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The 1920's Boom and the Great Crash

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George Bittlingmayer

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THE 1920'S BOOM AND THE GREAT CRASH

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ABSTRACT

The October 1929 crash and 1930-32 stock decline were matched by a major shift in antitrust policy and a three-year struggle over antitrust reform that ended in the NRA. Hoover's shift put in jeopardy the mergers and trade association agreements carried out in the 1920's with the approval of the FTC and the Departments of Justice and Commerce. The lax policies of the 1920's explain the boom and merger wave, stepped-up enforcement in late 1929 and the attorney general's Oct. 25, 1929 renunciation of the Coolidge policies explain the crash, and the struggle over antitrust provides a rationale for part of the post-1929 stock decline and increased volatility. For 1919-1930, quarterly stock returns are negatively related to FTC and DOJ merger case filings and positively related to merger activity. For the two weeks of the crash, firms that had made acquisitions in 1928 and 1929 lost 4 percent more in value. Finally, each of 322 New York Times news articles on antitrust for 1929-32 is linked with an average 1 percent decline of the Dow and a decline of normalized Dow returns equal to one-third of the local standard deviation. The results hold for 1929 as well as 1930-32. Each news article is also linked with an increase in volatility.

1. Introduction

The stock boom of the twenties, the October 1929 crash and the market's slide into the Great Depression remain puzzles to the present day. The Dow Industrial average quadrupled between January 1924 and September 1929, dropped 30 percent during one week of October 1929, and ultimately lost nearly 90 percent of its peak value by the middle of 1932.

The boom was wilder than historical associations with economic activity and earnings would have predicted. Not surprisingly, explanations invoke either speculative frenzy or realistic expectations of still higher earnings in the future. Explanations for the crash include the (inevitable) bursting of the speculative bubble, the weight of excess securities held in inventory, adverse financial developments in London and Berlin, errors by the Federal Reserve Board, and the Smoot-Hawley tariff bill. Despite the wealth of conjectures, empirical work on the boom and crash has been sparse.¹

The search for a cause may have missed the obvious, namely the fits and starts of antitrust. Tariff bills, monetary policy and the speculative excesses of investors surely affect the traded value of corporations, but only through product and credit markets or the ability to move the stock market away from fundamentals. Antitrust, in contrast, takes direct aim at corporations and thwarts mergers, forces divestitures, compels changes in business practice, and makes felons of corporate officers. In fact, we should be surprised if swings in antitrust failed to move stock prices.

¹ Davis (1975, pp. 191-197) and White (1990a) survey the explanations, Wanniski (1978) argues for the Smoot-Hawley tariff bill, and Bierman (1991) highlights the shift in Fed policy. In a test of the tariff-bill conjecture, White (1990b) reports that all stocks (exporters, import-competing, non-tradeables) declined roughly the same amount. A recent study by DeLong and Shleifer (1990) shows that closed-end funds traded above their net asset values in the boom, consistent with the view that financial assets generally traded above fundamental value.

The rough facts are encouraging. Coolidge's antitrust appointees followed a very permissive course, but Hoover's officials quickly swung the tiller. This shift led in turn to a struggle over antitrust reform that extended into the New Deal. The implied hypothesis, that lax antitrust lets markets boom and strict antitrust brings them down, also has some virtues. Classic trustbusting was in large part an effort to control the activities and scope of the modern corporation. Enforcement and interpretation by the courts were also unstable, contradictory, and heavily influenced by politics. Finally, antitrust is implicated in stock panics before and after the 1920's -- especially in the heyday of trustbusting under Theodore Roosevelt and William Howard Taft, and in the late 1930's revival under antitrust chief Thurman Arnold. The circumstances around modern crashes, May 1962 and October 1987, for example, are also relevant.

The smoking gun in the Great Crash is Attorney General William Mitchell's October 25, 1929 speech before the annual meeting of the American Bar Association. The Coolidge antitrust authorities had cleared mergers and trade association agreements administratively since 1925. While orthodox on the matter of cartels, the Trade Commission and the Antitrust Division promoted only slightly less offensive cooperative forms, especially trade association agreements that seemed to skirt legality. The two agencies acted without statutory authority, and their activities proved vulnerable. As Secretary of Commerce, Hoover also promoted trade associations and tried to shield them from the law. These lax policies provide an explanation for the boom.

Mitchell's October 1929 speech gave notice that Hoover's Antitrust Division would reverse course, eviscerate pre-clearance, and "deal vigorously with every violation of the Sherman Anti-Trust Act which comes to its attention."²

² Wall Street Journal, October 26, 1929, p. 7. New York Times, October 26, 1929, p.3. Chicago Journal of Commerce, October 26, 1929, p.1.

Lawsuits against high-profile studio mergers, the "radio-trust" (involving Westinghouse and General Electric holdings in RCA), the major oil companies and some of the very same trade associations and mergers that the Coolidge authorities had approved soon followed. The Justice Department also forced the FTC to abandon its policy of approving questionable trade practices.

Mitchell's speech marked the start of a three-year struggle over antitrust revision, with business groups and the American Bar Association backing attempts to revise or suspend the antitrust laws. Hoover offered stout opposition, and no revision took place during his term. Ultimately, the revisionists had their day in the National Industrial Recovery Act, the cornerstone of New Deal economic policy. It was passed and signed in the First Hundred Days, but then declared unconstitutional in May 1935.

In Section 2, I review the history of antitrust in the 1920's and early thirties. This history addresses various questions: Was antitrust important? What caused the shift in policy under Hoover? Was the shift anticipated? Was the 1929-1932 push for reform a major economic policy issue? I also provide a detailed account of the Great Crash. The October 23, 1929 abandonment of the Warner/Paramount merger and Mitchell's October 25 speech are leading candidates for the volatility, high volume and the net decline of the Dow of 8.4 percent over October 23 through 26. Some of the enforcement that followed may explain the declines on October 28, 29 and later in November. Budget and enforcement data for the antitrust agencies reinforce the impression that there was a shift in policy, especially for mergers.

Section 3 covers the mechanism by which antitrust might influence stock prices, and reviews evidence from other episodes. Formal statistical tests follow in Sections 4 through 7. First, stepped up merger policy -- arguably the most important type of policy for large, publicly traded firms -- was matched by stock price declines for 1919-1930. Second,

firms that had completed mergers in 1928 or 1929 experienced larger drops over each of the two weeks of the October 1929 crash. Finally, newspaper stories on antitrust, which I use as a proxy for new developments in the debate on antitrust reform, were correlated with daily stock price movements for 1929-31.

2. The Ups and Downs of Antitrust

Pre-History. Senator Sherman's law against monopolies and restraint of trade was passed in 1890, but its enforcement was sporadic, even willfully deficient until McKinley's assassination in September 1901. Theodore Roosevelt initiated the trustbusting of lore, and his successor William Howard Taft carried on dutifully. Their targets - Standard Oil, American Tobacco, DuPont and U.S. Steel, for example - were often forcefully divested. During the Rich Man's Panic of 1903, the Panic of 1907 and the 1911-12 recession, critics charged that these assaults unsettled stock prices. According to my estimates for 1904-1914, the typical antitrust filing accompanied a decline of the Dow industrial and various Cowles indices of several percentage points.³ These are probably best regarded not as estimates of the per case effect, but rather of a change in the rate of filings.

Roosevelt's trustbusting spawned reform efforts, notably the failed 1908 Hepburn Bill (distinct from the Hepburn Act regulating railroads). This bill would have allowed "reasonable restraints of trade" cleared by the Bureau of Corporations, the Federal Trade Commission's predecessor. Similar proposals were made in the early 1930's. The trade association, a central feature of the 1920's policy debate and ultimately the cornerstone of the National Recovery Administration, also had its origins in the effort to find shelter from the Sherman Act. Arthur Jerome Eddy, author of The New Competition, was the leader of the so-called association movement.

³ Bittlingmayer (1992, 1993).

Pressure for stricter antitrust led the Wilson administration to introduce and pass the 1914 Clayton and Federal Trade Commission Acts. Actual enforcement was uneven, and once the U.S. entered the First World War, antitrust became an early casualty. Industry-wide cooperation proceeded with the government's blessing, especially under the War Industries Board, whose policies included price-fixing, standardization, cooperative research, and rationalization of capacity.⁴ The wartime policies served in the 1920's and thirties as the model of the good old days, when industry cooperation under enlightened government brought benefits. Inflation and then deflation and recession after World War I led to charges of profiteering and monopoly, and antitrust experienced a revival under the late Wilson and Harding administrations.

Harding and Coolidge Policies. By 1920, antitrust had three targets: cartels, including trade associations; mergers; and vertical restraints. Harding's authorities pressed in hard on all three, but by the end of the Coolidge administration, antitrust was a shadow of its former self.

Table 1 has enforcement date for the two antitrust agencies. The FTC, besides its antitrust duties, also filed consumer protection suits. It issued 125 complaints in fiscal year 1919, up from 80 in 1918, and 16 in 1917. This number stayed above 100 through 1925, but then dropped sharply for 1926-1928. FTC "restraint of trade," or monopoly cases, climbed quickly to 121 in calendar year 1919. These dealt chiefly with vertical restraints (rebates for exclusive dealing, quantity discounts and resale price maintenance, for example). They fluctuated but stayed above 20 over 1921-1925, and then dropped to ten or less for 1926-1928. So, while the number of preliminary investigations increased through the twenties, the FTC issued fewer complaints, and especially fewer antitrust cases up through 1928. The FTC's budget also

⁴ Baruch (1921).

declined, by 43 percent in real terms from 1919 to 1928. No comparable data on investigations and finances exist for DOJ. A simple count of DOJ cases overall shows much volatility and no clear trend in the 1920's, but this may be misleading.

Consider the record on merger suits. Merger suits were especially important for large, publicly traded firms. A restrictive merger policy results in forced divestiture and restructuring, it influences the market for merger candidates, and it limits the ways firms can expand and invest. Summed merger cases for both agencies started high and declined over most of the decade. By the beginning of 1929, the agencies had attacked the merger of only one publicly traded firm in three years, the FTC's 1927 case against Consolidated Cigar. Also note the difference between the two antitrust agencies. The FTC sued 38 times over 1919-1928, the DOJ only six times or less than once per year. Only one of those DOJ cases -- the 1920 Swift filing -- was directed against a publicly traded firm. Mergers reached high levels, and a leading antitrust attorney said the law no longer barred mergers.⁵ Lax merger policy in the 1920's was no doubt aided by the 1920 U.S. Steel and the 1927 International Harvester decisions, which both sanctioned large market shares achieved through fusion.⁶

The historical background illuminates the data. In view of later events, Herbert Hoover's role deserves special mention. As Federal Food Administrator in the war, he successfully argued that cooperative industry forms were needed for the war effort, even though these violated the

⁵ Gilbert Montague in New York Times, February 12, 1928, Sec. II, p. 19, col. 1. The 1920's merger movement is documented in Eis(1969).

⁶ U.S. v. United States Steel 251 U.S. 417 (1920) and U.S. v. International Harvester 274 U.S. 693 (1927). Discussed in Handler (1932b, pp.181-185, 187-188), who also said: "The Bar during the period of the greatest merger activity relied upon the Steel decision. That its reliance was not misplaced the Harvester case amply demonstrates. Whether the court will go back to its earlier cases no one can say."

Sherman Act. As Secretary of Commerce under Harding and Coolidge, he led efforts to promote trade associations. His goals included the elimination of waste, informational services, standardization and "better business" activities.⁷ Industry forces that sought to build Eddy-inspired "open price plans" to exchange price information and "stabilize" industry invoked Hoover's name and rhetoric. Following the 1921 Hardwood decision, which declared an open-price plan illegal, Hoover spearheaded the attempt to keep statistical reporting legal, partly under Commerce Department auspices.⁸ He also at one point recommended antitrust immunity for manufacture of the same sort as had been extended to agricultural cooperatives and export groups.⁹ Hoover became the most prominent government official promoting "cooperative action."

