

# **Inflation Expectations and Recovery from the Depression in 1933: Evidence from the Narrative Record**

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## **Abstract**

This paper uses the historical narrative record to determine whether inflation expectations shifted during the second quarter of 1933, precisely as the recovery from the Great Depression took hold. First, by examining the historical news record and the forecasts of contemporary business analysts, we show that inflation expectations increased dramatically. Second, using an event-studies approach, we identify the impact on financial markets of the key events that shifted inflation expectations. Third, we gather new evidence—both quantitative and narrative—that indicates that the shift in inflation expectations played a causal role in stimulating the recovery.

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## Introduction

The Great Depression of the 1930s has gained renewed interest in recent years, as countries throughout the world slipped into deep recessions in the aftermath of the 2008 financial crisis. While the initial focus centered on the magnitude of the crisis and limiting the decline in output (Almunia et al. 2010), the debate has now shifted toward recovery. Moreover, with monetary policy constrained by the zero lower bound, just like in the 1930s, policymakers and economists are looking to history for insights into the forces that have sparked and sustained recoveries in the past.

One particularly noteworthy case is the U.S. recovery in 1933. After four years of depression and deflation (see Figures 1 and 2), the United States experienced a rapid turnaround recovery in the spring of 1933.<sup>1</sup> From March to July, industrial production rose by 57 percent.<sup>2</sup> No other period in U.S. history has experienced such a sudden upswing in economic activity. Therefore, policymakers and economists have rightly asked: Why did the recovery start in April 1933? And why was it so rapid?

The leading explanation, developed by Temin and Wigmore (1990), involves a sudden turnaround in inflation expectations. Temin and Wigmore argue that President Roosevelt, who assumed office in March 1933, established a new macroeconomic policy regime—one that generated inflationary expectations and sparked a rapid recovery.<sup>3</sup> More recently, Eggertsson (2008) develops a theoretical framework to model how a shift in expectations can explain the recovery from the Depression, effectively bolstering the work of Temin and Wigmore. Both studies have dramatically strengthened our understanding of the recovery from the Depression. However, while there now exists a strong theoretical basis and compelling historical argument for how a shift in expectations could explain the turnaround recovery from the depression, neither of the two studies provides much direct evidence—statistical or narrative—that inflation expectations did indeed change during the second quarter of 1933.

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<sup>1</sup> The National Bureau of Economic Research dates the trough in March of 1933.

<sup>2</sup> Board of Governors of the Federal Reserve System (2013), Statistical Release G.17, “Industrial Production and Capacity Utilization” (revision 2013).

<sup>3</sup> Temin and Wigmore (1990) suggest that the most important sign of the regime shift was the exit from the gold standard and subsequent dollar depreciation.

Our study rectifies this omission in the existing literature by gathering new evidence on inflation expectations from the historical narrative record.<sup>4</sup> In the process, we shed new insights into the role played by inflation expectations in the recovery from the Depression.<sup>5</sup>

Section 1 begins by asking whether inflation expectations changed during the second quarter of 1933. To answer this question, we examine three types of evidence from the historical narrative record. First, to identify spikes in news coverage about inflation, we construct new data series that measure the number of news articles containing the term inflation across several daily newspapers. Second, to get a sense of contemporaries' views on current and prospective macroeconomic developments, we read the accounts of contemporary observers contained in the historical news record. Third, to determine whether informed market observers expected inflation, we analyze the forecasts of contemporary business analysts. The totality of the evidence we gather indicates a dramatic increase in inflation expectations during the second quarter of 1933.

It is clear from the narrative record that inflation expectations did change in the second quarter of 1933, but what events caused the shift in inflation expectations? Section 2 documents the events that played a key role in shifting inflation expectations. Specifically, we read the daily news accounts to identify the dates of inflationary news shocks. Then we conduct an event-study analysis to estimate the impact of these inflationary news shocks on financial markets within a narrow window. We find that inflationary news shocks had large and strongly significant effects on financial markets: within 24 hours of an inflationary news shock, stock prices rose by roughly 5 percent and the dollar depreciated by roughly 2 percent. Moreover, based on our analysis, Roosevelt's communication strategy—primarily his public commitment to raise prices to pre-Depression levels, along with the abandonment of the gold standard, the passage of the Thomas Inflation Amendment, and a few other key actions—caused the shift in inflation expectations.

Section 3 examines the macroeconomic effects of this shift in inflation expectations. According to the empirical model that we construct, during the months that coincide with the Roosevelt

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<sup>4</sup> After the pioneer work of Friedman and Schwartz (1963), other scholars have used the narrative approach to gather evidence on the effects of macroeconomic policies or shocks: Carlson, Mitchener, and Richardson (2011), Hausman (2013), Jalil (2015), Monnet (2014), Nelson (2005), Ramey (2011), Romer and Romer (1989, 2004, 2010, and 2015), Richardson and Troost (2009), and Velde (2009), among others.

<sup>5</sup> Our study is similar in spirit to Nelson (1991) and Romer and Romer (2013), who use the narrative record to provide evidence on deflationary expectations in 1929 and 1930. A main difference between our study and these two earlier ones, however, is that we focus on the recovery from the Depression, rather than the onset.

inflationary regime shift, output growth was 7 percentage points higher than what would have been predicted given the normal behavior of money and financial crisis indicators. We then analyze an array of quantitative and narrative evidence that indicates that the shift in inflation expectations played a causal role in spurring the recovery.

Our study relates to recent debates over the role of macroeconomic policy in influencing expectations. For example, the U.S. experience in 1933 has provided the intellectual basis for some of Japan’s monetary actions that form a central component of “Abenomics.” In justifying the 2013 decision to raise the inflation target, the Governor of the Bank of Japan, Haruhiko Kuroda, cited the Roosevelt regime change as evidence that a shift toward inflationary policies can raise output growth in a liquidity trap (Kuroda, 2013). Furthermore, low headline inflation, falling inflationary expectations, and stagnant growth in the Eurozone have raised concerns among policymakers about the prospects of deflationary stagnation, akin to Japan in the 1990s. In January 2015, such concerns prompted the European Central Bank to initiate a program of quantitative easing designed, at least in part, to raise inflation expectations.<sup>6</sup> Moreover, there has been a wealth of recent theoretical research on how a shift to higher inflationary expectations can stimulate a depressed economy when nominal interest rates are up against the zero lower bound (see, for example, Bernanke, 2000; Eggertsson and Woodford, 2003; Krugman, 1998 and 2000; Svensson, 2003; and Woodford, 2003). However, little has been said or written about *how* policymakers can actually change inflation expectations. Our paper contributes to this literature by showing how a sharp change in the policy regime in 1933 caused a rapid change in inflation expectations.

## 1. Narrative Evidence of a Shift in Inflationary Expectations

### 1.1 Why Narrative Evidence?

There are several ways in which market participants and observers can estimate inflation expectations today, including both market- and survey-based measures. First, inflation expectations can be estimated by comparing the difference in yields on a regular Treasury security and a Treasury Inflation-Protected Security (TIPS) of similar maturity—the “breakeven” inflation rate. However, this measure is not available for 1933 since TIPS were only first auctioned in

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<sup>6</sup> See, for example, the press statement by the European Central Bank on January 22, 2015, available at [www.ecb.europa.eu/press/pressconf/2015/html/is150122.en.html](http://www.ecb.europa.eu/press/pressconf/2015/html/is150122.en.html)

January 1997. Second, inflation expectations can be estimated using the Michigan Survey. These estimates are obtained from survey responses of consumers to questions about their expected inflation rate over the next one- and 5-to-10 year time horizons. Again, this widely used measure of inflation expectations is not available for 1933 since the Michigan Survey was first published in January 1978. The Federal Reserve Bank of Philadelphia publishes a third measure of inflation expectations, based on a quarterly survey of professional forecasters (SPF). The estimates are based on the responses from private sector economists—who produce regular forecasts of economic variables as part of their jobs in the business world or on Wall Street—on the probability they attach to different outcomes. This survey started in the fourth quarter of 1968 and cannot therefore be used to estimate inflation expectations in 1933. Thus, the data that we would examine today to derive estimates of inflation expectations simply do not exist for the 1930s.

Nonetheless, two previous studies have attempted to measure inflation expectations during the Depression. Cecchetti (1992) constructs time-series forecasts for inflation based on data contemporaneously available to market observers, whereas Hamilton (1992) analyzes commodities futures markets. Though both studies are primarily concerned with the question of whether deflation was anticipated during the onset of the Depression, the two studies provide estimates for expected inflation throughout the Depression. The estimates for 1933 are shown in Table 1. Cecchetti's estimates are quarterly, while Hamilton's are for trimesters; all numbers are expressed at annual rates.

For the second quarter (or second third) of 1933, the results presented in the table arrive at conflicting conclusions: two of the four models predict deflationary expectations (-10.48 percent and -11.75 percent), whereas the other two predict positive inflationary expectations (12.39 percent and 6.21 percent). The two that predict deflationary expectations during the second quarter of 1933—Cecchetti's MA(2) and AR(1) models—indicate a later switch to inflationary expectations in the third quarter of 1933, months after the recovery from the Depression began. These results would, seemingly, be at odds with the accounts of Temin and Wigmore (1990) and Eggertsson (2008), who suggest that the change in expectations occurred during the second quarter of 1933, precisely as the recovery took hold. A switch from deflationary to inflationary expectations that lagged the recovery would contradict their central hypothesis that a shift in expectations—the result of a regime change—drove the recovery. However, the other two models indicate positive inflationary expectations during the second quarter of 1933. Nonetheless, because the results are not consistent across the various specifications, these empirical estimates provide

conflicting evidence on inflation expectations for the second quarter of 1933. In addition, since Cecchetti and Hamilton arrive at contradictory findings for their primary period of interest, 1929–30, they engage in a heated debate over which of their methodological approaches is more accurate. Cecchetti argues that Hamilton’s use of commodity futures markets may generate inaccurate estimates for expected inflation since the federal government intervened in agricultural futures markets, via the Federal Farm Board, to influence agricultural commodities prices by trading futures contracts. On the other hand, Hamilton argues that the models used by Cecchetti generate very different forecasts, under alternate, though equally plausible specifications.

Moreover, there is an additional methodological concern with the use of time-series forecasting methods for the window of the second quarter of 1933. Time-series forecasting methods assume that market participants formulate inflationary expectations on the basis of how previous trends evolved. Such a framework may not be applicable during a regime shift because a regime shift, by definition, involves a sudden break from the past—a sudden break in how policy variables are going to evolve and in existing macroeconomic trends and relationships. This raises the possibility that the change in expected inflation, surrounding a regime shift, could be substantially different from what is found using the time-series forecasting methods adopted by previous studies.

Thus, additional evidence on inflationary expectations—to resolve the question of whether market participants expected inflation during the second quarter of 1933—is needed. Specifically, we gather new evidence on market participants’ expectations for inflation from the historical narrative record. Narrative evidence is particularly helpful for three main reasons.

First, the writings of contemporary observers should reveal whether market participants expected inflation. If there was a dramatic shift from deflationary to inflationary expectations, such a sudden swing in public perceptions about inflation should be reflected in both the contemporaneous economic and financial press and the reports of contemporary forecasters. For example, Nelson (1991) carefully examines the historical news record during the onset of the Depression and finds overwhelming evidence in the financial press that market participants expected deflation. Yet, a comparable examination of the historical news record during the recovery from the Depression does not exist. Thus, there is potentially a wealth of information in the historical narrative record on market participants’ expectations for inflation that has so far been unexplored.

Second, retrospective statistical forecasting techniques to estimate expected rates of inflation based on data contemporaneously available to market observers presuppose that market participants in 1933 actually made forecasts in such a sophisticated manner—an assumption that may not be entirely accurate, especially in light of the evidence we find on how contemporary business analysts generated forecasts in 1933 (see Section 1.2.3). An analysis of the narrative record can, by contrast, identify the forecasts actually made at the time.<sup>7</sup>

Third, narrative evidence has the potential to identify the sources of any shifts in inflationary expectations in a way that may not be possible using purely statistical information. For instance, Romer and Romer (2013) examine the historical narrative record to identify the source of deflationary expectations during the onset of the Depression.<sup>8</sup> Likewise, identifying the source of any shifts in inflationary expectations during the recovery from the Depression is equally important. For Temin and Wigmore’s argument to hold—that a regime shift drove the recovery—it must not only be the case that inflation expectations changed, but also that they changed as a direct result of Roosevelt’s policy statements and actions.

## 1.2 Three Types of Evidence

In this section, we document the narrative evidence we have acquired to determine whether inflation expectations changed during the second quarter of 1933. We examine three types of evidence: (1) new data series on inflation news coverage, (2) the reports of contemporary observers contained in the historic news accounts, and (3) the forecasts of contemporary business analysts.

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<sup>7</sup> Indeed, the findings of a study by Klug, Landon-Lane, and White (2005) reinforce the concern that retrospective time series forecasts may not accurately reflect the forecasts of contemporary observers in real time. In evaluating whether the large decline in output during the depression was anticipated, these authors examine contemporary survey data on railroad shippers’ forecasts for economic activity. They find that the contemporary forecasts differ substantially from forecasts generated by simple time-series ARIMA forecasts, similar to the ones employed by Cecchetti (1992). Klug, Landon-Lane, and White conclude, “These experts were clearly making forecasts that had more than just past values...in their information set” (p. 47)—an observation that underscores the concerns we note above.

<sup>8</sup> According to Romer and Romer (2013), for a monetary explanation of the Great Depression to hold, it must not only be the case that market participants expected deflation, but also that the deflationary expectations were driven by monetary contraction. By carefully analyzing the historical news record, Romer and Romer show that deflationary expectations in 1930 and 1931 were indeed the result of monetary contraction, thereby reaffirming the role played by monetary forces in causing the Depression.

### 1.2.1 Inflation News Coverage

The first type of evidence that we examine from the historical narrative record are new data series that we construct on inflation news coverage. If there was a sudden and dramatic shift in inflation expectations, there should be a spike in public interest (and hence, in news articles) about inflation.

The new data series report the number of news articles containing the term “inflation” every month between January 1929 and December 1937 across five national daily news sources: the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, the *Chicago Tribune*, and the *Washington Post*. These newspapers are available electronically via ProQuest, permitting us to conduct a frequency keyword search for articles containing particular terms.<sup>9</sup>

Figure 3 displays the series. The solid line reports the number of news articles containing the term “inflation” anywhere in the article, whereas the dashed line reports the number of news articles containing the term “inflation” in the title. Both series shows a dramatic spike in news coverage of inflation in April 1933: 1,247 articles contained the term “inflation” anywhere and 390 articles contained “inflation” in their title, which is a threefold increase relative to January 1933. No other previous month even comes close to the spike in April 1933 (for example, in March, the previous month, 340 articles contained the term “inflation” anywhere and 57 articles contained the term “inflation” in their title). The rise is even more dramatic if compared with 1932. In April 1933, relative to the average for 1932, there is a sevenfold increase in the number of news articles containing the term “inflation” anywhere and a fifteen-fold increase in the number of news articles containing the term “inflation” in their titles.<sup>10</sup> This large spike is powerful evidence of a dramatic surge in public discussion about inflation in April 1933.<sup>11</sup>

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<sup>9</sup> We treat the term “inflationary” as synonymous with “inflation.”

<sup>10</sup> Breaking the results down by newspaper does not alter the findings. Across all five newspapers, there is a dramatic spike in April 1933.

<sup>11</sup> While inflation coverage in the daily news accounts remains elevated throughout the year, there is some decline in coverage following the high readings of April and May, though coverage still remains higher than before. Based on our reading of the narrative record, which we present in detail in the next subsection, we do not interpret this decline as reflecting a drop in inflation expectations. Instead, a likely explanation for the decline is that the elevated news coverage in April and May reflected the initial shock resulting from the Roosevelt Administration’s plans to pursue inflation. After two months of intense coverage, the shock value of the news dissipates, as market participants have had sufficient time to process the new developments.

To provide a benchmark for comparison, Figure 4 adds the corresponding series for the term “deflation.”<sup>12</sup> There are no spikes in the deflation series that are even remotely comparable to the spike in the inflation series, which provides even stronger evidence of a dramatic surge in public discussion about inflation in the spring of 1933.<sup>13</sup>

Lastly, to determine whether this sudden surge in news coverage on inflation was associated with President Roosevelt, we construct four new data series shown in Figure 5. Each series reports the number of news articles containing the following combinations of words: (1) Roosevelt and inflation, (2) Roosevelt and deflation, (3) Hoover and inflation, and (4) Hoover and deflation. Figure 5 shows a dramatic spike in news articles containing the words Roosevelt and inflation in April and May 1933, but no corresponding spikes in the other three series. The peak in the Roosevelt-inflation series is five times larger than the peak in any of the other series, at any month between 1929 and 1937, suggesting that the daily newspapers linked inflation to the Roosevelt Administration in the spring of 1933.

Together, these data series provide strong evidence of an increase in public discourse about inflation, and hence, suggestive evidence of a change in public perceptions about inflation in April 1933. To get a clear sense of contemporaries’ views on the prospects for inflation, we read the historical news accounts, which we document next.

### 1.2.2 Historical News Accounts

In this section, we present the evidence that we gather by reading the reports of contemporary observers contained in two historical news sources: *Business Week* and the *Economist*. We read these sources from October 1932, during the election campaign, through July 1933.

We focus on these two sources for two key reasons. First, these two sources were printed every week and, hence, highlighted important developments at a weekly frequency. This weekly frequency permits a careful reading of the news articles contained in these documents over a

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<sup>12</sup> We treat the term “deflationary” as synonymous with “deflation.”

<sup>13</sup> The absence of a spike in the deflation series does not mean that market participants did not anticipate deflation during the Depression. Rather, the absence of a spike more likely indicates that there was no sudden and immediate shock to public perceptions about deflation in one particular month or season. Instead, expectations of deflation may have become more gradually incorporated into the minds of the public over time.

prolonged period that may be too exhaustive with a set of daily news sources. (It should be noted, however, that in Section 2, we do read the news accounts for two daily newspapers, the *New York Times* and the *Wall Street Journal*, to conduct our daily event study analysis during the window of April to July 1933.)

Second, these two sources provide us with access to a diverse range of coverage. *Business Week* is a domestic news source and the *Economist* is an international news source with correspondents reporting from the United States. They provide detailed contemporaneous coverage of economic, financial, and political news in the United States and offer a clear sense of how contemporaries gauged prospective macroeconomic developments. Moreover, while the *Economist* is an international news source, it is particularly useful for our purposes because it tried to document the prevailing mood and state of affairs within the United States by summarizing what other news outlets in the country were reporting.

Below, we provide a detailed narrative of the evolution of public discussion about inflation during this period. Table 2 summarizes our main findings.

#### **From the Election Campaign until Inauguration:**

From the election until the inauguration, the reports of contemporary observers did not reflect expectations of inflation.

