in the level of unionization were more important. One advantage of this focus is that it is easier to measure the effect of "large changes" than it is to detect small changes in the current era of declining unionization. The time between the World Wars was particularly important in the history of unionization. Unlike most recent strikes, during that earlier period many strikes were an attempt by workers to change the "terms of trade" between workers and employers.

Our empirical approach melds two previous literatures: in one, the effects of strikes on industry-wide measures of output, such as inventories, are studied, and in the second, a standard "event study" approach is used to examine the relationship between strikes and *individual* firm stock valuations. We develop a data set with an unusually rich set of characteristics for each of the strikes for the time period 1925–37 and combine this information with stock return data. We use a very parsimonious model that helps provide one consistent interpretation of our results.

On a descriptive level, we find that strikes had large negative effects on industry stock valuation. In addition, longer strikes, violent strikes, strikes won by the union, strikes leading to union recognition, industry-wide strikes, and strikes that led to wage increases affected industry stock prices more negatively than strikes with other characteristics. We also examine industry stock price movements around the start and the end of the strike. It seems that "news" about the strike was revealed early and, in fact, there is some evidence that investors were able to predict strike outcomes. However, we do find larger reactions to some news that could only be completely revealed at the end of the strike (for example, worker wage changes).

The generally asymmetric response of stock prices to wins and losses is consistent with our expectations. Our analysis suggests that financial markets viewed union victories in the interwar period as very important determinants of the share of firm profits going to stockholders.

[16]Farber and Hallock (2000) discussed the changing stock price reaction to job loss announcements over time using data from 1970–97 and briefly discussed whether changes in technology have somehow made news less timely and therefore less "newsworthy." They found very little support for this hypothesis.

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