While Hoover promoted trade associations and briefly flirted with the idea that Commerce could provide advice on the legality of proposed trade association plans, ultimate responsibility for antitrust remained with the Antitrust Division and Federal Trade Commission. Attorney General Daugherty (1921-24) clashed with Hoover, and trade associations received rough treatment. The pressure came in part from Samuel Untermyer, counsel to a New York State committee investigating the construction industry and an adept user of publicity.¹⁰ Daugherty, implicated in the Teapot Dome scandal, was forced to resign in 1924, and Coolidge replaced him with Harlan Stone. Hoover and Stone worked together to find a test case that would "elicit from the Supreme Court the interpretation of the Sherman Act they wanted."¹¹ Stone was soon appointed to the Supreme Court, and he in fact authored the decisions for that test case - Maple

⁷ Himmelberg (1976, p.10).

⁸ Himmelberg (1976, p. 17). Hoover's 1922 annual report urged more liberal laws governing trade associations. New York Times, December 1922, p. 19, col. 1.

⁹ Hawley (1989, p. 1077).

¹⁰ Himmelberg (1976, p. 14)

¹¹ Hawley (1989, p. 1082). Himmelberg (1976, p. 46).

Flooring - which established safe havens for statistical exchanges of trade associations.

The new antitrust chief, William J. Donovan, initiated a new era in 1925. He proceeded firmly against overt price fixing, but promoted, without statutory authority, the practice of advance clearance of mergers and association activities. Some of the association activities would have been illegal under strict interpretations of the Sherman Act, and Donovan's aim appears to have been to create accomplished facts that the Supreme Court would have to endorse.¹² "Colonel" Donovan was not reappointed by Hoover in 1929, and he became a leading spokesman for antitrust reform.

The FTC also changed direction in 1925 with the appointment of William Humphrey as commissioner. In 1925 it said that it would allege unfair practices only "where said practices tend to suppress competition affecting the public and not where injury is to a competitor and redressable in the courts." It also advocated informal settlement, unless a formal complaint and trial were in the public interest.¹³

In 1926, the FTC established the Trade Practice Conference Division, under whose auspices industry associations could draft regulations or "codes".¹⁴ One commissioner stated that the aim of FTC-sponsored codes was gradually to liberalize the antitrust laws, and the FTC itself argued that it had a "duty to consider what the law ought to be, as well as what the law is."¹⁵

¹² Himmelberg (1976, p. 56-62). While the practice blossomed under Donovan, the origins may go back earlier. Antitrust lawyer Montague (1932, pp. 26-27) dated pre-clearance "as far back as fifteen years ago." Still, he cited Mitchell's October 25, 1929 address, which focuses on Coolidge policy, as evidence apart from his own experience.

¹³ Blaisdell (1932, 82-83). Montague (1932, p. 32) also attributes the FTC's decline to Supreme Court and appeals court decisions, as well as "the lack of supporting public opinion."

¹⁴ Himmelberg (1976, p.51, p. 62-65).

¹⁵ Himmelberg (1976, p. 64), and Federal Trade Commission (1929, p. 4, 31, 68)

The association movement blossomed by 1928 under Justice Department and Trade Commission policies. The weak statutory footing of these policies led some business interests to propose revision, while others thought that administrative change and a gradual easing of judicial interpretation were the more realistic route. The American Bar Association and National Association of Manufacturers both favored outright amendment at first to allow monopolies and price fixing "within limits." They came to favor administrative revision by 1929, chiefly to allow trade agreements to be cleared in advance.¹⁶ The U.S. Chamber of Commerce and the National Civic Federation continued to support outright amendment. The NCF, which was the leading force behind the Hepburn bill twenty years earlier and which represented business and labor, deserves special mention. It sought revision because it viewed many of the trade associations approved by the Coolidge authorities as operating in violation of the law. It wanted a firm legal foundation.¹⁷

Antitrust, though down when Coolidge left office, was not out. Table 1 shows an 18 percent increase in the FTC budget for fiscal 1929, and a further 32 percent increase for 1930. A flurry of academic articles and books also reflected renewed interest in antitrust.¹⁸ Forced to speculate on the causes for increased support and interest in the trust question, I would point to the rapid economic changes brought on by new products and forms of organization -- the automobile, the radio, the chain store and talking pictures -- which created losers as well as winners. While these

¹⁶ New York Times, March 22, 1928, p. 39, col. 1 (on ABA position). Himmelberg (1976, pp. 77-80). The Commerce Committee of the American Bar Association discussed "industrial self-government" similar to the ICC as a means of relief for "sick industries." New York Times, March 28, 1929, p. 22, col. 2.

¹⁷ Himmelberg (1981, p. 132).

¹⁸ Homan (1929) surveyed the recent literature. The February 1932 issue of the Columbia Law Review was devoted to the antitrust laws and included reviews of eight books, mostly published in 1931.

factors may explain the pressure, I do not rule out ineptitude in the political response that followed.

Hoover's Policies and Antitrust Reform. The studies by Himmelberg and Hawley, based largely on archival material, show that Hoover pushed tighter antitrust during 1929. Given his earlier record, this seems surprising, but his support of trade associations as Commerce secretary may have reflected his desire for more turf.¹⁹ As president, he passed over Donovan in his search for a new Attorney General, and he revealed a desire to "bring the Anti-Trust Laws into line with the public interest" in an interview with one candidate.²⁰ Once in office, he was sensitive to charges of being easy on business, and asked his attorney general to look into possible antitrust violations and questionable mergers.²¹ These may have included the Warner/Paramount merger, which was promoted as an entertainment industry alliance designed to compete with RCA, which itself controlled RKO, NBC and Victor Talking Machines.²² The Warner/Paramount merger was ultimately cancelled on October 23, when the Dow dropped 6 percent. A planned joint venture of RCA and General Motors also received much publicity. It was attacked in mid-October by the Radio Protective Association, which sent a telegram to the Attorney General,

¹⁹ I thank Lester Telser for this point.

²⁰ Himmelberg (1976, p. 89).

²¹ Himmelberg (1976, p. 90). Hoover's "good government" emphasis on scrupulous law enforcement was also reflected in his administration's support of Prohibition. Interestingly, Hoover's National Commission on Law Observance and Enforcement was headed by George Wickersham, who, as Taft's attorney general twenty years earlier, had moved vigorously against the trusts.

²² New York Times, August 21, 1929, p. 36.

urging him to stop the deal.²³ RCA's efforts to merge with ITT received newspaper attention as well.²⁴

The National Civic Federation's complaints about the deficient legal underpinnings of Coolidge-era practice precipitated the Hoover administration's about-face. "Initial study of the [NCF] committee's findings led to an almost immediate decision on [antitrust chief] O'Brian's part to abolish the former practice of reviewing and approving trade association proposals."²⁵ Associations seeking approval of their plans in late summer and fall of 1929 were turned away. The Bolt, Nut & Rivet association, organized under the "Graham Plan" and approved by the Justice Department in 1927, was the target of an investigation in the fall of 1929.²⁶ The resulting case was ultimately filed in 1931.

Merger policy picked up as well, with the FTC taking the lead. It filed against the McKesson & Robbins merger on August 27, Vanadium Alloys on September 19, and Charles Freshman (a radio merger) and Phillip Morris on October 18. Coincidental with the stricter merger and trade association policies, the Dow experienced eight drops of 2 percent or more from its peak on September 3 until October 19.

The attorney general's speech, delivered the evening of Friday, October 25, 1929 to the American Bar Association, linked three issues: antitrust, prohibition, and law enforcement generally. It was one of five dinner speeches and was probably delivered after 8:00 p.m.²⁷

²³ New York Times, September 20 (Section XX), September 22, September 27, 1929; October 12, p. 29; October 16, p. 26. In this last article, the Radio Protective Association claimed in its telegram that "eight years ago radio trust [RCA] obtained letter of immunity from Attorney General Daugherty."

²⁴ New York Times, August 4, 1929; December 12 (p. 44), 13 and 18 (p. 14), 1929 (hearings).

²⁵ Himmelberg (1976, p. 91).

²⁶ Himmelberg (1976, p. 93).

²⁷ American Bar Association (1929, p. 160). No time is given for 1929, but the 1930 banquet was scheduled for 7:15 p.m. American Bar Association (1930, p. 146).

"The Department of Justice is not the place in which to amend the Anti-Trust laws or any other acts of Congress. Changes in business conditions and methods of marketing, vertical trusts, chain stores and other modern developments, have come thick and fast and have been somewhat confusing to those dealing with the Anti-Trust laws....There has been a disposition here and there to go too far and transgress the law. The machinery of some trade associations seems to have been made use of for transactions that come dangerously near price-fixing."

On pre-clearance of mergers, Mitchell said that "the Attorney General has no power to license anyone to violate any statute. His determination that a transaction does not violate the statute may lawfully be reversed by himself or by any successor." The new policy on merger allowed letters stating either that (1) a merger violates the law, (2) the determination of the courts would be sought by means of a lawsuit, (3) circumstances were too complex and the Department of Justice would "reserve full liberty of action. Only in the clearest case would letters of advice be issued to the effect that no legal proceedings are likely to be instituted....[But] in no case, as yet, have we felt justified in declaring that the Department sees no objection to the transaction."²⁸ Data below in Figure 3 show that merger activity fell off through 1929.

Trading the week of Mitchell's speech had been unusually active beginning with Monday, October 21, when volume topped 6 million shares, although the the index dropped less than 1 percent. Tuesday remained active, and the Dow showed a 1.7 percent gain, but then dropped 6.5 percent on Wednesday. The range on Thursday was 13.5 percent and volume soared to almost 13 million shares. However, the Dow closed only 2.11 percent below Wednesday's close, attributed in the press to

²⁸ Mitchell's speech was quoted at length in the October 26, 1929 editions of the New York Times, p. 3; the Wall Street Journal, p. 7; and the Chicago Journal of Commerce, p. 1, as well as Printer's Ink [advertising journal], "How the Department of Justice Views Mergers," October 31, 1929; 153-154.

massive buying by a group of bankers led by J.P. Morgan.²⁹ Friday and the short (two-hour) Saturday session experienced little movement but Friday's volume was unusually high.³⁰ Figure 1 shows the high, low and close for the Dow on a daily basis, September through November 1929.

The Chicago Journal of Commerce credited the two-day plateau to the coordinated action of the banking pool.³¹ The New York Times, in contrast, claimed that Saturday's "prices were firm, without evidence of artificial support," that is, no evidence that the pool was active. It reported that the pool was "still operative," but did not hold large amounts of stock by Sunday.³² This raises the question of where and when the pool unloaded any securities it bought on Thursday and Friday. Fourteen and 12 percent declines followed on Monday and Tuesday, September 28 and 29. A Chicago newspaper claimed "the pool had either not thrown its resources into the breach

²⁹ New York Times, Friday, October 25, 1929, p.1. Also Galbraith (1954, p. 106). Davis (1975, p. 195).

³⁰ Friday's volume was 5,923,220 shares more than on any single day in the first nine months of 1929 except March 26. Volume for the two-hour Saturday session was 2,088,000 shares, which was a typical Saturday volume in 1929.

³¹ "Bankers Agree to Help Market: \$100,000,000 Pool Raised to Prevent Prices from Slipping Further. New York, Oct. 25--By far the most important market development market-wise today was the announcement from sources apparently authoritative that leading Wall Street bankers had agreed among themselves to establish a huge pool for the purposes of supporting stock prices." Chicago Journal of Commerce and LaSalle Street Journal, Saturday, October 26. "New York, Oct. 27--...[Saturday] was the third day that a group of the most powerful banks in the world played the part of Atlas to the weary market. The success of the emergency coalition in restoring sanity to the situation was generally admitted in Wall Street." Chicago Journal of Commerce, Monday, October 28, 1929. The bankers were identified as: Thomas W. Lamont and George Whitney, Morgan partners; Charles E. Mitchell, National City Bank; William C. Potter, Guaranty Trust Co.; Albert H. Wiggin, Chase National Bank; George F. Baker, Jr., First National Bank; and Seward Prosser, Bankers Trust Company. Chicago Journal of Commerce, Tuesday, October 29, 1929.