Though Roosevelt ran a campaign marked by optimism and a commitment to recovery, he did not present a detailed economic plan before the election. As a result, the editors of the *Economist* and *Business Week* did not expect Roosevelt's policies to be fundamentally different from those of the previous administration and were pessimistic about his ability to quickly take the country out of the Depression:

[W]e do not anticipate that any very radical experiments will be made. We doubt whether Mr Roosevelt, in any attempt which he may make to lift America from the depression 'by her own boot-jacks,' will succeed in evolving measures very different from those formulated and applied during the past two years by Mr Hoover. ("The New President," *Economist*, November 12, 1932)

No well-informed man in Wall Street expects the outcome of the election to make much real difference in business prospects, the argument being that while politicians may do something to bring on a trade slump, they can do nothing to change a depression into prosperity. ("United States," *Economist*, October 29, 1932)

There are important decisions of public policy to be made, but Administration new or old can perform no more miracles for business. (“And So to Work,” *Business Week*, November 16, 1932)

Furthermore, during the interregnum period between Election Day and the inauguration, Roosevelt continued to keep the public in the dark about his likely policies, leaving the country in a political standstill:

The market has tacitly suspended action and judgment until the new Roosevelt administration has assumed office and declared its policy on major questions. (“Investment Notes,” *Economist*, February 11, 1933)

Thus, Roosevelt’s policies were neither known nor expected to end the Depression.

Nonetheless, amidst this backdrop, a pro-inflationary movement—designed as a means of reversing four years of deflation and depression—was steadily gaining traction among the general public. The *Economist* described the growing influence of “Father Coughlin,” a Catholic priest from Detroit who preached the virtues of higher inflation in his Sunday radio sermons. According to the *Economist*, members of Congress were receiving letters from their constituents demanding support for Father Coughlin’s inflationist policies:

[Former U.S. Rep] Mr. Luce reminded his audience that outside Congress there was a sort of modern Peter the Hermit fomenting the present crusade for inflation by arguments which people in a million homes were eagerly absorbing by radio every Sunday afternoon. He referred to the addresses of the Rev. Father Coughlin, a Catholic priest of Canadian birth, of high standing in his church, and who is a pastor near Detroit. Every Sunday afternoon Father Coughlin discourses for an hour over a national ‘hook up’ on the issues of the day. He disclaims any sympathy with arraignment of the existing economic and financial system and, reserving his chief fury for the bankers, preaches doctrines which horrify them. He would have the Government re-mint every 20-dollar gold piece and make it a 40-dollar gold piece, thus doubling the volume of gold dollars and reducing the real value of every paper dollar outstanding to 50 cents. He claims that in this way more currency would be forced into circulation, and automatically cause a 50 per cent reduction of the burden of debt under which so many citizens of the United States, especially farmers, are being crushed. At the same time, he contends that the prices received by farmers and other producers would double overnight.

It costs Father Coughlin about \$4,000 per week for his national ‘hook-up,’ and he spends as much more in printing and distributing his addresses. But he secures practically all the money needed for these purposes in 1-dollar bills from people who listen to his speeches, feel that he is their self-appointed champion against their banker oppressors, and want the crusade to be a success. Every member of the old and the new Congress is daily receiving scores of letters from constituents demanding that he support the ‘Father Coughlin plan.’ (“United States,” *Economist*, March 4, 1933)

Inflation had clearly become a general topic of discussion among the American public. Moreover, the incoming Congress was set to receive an influx of new members who had capitalized on this pro-inflation movement during the 1932 election. The *Economist* reported, “It is well known that the inflation element which has Republican as well as Democratic adherents, will receive heavy

reinforcements from the personnel of the new Congress, many of whose members, particularly in the West, won large numbers of votes by their specific pledges to support a policy of currency inflation.”<sup>14</sup> Thus, the emerging political forces in 1933 were beginning to favor inflation.

However, Roosevelt was initially not seen as a firm adherent of this new inflationary movement. A month before the inauguration, the *Economist* considered Roosevelt to be “amply committed, both by the party ‘platform’ and by his own campaign speeches, against any attempt to tamper with the currency”<sup>15</sup> and further noted that “very few of the prominent leaders in either political party have so far definitely committed themselves to support inflation.”<sup>16</sup> Roosevelt’s relative silence on the topic of inflation helped to moderate inflationary expectations in early 1933.<sup>17</sup>

### **From Inauguration until the Exit from the Gold Standard:**

Speculation that Roosevelt might pursue an inflationary set of policies began to mount after the inauguration.

President Roosevelt’s inaugural address on March 4, 1933, came in the midst of crisis. A severe banking panic had swept the country in the weeks leading up to the inauguration. Close to \$2 billion, a third of the country’s stock of currency, was withdrawn from the banks, and many states were forced to declare bank holidays. George Harrison, Governor of the Federal Reserve Bank of New York, and Eugene Meyer, Governor (before 1935, the “Chairman” was called “Governor”) of the Board of Governors of the Federal Reserve, urged President Hoover to declare a national banking holiday, but the “lame duck” president, unable to convince the president-elect to sign a joint proclamation, decided not to act.<sup>18</sup>

Though President Roosevelt’s inaugural speech did not include any immediate actions, he expressed his determination to “act, and act quickly,” signaling the beginning of a change in tone. Roosevelt’s first action in office was to order a four-day nationwide banking holiday and to

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<sup>14</sup> “United States,” *Economist*, March 4, 1933.

<sup>15</sup> “Confusion in Congress,” *Economist*, February 4, 1933.

<sup>16</sup> “United States,” *Economist*, March 4, 1933.

<sup>17</sup> Regarding the US adherence to the gold standard, from the days of the election campaign until inauguration, both the *Economist* and *Business Week* consistently reported an American exit from the gold standard as very unlikely (see, for example, “The U.S. Election and the Dollar,” *Economist*, October 15, 1932; “The Dollar,” *Business Week*, March 8, 1933).

<sup>18</sup> See Ahamed (2009, pp. 442–48); “The U.S. Bank Problem,” *Economist*, March 11, 1933.

suspend all transactions in gold.<sup>19</sup> The *Economist* described the reactions to the Bank Holiday at the London Stock Exchange as reflecting “the general conviction that America’s troubles would not involve the devaluation of the dollar;”<sup>20</sup> nonetheless, *Business Week* reported some uneasiness in the markets about the future of the dollar:

Of course the country immediately began to debate whether it was off the gold standard. Secretary Woodin stoutly asserted it was not... Dealings in foreign exchange here and abroad were suspended, but various bootleg transactions, and clues to be had from movement of certain key prices, indicated that the rest of the world does not believe the dollar will soon be redeemable in gold of the old weight and fineness. Perhaps the best clue came from Canada, where the US dollar dropped to parity with the Canadian. The latter had been at about 14% discount compared with ours.” (“New Deal, New Money, New Banks,” *Business Week*, March 15, 1933)

Thus, the period between inauguration and the abandonment of the gold standard was characterized by growing uncertainty about the value of the dollar.

Alongside this growing uncertainty about the U.S. commitment to the gold standard, speculation that Roosevelt would pursue an inflationary course of action to fight the Depression began to mount. On March 15, *Business Week* published an article discussing whether Roosevelt’s banking emergency plan might be inflationary.<sup>21</sup> The article concluded that, despite containing deflationary measures, it was on the whole inflationary:

Whether his program for dealing with the banking emergency is inflationary or deflationary is still being debated. The answer seems to be that on the whole it is inflationary. It proposes to close indefinitely a large number of banks which by no stretch of imagination can be classed as “strong” – perhaps 5,000 of them – and that certainly is deflation. But the issuing of emergency currency based on any “good” asset of a bank, or even on its bare note, to almost any amount needed, is inflation with a vengeance. It turns frozen loans into currency on demand. (“New Deal, New Money, New Banks,” *Business Week*, March 15, 1933)

Furthermore, in the following issue, *Business Week* reported that a large group of economists had advised Roosevelt to take actions to raise the general price level as a means of achieving recovery:

On the plea that “recent banking developments present an unprecedented opportunity for attacking depression through restoring and stabilizing our broken down price level,” 141 economists representing 35 universities and colleges reminded President Roosevelt last week that they had counseled such an attack in a petition sent to him and to Congress on Feb 25 ... Its members say they wanted to show that “there is a very considerable conservative element, including professional economists who have spent much time in studying the matter, in favor of sound action designed to raise the general price level as a

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<sup>19</sup> “The U.S. Bank Problem,” *Economist*, March 11, 1933.

<sup>20</sup> “The Week in the Markets. The London Stock Exchange,” *Economist*, March 11, 1933.

<sup>21</sup> It is important to note that Friedman and Schwartz argue that the bank holiday, and subsequent actions for emergency revival of the banking system, played an important role in restoring confidence (Friedman and Schwartz, 1963, pp. 433-4).

means of starting America on the road leading out of the depression.” (“Inflation, Please,” *Business Week*, March 22, 1933)

In April, it became widely believed that the Roosevelt Administration would shift towards an inflationary set of policies. *Business Week* reported that during a press conference at the White House, Administration officials suggested a change in the direction of policy—a signal the magazine interpreted as evidence of a prospective shift toward an inflationary course of action:

The excited rumor goes the rounds in Washington and in Wall Street that inflation is imminent. . . We pointed out last week that the Administration had not yet attacked the one great central problem of business recovery. We remarked that the program up to that time had been deflationary, and that constructive plans had yet to be developed. Since then, a press conference at the White House developed the fact that the Administration holds exactly that view of the situation. The Administration will not rest content with clearing up the wreckage and softening hardships; it will formulate and enact a program for business revival. That it will be bold we have no doubt; the farm bill is evidence enough that the Administration is not afraid to experiment. Certainly, any plan for recovery that has any chance of success must be bold; the timid, piecemeal efforts have all been futile. This is inflation, if you like, in the sense that it is the reverse of deflation. . . Business recovery we must have, and in that sense, inflation. It must be brought about by government action. There is nothing in this to be terrified about. On the contrary—let’s go! (“Without Benefit of Greenbacks,” *Business Week*, April 19, 1933)<sup>22</sup>

Furthermore, as the inflationary tendencies of the Roosevelt administration became more widely discussed by the news media, public interest in the topic of inflation grew:

The whole subject of inflation is befuddled. The average business man is in a funk when the discussion starts. But because of the imminence of inflation and because of its extremely practice consequences, it behooves him to find out what it is all about. (“Recovery: The Next Effort,” *Business Week*, April 19, 1933)

The *Economist* also described inflation expectations on Wall Street:

As usual, Wall Street has interpreted the policy of the Washington Administration with uncanny accuracy. For a week or so before President Roosevelt announced his abandonment of the gold standard, Wall Street was “talking inflation.” It was generally believed that the Administration would continue to exercise a deflationary influence while banks were being closed and reorganized, insurance companies taken over, railroads placed in receivership, debts written down, and so on. It was shrewdly suspected, however, that the policy would subsequently be changed in an inflationary direction. (“Investment Notes: Wall Street and the Dollar,” *Economist*, April 22, 1933)

Thus, the news accounts report growing speculation about a shift toward inflation.

### **The Abandonment of the Gold Standard:**

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<sup>22</sup> Though the editors of *Business Week* expected inflation, they considered devaluation of the dollar unlikely by mid-April. Their argument was that the United States had such large gold reserves that abandonment of the gold standard would prove unnecessary. Indeed, the morning that Roosevelt took the United States off the gold standard, *Business Week* affirmed, “In the judgment of the *Business Week*, no change in the monetary system is among the early probabilities, nor will there be any such step taken save as a final resort” (“Without Benefit of Greenbacks,” *Business Week*, April 19, 1933).

The abandonment of the gold standard was the turning point. The reports of contemporary observers reflect a dramatic increase in inflation expectations.

The event that sharply raised inflation expectations was the abandonment of the gold standard. On April 19, Roosevelt took the United States off the gold standard and pledged to seek broad powers from Congress to raise prices. The abandonment of the gold standard surprised much of the financial community and reinforced the perception that inflation was imminent. In its first edition after the U.S. departure from the gold standard, *Business Week* wrote, “Inflation has begun. The Administration is definitely committed to reducing the purchasing power of the dollar.”<sup>23</sup> The magazine also described the abandonment of the gold standard as “the first move in the Administration’s program to raise prices” and concluded that “the long debate as to whether we are or are not going to attempt inflation is over—the Administration is committed.”<sup>24</sup> The *Economist* concurred in this assessment, affirming that a key reason for the abandonment of the gold standard was “to give an impetus to a rise of prices in America.”<sup>25</sup> The *Economist* viewed the exit from the gold standard as “the culmination of a rapidly growing volume of support in Congress and in American public opinion for inflationary measures.”<sup>26</sup> The abandonment of the gold standard was a crucial turning point in public perception about the likelihood of a rise in inflation.

#### **From the Exit of the Gold Standard until July:**

The passage of the Thomas Inflation Amendment and Roosevelt’s statements reaffirmed his commitment to raise prices. The reports of contemporary observers suggest that market participants continued to expect inflation through July.

A couple of weeks after the abandonment of the gold standard, the Farm Relief Bill, containing the Thomas Inflation Amendment, passed both chambers of Congress with overwhelming majorities (64 to 21 in the Senate and 307 to 86 in the House). The Inflation Amendment included a number of provisions designed to raise prices and further reinforced the notion that inflation was on the horizon. The amendment required the Federal Reserve Banks to buy \$3 billion of Federal bonds, upon Presidential request, and also granted the President of the United States the powers to

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<sup>23</sup> “Inflation Begins,” *Business Week*, April 26, 1933.

<sup>24</sup> “We Start,” *Business Week*, April 26, 1933.

<sup>25</sup> “The Fall of the Dollar,” *Economist*, April 22, 1933.

<sup>26</sup> *Ibid.*

reduce the legal gold content of the dollar, to make silver equally acceptable with gold at any ratio, and to issue up to \$3 billion in legal tender notes to meet maturing obligations or to buy government bonds.<sup>27</sup>

Contemporaries were stunned by the magnitude of these new powers. The *Economist* noted that the first provision—the purchasing of \$3 billion of bonds by the Federal Reserve banks—would alone “more than double the resources of the money market.”<sup>28</sup> The amendment was widely viewed as giving President Roosevelt “dictatorial powers” to control inflation: “the country has exchanged a President with little effective power for a ‘currency dictator.’”<sup>29</sup> The *Economist* concluded that the net effect of these new powers would be “to vest in the Executive discretionary control over the volume, character and metallic content of the currency.”<sup>30</sup>

Also in early May, Roosevelt gave the second of a series of fireside chats to the nation.<sup>31</sup> In his radio address to the American public, Roosevelt reaffirmed his commitment to raise prices to their pre-Depression levels and vowed to use his new powers—if necessary—to achieve this goal:

The administration has the definite objective of raising commodity prices to such an extent that those who borrowed will on the average be able to repay money with the same kind of dollar which they borrowed... These powers will be used when and if necessary to accomplish this purpose. (Franklin D. Roosevelt, “Second Fireside Chat,” speech, May 7, 1933)

Thus, in the three weeks following the abandonment of the gold standard, Roosevelt promised to raise prices and Congress endowed the President with enormous powers to achieve this goal.<sup>32</sup>

These dramatic developments caused market participants to expect inflation. *Business Week* reported, “The passage of the Thomas amendment by both houses of Congress has answered the question of whether we are going to have inflation.”<sup>33</sup> The *Economist* wrote, “The only topic of conversation in New York during the past week has been ‘inflation,’”<sup>34</sup> and observed, “It is

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<sup>27</sup> “Notes of the Week: Inflation in the U.S.,” *Economist*, May 6, 1933.

<sup>28</sup> *Ibid.*

<sup>29</sup> “Foreign Stock Exchanges – New York,” *Economist*, May 13, 1933.

<sup>30</sup> “United States – ‘Inflation Bill’ – Business Recovery – Gold Clause,” *Economist*, May 13, 1933.

<sup>31</sup> Roosevelt’s first fireside chat as President of the United States was on March 12, about the banking crisis.

<sup>32</sup> The new powers in the Inflation Amendment were discretionary and there was substantial speculation about how Roosevelt intended to use them. Nonetheless, it was widely believed that Roosevelt would not allow these new powers to go to waste. For example, the *Economist* reported, “Opinion is divided as to the use President Roosevelt will make of his powers, but no one expects that he will allow them to rust” (“Foreign Stock Exchanges – New York,” *Economist*, May 13, 1933).

<sup>33</sup> “Controlled Inflation,” *Business Week*, May 17, 1933.

<sup>34</sup> “United States – ‘Inflation Bill’ – Business Recovery – Gold Clause,” *Economist*, May 13, 1933.

evident that the tide of inflationary sentiment is running at full flood.”<sup>35</sup> Indeed, the view—described in both *Business Week* and the *Economist*—was that the Roosevelt Administration was embarking on a set of policies designed to generate a “controlled inflation”—one that would not runaway. *Business Week* described its assessment as follows: “This inflation is different. It contains controls that can be used to prevent a runaway...”<sup>36, 37</sup>

In June, Roosevelt reinforced his commitment to domestic objectives—namely to raise the price level in the United States—at the World Economic Conference. Representatives from 66 nations met at the conference to discuss joint action to fight depression, promote international trade, and stabilize exchange rates. However, during the conference, Roosevelt rejected a measure to promote currency stabilization. In a message to conference participants, Roosevelt denounced exchange stabilization “as one of ‘the old fetishes of so-called international bankers’”<sup>38</sup> and declared that America would not be deterred from its program to raise prices:

The sound internal economic system of a nation is a greater factor in its well-being than the price of its currency in changing terms of the currencies of other nations... The revaluation of the dollar in terms of American commodities is an end from which the Government and the people of the United States cannot be diverted. We wish to make this perfectly clear: we are interested in American commodity prices. What is to be the value in terms of foreign currencies is not and cannot be our immediate concern. (“World Conference. The Monetary Declarations,” *Economist*, July 8, 1933)

The *Economist* noted that the inflationary implications of Roosevelt’s message were clear:

The implications of his message were that America was no longer prepared to consider even an eventual return to an international gold standard, but was determined to retain *ad infinitum* a ‘managed’ dollar, whose exchange stability with other currencies would depend on the rest of the world keeping in step with the price level of the United States. (“Unfinished Symphony,” *Economist*, July 8, 1933)

Roosevelt’s position on currency stabilization frustrated many of the conference participants (and was cited as a reason for the breakdown of Conference talks), but his commitment to an inflationary course of action was perceived as unwavering.<sup>39</sup>

Given these powerful signals, market participants continued to expect inflation in June and July. In early July, the *Economist* analyzed President Roosevelt’s commitment to raise prices to their

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<sup>35</sup> “Notes of the Week: Inflation in the U.S.,” *Economist*, May 6, 1933.

<sup>36</sup> “Controlled Inflation,” *Business Week*, May 17, 1933.

<sup>37</sup> In May, *Business Week* ran regular advertisements, publicizing books and selling investment services, specifically catered to the topic of inflation.

<sup>38</sup> “Unfinished Symphony,” *Economist*, July 8, 1933.

<sup>39</sup> Even abroad, it was clear that the United States was embarking on an inflationary program. Roosevelt’s inflationary policies were frequently described as the “American experiment” (“Unfinished Symphony,” *Economist*, July 1, 1933).

pre-Depression level as a form of price-level targeting. According to its calculations, a 41 to 54 percent cumulative rate of inflation would be necessary to achieve the Administration's goals:

Let us assume that President Roosevelt would be content with the 1928 dollar which he mentioned in a broadcast about two months ago. To restore the 1928 situation it would be necessary for American wholesale prices (Bureau of Labor index) to rise 54 per cent and retail prices 41 per cent. ("Investment Notes. Wall Street Prospects," *Economist*, July 1, 1933)

While it is unclear whether the *Economist* believed that Roosevelt would be able to engineer such a dramatic increase in prices, it is nonetheless evident that market participants were expecting inflation of some form during the second quarter of 1933.

In sum, the reports of contemporary observers in the historical news record indicate that inflation expectations changed dramatically during the second quarter of 1933. These findings bolster the quantitative evidence presented in the previous subsection, which reveal a sudden spike in news articles about inflation in April 1933.<sup>40</sup>

### 1.2.3 Contemporary Forecasts

In this section, we analyze a third type of evidence from the narrative record: the forecasts of contemporary business analysts. This type of evidence may be particularly useful if forecasters reflect the expectations of market participants or influence the formation of market expectations. At a minimum, the forecasts reveal the expectations among a subset of informed market observers.

The forecasts that we examine are those in *The Magazine of Wall Street*, *Moody's Investment Survey*, the Harvard Economic Society's *Review of Economic Statistics*, Standard Statistics

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<sup>40</sup> To the best of our knowledge, there is no record of the Federal Reserve's opinion about Roosevelt's pro-inflationary policies. We have read the minutes of the meetings of the Open Market Policy Committee (OMPC)—which became the Federal Open Market Committee (FOMC) with the passage of the Banking Act of 1933—and the monthly issues of the *Federal Reserve Bulletin* from November 1932 to July 1933, and found little evidence on the Federal Reserve's view on this matter. There is, nonetheless, some mention in the minutes of the OPMC meeting in January 4, 1933, of concerns among members of the executive committee about "agitations, especially in Congress, for the adoption of inflationary measures" (Open Market Policy Conference files, box 1438, folder 1, January 4, 1933). For example, Governor Black of Atlanta stated in that meeting that "he was greatly impressed by the dangers of unsound inflationary proposals." According to Alan Meltzer, during the Roosevelt Administration, "the Federal Reserve played a subsidiary role—the backseat" (Meltzer, 2007, p. 415). The President and the Treasury decided upon the plan to reopen banks after the panic, the country's gold policy, and the dollar exchange rate, among other things (Meltzer, 2007, pp. 421–22). The Federal Reserve took few policy actions in the spring of 1933, and even the changes in the system's portfolio of government securities were essentially a response to decisions by President Roosevelt and the Treasury.

Company's *Standard Trade and Securities*, and *Business Week*. These are the same five forecasters analyzed by Romer (1990) in her study of the effects of uncertainty in the aftermath of the great crash of 1929. She used the reports of contemporary business analysts to determine whether professional forecasters became more uncertain following the great crash. So far, however, no one has exploited these sources to gather evidence on inflationary expectations.<sup>41,42</sup>

These publications provided investment advice, alongside coverage of economic, financial, and business-related news. Most importantly, each of these sources contains real-time forecasts of prospective macroeconomic developments. The forecasts were intended for any interested reader, but were often a component of their investment advice. Since a detailed justification accompanied each forecast, these sources shed light on the sources of any shifts in inflationary expectations among professional forecasters. Moreover, in contrast to the retrospective forecasts of earlier studies, these sources allow us to discern the forecasts that were actually made in real time.<sup>43</sup>

Before discussing the results, we explain how contemporary business analysts formulated their forecasts. They did not perform sophisticated statistical analyses nor did they conduct widespread surveys to gauge consumer or business expectations. Moreover, they did not assign numerical estimates to their forecasts. Instead, they forecasted general trends, based on whatever evidence—new policy developments, perceptions of market sentiment, data—they had at their disposal. As an illustrative example, consider the Harvard Economic Society's *Review of Economic Statistics*, which focused on two main pieces of information in formulating its forecasts: (1) new policy proposals and (2) three data series. The three data series analyzed in each issue were a speculation index (a stock market index reflecting the prices of all listed stocks), a business index (a measure of bank debits in 241 cities outside of New York City), and a money index (rates on short-term money).<sup>44</sup> For instance, in the following excerpt, the *Review of Economic Statistics* illustrates how

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<sup>41</sup> The Harvard Economic Society's *Weekly Letters*, one of the forecasters used by Romer, was absorbed by the Harvard Economic Society's magazine, *The Review of Economic Statistics*, beginning in 1932. *Business Week* is primarily a news magazine, but it occasionally provided forecasts. As such, we treat it as both a forecaster and a news magazine, though its forecasts are more sporadic than those from the other sources.

<sup>42</sup> In making use of contemporary forecasts, our study is similar in spirit to Dominguez, Fair and Shapiro (1988) and Klug, Landon-Lane, and White (2005), who also examine contemporary forecasts, though the focus of these two studies is on whether the large declines in output during the Depression were anticipated.

<sup>43</sup> Indeed, in his study of the usefulness of the Taylor rule for interpreting past policy decisions and mistakes, Orphanides (2003) emphasizes the importance of using the information that was available when decisions were made, in particular "real-time perceptions of the state of the economy" (p. 998).

<sup>44</sup> These three indices are the Harvard Economic Society's "speculation" (A curve), "business" (B curve), and "money" (C curve) series, described in Dominguez, Fair, and Shapiro (1988).

the co-movements in these data series can generate a forecast: “When business is depressed, a continued upward movement of Curve A (the speculation index) and a continued decline of Curve C (rates on short-term money) would forecast an upturn in business.”<sup>45</sup> In addition, it incorporated the likely effects of new policy developments into its forecasts. For example, during the second quarter of 1933, Roosevelt’s promise to raise prices factored heavily into its inflation forecasts. Thus, though contemporary business analysts did not rely on sophisticated statistical techniques to formulate their forecasts, they nonetheless made informed predictions, based on market sentiment, new policy proposals, and any relevant data series they deemed appropriate.

Table 3 summarizes the main results. All five forecasters predicted inflation, by some point, during the second quarter of 1933. Moreover, these inflationary forecasts were a direct result of Roosevelt’s actions and statements. On April 19, in response to signals from the Administration that it would seek an inflationary course of action to fight the depression, *Business Week* wrote, “Our forecast is an inflation which will almost precisely parallel the wartime inflation.”<sup>46</sup> On April 29, following the abandonment of the gold standard and passage in the Senate of the Thomas Inflation Amendment, the *Magazine of Wall Street* predicted, “We move toward inflation.”<sup>47</sup> On May 15, in its first monthly issue since the abandonment of the gold standard and the passage of the Inflation Amendment, the *Review of Economic Statistics* forecasted, “It has rather suddenly become evident that some sort of inflation is to come.”<sup>48</sup> On May 18, *Moody’s Investment Survey* noted, “The feeling seems to be that higher prices and activity will in any event be forced by more direct methods.”<sup>49</sup> Finally, on May 24, *Standard Trade and Securities* wrote, “A policy of price stimulation will be carried out.”<sup>50</sup> Thus, in April, a few business analysts were forecasting inflation, and by the end of May, all five forecasters had switched toward predicting price increases in some form. Furthermore, these inflationary forecasts continued into June and July.<sup>51</sup>

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<sup>45</sup> “The United States: Index of General Business,” *Review of Economic Statistics*, March 15, 1933, p. 46.

<sup>46</sup> “Recovery: The Next Effort,” *Business Week*, April 19, 1933, p. 1.

<sup>47</sup> “We Move Toward Inflation,” *Magazine of Wall Street*, April 29, 1933, p. 3.

<sup>48</sup> “The United States: Index of General Business,” *Review of Economic Statistics*, May 15, 1933, p. 61.

<sup>49</sup> “The Outlook,” *Moody’s Investment Survey*, May 18, 1933, p. 725.

<sup>50</sup> “The Business Prospect,” *Standard Trade and Securities*, May 24, 1933, p. 1.

<sup>51</sup> For example, on June 24, the *Magazine of Wall Street* wrote, “The American government is obviously committed to a policy of fostering a higher price level at home” (“The Trend of Events,” *Magazine of Wall Street*, June 24, 1933, p. 209), and on July 15, the *Review of Economic Statistics* predicted, “It is now evident that not a little but a good deal of inflation is intended” (“The Experiment with Inflation,” *Review of Economic Statistics*, July 15, 1933, p. 107).

There is, however, variation in the timing of the swing toward inflationary expectations among the forecasters. *Business Week*, the *Magazine of Wall Street*, and the *Review of Economic Statistics* confidently predicted inflation by mid-April to mid-May, whereas *Moody's Investment Survey* and *Standard Trade and Securities* were initially more skeptical of the notion that Roosevelt would resort to inflation and as a result, discounted the possibility of inflation. On May 3, *Standard Trade and Securities* wrote, "Little need for full recourse to these extreme [inflationary] measures is ever likely to arise,"<sup>52</sup> and on May 8, *Moody's* wrote, "The outlook is against an inflation of currency in the near future (notwithstanding all the talk and all the "motions" of inflation)."<sup>53</sup> Nonetheless, soon thereafter, these two sources switched toward inflationary forecasts and embraced the notion that inflation would materialize. By May 15, *Moody's* shifted away from deflationary expectations, writing, "Whatever may be thought about inflation, deflation is at an end."<sup>54</sup> Two weeks later, on May 29, *Moody's* declared that Roosevelt was committed to raising prices: "The nature of last week's news, which included the start of Federal Reserve open market operations and the proposal to take the country off gold by statute, should make it clear that the Administration is not wavering in its primary aim of securing a higher price level."<sup>55</sup> On June 15, *Moody's* again referred to the "determination of the Government to raise prices,"<sup>56</sup> and on July 20 predicted, "The trend of prices remains upward."<sup>57</sup> Likewise, on June 21, *Standard Trade and Securities* wrote, "Further inflation...seems indicated,"<sup>58</sup> and on July 26 predicted, "The stage is set for large potential inflation of credit and currency."<sup>59</sup>

There is also variation in the magnitude of expected inflation, as reflected in the forecasts. Though the forecasts did not assign numerical estimates to their expectations for inflation, the *Review of Economic Statistics* notes that inflation could range from "moderate" to "wild":

At the time of writing, the possible future developments range all the way from the adoption by the National Administration of what we will call "moderate" measures of inflation—which, if fortune favors, may be kept under control—to the wildest currency and credit expansion. It is still conceivable that, if developments at home and abroad are favorable, the United States will return to the former gold standard at no remote date. But it is also true that the forces of inflation, once released, have a way of gathering momentum not realized by those who advocate a managed currency, and, particularly if other developments are unfavorable, may carry a country to any extreme. Where, between

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<sup>52</sup> "Inflation Possibilities," *Standard Trade and Securities*, May 3, 1933, p. 2.

<sup>53</sup> "The Outlook," *Moody's Investment Survey*, May 8, 1933, p. 761.

<sup>54</sup> "The Outlook," *Moody's Investment Survey*, May 15, 1933, p. 739.

<sup>55</sup> "The Outlook," *Moody's Investment Survey*, May 29, 1933, p. 709.

<sup>56</sup> "The Outlook," *Moody's Investment Survey*, June 15, 1933, p. 665.

<sup>57</sup> "The Outlook," *Moody's Investment Survey*, July 20, 1933, p. 597.

<sup>58</sup> "The Business Prospect," *Standard Trade and Securities*, June 21, 1933, p. 1.

<sup>59</sup> "Budgetary Inflation," *Standard Trade and Securities*, July 26, 1933, p. 7.

these two limits, inflation will go, cannot possibly be foretold at the present time. (“The United States: Index of General Business, *Review of Economic Statistics*, May 15, 1933, p. 62)<sup>60</sup>

In June, *Standard Trade and Securities* implicitly reveals a range of estimates by expressing a hope for controlled—rather than runaway—inflation: “The Administration intends that prices should go higher, but an orderly, gradual and interrelated rise is hoped for, rather than runaway markets.”<sup>61</sup> On July 26, *Standard Trade and Securities* factored President Roosevelt’s objective of raising prices to their pre-depression level into their forecasts—at one point suggesting that a quick period of reflation back to pre-depression prices could be a possibility within months:

At present, the outlook is for devaluation of the gold dollar, the time method and degree being highly uncertain. Much will depend upon the rapidity with which prices rise. Thus, if the general wholesale price level, now about 68, rises in the next five months to 100, the 1926 base, it is believed that the President would then formally reduce the gold content of the dollar to the point at which it has depreciated in terms of foreign gold exchange. Thereafter, the attempt will be made to stabilize prices at that level by expanding and contracting the volume of currency and credit.” (“How Much Inflation?” *Standard Trade and Securities*, July 26, 1933, p. 6)

Thus, though the forecasters predicted inflation to materialize in some form, there was substantial uncertainty about its speed and magnitude, ranging from protracted and moderate to rapid and wild.

These inflation forecasts informed the investment advice offered by these publications, which encouraged investors to protect their investment holdings, under the threat of inflation. Specifically, the *Magazine of Wall Street* encouraged its readers to buy stocks, writing, “This publication has envisioned the possibility of some degree of inflation and has recommended investment protection by means of purchase of sound and carefully selected equities—equities which would give substantial promise of appreciation either under inflation or under normal economic revival.”<sup>62</sup> Likewise, due to expectations of higher prices, *Moody’s* adopted similar recommendations, writing, “The Administration’s goal in the matter of the price level is, at least, a good distance ahead yet. Therefore, subject to interruptions from time to time, the outlook is for

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<sup>60</sup> A month later, the *Review of Economic Statistics*, however, clarified its inflationary expectations as a result of Roosevelt’s policies and pledges: “In our issue of May 15 we pointed out that the prospect definitely was for inflation of some sort, but that the evidence then available was insufficient to justify a forecast of the extent to which it would be carried. The past month has made the situation clearer... The developments of the month, therefore, leave no reasonable doubt of the intention of the Administration to resort to distinctly inflationary measures; and this has evidently been the interpretation placed upon them by commodity and security markets” (“The United States: Index of General Business,” *Review of Economic Statistics*, June 15, 1933, p. 98).

<sup>61</sup> “The Business Prospect,” *Standard Trade and Securities*, June 21, 1933., p. 1.

<sup>62</sup> “How Far Can This Market Go?” *Magazine of Wall Street*, April 29, 1933, p. 8.

further rising stock prices over a period...Investment policy should be based on that belief. Stocks should not be sold by long term holders. Purchases for the long pull are to be recommended among carefully selected stocks.”<sup>63</sup>

Lastly, in addition to their own inflationary expectations, the forecasters also made frequent references to the widespread perception among the general public that inflation was coming. *Moody's* referred to the inflationary psychology among the public by writing, “Departure of this country from the gold standard, announcement by the President of his objective of price raising and finally the inflation means put at his disposal by Congress have stimulated speculative imagination and raised speculative prices substantially.”<sup>64</sup> The *Review of Economic Statistics* noted, “Without much doubt the prospect of inflation is now a definite factor in determining business sentiment.”<sup>65</sup> The *Magazine of Wall Street* wrote, “Inflationary psychology...has at this writing burst into full bloom of positive public conviction,”<sup>66</sup> and directly noted the presence of “expectations of inflation.”<sup>67</sup>

That all five forecasters predicted inflation can be taken as strong evidence, alongside the other narrative evidence gathered from the historical news record, that market participants expected inflation during the second quarter of 1933. Moreover, the reports of these forecasters reveal that the switch toward inflationary expectations was a direct result of Roosevelt’s policies, actions, and statements.

## 2. Key Events that Shifted Inflation Expectations

The evidence presented so far suggests not only that inflation expectations changed dramatically during the second quarter of 1933, but also that many events played a role in shifting inflation expectations. In this section, we compile a list of those events. Specifically, we examine the daily historical news record to identify the dates of news shocks that were perceived to be inflationary. We then analyze their impact on financial and exchange-rate markets. In essence, we conduct an

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<sup>63</sup> “The Outlook,” *Moody's Investment Survey*, June 5, 1933, p. 701.

<sup>64</sup> “Title,” *Moody's Investment Survey*, May 18, 1933, p. 725.

<sup>65</sup> “The United States: Index of General Business,” *Review of Economic Statistics*, June 15, 1933, p. 98.

<sup>66</sup> “How Far Can This Market Go?” *Magazine of Wall Street*, April 29, 1933, p. 7.

<sup>67</sup> “Taking the Pulse of Business,” *Magazine of Wall Street*, April 29, 1933, p. 32.

event study analysis to identify the impact of key events that shifted inflation expectations.<sup>68</sup>

To begin, we define an inflationary news shock as an event that provides new information that raises the prospects of inflation in the eyes of contemporary observers. In other words, to constitute an inflationary news shock, the event must be perceived as inflationary by contemporaries.

To identify the dates of inflationary news shocks, we read two daily newspapers—the *New York Times* and the *Wall Street Journal*. The daily news accounts offer three main benefits in assembling a list of inflationary news shocks. First, a careful reading of the news accounts, which reflect prevailing market perceptions, allows us to identify the events that were perceived as inflationary by contemporary observers.

Second, using the daily news accounts, we can identify the precise date when news shocks reached the public. Moreover, equipped with daily data, we can then analyze the impact of these news shocks on financial markets within a less-than-24-hour window. This window is narrow enough that it reduces the chances that other shocks confound our analysis, but large enough that it gives financial markets time to process the news.

Third, the daily news accounts allow us to separate developments that had already been anticipated from those that came as a surprise. Consider, for example, the Thomas Inflation Amendment, which was first passed by the Senate and then by the House, and ultimately signed into law by President Roosevelt. What dates represent surprise news shocks? Did all three events—the passage in the Senate, the passage in the House, and the signing into law by Roosevelt—come as a surprise? Or did passage in one body, combined with public support from Roosevelt, ensure its eventual enactment? In other words, what date really matters? Reading the historical news record allows us to get a sense of what developments were unanticipated, apart from those that had already been incorporated into market participants' expectations. A careful

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<sup>68</sup> Our approach is similar in spirit to other event studies of recent years that have analyzed the impact of monetary policy announcements on financial markets. See, for example, Chodorow-Reich (2014b), English, Van den Heuvel, and Zakrajsek (2012), Gagnon et al. (2010), Gilchrist and Zakrajsek (2012), Kiley (2013), Krisnamurthy and Vissing-Jorgenson (2011), Nakamura and Steinsson (2013), Swanson and Williams (2013), and Swanson (2011). For an early event study analysis, see Cook and Hahn (1989). To our knowledge, our paper is the first to conduct a comparable event studies analysis during the 1930s—and in particular, during a window of the Depression.

examination of the historical news record, therefore, allows us to separate surprise news shocks from developments that had already been anticipated.