³² New York Times, Sunday, October 27, 1929, p.1 and p. 16.

or had found the avalanche too great to be absorbed."³³ With hindsight, the New York Times claimed the flat Saturday market was due in part to a misconception about the purposes of the pool.³⁴ The net decline of the Dow from Tuesday to Tuesday was 30 percent.

An explanation for the crash based on fundamentals rather than the dynamics of bursting bubbles can take two forms. Either two or more separate revelations, say, one on Wednesday and one on Sunday caused separate crashes that occurred within five days of one another by mere chance, or one underlying factor caused the entire one-week decline, with individual daily movements governed by rumors, reassessments and new developments.

Mitchell's speech is a good candidate for the large movements and high volume that marked the five days ending Friday, October 25. Government officials typically distributed advance copies of their texts before delivering a speech;³⁵ the long, direct quotes in Saturday morning's papers suggest that the newspapers received the text before the speech was delivered on Friday; and the contents of a prepared talk by the attorney general on law enforcement were unlikely to remain secret.

If Mitchell's Antitrust Division was drawing lines in the sand, the planned merger of Warner Brothers and Paramount was a good place to start. Thursday's papers carried the story that the two companies had called off their deal, and gave Warner's second thoughts as the cause. The Wall Street Journal claimed that "both companies were awaiting sanction

³³ Chicago Journal of Commerce, "New Big Selling Wave Swamps N.Y. Market," Tuesday, October 29, 1929, p. 7. When Mitchell of City Bank entered Morgan's offices on Monday, the market rallied briefly until "it was stated at Morgan's that no statement would be made." Chicago Journal of Commerce, Tuesday, October 29, 1929, p.1,4.

³⁴ New York Times, Tuesday, October 29, 1929.

³⁵ Moley (1939).

of their plan from the Federal Trade Commission."³⁶ In light of Mitchell's speech, the FTC's sanction was irrelevant, since he reserved the right to sue. In fact, he sued Warner a month later over a different merger. If Warner or Paramount saw the handwriting on the wall, then the abandoned merger may have been one of a series of events that communicated a new antitrust regime. It stands as a possible proximate trigger for Wednesday's drop.

A causal link between Mitchell's Friday evening speech and the crash the following Monday and Tuesday faces an obstacle: two hours of flat trading Saturday morning. But a link cannot be ruled out. Mitchell shared Saturday's headlines with a group of bankers led by J.P. Morgan, and with his boss: "Bankers Pledge Continued Support; Hoover Says Business Basis Is Sound." Hoover, speaking to the press Friday afternoon, asserted that the "fundamental business of the country ...is on a sound and prosperous basis."³⁷ In addition, the first news report of a holding company merger of Hershey Chocolate, Kraft-Phenix Cheese and Colgate-Palmolive-Peet appeared.³⁸ This may have briefly halted speculation about the seriousness of a new antitrust crusade. One or more of these factors may have buoyed the market for the two hours before Saturday's noon close.

Alternatively, other bad antitrust news, made public later, may have reached investors later Saturday or Sunday. The Department of Justice, which had filed only one case against a publicly traded firm throughout the 1920's, attacked two mergers of publicly traded movie companies on November 27, 1929. One case involved Fox's acquisition of a

³⁶ Wall Street Journal, October 24, 1929.

³⁷ New York Times, October 26, 1929, p. 1. Chicago Journal of Commerce, October 26, 1929, p. 1,3. The same story also reported that the Senate Committee would investigate the crash and was considering legislation that would put a 5 percent tax on stock transferred in less than sixty days.

³⁸ Chicago Journal of Commerce, October 26, and 28, 1929, p. 1 and p. 3.

controlling share of Loew's. In the other case - Warner Brother's acquisition of a controlling interest in First National Pictures - the merger under attack was itself a response to antitrust objections. Those objections were voiced sometime before November 4, when Warner announced that it would buy out Fox in order to fix the problem. That acquisition provided the government with grounds for a suit.³⁹

Mitchell's speech and the movie cases were only the beginning. Representative Tinkham quickly introduced a bill that would have allowed pre-clearance of mergers, the policy Mitchell had effectively abandoned, and ex-antitrust chief Donovan endorsed the effort.⁴⁰ Businessweek of February 19, 1930, which had reported that "business has been extremely nervous" since Mitchell's speech, noted that antitrust chief John Lord O'Brian promised aggressive action before the Appropriations Committee of Congress. The "radio trust," investigated by the FTC for several years, was eventually sued in May 1930 by the Department of Justice.⁴¹ The Supreme Court's decision in the *Shade Shop* case curtailed FTC rule making powers in trade conferences.⁴² Finally, Standard Oil and 19 other oil companies were sued on February 15.

The market remained volatile through December, which coincided with the calling of the so-called "Hoover conferences" of industry. Hoover's stated purpose was to restore confidence and "stabilize" industry in the wake of the crash. Given his earlier links with the association movement and industry sentiment for antitrust reform, the calling of

³⁹ Chicago Journal of Commerce, November 4, 1929, p.1.

⁴⁰ New York Times, November 18, 1929; December 12, 1929.

⁴¹ Ironically, the cross-licensing agreement at issue was the product of Hoover's national radio conferences in the mid-1920s. Hawley (1989, p. 1100).

⁴² The ruling held that practices affecting the internal organization of an industry were out of bounds for the FTC. Businessweek, November 2, 1929. *FTC v. Klesner*, 280 U.S. 19 (1929). But Myron Watkins in *Handler* (1932a, pp.110-111) argues that this case, "properly construed," did not significantly restrict the FTC's jurisdiction.

these conferences may have raised hopes that Hoover would back industry. By the end of the year, the Dow was 25 percent above the post-crash low reached on November 13.⁴³

Decrees were entered against the Wool association in June and against California refineries in September. Businessweek viewed the wool case as a signal: "Trade Associations See Warning in Wool Institute Decree: Leaders Study Price-Fixing Charges for Guide to Future Policy of Department of Justice."⁴⁴ The scrapping of the refinery code was another ominous development. The code had been approved by the FTC in August 1929, and "the real casualty was the trade practice codes of the FTC."⁴⁵ The Justice Department clashed with the FTC, asserting that practices it sanctioned were in fact illegal, which led the FTC to revise many codes and eventually to abandon the practice altogether.⁴⁶ In the case of the oil industry, however, Hoover apparently intervened and effectuated a restoration of the code. He had displayed an inconsistent willingness to tolerate cooperative activities in natural resource industries.⁴⁷

Calls for revision arose in 1930 and 1931. Bernard Baruch (former head of the War Industries Board and later influential in shaping the NRA) denounced the "public lunacy"

⁴³ Utility stocks deserve special mention. As White (1990a) points out, the mid-1929 boom in utilities was greater than in industrials and the October drop greater. Utilities had experienced their own merger wave in the 1920s, but at the same time, they were the subject of an FTC investigation and were ultimately regulated in the 1935 Utilities Holding Company Act.

⁴⁴ Businessweek, July 9, 1930, p. 12.

⁴⁵ Himmelberg (1976, p. 95).

⁴⁶ Himmelberg (1976, p. 96). The end of trade code endorsement was common knowledge in early 1930. Businessweek, April 30, 1930, p. 5. Former FTC Commissioner Myers (1932, p.133) asserted: "Nothing has so hurt the Commission in the eyes of the business world as its vacillating policy in reference to trade practice conferences. For more than a year and a half, during one of the most critical periods in our economic history, the matter has been suspended in air."

⁴⁷ Himmelberg (1976, p. 97-103).

of the Sherman Act.⁴⁸ The NCF arranged a meeting with Hoover in late April 1930, but decided to postpone a political push until the tariff bill was out of the way.⁴⁹ An article on the case against the merger of 28 drug wholesalers, a merger approved by Donovan under Coolidge, also mentioned calls for revision that would let business know whether a merger was legal in advance.⁵⁰ Hoover's October 7, 1930 speech to the AFL, offering to reduce "destructive competition" and a revision of regulatory laws if they "produce a competition which destroys stability in an industry" fueled speculation that revision would occur.⁵¹ Industry leaders expected Hoover to mention modification in his December address to Congress, where he in fact called for a study of the effects of antitrust.⁵² He warned, however, that substantial changes would "open the door to price fixing, monopoly, and the destruction of healthy competition."⁵³

The Senate Judiciary Committee appointed a subcommittee to follow up on Hoover's request. Pre-clearance of association agreements, alternatives to costly litigation, mergers, and natural resource industries were slated for special

⁴⁸ New York Times, May 2, 1930 and Himmelberg (1976, p. 110). Baruch, who was well connected in Washington, had displayed optimism in early 1929, citing, among other factors, cooperation "within the ranks of business," and between government and business, "with results that are beyond measure," as well as a "far wider fund of statistical knowledge than business men had ever had before." Interestingly, Baruch got out of the market in September 1929. Davis [1975, p. 147 (quoting American Magazine, June 1929) and p. 190].

⁴⁹ Himmelberg (1976, p. 113).

⁵⁰ Businessweek, June 15, 1930.

⁵¹ New York Times, October 7, 1930. Himmelberg (1976, p. 114). Since Hoover's topic was bituminous coal and similar industries, it's unclear how far he was willing to go.

⁵² New York Times, November 23, 1930 and December 3, 1930. Himmelberg comments that Hoover's message "almost certainly did advance the cause of revision, but its major effect probably was to raise hopes Hoover had no intention of requiting." Himmelberg (1976, p. 114).

⁵³ Quoted in Himmelberg (1981, p. 129).

attention.⁵⁴ Legislation introduced by Senator Nye in early 1931 would have assigned policing of trade associations to the FTC and was aimed at below-cost selling.⁵⁵ The American Bar Association and the National Association of Manufacturers came out in favor of changes.⁵⁶ However, the attorney general reiterated his commitment to enforcing the laws as they existed.⁵⁷ Hoover countered these pressures in June 1931 with his "American Plan" of "organizing cooperation," chiefly focused on trade association programs that emphasized Hoover's traditional aims, in particular "fact finding."⁵⁸

The debate on reform took a dramatic twist in September 1931 when Gerard Swope, president of General Electric, presented what came to be called the Swope Plan, which called for compulsory organization of firms into trade associations to function under federal supervision.⁵⁹ Hoover opposed the Swope plan, arguing to his Solicitor General that it was "unconstitutional."⁶⁰ Senator LaFollette opened hearings on his bill for a National Economic Council in late October, providing a platform for business spokesmen such as Swope. Conferences on antitrust reform suddenly blossomed at major universities.⁶¹ The Chamber of Commerce issued a committee report, recommending changes in antitrust and ultimately approved the Swope plan.⁶² Topics at a Columbia University conference held December 1931 included pre-clearance of mergers, association agreements and other business conduct, repeal of Section 7 of the Clayton Act, "stabilization" plans generally and for natural resource industries in particular,

⁵⁴ Businessweek, January 14, 1931, p. 30.

⁵⁵ Businessweek, January 21, 1931., p. 10-11.

⁵⁶ New York Times, March 21, 25, 1931.

⁵⁷ New York Times, April 16, 1931.

⁵⁸ Hawley (1989, p. 1093).

⁵⁹ New York Times, Sep 17, 1931. Businessweek, Sep 23, 1931. Interestingly, General Electric was the target of more federal antitrust suits up to 1945 than any other firm.

⁶⁰ Himmelberg (1976, p. 160) and Hawley (1989, p. 1092.).

⁶¹ Himmelberg (1976, p. 127).