Thus, we read the daily historical news accounts to compile a list of inflationary news shocks. Specifically, we read the “Topics in Wall Street” section in the *New York Times* and the “Abreast of the Market” section in the *Wall Street Journal*. These sections provide in-depth, daily coverage of financial developments for readers interested in economic, business, and financial news. We focus on the period from April to July 1933, the months that coincide with elevated inflationary expectations, according to the contemporary news accounts and reports of forecasters, documented in Section 1 of the paper.

## 2.1 Inflationary News Shocks

The historical news record identifies five inflationary news shocks: (1) the abandonment of the gold standard, combined with a pledge by Roosevelt to raise prices (April 19), (2) the passage of the Thomas Inflation Amendment in the Senate (April 28), (3) the announcement of open-market operations (May 24), (4) the announcement of the government’s decision to repeal the gold clause, alongside overnight news of a reduction in the rediscount rate of the Federal Reserve Bank of New York (May 26), and (5) Roosevelt’s rejection of a plan to stabilize the value of the dollar at the World Economic Conference (June 19). We consider these episodes one at a time.

### *Event #1: Abandonment of the Gold Standard, Combined with a Pledge by Roosevelt to Raise Prices (April 19)*

On April 19, President Roosevelt ordered an embargo on all exports of gold, except those earmarked for foreign countries, effectively taking the United States off the gold standard. Simultaneously, the Administration announced that it would seek from Congress, in the form of an amendment to the Farm Relief Bill, broad powers to dictate a policy of controlled inflation to raise prices.

These actions were unanticipated. On the morning that Roosevelt took the United States off the gold standard, the *New York Times* reported, “There was no indication that among the influential

elements in the financial community there is any less hostility to ‘currency tinkering’<sup>69</sup> and the *Wall Street Journal* reported, “The President made it known that he did not favor any of the currency inflation proposals before the Senate”<sup>70</sup>—statements that reflect a lack of awareness about Roosevelt’s upcoming plans to abandon the gold standard and seek inflationary powers from Congress.

The actions of April 19 were perceived as inflationary. The *New York Times* wrote that the main motivation behind the Administration’s actions was “to bring commodity prices up”<sup>71</sup> and reported, “Wall Street seemed to be interested yesterday chiefly in the inflationary influences set in motion by the news from Washington. Commission houses spoke assuredly of an inflation market and rallied their followers accordingly.”<sup>72</sup> The *Wall Street Journal* described the news about the administration’s plans as a potential precursor to “outright inflation.”<sup>73</sup> The *New York Times* summarized the mood by noting, “Talk of inflation monopolized interest in Wall Street.”<sup>74</sup>

#### *Event #2: The Passage of the Thomas Inflation Amendment in the Senate (April 28)*

Though the Thomas Inflation Amendment was widely discussed in the news accounts during the last two weeks of April, it was not known whether the Farm Relief Bill, containing the Inflation Amendment, would clear the Senate, causing investors to hold back until the fate of the bill became settled. On Wednesday, April 26, the *New York Times* reported, “The view was expressed in some quarters that aggressive operators are unlikely to be resumed until after the fate of the Thomas inflation bill becomes known. This may explain the eagerness with which Wall Street is awaiting the final vote on the bill.”<sup>75</sup> On Thursday, April 27, the *New York Times* wrote, “The uncertainties of the moment, particularly those surrounding the progress of legislation in Washington, were uppermost in the minds of speculative operators.”<sup>76</sup> On Friday, April 28, hours before the bill was passed, the *New York Times* noted, “Speculative impulses [were] largely

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<sup>69</sup> “Topics in Wall Street,” *New York Times*, April 19, 1933.

<sup>70</sup> “Abreast of the Market,” *Wall Street Journal*, April 19, 1933.

<sup>71</sup> “President Takes Action,” *New York Times*, April 20, 1933.

<sup>72</sup> “Topics in Wall Street,” *New York Times*, April 20, 1933.

<sup>73</sup> “Off Gold Again,” *Wall Street Journal*, April 20, 1933.

<sup>74</sup> “Topics in Wall Street,” *New York Times*, April 21, 1933.

<sup>75</sup> “Topics in Wall Street,” *New York Times*, April 26, 1933.

<sup>76</sup> “Topics in Wall Street,” *New York Times*, April 27, 1933.

suppressed as a result of the approaching vote in Washington on the Thomas inflation bill.”<sup>77</sup> The Senate passed the bill and adjourned at 7:02 p.m., after the close of the Stock Exchanges on Friday, April 28.<sup>78</sup>

The news of the passage of the inflation amendment was perceived as inflationary. The *Wall Street Journal* described the amendment as “embodying the Administration’s inflation program.”<sup>79</sup> In addition, passage in the Senate, combined with public knowledge about the large pro-inflationary forces in the House and Roosevelt’s support for the bill, ensured that the measure would become law in the eyes of contemporaries. Indeed, after the bill cleared the Senate, the *New York Times* wrote, “The reasonable certainty of [the] passing of the measures is recognized in Wall Street.”<sup>80</sup>

### *Event #3: Announcement of Open-Market Operations (May 24)*

On May 22 and 23, rumors began to circulate that the government would commence open-market purchases of government securities, though the rumors could not be confirmed, with the *New York Times* reporting, “Wall Street was unable to confirm [the rumors].”<sup>81</sup> However, on May 24, the Administration made a formal announcement of its intention to begin buying government securities, as provided in a provision of the Thomas Inflation Amendment that authorized purchases of up to \$3 billion in government securities, at the behest of the President.

The May 24 announcement was perceived as inflationary. The *New York Times* reported, “What Wall Street described as a ‘secondary inflation market’ aroused speculative enthusiasm on all Exchanges yesterday”<sup>82</sup> and the *Wall Street Journal* wrote, “Formal announcement from the Secretary of the Treasury that the Federal Reserve had been authorized to start purchase of government securities, to bring about a further expansion of credit, stimulated a return of

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<sup>77</sup> “Topics in Wall Street,” *New York Times*, April 28, 1933.

<sup>78</sup> As a result, markets did not process the overnight news of the passage of the Inflation Amendment until Saturday, April 29 (“The Day in Washington,” *New York Times*, April 29, 1933; “Abreast of the Market,” *Wall Street Journal*, May 1, 1933).

<sup>79</sup> “Abreast of the Market,” *Wall Street Journal*, May 1, 1933.

<sup>80</sup> “When the Bill Passes,” *New York Times*, May 2, 1933.

<sup>81</sup> “Open-Market Operations,” *New York Times*, May 23, 1933.

<sup>82</sup> “Topics in Wall Street,” *New York Times*, May 25, 1933.

inflationary psychology.”<sup>83 84</sup>

*Event #4: Announcement of the Government’s Intention to Repeal the Gold Clause, alongside Overnight News of a Reduction in the Rediscount Rate of the Federal Reserve Bank of New York (May 26)*

Two inflationary developments appeared in the news on May 26. First, the Federal Reserve Bank of New York made an overnight announcement of a reduction in its rediscount rate by 50 basis points (from 3 percent to 2 ½ percent).<sup>85</sup> Second, Roosevelt announced his plan to repeal the gold clause in all public and private obligations, rendering unenforceable any contracts that specified payment in a fixed amount of gold, as opposed to legal tender.

These actions appear to have been unanticipated. The news accounts in the days leading up to May 26 do not indicate any knowledge about these prospective events. Moreover, these actions were perceived as inflationary. In particular, the repeal of the gold clause reinforced the perception that the Administration was planning to resort to inflationary measures and would not be returning to its former gold standard. Due to these developments, the *New York Times* wrote that the market “was being swept by inflation fever.”<sup>86,87</sup> Moreover, once Roosevelt announced his support for repeal of the gold clause, the news accounts described passage by Congress as certain.<sup>88</sup>

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<sup>83</sup> “Abreast of the Market,” *Wall Street Journal*, May 25, 1933.

<sup>84</sup> Because the rumors of the government’s open-market operations were unconfirmed until the Secretary of the Treasury’s formal announcement on May 24, we list May 24 as the date of the inflationary news shock. Nonetheless, it is important to note that the rumors may have influenced expectations, among at least some market participants, by at most one or two days earlier.

<sup>85</sup> Specifically, this development occurred after the close of the market on May 25. *The Wall Street Journal* reported, “The announcement of the reduction in the bank rate came after the close [of the market]” (“Bank Rate Cut to 2 ½,” *Wall Street Journal*, May 26, 1933). As a result, markets did not process the news until May 26.

<sup>86</sup> “Topics in Wall Street,” *New York Times*, May 27, 1933.

<sup>87</sup> One of the forecasters, the *Review of Economic Statistics*, cited the developments at the end of May—the announcement by the Administration that it had authorized the Federal Reserve to begin purchasing government securities and that it planned to repeal the gold clause, alongside the reduction in the Federal Reserve Bank of New York’s rediscount rate—as justification to continue forecasting inflation in its June issue (“The United States: Index of General Business Conditions,” *Review of Economic Statistics*, June 15, 1933, p. 98).

<sup>88</sup> For example, on May 29, the *New York Times* reported, “Passage is held certain” (“Gold Clause Vote Scheduled Today,” *New York Times*, May 29, 1933). Indeed, a few days later, on June 5, Roosevelt signed into law the Gold Standard Act, which repealed the gold clause.

### *Event #5: Roosevelt's Message to the World Economic Conference (June 19)*

On June 19, Roosevelt announced to the World Economic Conference that contrary to rumors then circulating, his Administration would not support any plans to stabilize the dollar, citing internal considerations, i.e., the need to raise domestic price levels, as more important than stable exchange rates. The announcement came as a surprise. In the run-up to the announcement, speculation mounted that the deliberations of the World Economic Conference would lead to a plan for currency stabilization. For example, on June 17, the *New York Times* reported, “Bankers, for the most part, felt that if some plan for steadying the exchanges had not yet been settled on, it soon would be.”<sup>89</sup>

Contemporary observers interpreted Roosevelt's June 19 message as inflationary. The *New York Times* reported, “The financial community yesterday construed President Roosevelt's rejection of the stabilization plan as meaning that inflation was to be pursued”<sup>90</sup> and the *Wall Street Journal* described Roosevelt's announcement as “new evidence that the Administration is bent on bringing about a further rise in the domestic price level.”<sup>91</sup>

### *Events That Did Not Make the List: The Fireside Chats and the Passage of the NIRA*

While a careful reading of the daily news accounts identifies the five inflationary news shocks noted above, a few well-known events did not make our list. We consider those events here.

**The Fireside Chats:** Roosevelt delivered a radio address—his second fireside chat—on May 7. According to the press accounts, in the run-up to the address, market observers were eager to know how Roosevelt planned to use his new inflationary powers. While Roosevelt re-affirmed his commitment to raise prices in the address, he did not disclose additional details about how he intended to use his new powers. Moreover, because the Administration had already been pledging to raise commodity prices, beginning on April 19, the day the Administration took the United States off the gold standard and announced its plan to seek broad powers from Congress to raise

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<sup>89</sup> “Stabilization,” *New York Times*, June 17, 1933.

<sup>90</sup> “Off Again, On Again,” *New York Times*, June 20, 1933.

<sup>91</sup> “Abreast of the Market,” *Wall Street Journal*, June 20, 1933.

prices, Roosevelt's radio address did not provide new information, in the eyes of contemporary observers. Indeed, in summarizing the reaction to the address, on May 9, the *Wall Street Journal* wrote, "While the President's radio address to the country was regarded as generally constructive in tenor, it did not add anything to the country's knowledge of what the Administration proposes to do with the powers over the currency reposed in it by Congress"<sup>92</sup> and the *New York Times* reported, "Wall Street sought to judge the status of the president's inflation program. Speculators were wary; they could not tell from the President's radio address what he had in mind in the way of a definite monetary policy."<sup>93</sup> Because the daily news accounts describe Roosevelt's May 7 radio address as failing to provide new information, this episode does not constitute an inflationary news shock.

Roosevelt delivered his next fireside chat on July 24. This address focused on the Administration's objectives of achieving recovery via the newly passed National Industrial Recovery Act (NIRA). Yet, similar to the previous fireside chat, the daily news accounts characterize this radio address as failing to offer new information. The *Wall Street Journal* reported, "The speech revealed nothing new, merely elaborating previous views expressed in Administration quarters in regard to the need of increasing purchasing power and getting people back to work."<sup>94</sup> Thus, because the news accounts describe Roosevelt's radio address on July 24 as failing to provide new information, this episode also does not make our list of inflationary news shocks.

**The Passage of the NIRA:** The passage of the NIRA was not described as inflationary by the daily news accounts.<sup>95</sup> Though some features of the Act (e.g. codes designed to increase wage rates and the authorization of a large public works program, to be financed through borrowing) may have been perceived as inflationary, the actual passage of the NIRA did not trigger the same kind of inflationary enthusiasm generated in the aftermath of the passage of the Thomas Inflation Amendment, according to the press accounts. There are several potential explanations. First, market participants may have adjusted their expectations gradually over time in response to new information about the NIRA, rather than on the days the bill cleared certain legislative hurdles or

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<sup>92</sup> "Abreast of the Market," *Wall Street Journal*, May 9, 1933.

<sup>93</sup> "Topics in Wall Street," *New York Times*, May 9, 1933.

<sup>94</sup> "Abreast of the Market," *Wall Street Journal*, July 26, 1933.

<sup>95</sup> The NIRA was signed into law on June 16, 1933.

became law.<sup>96</sup> Second, market participants may have held off on making inflationary predictions, until the specific codes, which were not announced until later, became public knowledge.<sup>97</sup> Third, some measures of the bill, such as tax increases, may have been perceived as deflationary, potentially offsetting the inflationary influences of other provisions of the bill.<sup>98</sup> And fourth, though the NIRA was designed, in part, to raise wages, the public may not have viewed the act as an effective tool to raise the general price level, akin to the Thomas Inflation Amendment. Future research may be needed to sort this out. Nonetheless, because the daily news accounts do not describe the passage of the NIRA as inflationary, it does not make our list of inflationary news shocks.

Nonetheless, a crucial caveat accompanies the omission of these episodes. Though the two fireside chats and the passage of the NIRA do not make our list of inflationary news shocks, it would be difficult to argue that these events were inconsequential. Direct and repetitive communication of the Administration's objective of raising prices to their pre-Depression level permitted many of the forecasters to estimate the magnitude by which prices might rise, as indicated in Section 1 of this paper, and may have reinforced the notion among the general public that prices would rise. Moreover, the NIRA helped fuel the narrative, echoed in the historical news accounts and in the reports of contemporary forecasters, that Roosevelt was willing to experiment with bold, new measures to jumpstart recovery. Thus, even if those episodes do not appear on our list of inflationary news shocks, they most likely did matter in cementing the notion that a change in the macroeconomic policy regime had taken place.

## 2.2 Event-Study Analysis

Equipped with a list of inflationary news shocks, we can examine the impact of these events on financial markets—specifically, on stock and foreign-exchange markets. Indeed, because we have identified the dates of these shocks and have daily data on stock prices and exchange rates, we can

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<sup>96</sup> It is, nonetheless, important to note that our reading of the daily news accounts does not identify any clear days when news about the NIRA was described as inflationary.

<sup>97</sup> In reporting the passage of the NIRA by Congress, the *Wall Street Journal* suggested that this may be the case: “In the coming months, that program will be given a thorough test. The administering of the terms of the National Industrial Recovery Act and the moves of industrial groups, under its provisions, will be a most important factor stock market-wise” (“Market Diary,” *Wall Street Journal*, June 15, 1933).

<sup>98</sup> For example, the *New York Times* wrote that business men may “become discouraged over the many new taxes included in the National Industrial Recovery Act” (“Taxes and Repeal,” *New York Times*, June 17, 1933).

analyze the impact of these news shocks within a very narrow window.

If higher inflationary expectations generate expectations of higher future nominal earnings and dividends, stock prices should rise. Or, alternatively, if investor psychology links higher inflation with higher stock prices, a development that raises inflationary expectations would induce investors, in an attempt to profit from subsequent price advances, to quickly buy stocks, thereby causing an immediate increase in stock prices. The narrative accounts support this latter interpretation. For example, in May 1933, the *Wall Street Journal* described “inflationary psychology as a factor contributing to the urge to buy stocks.”<sup>99</sup> Similarly, contemporary observers associated higher inflationary expectations with a depreciating dollar. The purchasing power parity (PPP) approach suggests that, once the United States is off the gold standard and its exchange rate is allowed to fluctuate, inflation differentials will be offset by changes in the exchange rate (unless tight capital controls are in place). Therefore, when prices in the United States are expected to rise faster than prices in other countries, the U.S. dollar would be expected to depreciate relative to other currencies.

Table 4 displays the percentage change in the Standard’s Daily Stock Price Index and the unit change in cents in the dollar-to-pound and dollar-to-franc exchange rates surrounding the five inflationary news shocks.<sup>100, 101</sup> As is visible in the table, stock prices increase and the dollar depreciates substantially surrounding each episode. Moreover, the largest movements occurred on April 19, with the abandonment of the gold standard and the announcement by the Administration that it would seek broad powers to raise prices; on April 28, as a result of the overnight news of the passage of the Thomas Inflation Amendment in the Senate; and on June 19, when Roosevelt addressed the World Economic Conference.<sup>102</sup>

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<sup>99</sup> “Abreast of the Market,” *Wall Street Journal*, May 30, 1933.

<sup>100</sup> The stock price data come from Standard Statistics Company’s *Standard Trade and Securities*. Specifically, we utilize Standard’s Daily Stock Price Index—a stock price index that reflects 90 composite stocks and that is weighted by the number of shares of each stock outstanding. The index is available at a daily frequency and is based on daily closing prices. In addition, the daily exchange rate data come from the daily issues of the *New York Times*. We report the exchange rate of the U.S. dollar against two of its major trading partners—one that was off the gold standard (Britain) and another that was on the gold standard (France).

<sup>101</sup> Figures A.1 and A.2 in the Appendix show daily stock prices and exchange rates (in logs), respectively, for the entire window of analysis: April 1 to August 1, 1933. The vertical lines in the graphs indicate the dates of the five inflationary news shocks.