⁶² New York Times, September 19, 1931. October 5, 1931.

the creation of a "Trade Court," and prohibitions against selling below cost.⁶³

Hearings on antitrust revision were held in March and February of 1932, and various bills were introduced that reflected aspects of the Swope plan, earlier FTC practice or some other revisionist model. Business groups actively lobbied the President. Among them was Julius Barnes, chair of the Chamber of Commerce and Hoover's colleague at the Food Administration.⁶⁴ These efforts were, in Himmelberg's view, not failures, but rather the precursors to the successful NRA legislation passed a year later.⁶⁵ Revision was pushed by the Chamber of Commerce chair, Justice Brandeis, the American Bar Association, the accounting firm of Ernst & Ernst and prominent antitrust attorney Gilbert Montague.⁶⁶ In December of 1931, former antitrust chief Donovan drafted an association agreement for a group of regional coal producers. It was viewed as a test case.⁶⁷ The government sued, and the Supreme Court upheld the agreement in Appalachian Coals in March 1933. The case remains an antitrust embarrassment to the present day.

Antitrust revision was also a prominent topic in the days leading up to the 1932 party conventions.⁶⁸ Indeed, antitrust

⁶³ Handler (1932a), in particular Montague (1932), Myers (1932), and Watkins (1932). One discussant and strong supporter of "regulated production" and critic of association antitrust policy, David Podell, denied, however, that "the collapse of the merger movement since the Fall of 1929 is in any wise traceable to an overzealous enforcement of our Anti-Trust Laws." Handler (1932a, p. 69).

⁶⁴ Himmelberg (1976, p. 161-162.) Himmelberg (1981, p. 128).

⁶⁵ Himmelberg, p. 164.

⁶⁶ New York Times, January 31, 1932, March 22, 1932; April 14, 1932; June 27, 1932

⁶⁷ Himmelberg (1976, p. 153).

⁶⁸ The danger of revision led a group of 97 leading economists to voice their opposition to reform and to the "assertion that the Sherman Act is responsible in large part for the present depression." Fetter (1932).

revision was part of the Democratic platform.⁶⁹ More important were FDR's expected policies and prospects in the election. According to Hoover's memoirs, FDR had promised antitrust revision to the head of the Chamber of Commerce in return for business support in the election.⁷⁰ Hardly surprising for this view, the Dow rose markedly -- 26 percent in July and 34 percent in August -- after FDR's nomination was assured in late June, and it became clear that he would defeat Hoover. By the end of 1932, industry expected revision, and even attorney general Mitchell urged changes.⁷¹ The reforms were ultimately carried out in the National Industrial Recovery Act of 1933.

3. Antitrust and the Stock Market

Federal antitrust governs merger, vertical arrangements, and diverse cooperative practices, ranging from cartels to patent agreements. If antitrust ultimately moved stock prices, it had to influence, say, the extent and nature of merger activity, and this in turn had to influence stock prices. Can we construct those links?

Irving Fisher's serially correlated errors in stock market prediction before and after the crash are legend. His views on antitrust, mergers and the boom are less well known. Speaking to the American Bankers Association on the evening of the October 23, 1929 slide, he commented that "the old 'trust-busting' sentiment has lapsed almost completely," and he attributed the high level of stock prices to the mergers that the new policies allowed and to the "anticipation of future economies arising from them."⁷²

His book on the crash, which had a preface dated December 15, 1929, repeated this theme:

"During the Roosevelt and Wilson regimes there was an organized effort at 'trust busting'; it was the popular

⁶⁹ New York Times, June 30, 1932; Sept 17, 1932.

⁷⁰ Hoover (1952, p. 335).

⁷¹ December 8, 1932; Dec 25, 1932.

⁷² New York Times, October 24, 1929, p. 2.

sport of politicians, but in these days under Coolidge and Hoover, governmental authorities have gone the limit to stretch the Sherman Act and Clayton Act in order to aid the movement for business efficiency, ...While we avoid the word 'trust' today, we do have the same result through 'mergers'; these have not fallen heir to the unpopularity of the trusts, but are recognized as a means of economy. ... There has been no [antitrust] crusade, and for obvious reasons." Fisher (1930, pp. 106-107).

Fisher viewed mergers as largely productive; he attributed the high stock prices to the merger boom; and he chalked up the boom to enlightened antitrust. But he missed the shift in policy under Hoover.⁷³

Fisher's notions about the efficiency and stock-market effects of mergers may seem overblown. After all, productivity and profits of acquired units and stock prices of acquiring firms show only modest gains. But this confuses the contribution of individual mergers at the margin with their contribution overall. An example from another area illustrates the point. Studies of the returns to education to individual students typically find normal returns, but that finding provides no guide to the consequences of a forced 50 percent reduction in the number of college graduates. The relevant question is what would happen to productivity, profits and stock prices if government policies lowered the volume of mergers by half?

Work by Telser (1984 and 1987, ch.8) is suggestive and offers pertinent cross-section evidence. His theoretical model regards merger as a method of transferring private knowledge when differences arise across firms as the result

⁷³ The idea that filing lawsuits against mergers affects the overall level and nature of merger activity is no Fisherian quirk. See Stigler (1966) on the influence of antitrust on concentration and merger; Bittlingmayer (1985) on the Great Merger Wave and the debate over the role of antitrust in it's rise and fall; Scherer and Ross (1990, p. 150, pp. 155-159) on the effect of antitrust at the turn of the century, on the 1950 merger law, and on 1980's policies; and Shleifer and Vishny (1991, p.58) on antitrust and the 1980's merger wave. Oddly, modern financial economics is puzzled by merger waves. Brealey and Myers (1991, p. 923-924) regard them as one of "10 unsolved problems in finance."

of innovation. Using data for 1879-1930, he finds that merger intensity is positively related to the growth of an industry at the two-digit SIC level, $r = 0.689$ ($n=18$). Statistically, a 1 percentage point increase in the rate of growth of an industry is associated with a 17 percentage point increase in the fraction of industry capital involved in merger over a decade. Gort (1969), using data at the 3-digit level for the 1950's also finds that merger activity is correlated with industry growth, as well as the technical personnel ratio, productivity change and R&D intensity, $0.454 \leq r \leq 0.737$ ($n=46$ to 101). Telser interprets these measures as proxies for technical progress. On this view, a strict merger policy prevents the transfer of knowledge. So, while causation may run from technical change -- as proxied by growth, R&D and the other variables -- to merger, we cannot rule out some reverse causation. The government arguably has more direct control over merger activity than it does over industry growth rates and R&D, and its policies may affect merger in some industries more than others.

Some of the dynamic benefits of merger are also relevant. By lowering the cost of exit, an unrestricted merger market raises expected returns to new and existing firms. The option of exit-through-merger is particularly important for firms that develop intangible capital, for whom liquidation would mean larger losses. Potential acquirers also have more options because they may choose between direct new investment and buying assets that represent a partially or even fully successful effort assembled by someone else. So, both types of firms, potential buyers and potential sellers, should be worth more with a lax merger policy.

The second pillar of antitrust, cartel policy, was at the heart of the dispute over trade association activities and antitrust reform, and it was an integral part of the NRA. It also has the potential for moving stock prices. First, simple monopoly profits would explain why stock prices rose when cartels were tolerated and fell when they were not,

provided that listed firms were substantially cartelized. Second, efficiency rationales are also possible. For example, the exchange of information loomed large in the debate, and the effect it might have on competition and efficiency is not settled. Finally, even some classic cartels have a defense. Fisher, as well as other economists, have argued that fixed costs and increasing returns result in cutthroat competition because marginal cost is less than average cost. Fisher viewed these cost conditions as widespread, and backed control of cartels instead of forcing competition under all circumstances with antitrust.⁷⁴ Insights based on the theory of the core, due to Telser and Sharkey, have led to renewed interest in the sustainability of purely competitive outcomes.⁷⁵ There may exist no competitive equilibrium under a range of cost and demand conditions, and this provides an efficiency rationale for cooperative forms of industry organization, including some of the controversial practices of the 1920's and thirties.

The literature on vertical arrangements would fill a small library. More intriguing in my view, but barely explored, is that actual antitrust cases dealing with vertical restraints seem to have been directed at new, high-growth industries and new practices: film producers and distributors (Fox, Loew's, Paramount), radio (RCA) and tabulating machines (IBM).

Was the shift in policy large enough to cause a crash? Mitchell threatened law suits in place of advance consultation. He put the legality of future mergers in doubt, and he also put at risk the completed mergers from the 1920's boom. From the vantage of 1929, antitrust had gone through several gyrations since 1900. A prediction in 1929 that a massive antitrust campaign would happen again would

⁷⁴ Fisher (1920, pp.314-332).

⁷⁵ Telser (1978, 1987) and Sharkey (1982).

have been confirmed within ten years by the late 1930's antitrust revival under Thurman Arnold.

At a brute empirical level, recent events show that antitrust and broadly related policies may in fact move stock prices. Mitchell and Netter implicate antitakeover legislation as a precipitating factor in the October 1987 crash. Cutler, Poterba and Summers, while pessimistic about the ability of political and economic events to explain observed volatility, still identify in a cursory analysis a number of political events linked with the fifty largest stock movements since August 1945: Truman defeats Dewey (-4.61% drop of S&P), Eisenhower's heart attack (-6.62%), and IBM wins appeal of antitrust case (+3.27%), for example. The reaction to Eisenhower's heart attack is intriguing. His Vice-president, Richard Nixon, launched a period of aggressive antitrust when he assumed the presidency in 1969. Cutler et al. also mention Kennedy's forced rollback of steel prices - reminiscent of Teddy Roosevelt's struggles with turn-of-the-century trusts. Kennedy's action was marked by a drop in the S&P of -6.68 percent on May 28, 1962. More recently, George Bush's off-hand remark on credit card interest rates was linked with the large decline of December 1991.

4. Stock Prices and Merger Cases, Good Times and Bad

In Bittlingmayer (1992), I showed that total DOJ cases were correlated with declines of the Dow industrial average over 1904-1944. Table 2 provides more detailed evidence for 1919-1930 and focuses on the effect on stock returns of merger activity and DOJ and FTC enforcement of prohibitions against merger and ownership of stock. By choosing that period, I can use the quarterly merger data available in Eis (1969) and cover the boom and crash. We know that changes in merger policy and changes in stock prices coincided in the last quarter of 1929. My aim is to see whether that holds for the rest of the twelve years in my sample.

The regressions portray quarterly returns of the Standard industrial average as a function of changes in industrial production, FTC and DOJ merger cases, and two measures of merger activity. We should resist the temptation to view this as a structural model. The change in production, endogenous without doubt, represents factors that ultimately affect real output. A long line of research finds a stable statistical link between changes in production and changes in stock prices, at least for the United States.⁷⁶

DOJ and FTC merger cases are based on all federal cases alleging anti-competitive acquisition of stock under Section 7 of the Clayton Act - all FTC merger cases fall under this heading - or anti-competitive merger or stockholdings under the Sherman Act, which are exclusively Justice Department cases.⁷⁷ The implicit structure imposed is that merger cases have significant effects while other kinds of cases do not. Moreover, I assume that actual cases are largely surprises, at least quarter-to-quarter. Figure 2 shows total merger cases, FTC plus DOJ, as well as the natural log of Standard Industrials. The cases are volatile and show no obvious serial dependence. Note the spikes in late 1919 (representing in large part the FTC's six meat packing cases) and in the fourth quarter of 1929. As noted before, the trend until 1929 was downward.

I also employ two measures of merger activity, the natural log of the number of firm disappearances and the natural log of the value firm disappearances. Figure 3 shows the relation between firm disappearances at a one quarter lead and stock prices. Actual firm disappearances typically follow the first reports of a merger by several months. A long line of research links merger activity and stock booms, but assumes that causation runs from booms to mergers. Since merger announcements cause large movements in stock prices --

⁷⁶ See Bittlingmayer (1992), Fama (1990) and Schwert (1990) for recent examples and cites to earlier results.

⁷⁷ Appendix A lists the DOJ cases individually.

and since stock prices react immediately to new developments, while a consummated merger represents the end of trail that stretches many months into the past -- causation from mergers to stock prices seems just as reasonable.