<sup>102</sup> Because we focus only on the daily impact in financial markets, we may be underestimating the effects of these events on financial markets, if market participants took more than one day to fully absorb the news or if rumors about the inflationary developments leaked earlier. For example, according to the daily news

To get a better perspective on the effects of these inflationary news shocks on stock and exchange-rate markets, we estimate the following regression:

$$\Delta y_t = \alpha + \beta_0 N_t + \beta_1 N_{t-1} + \varepsilon_t \quad (1)$$

where  $\Delta y$  represents the daily change in stock prices (in log units) or the daily change in the dollar-to-pound or dollar-to-franc exchange rate (in log units), and  $N$  represents a news shock dummy that equals one on the day of an inflationary news shock.<sup>103</sup> Because we estimate the regressions at a daily frequency, the coefficient of the contemporary news shock dummy identifies the effect of the inflationary news shock on stock prices or the exchange rate within a less-than-24-hour window. The coefficient of the lagged news shock dummy identifies any spillover effects into the following day.

The results are shown in Table 5. Column 1 reports the results for stock prices, column 2 reports the results for the dollar-to-pound exchange rate, and column 3 reports the results for the dollar-to-franc exchange rate. Across all three specifications, the constant term is positive, ranging from 0.001 to 0.002, suggesting that stock prices were growing and that the dollar was depreciating over this period, though these coefficients are statistically insignificant (the p-values equal 0.540, 0.375, and 0.360, respectively).

The main result from the regressions, however, is that inflationary news shocks have a large, positive, and strongly significant impact on financial markets. The coefficient estimates indicate

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accounts, the stock market continued to process the inflationary news from April 19 into the following day—April 20, with the *New York Times* reporting, “Talk of inflation monopolized interest in Wall Street” (“Topics in Wall Street,” *New York Times*, April 21, 1933). Indeed, on April 20, the stock index increased by 9.5 percent—even larger than the increase on April 19. Or consider another episode—inflationary news shock #3, which involved the May 24 announcement of open market operations. According to the daily news accounts (and as noted in the body of the paper), rumors began to surface earlier, in the form of an unverified dispatch from Washington that could not be confirmed by the press, that the government would begin purchasing government securities (“Open-Market Operations,” *New York Times*, May 23, 1933). Perhaps as a result of these rumors, stock prices increased by 3.8 percent on May 23. Combining the increases on April 19–20 and May 23–24 into one statistic yields 17.4 percent and 5.8 percent, respectively—much larger increases in stock prices than those noted in Table 4. A similar calculation for exchange rates also yields larger effects (33 cent and 27 cent depreciations in the dollar-pound and dollar-franc exchange rates on April 19–20 and 3.25 cent and 3.67 cent depreciations in the dollar-pound and dollar-franc exchange rates on May 23–24).

<sup>103</sup> If the news shock occurred after the close of markets (as was the case for inflationary news shock #2, on April 18), then the dummy records a value of one on the following day, the first day the markets can process the news.

that an inflationary news shock causes an increase in stock prices of roughly 5 percent and a dollar depreciation of roughly 2 percent by the close of the market on the day of the news shock. The positive coefficients for the lagged inflationary news dummy across all three specifications suggest some spillover effects into the next day, though the coefficients are small and for the most part, statistically insignificant.

The finding that an inflationary news shock raises stock prices and reduces the value of the dollar is consistent with the reports of contemporary observers. During the second quarter of 1933, the newspaper accounts made frequent references to “an inflationary flight into equities”<sup>104</sup> and to an “inflationary purchase of speculative ordinary stocks”<sup>105</sup>—statements that suggest a link between higher inflationary expectations and stock prices. Likewise, the widespread perception of a link between inflationary expectations and the value of the dollar, as expressed in the historical news reports, is supportive of these findings. For example, the *Wall Street Journal* noted, “Movements in the pound sterling will continue to be the immediate gauge of inflation prospects.”<sup>106</sup>

In addition to estimating the impact of inflationary news shocks on financial markets, we use equation (1) to determine if these news shocks had an impact on news coverage about inflation—specifically, by replacing the dependent variable with the log change in the number of articles (among the five daily newspapers from Section 1.2.1) containing the terms “inflation” or “inflationary”.<sup>107</sup> As shown in column (4) of Table 5, inflationary news coverage increased substantially on the day after an inflationary news shock. The coefficient estimate for the lagged news shock dummy is large, positive, and significant, indicating a 60 percent increase in the number of news articles containing the term “inflation” on the day after an inflationary news shock. Since the morning publication of newspapers meant that it usually took a day for events to be reported, it is not surprising that news shocks affect inflationary news coverage with a one-day lag.

These results suggest that agents reacted quickly to news about the prospects of inflation, bidding stock prices up and the value of the dollar down. Thus, these findings shed insights into the key

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<sup>104</sup> “Investment Notes: Wall Street and the Dollar,” *Economist*, April 22, 1933.

<sup>105</sup> “Course of Equity Share Values,” *Economist*, May 6, 1933.

<sup>106</sup> “Revising the Outlook,” *Wall Street Journal*, June 20, 1933.

<sup>107</sup> Figure A.3 in the Appendix shows the daily frequency of inflationary news coverage together with the five inflationary news shocks, denoted by vertical lines, from April 1 to August 1, 1933.

events that raised inflationary expectations during the second quarter of 1933.<sup>108</sup>

### 3. Macroeconomic Effects of the Shift in Inflation Expectations

This section focuses on the macroeconomic effects of the shift in inflation expectations during the second quarter of 1933. We begin with an econometric framework that quantifies the degree to which output growth differed from normal in the spring of 1933. Then, we examine an array of new quantitative and narrative evidence on the sources of recovery. This new evidence indicates that the shift in inflation expectations played a causal role in stimulating the recovery.

#### 3.1 An Econometric Framework

The narrative evidence presented in the previous sections (the newly constructed series on inflation news coverage, the reports of contemporary observers, the forecasts of contemporary business analysts, and the event study analysis) indicates that inflation expectations changed dramatically during the second quarter of 1933. What were the macroeconomic effects of this shift in inflation expectations?

Temin and Wigmore (1990), in their seminal contribution, argue that a pro-inflation regime shift explains why the recovery from the Depression began in April 1933. Using the framework of Sargent (1982), who defines a regime shift as an abrupt change in the government rule, strategy or policy for taking actions, Temin and Wigmore argue that the events of the second quarter of 1933 constitute a regime change. Indeed, our reading of the historical news accounts reveals that this was the case: Contemporary observers perceived Roosevelt's policy statements and actions to signal a sharp break in the government strategy or rule for taking actions. For example, the following passage from the *Economist* reflects the widespread contemporaneous perception of a dramatic and sudden break from orthodox policy:

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<sup>108</sup> In addition, there is suggestive evidence in the historical narrative record that prior to each of these news shocks, inflationary expectations may have been on the verge of subsiding. We describe this evidence in Section A.2 of the Appendix. This narrative evidence leads us to conclude that these news shocks were critical in sustaining positive inflationary expectations from April to July. It appears that Roosevelt, intentionally or not, intervened to reassert his Administration's commitment to raise prices at those precise moments when inflationary expectations, as reported in the press, showed signs of subsiding. Please see Section A.2 of the Appendix for in-depth details.

There is no record, until the present year, of a Government which has deliberately planned an inflation of credit or currency not as a means of raising revenue but with the conscious aim of raising the price level ... The canons of orthodoxy were broken as completely as precedent was shattered. Having demonstrated his ability to balance the ordinary Budget, the President has now instituted enormous extraordinary expenses which are to be met by borrowing. The dollar has not so much been allowed to fall after a heroic struggle to maintain its value as encouraged and egged on to depreciate. The printing of paper money, the familiar symbol of Governmental insolvency, has not been rigidly forsworn, but held over the markets as an ultimate threat. The Administration has taken powers of compulsion over industry, not in order to moderate the rise in costs of production, but by raising wages and limiting the hours of work deliberately to increase them as rapidly as possible. In these ways the wind has been sown. (“Sowing the Wind,” *Economist*, July 15, 1933)

Moreover, this perception of a sharp break with previous policy produced a dramatic change in expectations. Market observers were euphoric that action was finally being taken to end the depression. The *Economist* described the “psychological optimism” that prevailed throughout the nation:

There is a sense, both at Washington and throughout the country, of confidence, almost amounting to elation, that action will be taken to grapple with the forces that have brought about the depression. (“The Washington Enigma,” *Economist*, May 27, 1933)

Thus, this narrative evidence, together with the data presented in Figure 5, which reveals a sudden surge in news articles linking the Roosevelt Administration to inflation, corroborates the claim that the events of the second quarter of 1933 constitute an inflationary regime shift.

The theoretical literature provides many insights into how a shift toward higher inflationary expectations can stimulate a depressed economy. When nominal interest rates are near the zero lower bound, expected future inflation allows the economy to achieve the negative “natural” (real) rate of interest that is needed to offset the fall in output (e.g., Krugman, 1998; Eggertsson and Woodford, 2003). Moreover, Eggertsson and Krugman (2012) show that when the output shock is the result of deleveraging, as was the case in the Great Depression, a shift toward positive inflation expectations has strongly stimulative effects on output. In light of these potential effects, we develop an empirical framework to quantify the aggregate output effects of the inflationary regime shift.

A crucial issue in empirically identifying the output effects of the Roosevelt inflationary regime shift is that the regime shift followed other contractionary developments earlier in the year. A massive banking panic, which broke out in the final months of 1932, intensified in early 1933. In addition, to defend against gold outflows, the Federal Reserve increased its discount rate in February. Thus, in estimating the impact of the Roosevelt regime shift on output, it is crucial to

develop a framework that controls for the effects of the banking crisis and other monetary shocks earlier in the year.<sup>109</sup>

To do this, we construct an empirical model based on the framework developed in Bernanke (1983) that captures the relationship among three variables: money, financial crisis indicators, and output. To tease out the nonmonetary effects of the financial crisis from the effects of changes in the supply of money, Bernanke estimates the following equation:

$$Y_t = \sum_{i=1}^2 \beta_i Y_{t-i} + \sum_{i=0}^2 \alpha_i M_{t-i} + \sum_{i=0}^1 \delta_i DBANKS_{t-i} + \sum_{i=0}^1 \phi_i DFAILS_{t-i} + \varepsilon_t \quad (2)$$

where  $Y$  denotes the growth rate of industrial output (relative to its exponential trend),  $M$  represent “M1 monetary shocks” (defined as the residuals from a regression of the rate of growth of M1 on four lags of the growth rates of industrial production, wholesale prices, and M1 itself), and  $DBANKS$  and  $DFAILS$  are financial crisis proxies that measure the first difference of deposits of failing banks and the first difference of liabilities of failing businesses, respectively.<sup>110</sup> The regressions are estimated at a monthly frequency from January 1919 to December 1941. The monetary shock variables are designed to measure the effects of nominal disturbances, while the financial crisis proxies are designed to tease out the nonmonetary effects of the financial crises, after controlling for the effects of monetary shocks. Because the financial crisis proxies and the monetary shock variables are large and statistically significant, Bernanke concludes that the financial crises had substantial nonmonetary effects on output, apart from the monetary effects identified by Friedman and Schwartz. Based on the findings from his model, Bernanke argues that the nonmonetary effects of the financial crises played a crucial role—alongside monetary forces—in causing the Great Depression.

To identify the effects of the Roosevelt regime shift, apart from the other developments of 1933, we augment Bernanke’s original model to include a regime shift dummy. Specifically, we estimate the following regression:

$$Y_t = \sum_{i=1}^2 \beta_i Y_{t-i} + \sum_{i=0}^2 \alpha_i M_{t-i} + \sum_{i=0}^1 \delta_i DBANKS_{t-i} + \sum_{i=0}^1 \phi_i DFAILS_{t-i} + \lambda R_t + \varepsilon_t \quad (3)$$

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<sup>109</sup> Several scholars—including Romer and Romer (1989) and Hausman (2013)—have called attention to the fact that output grew rapidly during the spring of 1933 following contractionary developments earlier in the year.

<sup>110</sup> In a second specification, Bernanke replaces the monetary shocks with price shocks. See Bernanke (1983, p. 268) for more details.

where  $R_t$  represents a regime shift dummy that equals one in the months that coincide with the Roosevelt regime shift. We construct the regime shift dummy based on the narrative evidence presented in Section 1. The narrative evidence is clear in assigning the regime shift to the period between April and July 1933—that is, to those months when there was a widespread perception of an imminent rise in inflation among market participants. The dummy variable is designed to capture the effects of the regime shift, after controlling for the effects of financial crises and other monetary developments.<sup>111</sup>

Table 6 displays the results. Column (1) is the original Bernanke specification, whereas column (2) includes the regime shift dummy.<sup>112, 113</sup> The coefficient estimate of the regime shift dummy is large, positive, and strongly significant—0.0697 (t-stat = 5.17). This coefficient estimate suggests that during the months that coincided with the Roosevelt regime shift, output growth was higher by 7 percentage points than what would have been predicted, given the normal behavior of money and financial crisis indicators from 1919 to 1941.<sup>114</sup> Moreover, based on these results, the estimated four-month cumulative impact of the regime shift on industrial production is an increase of 50.4 percent.<sup>115</sup> Industrial production grew by 57 percent between March and July 1933, indicating that the Roosevelt regime shift can account for 88 percent of the recovery over this period.<sup>116</sup> Interestingly, this estimate is similar to the findings of Eggertsson (2008). In his calibration of a dynamic stochastic general equilibrium model of the U.S. economy from 1929 to

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<sup>111</sup> Another study that has used a dummy variable in a time series regression to separate the output movements of 1933 is McCallum (1990) in his study on whether a monetary base rule could have prevented the Depression.

<sup>112</sup> Column (3) includes the dollar exchange rate, in addition to the regime shift dummy, which we discuss in the next subsection.

<sup>113</sup> The coefficient estimates for regression 1 in Table 6 differ slightly from those in Bernanke (1983). The data series used by Bernanke on industrial production have undergone revisions since the publication of Bernanke's study. For accuracy, the coefficient estimates that we report in Table 6 reflect the most recent set of revisions and thus differ slightly from the coefficients reported in Bernanke (1983). Nonetheless, Bernanke's basic findings remain intact.

<sup>114</sup> These results are robust to using different lags—between one and eight—for industrial production.

<sup>115</sup> The cumulative impact over four months includes the direct contemporaneous effects of the regime shift in each month, along with the effects working through the behavior of lagged output. For example, the impact in month 1 is the Roosevelt regime shift dummy,  $\lambda$ . The impact in month 2 is  $\lambda + \beta_1\lambda$ , the Roosevelt regime shift dummy,  $\lambda$ , plus the impact in month 1 times the coefficient on lagged output,  $\beta_1\lambda$ . The impact in month 3 is  $\lambda + \beta_1(\lambda + \beta_1\lambda) + \beta_2\lambda$ , the Roosevelt regime shift dummy,  $\lambda$ , plus the impact in month 2 times the coefficient on lagged output,  $\beta_1(\lambda + \beta_1\lambda)$ , plus the impact in month 1 times the coefficient on the second lag of output,  $\beta_2\lambda$ , and so on.

<sup>116</sup> Using wholesale price shocks, rather than M1 shocks (as described in Bernanke, 1983, p. 268), does not change the basic findings. The coefficient estimate of the regime shift dummy is still strongly significant, though the estimate is smaller—0.0385 (t-stat = 2.73). In this specification, the estimated four-month cumulative impact of the regime shift is an increase of industrial production of 27.4 percent, suggesting that roughly 48 percent of the recovery can be attributed to the regime shift.

1937, Eggertsson concludes that the regime change can account for 79 percent of the recovery in output in the period 1933–37. Thus, the results from our empirical framework complement those of Eggertsson and provide additional support to the notion that a regime shift drove the initial wave of recovery during the second quarter of 1933.<sup>117</sup>

## 3.2 Could Other Forces or Policies Have Driven the Recovery?

The preceding results indicate that monthly output growth was higher by 7 percentage points during the months that coincide with the Roosevelt inflationary regime shift, relative to what would have been predicted, given the normal behavior of money and financial crisis indicators. Yet, one concern with the preceding empirical specification could be that a dummy variable that equals one in the months that coincide with the Roosevelt regime shift picks up the effects of the shift in inflation expectations, along with any other concurrent forces or policies that may have played a role in stimulating the recovery. Could other forces or policies have driven the recovery?

### 3.2.1 Exit from the Gold Standard

One obvious possibility is the abandonment of the gold standard, which coincided with the swing from contraction to expansion in April 1933. Could the abandonment of the gold standard and subsequent dollar devaluation have driven the rapid recovery? Several pieces of evidence indicate that this is unlikely the main source of the rapid recovery.

First, in 1933, international trade was a small share of the U.S. economy—according to the Bureau of Economic Analysis, total trade (exports plus imports) was 7.3 percent of U.S. GDP—and the trade deficit actually widened (from \$11.5 billion in 1932 to \$12.8 billion in 1933).<sup>118</sup> Second, adding the dollar exchange rate vis-à-vis the British pound as a proxy for the direct effects of devaluation in our empirical specification changes none of our results; the regime shift dummy is still large, positive, and strongly significant, whereas the coefficient for the dollar exchange rate is statistically insignificant (see column (3) of Table 6). Third, the boom in output growth in the months that followed the U.S. abandonment from the gold standard was unusual, relative to other

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<sup>117</sup> Eggertsson, however, focuses on the recovery from 1933 to 1937, whereas we focus on the turning point in the second quarter of 1933.

<sup>118</sup> Source: BEA NIPA table 1.1.6.

countries. Table 7 presents the percentage change in industrial production in the four months after abandonment of the gold standard across a range of countries.<sup>119</sup> The table shows that the United States is a huge outlier: industrial production in the United States increased by 69.5 percent, whereas in other countries, it declined by 2.6 percent on average.<sup>120</sup> To put this in perspective, the country that ranks second in terms of output growth is the United Kingdom, with an increase in industrial production of only 9 percent—a difference of more than 60 percentage points with the United States. This huge divergence between the United States and the rest of the world suggests that something else, beyond the direct effects of devaluation and abandonment of the gold standard, drove the U.S. recovery.<sup>121</sup>

Moreover, contemporaries were aware of the uniqueness of the rapid recovery in the United States, in comparison to other countries' post-devaluation experiences, and attributed the strong recovery to the inflationary regime adopted by the Roosevelt Administration. For example, in May 1933, the *Economist* reported that public opinion abroad began to shift in favor of inflation, as a result of the perceived successes of Roosevelt's policies:

It was hardly to be expected that President Roosevelt could, as if with a magician's wand, produce such impressive evidences of recovery without convincing many people that he has discovered the sovereign cure for all our ills. In his own country he is carrying all before him. Monday's debate in the House of Commons showed that there is an impressive body of opinion in this country prepared to follow in his footsteps, and it is only natural that each fresh appearance of success should attract new followers. The Dominions and the Scandinavian countries are already half-converted. Only in the nations of Continental Europe is there a total lack of enthusiasm for a policy of monetary expansion—a body of dissent rendered formidable by its recent and thorough familiarity with the subject. It is thus no exaggeration to say that opinion in at least half of the world

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<sup>119</sup> The data come from the League of Nations *Statistical Yearbook*. See the note to Table 7 for further details.