I use undifferenced measures of merger activity for the current quarter and at a one-quarter lead. This amounts to letting the data decide how much differencing should take place. Since returns are differences of the natural log of levels, it might make sense to use percent changes in merger activity. But merger disappearances in fact represent the short-run change in the number of firms as a consequence of merger. Since reported mergers lag news of mergers, I use next quarter's merger activity as well as this. Finally, I also use a zero-one variable equal to one for the fourth quarter of 1929. This should guard against the possibility that any estimated correlation between merger cases and stock returns is driven by the October 1929 crash.

The results confirm earlier work and find a strong quarter-by-quarter relation between industrial stock returns and percent changes in industrial production. More surprising are the coefficients for DOJ and FTC merger cases. Each DOJ case is linked with a drop of stock prices of -5.7 to -9.1 percent, each FTC case with a drop of -1.4 to -2.2 percent. These are definitely not good estimates of the wealth effects of a single case any more than the -6.68 percent decline of the S&P on May 28, 1962 represents the wealth effects of a forced reduction in steel prices. At a mechanical level, these estimates may represent the effect of moving from an enforcement regime stricter by one case per quarter into the indefinite future. At the more sophisticated level of law enforcement and signalling of policy, they reflect what investors infer from an extra case per quarter about expected future merger policy, merger activity and the resulting stock prices, against the background of hot and cold antitrust. Mitchell's announcement and DOJ merger filings against three large, publicly traded firms in high-

growth industries (Fox, Warner and RCA) came after nearly a decade of very lax merger enforcement. From that point of view, the question is, how many merger cases does it take to squelch a merger wave? The larger estimated coefficients for DOJ than for FTC merger filings may be due to DOJ's greater enforcement powers - Sherman Act cases, criminal merger filings, as well as Section 7 cases - or the more radical shift in policy at DOJ. Finally, an upsurge in merger enforcement may signal unfavorable business policy across the board. If true, the results here still offer lessons for the cause and cure of at least some financial panics.⁷⁸

According to the estimates, next quarter's merger activity was positively related with stock returns, and the current quarter's merger activity negatively, although with a smaller coefficient. The net effect was positive. Adding merger activity, however, leaves the estimated effect of merger cases largely unaltered. Finally, the zero-one variable for the fourth quarter of 1929 shows a coefficient of -18.0 to -28.6 percent, indicating that something not reflected in merger activity or merger case filings occurred that quarter. One candidate is tighter antitrust, as reflected in the attorney general's October 25 speech to the ABA. While the addition of the zero-one variable typically causes estimates of DOJ and FTC merger cases to drop, only the FTC case coefficient comes within two standard errors of zero.

⁷⁸ Two disastrous stock-market quarters, 1929:IV and 1930:II, each with two DOJ cases, are responsible for only part of the large negative value for DOJ merger cases. Restricting the regression in column three to 1919:I-1929:III results in coefficients for DOJ of -4.3% and FTC of -1.7%. Using dummies in place of actual case filings for the entire sample period yields large significant effects for quarters with DOJ filings, but small negative effects for quarters with FTC filings.

5. Mergers and a Cross-Section Test for the Two Weeks of the Crash

Sub-rosa administrative clearance of mergers developed under Colonel Donovan's Antitrust Division. The new attorney general renounced it on October 25, 1929, and I have found no earlier public statement along the same lines. Subsequent enforcement revealed that his speech was not idle talk. If his announcement represented major news for merger policy, then stock prices of three classes of firms should have been affected disproportionately: likely bidders, likely acquirees, and firms that had in fact announced or completed a merger.

A short list of announced but still pending merger partners could be put together from press reports. A longer list of possible merger partners would require extensive data, in this instance for events that occurred over sixty years ago. I leave aside the statistical and economic problems involved in predicting who will merge.

In contrast, the list of firms that actually merged is a matter of record, and this record was compiled in the worksheets Carl Eis used for his study of the 1920's merger wave. Eis recorded 1,094 firm disappearances in manufacturing and mining for 1928 and 1929. Since many firms were bought by the same acquirer, Eis's records show only 467 distinct acquirers for those two years. And of that total, 92 were manufacturing firms traded on the New York Stock Exchange in 1929. Of those 92 firms, 26 made acquisitions in 1928 only, 40 in 1929 only, and 26 in both years.⁷⁹ I use the merger record for all of 1929 because mergers that were completed in November and December were in all likelihood anticipated earlier.⁸⁰

⁷⁹ I excluded one of Eis's firms: Webster Eisenlohr, a cigar company. Its stock declined from \$69 to \$15 the first week and then to \$8.75 the second week of the crash, an unusually large decline, even by the standards of the Great Crash.

⁸⁰ Note that this imparts a (small) survivor bias to the data since only mergers still worth pursuing after the crash appear on

The control group is composed of 267 manufacturing firms with CRSP-defined SIC codes 20 through 39 who were also listed on the NYSE for all of 1929. My interest is in the two weeks of the crash, but the CRSP data before July 1962 are monthly. Consequently, I collected prices for October 19, 26 and 31. These define stock-market weeks because trading was suspended on Friday and Saturday, November 1 and 2. I also used the percentage range for January 2-October 19, 1929 as a way of controlling for the inherent volatility of the stock. Garman and Klass (1980) show that range is proportional to the standard deviation of returns under conditions discussed in the next section.

Tables 3 and 4 attack the numbers from two directions. Let R_i be the return of stock i , and $G_i = \ln(H_i) - \ln(L_i)$, the percentage range based on the high and low for the stock. In Table 3, I regress R_i/G_i , the return as a fraction of the range for stock i , on a zero-one variable, M_i , that is equal to 1 if the stock appeared in Eis's worksheets in 1928 or 1929 and 0 otherwise. According to the first column of results, firms with no mergers in those two years experienced drops of -41.4 percent of their 1929 range, while those with mergers in one or both years fell an extra -10.7 percent, or -52.1 percent in all. The difference is statistically significant for the two weeks taken together ($t=2.82$), and separately for the weeks ending October 26 ($t=2.12$) and October 31 ($t=2.12$). The introduction of two-digit SIC industry effects -- whose coefficients are not reported here -- leaves the overall results unchanged. Division of the sample into high- and low-range stocks results in substantially greater declines normalized by the range for small-range stocks, -47.8 rather than -30.6 percent. The significant effects of merger are also confined to that group, which comprises 63 percent of the entire sample.

Eis' worksheets. But the prices of those merging parties presumably fell less than of firms whose mergers were cancelled. The bias favors the finding of no difference.

Table 4 shows regressions of the form:

$$R_i = \alpha + \beta M_i + \gamma \ln(G_i) + \epsilon_i.$$

The use of the natural log of the percentage range, which is proportional to "log variance," is defended at greater length in time series work below. At a practical level, it means that extreme observations have less influence. The regression for the second week of the crash, which ended October 31, also includes the previous week's return. This is an attempt to control for other, unknown factors besides previous volatility and merger history that spanned the two weeks.

The regressions say that merging firms suffered extra declines of -3.9 percent over two weeks, -1.4 percent in the first week and -2.6 percent in the second week. Industry effects alter that result little, but a division into small and large pre-crash ranges shows that for small-range firms, the effect was larger (-4.7 rather than -1.6 percent) and divided roughly equally over the two weeks. What is more, for the small-range sub-sample, stocks that fell greatly the first week fell more in the second week: each -10 percent decline to October 26 meant an extra -1.7 percent decline to October 31. Some common, omitted factor was at work for this group. Large-range stocks, arguably more speculative, fell by the same percentage as small-range stocks, but the effects of merger history and past volatility were small and unstable. Also, strong declines in the first week were partly made up the week after ($t=1.84$). Log volatility, $\ln(G_i)$, while significant in the full sample, provides only a partial statistical explanation for the drop. A 100 percent increase in G_i lowered the two-week return by -8.6 percent.

The extra decline of -3.9 percent during the crash for firms involved in mergers 1928-29 supports the view that the public renunciation of pre-merger clearance and vow to "enforce the law" put recently completed mergers in danger, more danger than the unpublicized suspension of pre-merger

clearance since March 4. It also imposed a de facto tax on future expansion and investment through merger. While four percent may seem large, Mitchell and Netter found net average daily movements, up and down, ranging from 1.43 to 5.25 percent for 19 takeover stocks on five days before and after the October 19, 1987 crash that were associated with the antitakeover bill they investigate.⁸¹

6. The 1929-1932 Antitrust Debate and Daily Returns

The debate on antitrust reform also provides a testing ground for the view that stock prices and antitrust were linked. I need only an objective measure of the degree of attention paid to the antitrust question. However, I want to pick my measure well. If I searched over, say, ten possible indicators, I could expect to reject the null for one at the 10 percent level, even if antitrust has no effect on stock prices. My choice is all antitrust stories listed in the New York Times Index for 1929-1932. This includes statements by the President and by antitrust officials, rumors, and major actions and statements by private individuals. Appendix B has a breakdown by index headings. Figure 4 shows the natural log of the Dow and a moving four-day sum of the number of New York Times antitrust stories.

I stress that my aim is to explain some of the short-run movements of stock prices. Clearly, other factors, notably the one-third decline in the price level influenced share prices, either directly or indirectly through expected economic activity and earnings.

Table 5 provides summary statistics for the change in the natural log of the Dow industrial index over one, four and eight-day intervals, $R_{t,t-1}$, $R_{t,t-4}$ and $R_{t,t-8}$. These

⁸¹ An alternative explanation would emphasize that merging companies are growth stocks and that these might suffer more in a crash of indefinite origin, but the breakdown by range and the results from including $\ln(G_i)$ itself provide no support for that view. In fact, the small-range stocks declined just as much as the large-range stocks, but having a recent merger hurt them more.

returns show the familiar kurtosis, which declines with the return interval. Clearly, inferences that rely on the assumption of normality would be flawed.

Consider returns divided by a local measure of standard deviation. One particularly efficient estimate of variance is based on the range. Suppose that the Dow is a continuous diffusion process with (locally) constant variance. Let H_t be the natural log of the day's high, L_t the natural log of the day's low, and define $G_t = H_t - L_t$, that is, the range as a percent of the Dow's average value. Then

$$s^2_t = \frac{G_t^2}{4 \ln 2} \quad (1)$$

is an estimator of the daily variance.⁸² Call the estimator based on an eight-day average of (1), days $t-7$ through t , $\overline{s^2}_t$. Then new, standardized returns can be constructed as

$$RSD_{t,t-k} = \frac{R_{t,t-k}}{\sqrt{k \overline{s^2}_t}} \quad k = 1, 4, 8. \quad (2)$$

Table 5 summarizes the results of this exercise. Standardized one, four and eight day returns have standard deviations near unity. Kurtosis is greatly reduced, in fact, even negative over four and eight days.

The regression results in Table 6 are based on a conjecture. The October crash is linked in time with Attorney General Mitchell's announcement, and April 1930-June 1932 was marked by a slide in prices and an unsuccessful attempt at antitrust revision. If this policy struggle was a factor in the slide in stock prices, prices should have fallen more in the days leading up to new developments than on other days.

⁸² Parkinson (1980) and Garman and Klass (1980).

Consider the distributed lag regressions of returns, $R_{t,t-k}$, on a count of current and leading New York Times antitrust pieces on day t , X_t :

$$R_{t,t-k} = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + u_t \quad k = 1, 4. \quad (3)$$

(Regressions involving eight-day returns include extra lagged terms.) A negative effect of antitrust developments on stock prices will be reflected in $\sum \beta < 0$.

Note that even when returns are measured over four or eight days, leads and lags of X_t are still measured over single days. This inflates the per unit estimated effects of X_t by a factor of four or eight. (Summing the X_t over four and eight days and using fewer explanatory variables yields equivalent results.) Eight-day regressions are based on overlapping observations at four-day intervals, with the White-Hansen method used to provide consistent estimates of the standard errors.

Consider the first three columns, which are based on raw, unstandardized returns. Each news story is linked with a 0.84, 0.76 (=3.05/4) or 0.66 (=5.30/8) percent decline of the Dow. There seems to be no systematic difference between 1929 and 1930-1932. The estimated constant term reflects the effect of no news on the antitrust front, against the background of intermittent antitrust activity.

The results do suffer from obvious statistical shortcomings: severe departures from normality of the residuals in all cases, autocorrelation of the residuals in some cases (especially of higher order), and the suspicion that October 1929 is very influential. Only the last problem throws a cloud on the estimated coefficient, and these estimates provide a useful benchmark.

The last three columns of Table 6 are based on $RSD_{t,t-k}$, the standardized Dow returns. These are nearly unit normal and the absolute values of the six extreme observations, maximum and minimum for each of three variables, fall in the

range [2.4, 3.1]. The regression estimates point in the same direction, however. Each antitrust event is linked with a standardized decline of 36 percent of the local estimated standard deviation. The result over four and eight days suggests a lower but statistically significant cumulative effect $-0.28 (= -0.57/\sqrt{4})$, and $-0.24 (= -0.67/\sqrt{8})$. This result is stable across sub-periods.⁸³ Since the daily standard deviation was 2.4%, this implies a per story effect of -0.6 to -0.9 percent.

These estimates summarize short-term correlations: returns dropped when the trust issue heated up. I would caution against a long-term interpretation. For example, the estimates seem to imply that if only half as many antitrust stories had been printed, the Dow would have been $(322/2)0.84\% = 135$ percent higher at the end of 1932. But this amounts to an out-of-sample prediction.

7. The Antitrust Debate and Volatility

Given the difficulty of telling good news from bad, a stronger implication of the view that the antitrust discussion influenced stock prices is that new developments should raise the volatility of prices. Some technical problems deserve attention.

I rule out two obvious measures of volatility, the absolute value of the daily return and the return squared, because of the statistical problems they raise. Both are highly non-normal and both would give substantial weight to relatively rare fluctuations.

The natural log of the one-day return, $\ln(R_{t,t-1}^2)$, is an alternative measure that places more statistical weight on ordinary fluctuations. Note that $\ln(R_{t,t-1}^2) = 2 \ln(|R_{t,t-1}|)$. However, this measure is still highly non-normal, as can be seen in Table 5.

⁸³ The division by the square root of the number of days yields standardized returns on a per day basis.

A related estimate of volatility uses the natural log of the $k+1$ -day average return squared, but reduces the number of non-overlapping observations by a factor of $1/(k+1)$:

$$T_{t,t-k} = \ln \left(\frac{\sum_{i=0}^k R_{t-i;t-i-1}^2}{k+1} \right) \quad k = 1, 3, 7 \quad (4)$$

Summary statistics in Table 5 show that as k increases, $T_{t,t-k}$ becomes normal, and in fact "thin-tailed" for $k = 7$. Figure 2 plots $T_{t,t-3}$ and the four-day moving sum of the number of antitrust stories.

An alternative measure of volatility analogous to $\ln(R_{t,t-1}^2)$ is the natural log of the percentage range, $\ln G_t$. This measure is inherently normal, so that a range-based measure of volatility does not need to be based on an average over several days.

Another point deserves attention. Both types of volatility measure, $T_{t,t-k}$ and $\ln G_t$, show a steady increase over the period 1930-1932. Regressions on trend suggest an annual increase of 50 percent. However, absolute measures, say, absolute values of changes in the Dow or the Dow's range, show a steady downward trend over this period. The increase in the measures here may be an artifact of the sustained drop of the Dow. Still, the apparent long-term trend, up or down, has to be addressed.

Table 7 presents the results. Each news story is linked with an 84 percent increase in $T_{t,t-1}$. This declines to 61 percent when past $T_{t,t-1}$ are included. The Ljung-Box statistics, which are valid even in the presence of lagged dependent variables, indicate no serial correlation. Results for $T_{t,t-k}$ averaged over four and eight-day periods suggest similar effects, roughly between 50 and 100 percent per news story.

Table 8 provides alternative estimates based on $\ln G_t$. Each news story results in a 30 to 45 percent increase in the range when past values $\ln G_t$ are not included. These regressions are plagued by severe autocorrelation, even when sampled at every other or every fourth observation. Adding past values of $\ln G_t$ eliminates this autocorrelation, but reduces the coefficient estimates by half, to 17 and 22 percent. Since $\ln G_t = (1/2)\ln G_t^2$, and since G_t^2 is proportional to variance and hence to $T_{t,t-k}$, the results here are consistent with those in Table 7, where summed coefficients were typically about twice as large. Since I use the range from a particular day, rather than an average over several days, I include a dummy for the Saturday short session. The range was typically 40 percent lower on Saturdays. Time trend and Saturday alone explain 29 percent of the variation in log of range.

6. Concluding Comments

Economically efficient law enforcement minimizes the sum of the costs of crime plus the costs of crime prevention, including the unwanted incentives that crime enforcement has on behavior. But economists typically view the monopoly problem differently. A popular advanced text motivates a purely theoretical analysis of monopoly by pointing to notional welfare losses of monopoly, including the divergence between marginal and average cost, rent-seeking and X-inefficiency. The author cites estimates that put those losses at 0.1 to 7 percent of GNP.⁸⁴ But the costs of monopoly are like the costs of office politics: they can't be assessed without knowing the costs of suppression in actual practice. In the case of monopoly, what has been the cost of using the antitrust laws? Part of that cost may be reflected in financial markets.

⁸⁴ Tirole (1989, p. 68).

While the ups and downs of antitrust provide a simple and unified explanation for the twenties boom, the Great Crash and some of the volatility that followed, I've left some fertile ground untilled. The unsettled antitrust politics at the end of World War I, Supreme Court decisions of the twenties and thirties, the changing fortunes of the FTC at the hands of Congress and the courts, the details of association policy (especially the NRA) and the TNEC investigations of the late 1930's may provide relevant evidence for the proposition that government regulation of the corporation and business practice affected the overall level and volatility of stock prices. The contribution of merger in the aggregate also deserves attention.

Table 1
Measures of Antitrust Enforcement, 1917-1934

	<u>Federal Trade Commission</u>				<u>Merger Cases</u>				
	DOJ Cases	Preliminary Inquiries	Complaints Issued	Restraint of Trade Cases	DOJ	FTC	Sum	Listed Co's	FTC Budget*
1917	21	462	16	20					
1918	10	611	80	64					
1919	3	843	125	121	0	9	9	7	1,737
1920	8	1,107	220	18	1	3	4	3	1,117
1921	20	1,070	156	26	0	4	4	3	1,246
1922	17	1,223	104	32	2	2	4	1	1,048
1923	8	1,234	121	50	0	5	5	3	978
1924	13	1,568	143	51	0	5	5	4	1,012
1925	12	1,612	118	21	0	4	4	3	987
1926	9	1,483	57	4	2	0	2	0	976
1927	13	1,265	45	8	1	2	3	1	984
1928	17	1,331	58	10	0	4	4	0	984
1929	8	1,469	100	17	3	8	11	5	1,163
1930	3	1,505	171	12	2	1	3	1	1,535
1931	5	1,380	110	4	0	1	1	1	2,096
1932	9	1,659	90	3	0	0	0	0	2,279
1933	9	1,593	52	4	0	2	2	2	1,887
1934	6	2,151	98	14	0	0	0	0	1,681

* Thousands of 1929 dollars.

Note: Calendar Year for DOJ and FTC Cases, Fiscal year ending June 31 for FTC investigations, complaints and budget.

Sources: DOJ Cases and FTC Restraint of Trade Cases from Posner (1970, Tables 1 and 2, pp. 366 and 369); FTC Preliminary Inquiries and Complaints Issued from FTC Annual Report (1935, Tables 1 and 3, pp. 82-83); DOJ Merger Cases compiled from Commerce Clearing House, The Federal Antitrust Laws (1952); FTC Merger Cases compiled from Commerce Clearing House, FTC Docket of Complaints (1988); FTC Budget from Shugart (1990, Table 4.3, p. 90).

Table 2

Regressions of Standard's Industrial Returns on Percent Change in Industrial Production, Number of DOJ and FTC Merger Cases and Two Measures of Merger Activity, 1919:I-1930:III, Quarterly Data

Constant	0.061 (0.020)	0.051 (0.019)	0.059 (0.017)	0.053 (0.017)	-0.050 (0.079)	-0.074 (0.077)	-0.034 (0.105)	-0.002 (0.101)
% Δ Prod _t	-.-	-.-	0.776 (0.206)	0.659 (0.213)	0.697 (0.206)	0.544 (0.211)	0.779 (0.205)	0.628 (0.207)
DOJ _t	-0.088 (0.024)	-0.058 (0.026)	-0.087 (0.021)	-0.068 (0.024)	-0.091 (0.021)	-0.069 (0.023)	-0.082 (0.022)	-0.057 (0.024)
FTC _t	-0.021 (0.011)	-0.014 (0.011)	-0.022 (0.010)	-0.017 (0.010)	-0.024 (0.010)	-0.018 (0.010)	-0.021 (0.010)	-0.014 (0.010)
Ln(DIS _{t+1})	-.-	-.-	-.-	-.-	0.052 (0.030)	0.061 (0.029)	-.-	-.-
Ln(DIS _t)	-.-	-.-	-.-	-.-	-0.023 (0.029)	-0.027 (0.028)	-.-	-.-
Ln(VAL _{t+1})	-.-	-.-	-.-	-.-	-.-	-.-	0.030 (0.020)	0.040 (0.020)
Ln(VAL _t)	-.-	-.-	-.-	-.-	-.-	-.-	-0.026 (0.020)	-0.032 (0.019)
Unity for 1929:IV	-.-	-0.286 (0.110)	-.-	-0.180 (0.106)	-.-	-0.217 (0.103)	-.-	-0.232 (0.105)
R ²	0.27	0.37	0.45	0.48	0.50	0.55	0.48	0.54
D-W	2.02	1.82	2.54	2.32	2.71	2.48	2.54	2.26
Ljung-Box Q	27.1	27.2	24.5	22.5	26.0	23.2	25.0*	22.7

* Ljung-Box significant at the 5 percent level.

Notes: Standard errors in parentheses. DIS_t is quarterly firm disappearances through merger, VAL_t is quarterly value of mergers.

Sources: Standard Industrial returns from Standard Statistics (1932); industrial production (seasonally adjusted Federal Reserve data) from Nelson (1959), Appendix C, Table C-7; DOJ merger cases are compiled from Commerce Clearing House (1952); FTC merger cases are compiled from Commerce Clearing House (1988); merger disappearances and value of disappearances from Eis (1969), Table 1.

Table 3

Stock Returns, October 19-31, Divided by Percentage Range,
January 2-October 19, 1929, Regressed on 1928-29 Merger Variable

		Industry Effects	Small Range	Large Range
<u>Two weeks ending October 31:</u>				
Constant	-0.414 (0.019)	-0.369 (0.076)	-0.478 (0.026)	-0.306 (0.021)
M _i , Merger 1928-29	-0.107 (0.038)	-0.099 (0.040)	-0.136 (0.051)	-0.040 (0.042)
<u>One week ending October 26:</u>				
Constant	-0.210 (0.013)	-0.205 (0.050)	-0.240 (0.018)	-0.160 (0.014)
M _i , Merger 1928-29	-0.053 (0.025)	-0.052 (0.026)	-0.072 (0.035)	-0.011 (0.028)
<u>One week ending October 31:</u>				
Constant	-0.203 (0.013)	-0.164 (0.052)	-0.237 (0.018)	-0.145 (0.016)
M _i , Merger 1928-29	-0.055 (0.026)	-0.047 (0.027)	-0.064 (0.035)	-0.029 (0.032)
Observations	359	359	227	132

Notes: Standard errors in parentheses. Two-digit Standard Industrial Classification dummies for manufacturing industries are included but not reported in the second column of results. The "small range" subsample is made up of firms whose trading range for January 2 through October 19, 1929 was less than or equal to the sample mean of 0.56584.