<sup>120</sup> The industrial production data from the League of Nations differ slightly from the Federal Reserve's industrial production data for the United States. According to the *Federal Reserve's G.17 Statistical Release*, U.S. industrial production increased by 57 percent from March to July, whereas according to the *League of Nations Statistical Yearbook*, U.S. industrial production increased by 69.5 percent. Though there is some discrepancy between these two sources, what is most important is that both sources indicate dramatic increases in industrial production during the second quarter of 1933.

<sup>121</sup> One potential concern may be that suspension occurred at different timings for different countries. Because the United States abandoned the gold standard after a longer period of contraction, in comparison to the wave of countries that abandoned the gold standard in the fall of 1931, one might wonder whether the U.S. recovery was more rapid because the United States had fallen further and over a longer period. However, one piece of evidence suggests otherwise. Countries that suspended the gold standard after March 1933 also did not grow rapidly in the immediate aftermath of suspending. Table 7 contains four countries that suspended after the United States—none of which experienced a recovery even remotely comparable to the rapid U.S. boom: Belgium (3.2 percent increase in industrial production), France (8.2 percent increase), Italy (5.6 percent increase), and Poland (2.8 percent increase). This suggests that the U.S. recovery in the four months following the suspension of the gold standard was truly unusual, relative to other countries' experiences, even after taking into account varying dates of suspension.

is moving rapidly towards acceptance of deliberate inflation. (“Sowing the Wind,” *Economist*, May 15, 1933)

In addition, in July 1933, the editors of the *Economist* wrote an article that compared the British devaluation in September of 1931 with the recent U.S. devaluation. The editors described the more rapid U.S. recovery and attributed this difference in economic performance between the two countries, in part, to the elevated inflation expectations in the United States:

When the United States went off gold ... the depreciation of the dollar gave rise to fear—or hope—of inflation, which made people anxious to transfer their money into goods. The resultant increase in the demand for goods tended to raise prices and increase the volume of goods moved. On the other hand, when Great Britain went off the gold standard there was no hoarded money within the country, and the temporary rise in prices which set in immediately after the depreciation was not maintained. (“1931 and 1933 – A Contrast,” *Economist*, July 8, 1933)

This comparison of the United States and British post-devaluation experiences seems to corroborate the broader trends noted in Table 7—that the rapid U.S. surge in output was unusual, relative to other countries’ experiences. Furthermore, as is clear in the above accounts, contemporaries attributed the robust U.S. recovery, at least in part, to the expansionary set of measures adopted by Roosevelt and to the heightened inflation expectations. Thus, the narrative accounts provide further support to the notion that a pro-inflation regime shift—rather than the direct effects of devaluation—drove the recovery. As such, the findings of this paper are more consistent with the argument of Temin and Wigmore (1990) that the abandonment of the gold standard played a crucial role in the recovery, perhaps in part because devaluation had direct effects, but much more importantly, because devaluation signaled a new policy regime, and thereby caused a rapid change in expectations.

### 3.2.2 Narrative Evidence on the Causal Link

But could some other, unknown force explain the recovery, rather than the shift in inflation expectations? To help answer this question, we gather evidence from Friedman and Schwartz (1963) and the historical narrative record.

In their *Monetary History of the United States*, Friedman and Schwartz claim that the “economic recovery in the half-year after the panic owed nothing to monetary expansion.”<sup>122</sup> After correcting for statistical discrepancies caused by a shift in the treatment of restricted and unrestricted deposits

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<sup>122</sup> Friedman and Schwartz (1963, p. 433).

in unlicensed banks, they conclude that the money stock rose only slightly after March 1933.<sup>123</sup> Yet, despite small changes in the money supply, the U.S. economy experienced four months of extraordinary growth in the spring of 1933. According to the Federal Reserve, industrial production rose 57 percent from March to July (see Figure 1). Department store sales, as shown in Figure 6, increased nearly 20 percent in the same period. Prices also rose, though less remarkably—Figure 2 shows that wholesale prices (PPI) rose 14 percent while consumer prices increased 4 percent from March to July. This expansion in total nominal spending without a commensurate growth in the money supply indicates that any explanation of the recovery should be consistent with an increase in the velocity of money in circulation. This increase in velocity can be easily confirmed using the accounting identity  $MV=PY$ . With the price level (P) little changed during this period and the money supply (M) not increasing in line with the expansion in output (Y), there must have been a corresponding increase in velocity (V). Friedman and Schwartz also validate this interpretation by pointing to the reduction in the public's money balances relative to income (an increase in the velocity of money) as an important contributor to the recovery after the banking panic (pp. 433–64).

Thus, the evidence suggests that the force driving the increase in the velocity of money also explains the bulk of the recovery. What then spurred this rapid increase in velocity? The narrative record provides a clear answer: a sudden change in expectations. The editors of the *Economist* attributed the rapid recovery to the “enhanced velocity of monetary circulation” and identified a sudden shift in market expectations—or in their words, “a change in national psychology”—as the source of this increase in velocity:

Though much has been heard of America's ‘inflationary’ intentions, of actual inflation, so far, there has been none. The entire increase in America's economic activity is due to enhanced velocity of monetary circulation, reflecting a change in national psychology. (“Investment Notes. Wall Street Prospects,” *Economist*, July 1, 1933)

Not only does the above passage from the *Economist* corroborate the quantity theory interpretation of events outlined above, but it also reveals that contemporaries attributed the rapid increase in velocity to a dramatic change in market expectations.

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<sup>123</sup> Friedman and Schwartz argue that the drastic decline in the recorded money stock in March 1933 and the consequent apparent rise throughout the rest of the year are “statistical fiction”: restricted and unrestricted deposits in unlicensed banks were counted in the recorded money stock before the bank holiday and excluded thereafter. They claim that correcting for this statistical discrepancy would yield “a milder decline (in the money stock) before March and a milder rise thereafter” (p. 428).

Moreover, the narrative record provides perhaps even stronger evidence that the Roosevelt regime shift, by inducing a change in market expectations toward higher inflation, drove this rapid increase in velocity. The narrative accounts directly discuss the transmission mechanism from higher inflationary expectations to real recovery during the second quarter of 1933. According to the *Economist*, consumers, acting in anticipation of price increases, increased their spending, helping to boost aggregate demand:

The depreciation of the dollar gave rise to fear—or hope—of inflation, which made people anxious to transfer their money into goods. The resultant increase in the demand for goods tended to raise prices and increase the volume of goods moved. (“1931 and 1933 – A Contrast, *Economist*, July 8, 1933)

Indeed, the available data on consumer demand corroborate this evidence: Figure 6 shows that seasonally adjusted retail sales jumped in April and continued to increase through August.

In addition, according to the *Economist*, wholesalers, acting in anticipation of price increases, increased their spending to build up their inventory holdings:

It appears that active buying has come from jobbers and wholesalers who are replenishing or accumulating stocks in anticipation of further advances in price. It is hardly too much to say that the rise in price has been more the cause than the result of demand...It may be difficult for European readers of the *Economist* to understand the mental processes of the average American confronted by a programme frankly described as inflation and devaluation...when an American shopkeeper acts in expectation of ‘inflation,’ he does not turn to a foreign currency, but increases his inventory or purchases common shares. Indeed, he does not visualize ‘inflation’ as a depreciation of the dollar but as a rise in other forms of value. (“United States. Rising Prices – Farm Bill – Bank Statement,” *Economist*, May 27, 1933)

In another issue, the *Economist* suggests that expectations of higher future input costs and growing consumer demand induced producers to increase production:

It is already being appreciated that the remarkable expansion in industrial activity is partly in anticipation of a rise in working costs and partly a gamble on a sustained increase in consumption. (“The Stock Exchange,” *Economist*, July 15, 1933)

These developments are also corroborated by the data. Industrial production increased from April to August at an average rate of 5.5 percent per month (see Figure 1). Moreover, as Figure 7 shows, durable manufacturing production, which tends to be more sensitive to interest rates and expectations of future growth, increased more strongly than nondurable manufacturing. Manufacturers’ inventories were slower to increase given the concurrent surge in production and sales, but they started to rise in June and increased throughout the rest of the year (see Figure 8).<sup>124</sup>

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<sup>124</sup> These results relate to the recent findings of Olney and Pacitti (2013), who show that recoveries are slower when services are a larger share of the economy. In the 1930s, manufacturing was still a significant share of U.S. output; therefore, as Olney and Pacitti find, forward-looking goods’ producers, by responding to anticipated increases in demand, could support a fast recovery.

We find similar evidence in the forecasts of contemporary business analysts. For example, in June 1933, the *Review of Economic Statistics* attributed the recovery and the improvement in business sentiment to the shift in inflation expectations:

Another important development of the month has been a great improvement of business sentiment, which seems to be very general ... Without much doubt the prospect of inflation is now a definite factor in determining business sentiment; and in this way it has been an important influence making for increase of general business activity. ("The United States: Index of General Business," *Review of Economic Statistics*, June 15, 1933, p. 98)

Thus, the narrative evidence indicates that a shift in inflation expectations changed consumer and producer behavior during the second quarter of 1933, helping to stimulate the recovery from the Depression. This evidence suggests that the regime shift, by changing market expectations, played a causal role in spurring the recovery. It also reinforces the notion that an inflationary regime shift accounts for the bulk of the recovery.<sup>125</sup>

### 3.3 Why Were the Effects So Rapid?

The preceding evidence suggests that a pro-inflation regime shift played a causal role in stimulating the rapid recovery during the second quarter of 1933 by raising inflation expectations. But why were the effects so rapid? The perception that Roosevelt had adopted a set of inflationary policies to raise prices coincided with an almost immediate surge in economic activity. Most empirical studies indicate that monetary policy, via a standard real interest rate channel, affects the

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<sup>125</sup> Three important caveats merit attention. First, expectations of higher inflation accompanied expectations of higher growth. Four years of deflation and depression made deflation synonymous with depression in the minds of many Americans. As a consequence, expectations of higher inflation—the reverse of deflation—were often linked with expectations of future growth. In a recent paper, Werning (2011) argues that such expectations for higher growth may have their own direct stimulative effects on consumer and producer behavior, independent of the effects of higher inflationary expectations. Yet, in the context of the Great Depression, higher inflation expectations—widely viewed as a corrective strategy for reversing four years of deflation—led to expectations of higher growth. Therefore, a persuasive argument could be made that expectations of higher growth in 1933 were themselves a byproduct of higher inflation expectations. Second, Friedman and Schwartz explain the expansion in velocity as the result of the revival of the banking system after the panic of 1933. While rehabilitation of the financial sector no doubt improved confidence and restored trust in the banking system, our reading of the narrative record nonetheless indicates that a shift in inflation expectations accounts for the bulk of the increase in velocity. Thus, our findings for the second quarter of 1933 are more consistent with the account of Temin and Wigmore (1990) that a regime shift caused the recovery. Third, while our findings indicate that a shift in inflation expectations played a causal role in stimulating the recovery, we cannot claim that the shift in inflation expectations explains the entirety of the recovery. A new study by Taylor and Neumann (2014) discusses and evaluates a variety of potential forces that may have played a role in the recovery. We direct interested readers to their study for further details.

real economy only with a lag.<sup>126</sup> Why then were the effects of the sudden surge in inflation expectations so rapid during the second quarter of 1933?

Our reading of the historical, narrative record indicates that the spurt in inflationary expectations was connected with a perception that prices might quickly rise to their pre-1929 levels. Roosevelt's policy statements communicated a commitment to price level targeting, rather than inflation targeting. In other words, Roosevelt pledged to raise prices to the levels that had prevailed before the depression; he did not pledge to permanently raise the rate of inflation.

The literature on price level targeting has shown that, relative to inflation targeting, this policy choice has the advantage of removing more uncertainty in terms of the future level of prices.<sup>127</sup> Under price-level targeting, inflation depends on the relationship between the current price level and its target. Inflation expectations will be higher the lower is the current price level. Thus, Roosevelt's commitment to a price-level target caused market participants to expect inflation until prices were back at that higher set target.

Most importantly, the narrative evidence indicates that there was a perception among some contemporary observers that prices would rise rapidly to the new target. Accordingly, consumers and producers needed to act quickly to stay ahead of inflation. For example, consider Figure 9, which appeared in *Business Week* on May 10, 1933. The headline reads, "Inflation Will Catch You IF YOU DON'T WATCH OUT," suggesting the need for consumers and businesses to act quickly to avoid being overcome by inflation. The advertisement contains the following warning about "the imminence of inflation":

Inflation means distribution of buying power, credit expansion, rising prices, restoration of markets, increased business turnover. But its benefits will not be distributed equally. Inflation will mean most to the business man who meets it half way, who increases his business pace to keep up with the accelerated dollar, who unleashes his jealously guarded cash reserves and credit, who first woos anew the markets he has neglected in the years just past...Inflation is already under way, will gather speed daily. ("Inflation Will Catch You," *Business Week*, May 10, 1933)

Thus, the narrative accounts reveal that market participants were receiving messages to act quickly—to stay ahead of inflation—which is consistent with the rapid increase in velocity

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<sup>126</sup> For example, see Romer and Romer (1989, 2004).

<sup>127</sup> The benefits from price level targeting in a rational expectations framework were first highlighted by Svensson (1999). For more recent work on the merits of price-level targeting in alleviating the effects of the zero lower bound for nominal interest rates, see Eggertsson and Woodford (2003) and Gaspar, Smets, and Vestin (2007).

documented earlier. The narrative accounts also indicate that the pro-inflationary regime shift had such immediate effects because Roosevelt’s pledge to raise the price level to its 1929 level induced market participants to believe that inflation was imminent and thus, that they needed to alter their behavior quickly.

### 3.4 After July 1933

As we can see in Figure 1, which displays monthly U.S. industrial production from 1929 to 1937, after the dramatic surge in industrial production between April and July, the recovery experienced a setback: Industrial production fell in August and continued to decline through November. What happened after July?

Since our study focuses on the shift in inflation expectations during the turning point—that is, during the spring of 1933—we reserve an extended discussion of the post-July period for the appendix (see Section A.3). To briefly summarize the findings in our appendix, we discuss two potential explanations, cited in the historical narrative record, for the setback. First, the implementation of the NIRA, which occurred at roughly the same time as the slowdown, may have generated uncertainty and caused other supply-side distortions that curtailed economic activity.<sup>128</sup> Second, beginning in early August, the Roosevelt Administration hinted that because the recovery had proceeded so smoothly and because the NIRA was about to be implemented, it no longer considered inflation necessary; as such, market participants’ expectations for inflation may have subsided, potentially derailing the recovery. For example, in early August, an article in the *New York Times* entitled “Inflation Put Off, Officials Suggest” reported:

The government does not contemplate entering upon inflation of the currency at present and will issue cheaper money only as a last resort to stimulate trade, according to a close adviser of the President who discussed financial policies with him this week. This official asserted today that the President was well satisfied with the business improvement and the government’s ability to borrow money at cheap rates. These are interpreted as good signs, and if the conditions continue as the recovery program broadened, it was believed no real inflation of the currency would be necessary. (“Inflation Put Off, Officials Suggest,” *New York Times*, August 4, 1933)

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<sup>128</sup> A new study by Taylor and Neumann (2014) finds evidence that the implementation of a subprogram of the NIRA—the President’s Reemployment Act (PRA)—may have played a role in the slowdown. The PRA set minimum wages at 40 cents per hour and reduced maximum workweeks to 35 hours to promote work sharing. In cross-sectional regressions, Taylor and Neumann find that lower-wage industries, which were more likely to be affected by the new minimum wage guidelines, experienced larger declines in output than higher-wage industries, which were less likely to be affected by the new guidelines, from July to November 1933.

As a result of these new signals from the Administration, the forecasters stopped predicting inflation. *Moody's* reported, "The Administration itself appears to act as though it were 'afraid' of inflation, at least, of any drastic inflation"<sup>129</sup> and the *Magazine of Wall Street* began to notice the existence of "inflationary doubts"<sup>130</sup> among the public. Such a sudden reversal of inflationary expectations could have derailed the recovery. Indeed, we direct interested readers to the appendix for an in-depth discussion of the various forces that may have derailed the recovery and of the evolution of inflation expectations in the second half of 1933.

Nonetheless, in spite of the setback, the recovery in the spring of 1933 marks the end of the Great Contraction of 1929–33 and the beginning of a longer recovery. The NBER dates the trough of the Depression in March 1933. Over the next three years, from 1933 to 1936, real GDP grew at an average rate of 11 percent per year. Indeed, with the exception of 1936–37, the U.S. economy continued to recover through World War II. Thus, the recovery during the spring of 1933 marks the turning point—the moment when the contraction ended and a real broad-based recovery started.<sup>131</sup>

## 4. Conclusion

This paper improves on our understanding of the recovery from the Depression in several ways. First, by analyzing a variety of evidence from the historical narrative record, which include newly constructed data series on inflation news coverage, the reports of contemporary observers contained in the historical news accounts, and the forecasts of contemporary business analysts, we show that inflation expectations shifted dramatically during the second quarter of 1933. Second, using a daily event study analysis, our paper identifies the key events that shifted inflation expectations and their impact on financial markets. Third, our study provides new quantitative and narrative evidence on the link between higher inflation expectations and the recovery in the spring of 1933.

This paper bolsters the work of two influential studies on the turning point from the Depression. Temin and Wigmore (1990) argue that a shift to a pro-inflationary macroeconomic policy regime

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<sup>129</sup> "Forces Behind the Stock Market," *Moody's Investment Survey*, September 11, 1933, p. 505.

<sup>130</sup> "Bond Prices Hold Firm," *Magazine of Wall Street*, September 16, 1933, p. 523.

<sup>131</sup> For an excellent study on the U.S. recovery throughout the 1930s—beyond the turning point—see Romer (1992).

triggered recovery, and Eggertsson (2008) develops a theoretical framework to explain how an abrupt shift in expectations could have generated a recovery. Yet, neither study incorporates narrative evidence to document that inflation expectations did indeed shift and that there was a widespread perception, among contemporary observers, of a dramatic change in the macroeconomic policy regime. This paper fills in this crucial gap.