Table 4

Stock Returns, October 19-31, Regressed on 1928-29 Merger Variable and Natural Log of Range, January 2-October 19

		Industry Effects*	Small Range**	Large Range
<u>Two weeks ending October 31:</u>				
Constant	-0.260 (0.012)	-0.220 (0.035)	-0.253 (0.024)	-0.264 (0.018)
M_i , Merger 1928-29	-0.039 (0.016)	-0.035 (0.017)	-0.047 (0.016)	-0.016 (0.035)
$\ln(G_i)$, Log Range	-0.086 (0.012)	-0.079 (0.013)	-0.085 (0.020)	-0.012 (0.047)
<u>One week ending October 26:</u>				
Constant	-0.135 (0.078)	-0.126 (0.023)	-0.131 (0.015)	-0.139 (0.011)
M_i , Merger 1928-29	-0.014 (0.011)	-0.015 (0.011)	-0.021 (0.011)	0.002 (0.022)
$\ln(G_i)$, Log Range	-0.046 (0.008)	-0.046 (0.008)	-0.045 (0.013)	-0.006 (0.030)
<u>One week ending October 31:</u>				
Constant	-0.131 (0.013)	-0.100 (0.029)	-0.100 (0.018)	-0.156 (0.018)
M_i , Merger 1928-29	-0.026 (0.013)	-0.020 (0.014)	-0.023 (0.011)	-0.016 (0.030)
$\ln(G_i)$, Log Range	-0.042 (0.010)	-0.035 (0.010)	-0.032 (0.014)	-0.007 (0.041)
Return, week ending Oct. 26	-0.046 (0.065)	-0.050 (0.066)	0.170 (0.068)	-0.220 (0.119)
Observations	359	359	227	132

See notes to Table 3.

Table 5
 Summary Statistics of Return and Volatility Measures
 Jan. 2, 1929-Dec. 31, 1932 (n=1191)

Var.	Mean	S.D.	Skewness	Kurtosis
$R_{t,t-1}$	-0.00135	0.0243	0.19	4.07
$R_{t,t-4}$	-0.00540	0.0470	0.07	2.09
$R_{t,t-8}$	-0.01081	0.0678	-0.15	1.61
$RSD_{t,t-1}$	-0.05783	0.9847	0.01	0.28
$RSD_{t,t-4}$	-0.10094	0.9871	0.05	-0.36
$RSD_{t,t-8}$	-0.11362	0.9846	0.01	-0.72
$\ln(R_{t,t-1}^2)$	-9.137	2.3169	-0.94	1.54
$T_{t,t-1}$	-8.453	1.5661	-0.47	0.49
$T_{t,t-3}$	-8.151	1.2337	-0.17	0.03
$T_{t,t-7}$	-8.016	1.0913	-0.01	-0.35
$\ln G_t$	-3.494	0.4583	0.29	0.14

Table 6
 Regressions of Dow Return and Standardized Dow Return over
 One, Four and Eight Trading Days on NYT Antitrust Dates

$$R_{t,t-k} = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + u_t \quad k = 1, 4$$

$$R_{t,t-8} = \alpha + \sum_{i=0}^{19} \beta_i X_{t-7+i} + u_t$$

	Dependent Variable:					
	Dow Return			Standardized Dow Return		
	$R_{t,t-1}$	$R_{t,t-4}$	$R_{t,t-8}$	$RSD_{t,t-1}$	$RSD_{t,t-4}$	$RSD_{t,t-8}$
	<u>1929-1932</u>					
α	0.09	0.35	0.61	0.04	0.07	0.11
SE(α)	0.11	0.44	0.88	0.04	0.09	0.13
$\Sigma\beta_i$	-0.84	-3.05	-5.30	-0.36	-0.57	-0.67
SE($\Sigma\beta_i$)	0.30	1.37	3.67	0.12	0.28	0.46
Sig.Level	0.01	0.03	0.15	0.02	0.04	0.15
R ²	0.03	0.08	0.11	0.02	0.06	0.09
D-W	2.04	2.00	1.10	2.03	1.95	1.14
Ljung-Box	150*	13	67*	121*	14	65*
n	1191	298	298	1191	298	298
	<u>1929</u>					
α	-0.00	0.67	1.61	0.04	0.23	0.37
SE(α)	0.00	0.65	0.93	0.07	0.17	0.19
$\Sigma\beta_i$	-0.31	-3.84	-8.91	-0.14	-0.66	-0.99
SE($\Sigma\beta_i$)	0.52	1.99	2.67	0.23	0.49	0.52
Sig.Level	0.57	0.06	0.01	0.53	0.20	0.06
R ²	0.07	0.53	0.64	0.05	0.25	0.32
D-W	1.82	1.93	1.23	1.95	1.85	1.27
Ljung-Box	150*	12	23	58	22	25
n	291	73	73	291	73	73
	<u>1930-1932</u>					
α	0.14	0.49	0.81	0.06	0.08	0.12
SE(α)	0.13	0.55	1.03	0.06	0.11	0.14
$\Sigma\beta_i$	-1.07	-3.33	-5.62	-0.50	-0.69	-0.87
SE($\Sigma\beta_i$)	0.36	1.69	3.51	0.16	0.34	0.48
Sig.Level	0.01	0.05	0.11	0.01	0.05	0.07
R ²	0.03	0.10	0.15	0.03	0.09	0.14
D-W	2.10	2.13	1.17	2.04	2.03	1.15
Ljung-Box	136*	17	48	106*	11	48
n	900	225	225	900	225	225

* Ljung-Box Q-statistic significant at 5% level or less.

Note: Coefficients in the Dow Return columns are multiplied times 100 and express percentage effects. Standard errors for the regressions of eight-day returns at four-day intervals are corrected for first-order serial correlation using the White-Hansen method implemented with the "ROBUSTERRORS" option of RATS. Significance levels smaller than 0.01 are rendered as 0.01.

Table 7
 Regressions of Natural Log of Average Return Squared over
 Two, Four and Eight-day periods ($T_{t,t-k}$, $k = 1, 3, 7$) on NYT
 Antitrust Dates, Past $T_{t,t-k}$, and Trend.

$$T_{t,t-1} = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + \sum_{i=2}^4 \gamma_i T_{t-2i;t-2i-1} + \delta \text{TREND} + u_t$$

$$T_{t,t-3} = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + \sum_{i=1}^2 \gamma_i T_{t-4i;t-8i} + \delta \text{TREND} + u_t$$

$$T_{t,t-7} = \alpha + \sum_{i=0}^{19} \beta_i X_{t-7+i} + \sum_{i=1}^2 \gamma_i T_{t-8i;t-16i} + \delta \text{TREND} + u_t$$

	$T_{t,t-1}$		$T_{t,t-3}$		$T_{t,t-7}$	
α	-9.81	-5.45	-9.51	-4.44	-9.42	-4.60
SE(α)	0.13	0.58	0.14	0.60	0.17	0.81
$\Sigma\beta_i$	0.84	0.61	0.88	0.54	1.00	0.63
SE($\Sigma\beta_i$)	0.25	0.24	0.29	0.26	0.66	0.39
Sig.Level	0.01	0.01	0.02	0.04	0.13	0.11
$\Sigma\gamma_i$	-.-	0.45	-.-	0.53	-.-	0.51
SE($\Sigma\gamma_i$)	-.-	0.06	-.-	0.06	-.-	0.08
Sig.Level	-.-	0.01	-.-	0.01	-.-	0.01
δ	0.18	0.10	0.19	0.08	0.19	0.09
SE(δ)	0.02	0.02	0.02	0.02	0.03	0.03
R^2	0.21	0.29	0.32	0.47	0.41	0.57
D-W	1.66	1.81	1.13	2.02	0.45	0.92
Ljung-Box	157*	39	121*	5	329*	92*
n	596	596	298	298	298	298

* Ljung-Box Q-statistic significant at 5 percent.
 Note: δ and SE(δ) are multiplied by 100 and express percentage effects.
 Standard errors for the regressions of eight-day returns at four-day intervals are corrected for first-order serial correlation using the White-Hansen method implemented with the "ROBUSTERRORS" option of RATS. Significance levels smaller than 0.01 are rendered as 0.01.

Table 8

Regressions of Natural Log of Daily Range Divided by Dow, $\ln G_t$, Regressed on NYT Antitrust Dates, Past Values of $\ln G_t$, Trend and a Saturday Dummy, Sampled at Every Second and Every Fourth Observation

$$\ln G_t = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + \sum_{i=2}^4 \gamma_i G_{t-2i} + \delta \text{TREND} + \phi \text{SAT} + u_t \quad t = 2, 4, 6, \dots$$

$$\ln G_t = \alpha + \sum_{i=0}^{15} \beta_i X_{t-3+i} + \sum_{i=1}^2 \gamma_i G_{t-4i} + \delta \text{TREND} + \phi \text{SAT} + u_t \quad t = 4, 8, 12, \dots$$

	<u>t = 2, 4, 6 ...</u>			<u>t = 4, 8, 12 ...</u>	
α	-3.81	-3.88	-1.51	-3.89	-1.68
SE(α)	0.03	0.03	0.17	0.05	0.23
$\Sigma \beta_i$	-.-	0.30	0.17	0.45	0.22
SE($\Sigma \beta_i$)	-.-	0.06	0.06	0.11	0.10
Sig. Level	-.-	0.01	0.01	0.00	0.02
$\Sigma \gamma_i$	-.-	-.-	0.61	-.-	0.57
SE($\Sigma \gamma_i$)	-.-	-.-	0.43	-.-	0.06
Sig. Level	-.-	-.-	0.01	-.-	0.01
δ	0.06	0.06	0.02	0.06	0.03
SE(δ)	0.00	0.00	0.00	0.00	0.00
ϕ	-0.39	-0.41	-0.37	-0.40	-0.44
SE(ϕ)	0.05	0.05	0.05	0.08	0.07
R^2	0.29	0.33	0.52	0.31	0.50
D-W	0.92	0.96	1.39	0.97	1.91
Ljung-Box	796*	661*	96*	154*	11
n	596	596	596	298	298

* Ljung-Box Q-statistic significant at 5 percent.

Note: δ and SE(δ) are multiplied by 100 and express percentage effects.

Figure 1
 Daily High, Low and Close of Dow Industrials,
 September-November 1929

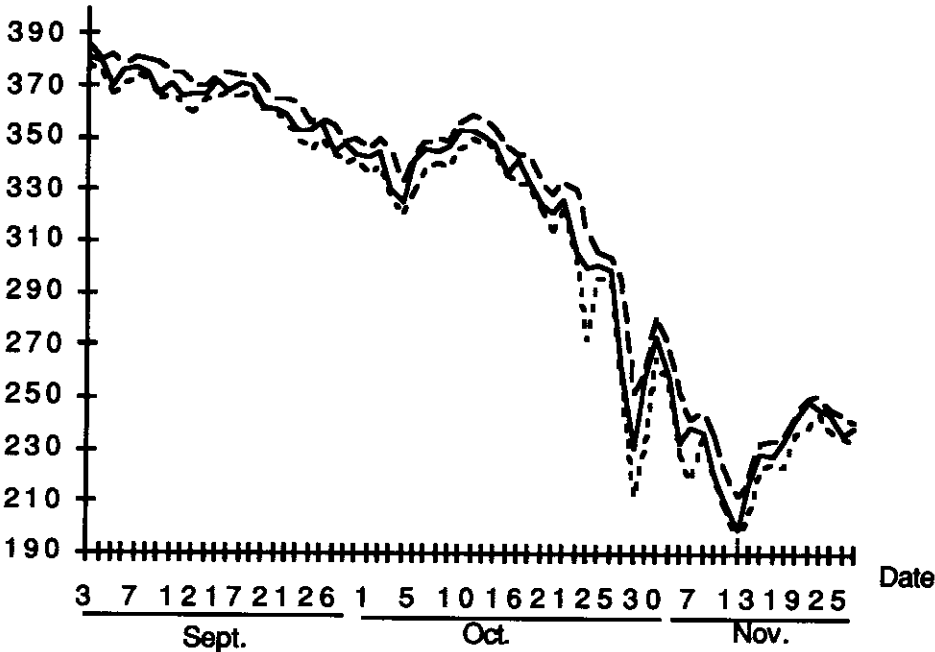


Figure 2
Natural Log of Standard Industrials and Total Number
of FTC and DOJ Merger Cases, 1919-1930

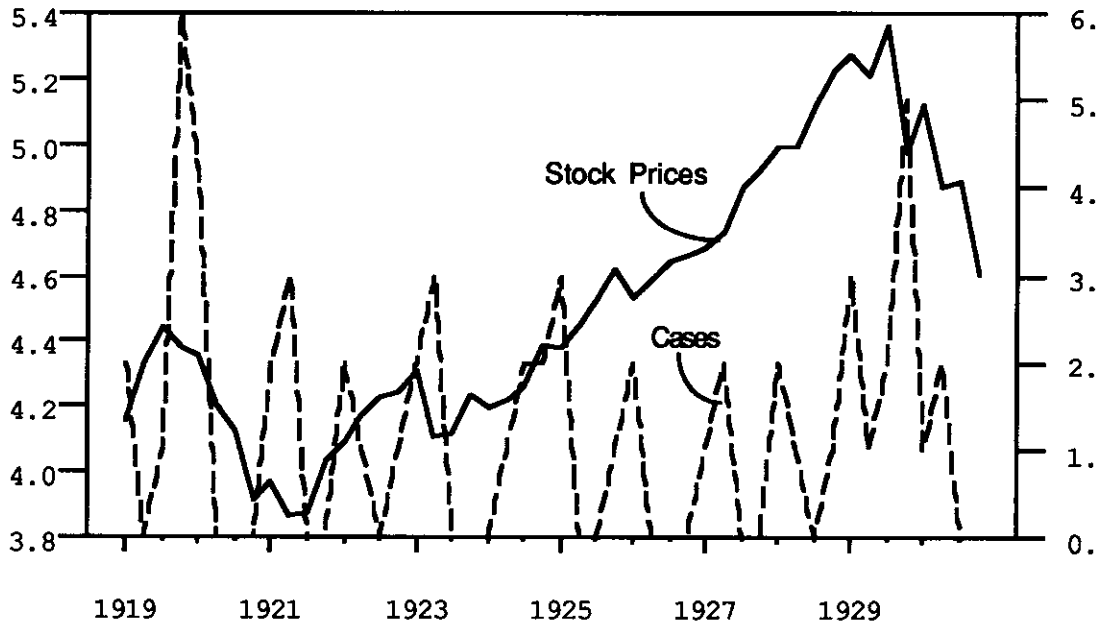


Figure 3

Natural Log of Standard Industrials and Number of Firm Disappearances through Merger at One Quarter Lead, 1919-1930

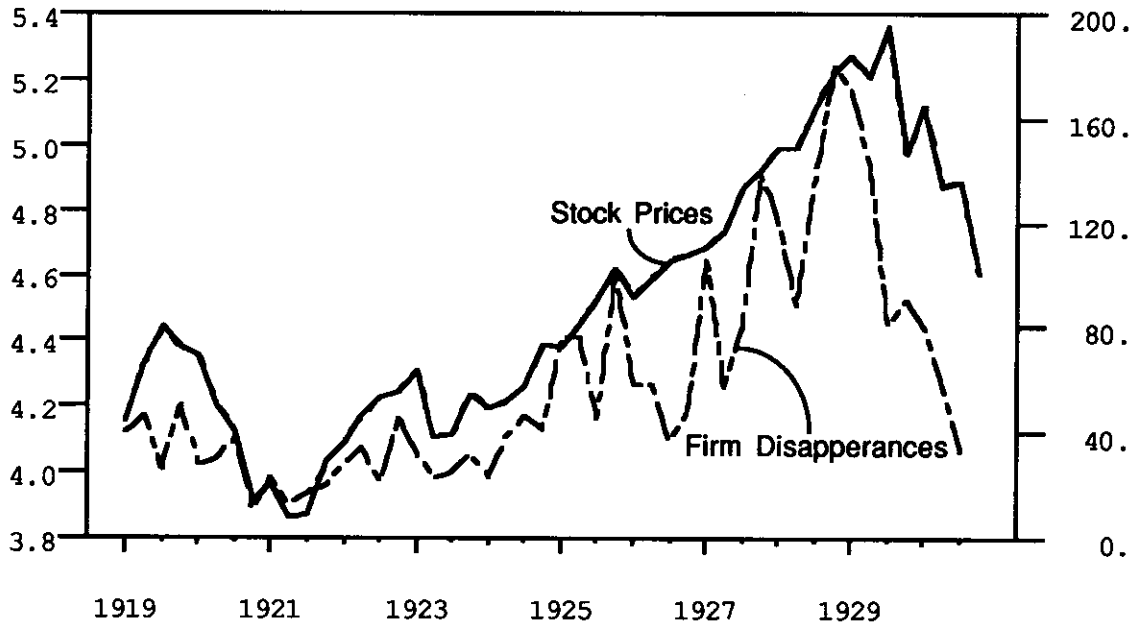


Figure 4

The Natural Log of the Dow Industrial Average and the Moving
Four-Day Sum of New York Times Antitrust News Stories,
January 2, 1929 - December 31, 1932

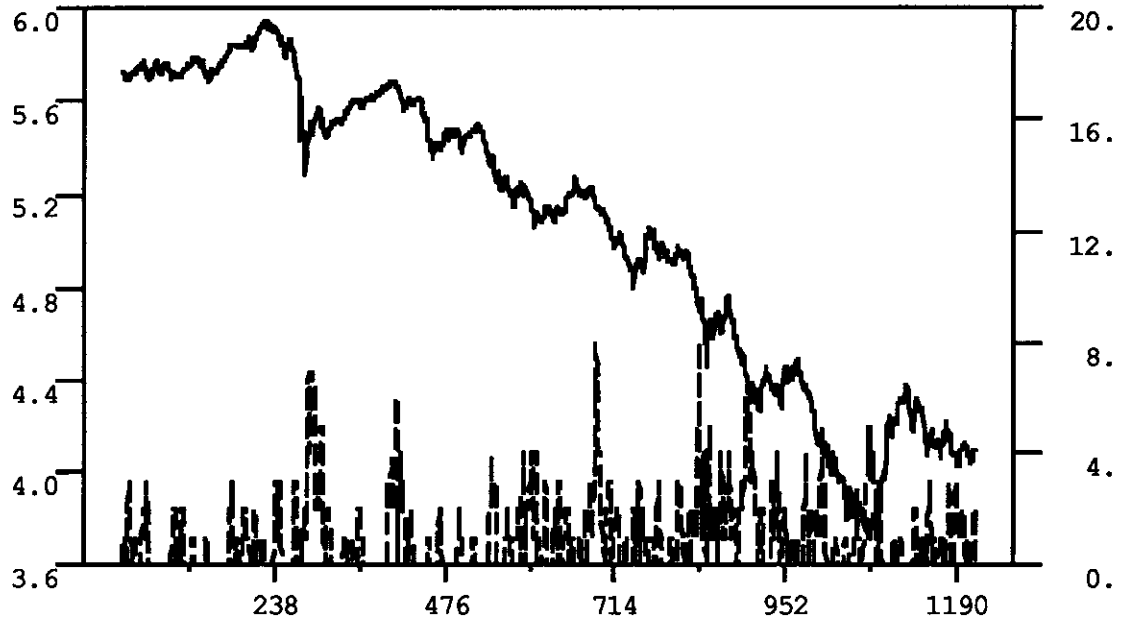
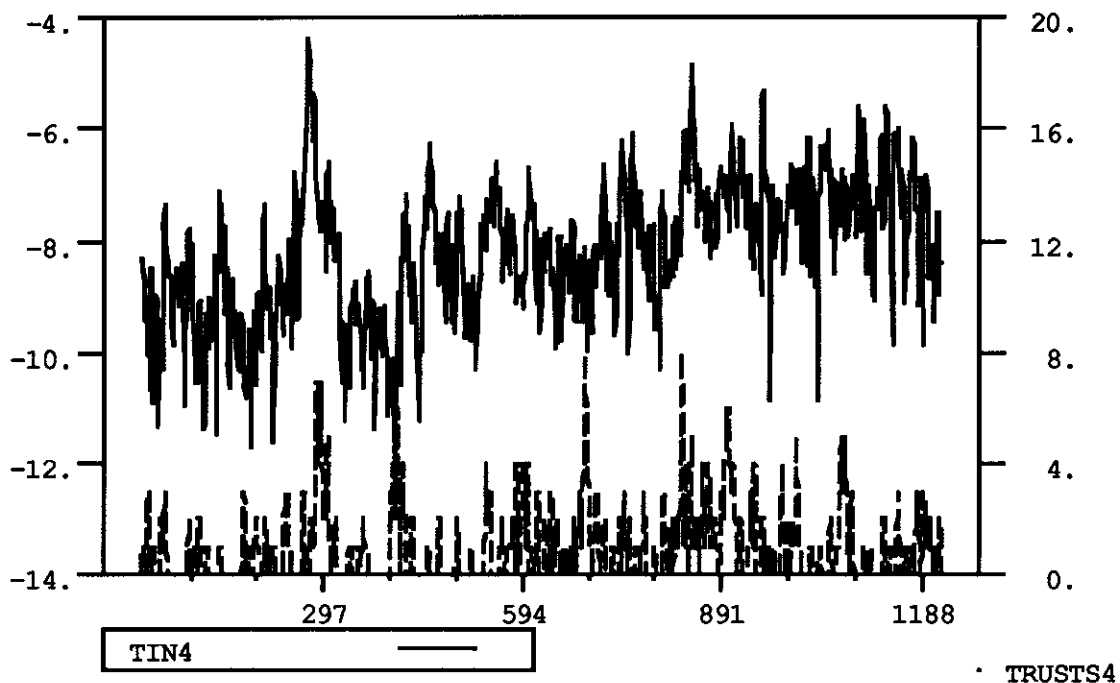


Figure 5

The Natural Log of Four-Day Mean Returns Squared, $T_{t,t-3}$, and
the Four-Day Sum of New York Times Antitrust News Stories,
January 2, 1929 - December 31, 1932



APPENDIX A

DOJ Merger and Stock Ownership Cases, 1919-1930

DATE	Case: Charge, Exchange (if any)
2/27/20	Swift: Sec. 7, Sherman, Curb Exchange
1/10/22	Cement Securities: Sherman (control of competitors)
3/6/22	United Gas: Sherman (acquiring, combining competitors)
2/8/26	Ward Food Products: Sec. 7, Sherman
2/13/26	National Food Product: Sec. 7
2/18/27	National Gum: Sec. 7
2/18/29	Ludowici-Celadon: Sherman (criminal and civil merger)
11/27/29	Fox Theatres: Sec. 7, NYSE
11/27/29	Warner Brothers: Sec. 7, NYSE
4/2/30	Foster & Kleister: Sherman (acquiring competitors)
5/13/30	RCA: Sherman (cross-patent, cross-stock ownership), NYSE

APPENDIX B

The 322 stories that form the basis for the count variable X_t where based on all entries under the headings below (no "*") or those involving stories dealing with antitrust, reform proposals and the Swope Plan (with an "*") in the New York Times Index:

Antitrust	136
Appalachian Coal*	4
Business-Codes	2
Clayton Act	1
Donovan, Wm.*	1
Hoover-Antitrust	6
Hoover-Trusts	3
Industry-Codes	16
Industry-Trade Associations*	10
Industry-US*	11
Industry-Merger	1
Industry-Self-Regulation	1
Mergers*	1
Mitchell, Wm.*	5
Sherman Act	41
US-Econ Conference	17
US-Econ Conditions*	4
US-Trade Associations*	10
US-Trade Commission	51
Walsh*	1

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