Our paper also complements two new studies on the sources of recovery in the spring of 1933. Taylor and Neumann (2014) analyze a variety of forces that may have contributed to the recovery and post-July setback; of particular interest, they suggest that confidence effects, perhaps bolstered by the reopening and rehabilitation of the banking sector, sparked the initial increase in spending in March and early April 1933. Hausman (2013) concludes that, by raising farm incomes, devaluation directly stimulated demand in agricultural states, helping to boost output growth in 1933. Yet, both studies suggest that an increase in inflation expectations may be the key to understanding the rapid recovery. Taylor and Neumann observe that the recovery accelerated following the inflationary news shocks identified by our study, leading them to conclude that a shift toward positive inflation expectations played a critical role—if not the major role—in driving the rapid recovery. Moreover, Hausman notes that even if devaluation had direct effects, the positive impact of devaluation on farm incomes via higher prices for farm goods would likely be counteracted by the negative impact of higher prices for goods on urban consumers. As a result, Hausman concludes that another channel, beyond the direct effects of devaluation, must explain the overall recovery. He proposes that devaluation, by raising farm prices, signaled higher inflation and thereby stimulated the economy via increased inflation expectations. This channel is consistent with the narrative and quantitative evidence that we document on the link between the shift in inflation expectations and the recovery. Most notably, by showing that inflation expectations changed dramatically during the second quarter of 1933, our paper bolsters the findings of these two other studies.

Finally, this study shows that a well-targeted communications strategy can dramatically shift market expectations during a depression. A growing theoretical literature argues that a shift to higher inflationary expectations can stimulate a depressed economy under the appropriate set of conditions.<sup>132</sup> Yet, one area where this literature largely remains silent is over the question of *how*

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<sup>132</sup> See, for example, Bernanke (2000), Eggertsson and Woodford (2003), Krugman (1998, 2000), Svensson (2003), and Woodford (2003).

macroeconomic policymakers can influence expectations—enough to produce a recovery.<sup>133,134</sup> This paper shows that—under the right set of conditions—macroeconomic policymakers can engineer a change in expectations that can set a recovery in motion.<sup>135</sup> Indeed, during the second quarter of 1933, Roosevelt established a bold new macroeconomic policy regime—one that shifted inflation expectations and ended the Depression.

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<sup>133</sup> For example, Krugman (2000, p. 236), in discussing the theoretical basis for raising inflationary expectations in a liquidity trap, notes that “it is not enough to get central bankers to change their spots; one must also convince the market that the spots have changed, that is, actually change expectations. The truth is that economic theory does not offer a clear answer to how to make this happen.”

<sup>134</sup> Our study also adds to the literature on central bank communication strategies. In a survey of this literature, Blinder et al. (2008) emphasize the need for further research on how policymakers’ communication with the general public affects expectations and on what constitutes an “optimal” communication strategy.

<sup>135</sup> It is important to note, however, that Roosevelt benefited from a constellation of forces—growing political and public support for inflation and overwhelming one-party control of the executive and legislative branches of government—that may not always be within the reach of policymakers.

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## Tables and Figures

Table 1. Estimates for Expected Inflation in 1933 from Earlier Studies

	<b>Cecchetti (1992)</b>			<b>Hamilton (1992)</b>
	MA(2) Model	AR(1) Model	Interest- Rate Model	Commodities Futures Market
1933 Q1	-4.68	-6.48	22.07	
1933 First Third				-6.12
1933 Q2	-10.48	-11.75	12.39	
1933 Second Third				6.21
1933 Q3	7.07	3.51	-4.04	
1933 Final Third				3.96
1933 Q4	22.97	16.62	4.47	

Source: The first three columns display estimates of expected inflation from Cecchetti (1992), whereas the last column displays estimates from Hamilton (1992).

Note: Cecchetti's estimates for expected inflation correspond to quarters of the year, whereas Hamilton's estimates correspond to thirds of the year. Cecchetti uses three methods to extract forecasts for inflation—a MA(2) model, AR(1) model, and an interest-rate model. All numbers are expressed at annual rates.

Table 2. Evidence from the Historical News Record

Period	Evidence	Quote
From election campaign until inauguration	Roosevelt's policies were neither expected to be fundamentally different than Hoover's nor to end the Depression	No well-informed man in Wall Street expects the outcome of the election to make much real difference in business prospects. ("United States," <i>Economist</i> , October 29, 1932)
	Growing public support for inflation	Every member of the old and the new Congress is daily receiving scores of letters from constituents demanding that he support the 'Father Coughlin plan' [for inflation]. ("United States," <i>Economist</i> , March 3, 1933)
From inauguration until the exit from the gold standard	Speculation about Roosevelt pursuing inflationary policies to fight the Depression	The excited rumor goes the rounds in Washington and in Wall Street that inflation is imminent . . . This is inflation, if you like, in the sense that it is the reverse of deflation. ("Without Benefit of Greenbacks," <i>Business Week</i> , April 19, 1933)
The abandonment of the gold standard	The turning point	The long debate as to whether we are or are not going to attempt inflation is over—the Administration is committed. ("We Start," <i>Business Week</i> , April 26, 1933)

Table 2. Evidence from the Historical News Record (continued)

Period	Evidence	Quote
From the exit of the gold standard until July	The Thomas Inflation Amendment reinforced the notion that inflation was on the horizon.	<p>The country has exchanged a President with little effective power for a “currency dictator.” (“Foreign Stock Exchanges – New York,” <i>Economist</i>, May 13, 1933)</p> <p>The passage of the Thomas amendment . . . has answered the question of whether we are going to have inflation. (“Controlled Inflation,” <i>Business Week</i>, May 17, 1933)</p>
	Roosevelt's communication strategy	The administration has the definite objective of raising commodity prices to such an extent that those who borrowed will on the average be able to repay money with the same kind of dollar which they borrowed. (Franklin D. Roosevelt, “Second Fireside Chat,” May 7, 1933)
	Roosevelt reinforced his commitment to domestic objectives in his message to the World Economic Conference	We wish to make this perfectly clear: we are interested in American commodity prices. What is to be the value in terms of foreign currencies is not and cannot be our immediate concern. (“World Conference. The Monetary Declarations,” <i>Economist</i> July 8, 1933)

Table 3. Inflation Forecasts during Second Quarter 1933

<b>Forecaster</b>	<b>Issue</b>	<b>Forecast</b>
<i>Business Week</i>	Apr 19	Our forecast is an inflation which will almost precisely parallel the wartime inflation.
<i>The Magazine of Wall Street</i>	Apr 29	We move toward inflation.
<i>Review of Economic Statistics</i>	May 15	It has rather suddenly become evident that some sort of inflation is to come.
<i>Moody's Investment Survey</i>	May 18	The feeling seems to be that higher prices and activity will in any event be forced by more direct methods.
<i>Standard Trade and Securities</i>	May 24	A policy of price stimulation will be carried out.

Table 4. Movements in Stock Prices and Exchange Rates on the Dates of Inflationary News Shocks during Second Quarter 1933

Date of Inflationary News Shock	Percentage Change in Stock Index	Unit Change (in Cents) of the Dollar-to-Pound Exchange Rate	Unit Change (in Cents) of the Dollar-to-Franc Exchange Rate
April 19	7.18	19.50	23.50
April 28	6.11	6.75	17.00
May 24	1.97	1.37	1.00
May 26	2.91	2.00	2.13
June 19	7.21	7.00	7.50
Avg. April–July	0.58	0.99	1.27

Note 1: For the second inflationary news shock, the table reports the change on April 29—rather than April 28. The Senate passed the Thomas Amendment and adjourned at 7:02 p.m., after the close of markets on April 28. As a result, financial markets could not process the news until April 29, the following day.

Note 2: To provide a benchmark, the last line in the table shows the average daily change in stock prices and exchange rates between April and July.

Source: The stock price data come from *Standard Trade and Securities* and the exchange rate data come from the daily issues of the *New York Times*.

Table 5. Regression Results: Response of Financial Markets to an Inflationary News Shock

	Dependent Variable: Change in Log			
	(1) Stock Prices	(2) Dollar-to- Pound Exch. Rate	(3) Dollar-to- Franc Exch. Rate	(4) Inflationary News Coverage
Inflationary News Shock Dummy	0.047** (0.013)	0.018** (0.006)	0.021** (0.006)	-0.287 (0.283)
Lagged Inflationary News Shock Dummy	0.023 (0.014)	0.011+ (0.006)	0.004 (0.007)	0.612* (0.283)
Constant	0.002 (0.003)	0.001 (0.001)	0.002 (0.001)	-0.013 (0.059)
Observations	100	101	101	121
R-squared	0.13	0.11	0.11	0.05

Note: The dependent variable is the log change in stock prices, the dollar-to-pound exchange rate, the dollar-to-franc exchange rate, or the number of news articles containing the term “inflation” or “inflationary” in five daily newspapers (*New York Times*, *Wall Street Journal*, *Los Angeles Times*, *Chicago Tribune*, and *Washington Post*). The stock price data come from *Standard Trade and Securities*, and the exchange rate data come from the daily issues of the *New York Times*. The regression is estimated from April 1, 1933, to July 31, 1933. Standard errors are in parentheses; +  $p < 0.10$ , \*  $p < 0.05$ , and \*\*  $p < 0.01$ .

Source: *Standard Trade and Securities*.

Table 6. Estimated Output Equations

	(1) Bernanke (1983)	(2) With Regime Shift Dummy	(3) With Regime Shift Dummy and Exchange Rate
Monthly IP growth (t-1)	0.611** (0.0625)	0.519** (0.0620)	0.519** (0.0621)
Monthly IP growth (t-2)	-0.123* (0.0606)	-0.125* (0.0576)	-0.125* (0.0577)
Shocks to M1	0.350** (0.113)	0.400** (0.108)	0.399** (0.108)
Shocks to M1 (t-1)	0.0668 (0.114)	0.156 (0.110)	0.156 (0.110)
Shocks to M1 (t-2)	0.119 (0.115)	0.205+ (0.110)	0.205+ (0.110)
Shocks to M1 (t-3)	0.161 (0.112)	0.277* (0.108)	0.275* (0.109)
DBANKS	-0.000055** (0.000011)	-0.000037** (0.000011)	-0.000037** (0.000011)
DBANKS (t-1)	-0.000027* (0.000011)	-0.000021+ (0.000011)	-0.000021* (0.000011)
DFAILS	-0.000085 (0.000065)	-0.000046 (0.000063)	-0.000046 (0.000063)
DFAILS (t-1)	-0.00015* (0.000065)	-0.000081 (0.000063)	-0.000082 (0.000063)
Roosevelt dummy		0.0697** (0.0135)	0.069** (0.0136)
ER: pounds per dollar			0.0023 (0.0066)
Observations	250	250	250
Adj. R-Squared	0.433	0.487	0.486
p-val Breusch–Godfrey test	0.296	0.099	0.099

Note: Data are monthly; standard errors are in parenthesis; +  $p < 0.10$ , \*  $p < 0.05$ , and \*\*  $p < 0.01$ . Sources: The industrial production index is from the *Federal Reserve's G.17 Industrial Production and Capacity Utilization Statistical Release* (revision 2013); M1 is from Friedman and Schwartz (1963), Table A-1; the wholesale price index is from NBER macrohistory series m04048; deposits of failing banks are from *Survey of Current Business, Biennial Supplement*; and liabilities of failing banks and exchange rates are from the *Federal Reserve Bulletin*. See text for details on construction of variables.

Table 7. Percentage Change in Industrial Production in the Four Months after  
Suspension of the Gold Standard

Country	Date	% Change in Industrial Production
Austria	Sep 1931	-5.5
Belgium	Mar 1935	3.2
Canada	Sep 1931	-12.1
Chile	Apr 1932	6.0
Czechoslovakia	Sep 1931	-20.8
France	Oct 1936	8.2
Germany	Jul 1931	-15.4
Hungary	Q3 1931	-8.6
Italy	May 1934	5.6
Japan	Dec 1931	-5.2
Poland	Apr 1936	2.8
Sweden	Sep 1931	3.2
United Kingdom	Q3 1931	9.0
United States	Mar 1933	69.5
Average, Excluding U.S.		-2.6

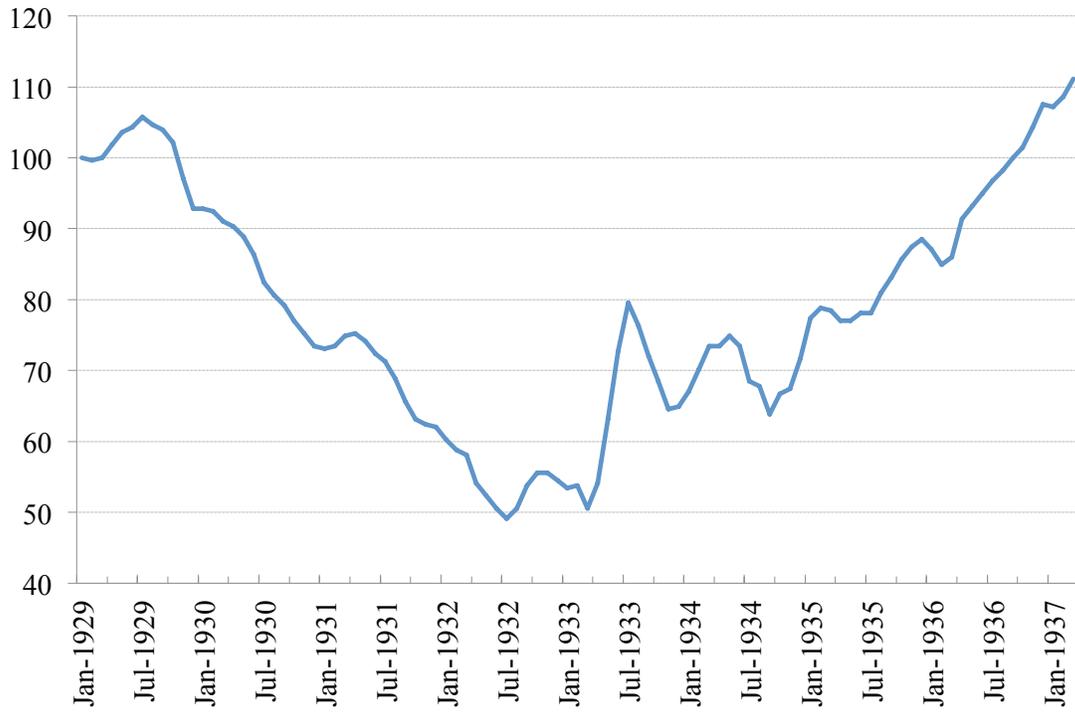
Source: All data are from various issues of the *League of Nations Statistical Yearbook*, which may be downloaded at <http://digital.library.northwestern.edu/league/stat.html>

Note 1: The data reflect the percentage change in industrial output in the four months following suspension of the gold standard, with two exceptions. The League of Nations only reports quarterly indices of industrial production for Hungary and the U.K. As a result, the table reports the percentage change in industrial production from the quarter of suspension to the following quarter for those two countries.

Note 2: Dates of suspension come from Bernanke and James (1991), which also originate with the League of Nations. Bernanke and James list three dates: suspension of gold standard, foreign exchange control, and devaluation. Occasionally, these three dates differ. In cases where dates differ, we use the earliest date. For example, Bernanke and James list the U.S. as suspending the gold standard and imposing foreign exchange controls in March 1933, but devaluing in April 1933. Thus, the table above lists March 1933 as the date of suspension for the U.S. However, the results

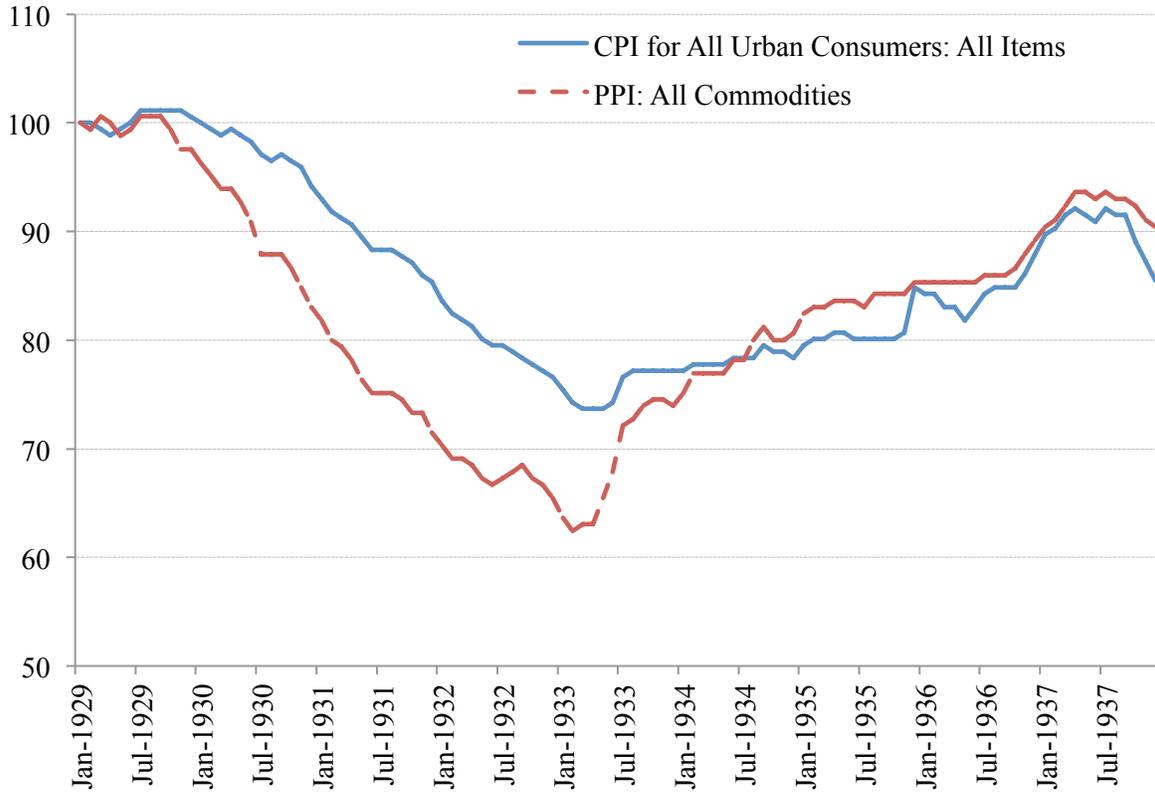
are not sensitive to the method used to construct these dates. Because the increase in economic activity in the U.S. was so large relative to other countries' experiences, the main findings still hold when the U.S. suspension is dated in April and when dates for other countries vary among the three categories listed by Bernanke and James. Thus, the results are robust to different methods in identifying dates of suspension.

Figure 1. Industrial Production, Seasonally Adjusted, 1929–1937 (Jan 1929 = 100)



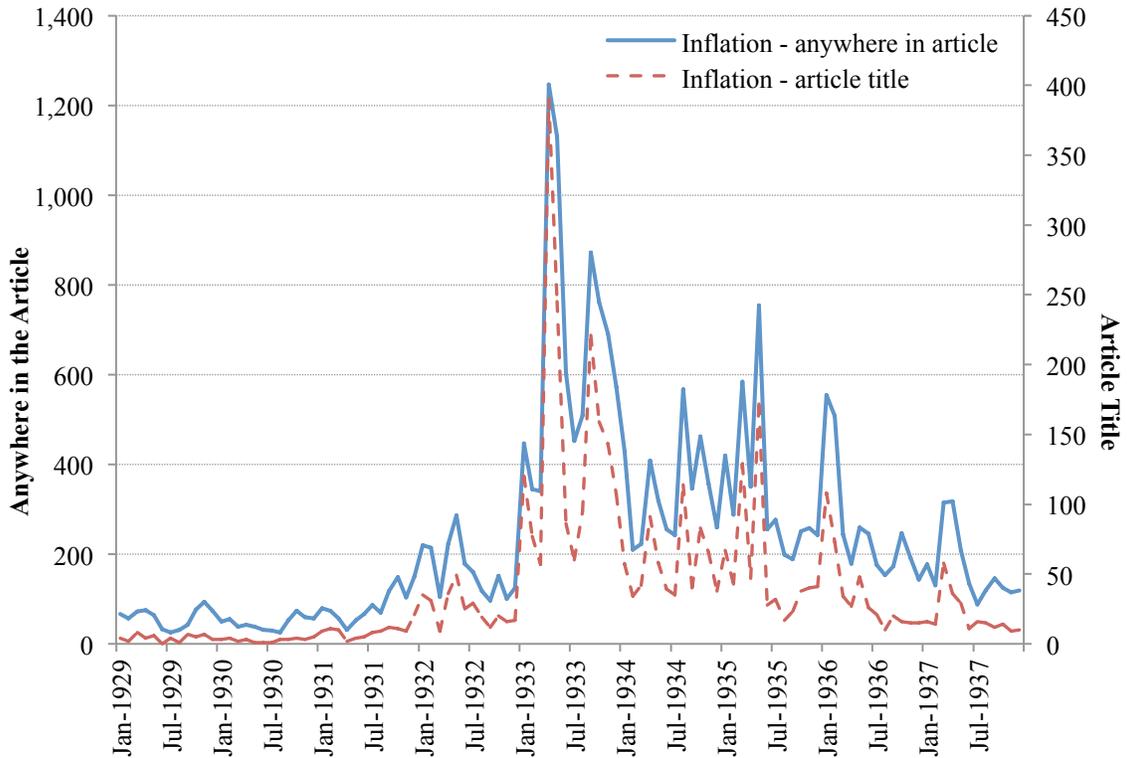
Source: Federal Reserve Board, Statistical Release G.17, “Industrial Production and Capacity Utilization,” 2013.

Figure 2. Price Indexes, 1929–1937 (Jan 1929 = 100)



Source: Federal Reserve Economic Data (FRED) series Consumer Price Index for All Urban Consumers (CPIAUCNS) and Producer Price Index: All Commodities (PPIACO), not seasonally adjusted.

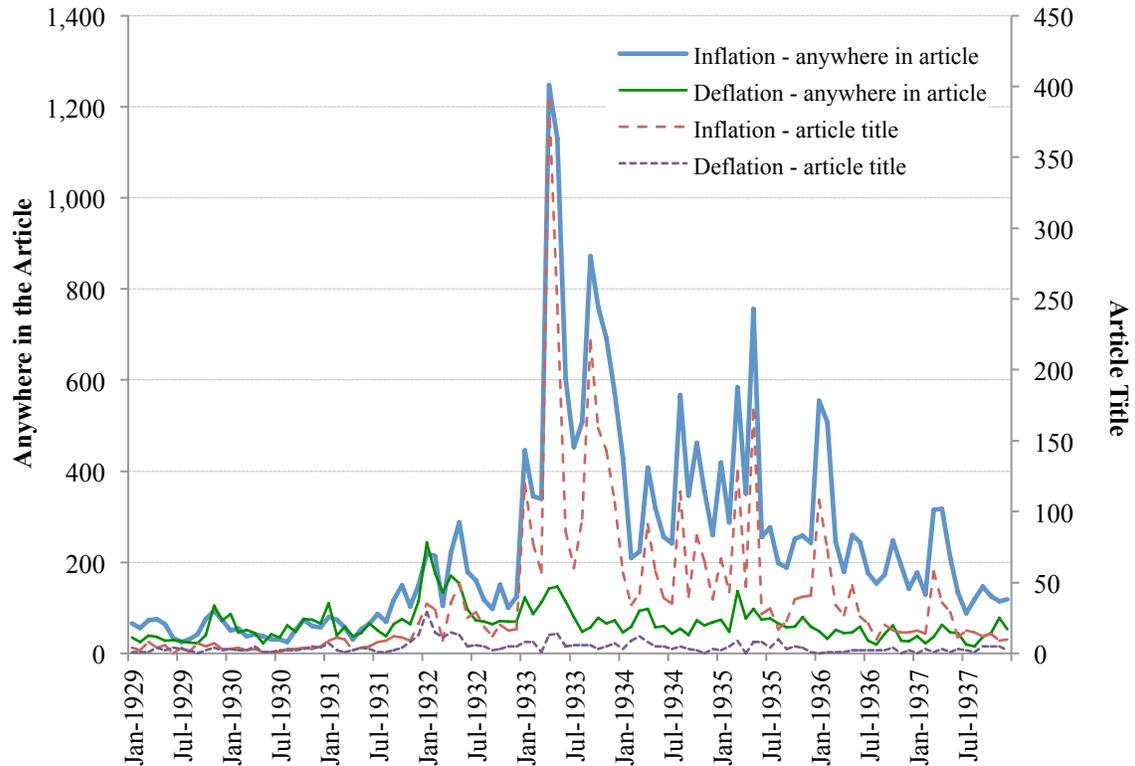
Figure 3. Monthly Frequency of the Term “Inflation”



Note: The figure displays the monthly frequency of the terms “inflation” or “inflationary” aggregated across five national daily news sources: the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, the *Chicago Tribune*, and the *Washington Post*. These newspapers are available electronically via ProQuest. One series considers only the article’s title while the other series considers the entire article.

Source: ProQuest Historical Newspapers.

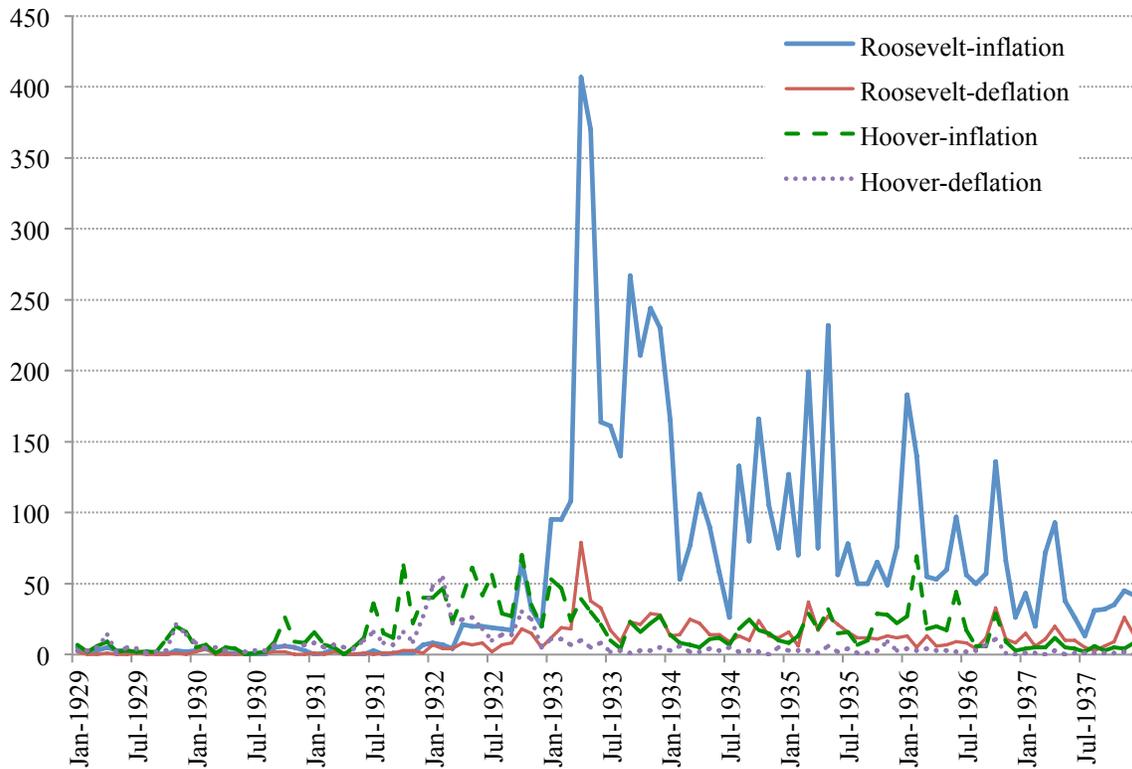
Figure 4. Monthly Frequency of the Terms “Inflation” and “Deflation”



Note: The figure displays the monthly frequency of the following terms: “inflation” or “inflationary” and “deflation” or “deflationary.” For each term, one series considers only the article’s title while the other series considers the entire article. The figure presents the aggregate results across five national daily news sources: the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, the *Chicago Tribune*, and the *Washington Post*. These newspapers are available electronically via ProQuest.

Source: ProQuest Historical Newspapers.

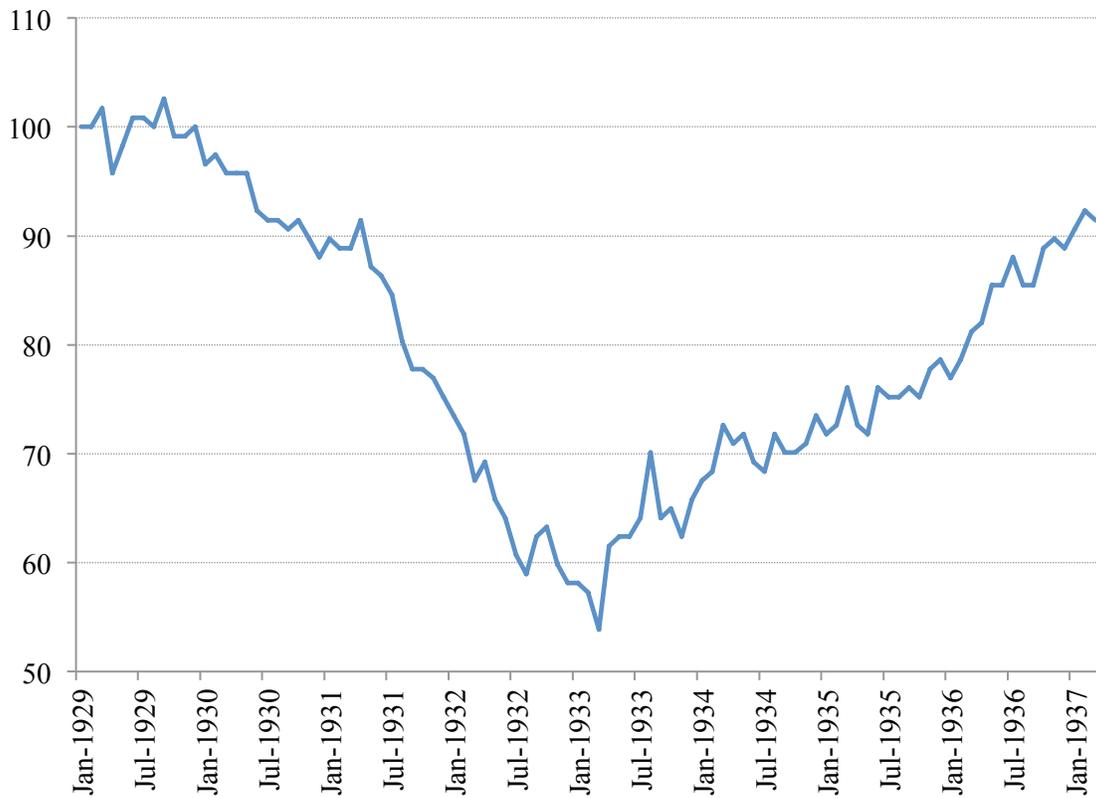
Figure 5. Monthly Frequency of the Terms “Inflation” and “Deflation” Combined with Presidents’ Names, Hoover and Roosevelt



Note: The figure displays the monthly frequency of the following four combinations of terms: (1) Roosevelt and inflation, (2) Roosevelt and deflation, (3) Hoover and inflation, and (4) Hoover and deflation. We treat the terms “inflationary” and “deflationary” as synonymous with “inflation” and “deflation,” respectively. All series consider the entire article and present the aggregate results for five national daily news sources: the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, the *Chicago Tribune*, and the *Washington Post*. These newspapers are available electronically via ProQuest.

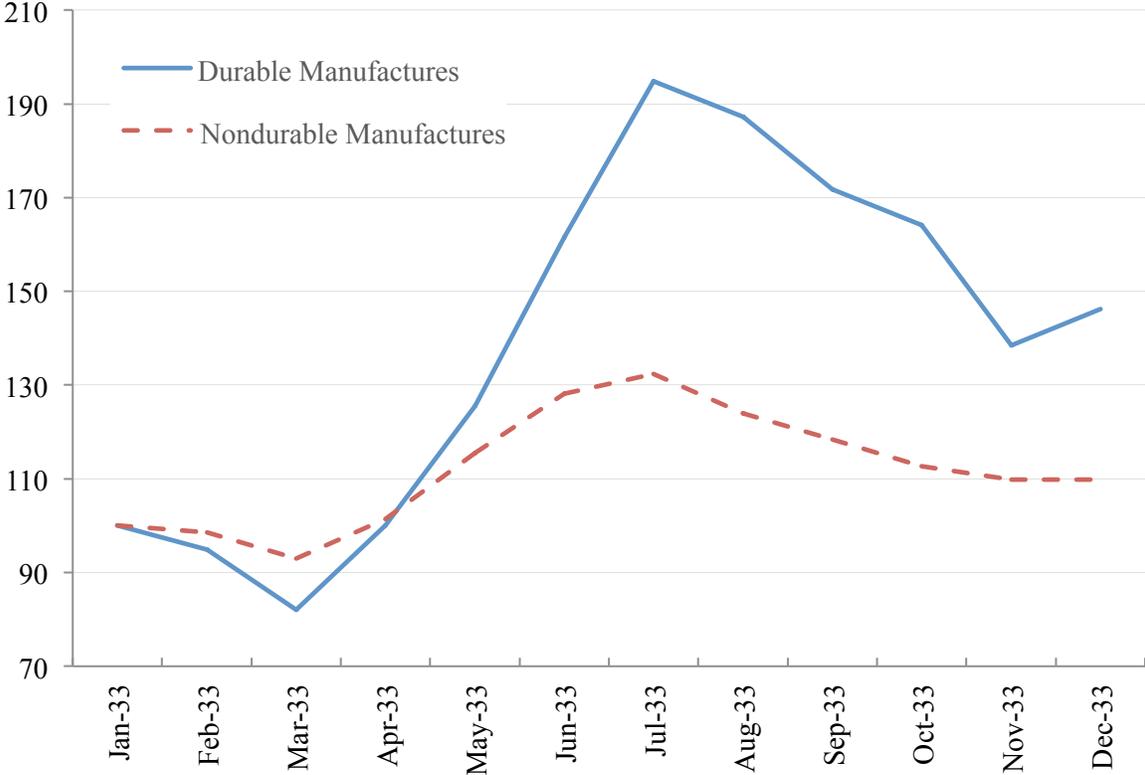
Source: ProQuest Historical Newspapers.

Figure 6. Retail Sales, Seasonally Adjusted (Jan 1929 = 100)



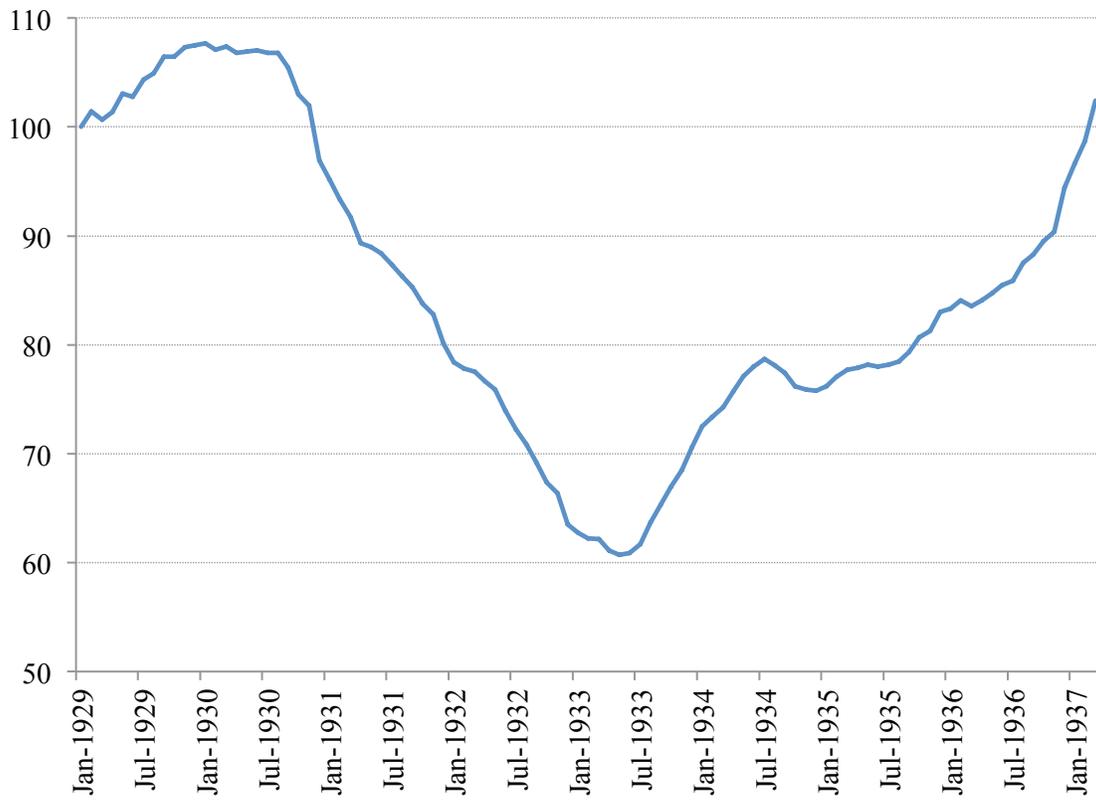
Source: NBER macrohistory series m06002a, seasonally adjusted (from FRED).

Figure 7. Durable and Nondurable Manufacturing Production in 1933 (Jan 1933 = 100)



Source: Federal Reserve Bulletin August 1940.

Figure 8. Manufacturers' Inventories, Seasonally Adjusted (Jan 1929 = 100)



Source: NBER macrohistory series m05104a, seasonally adjusted (from FRED).



## Appendix

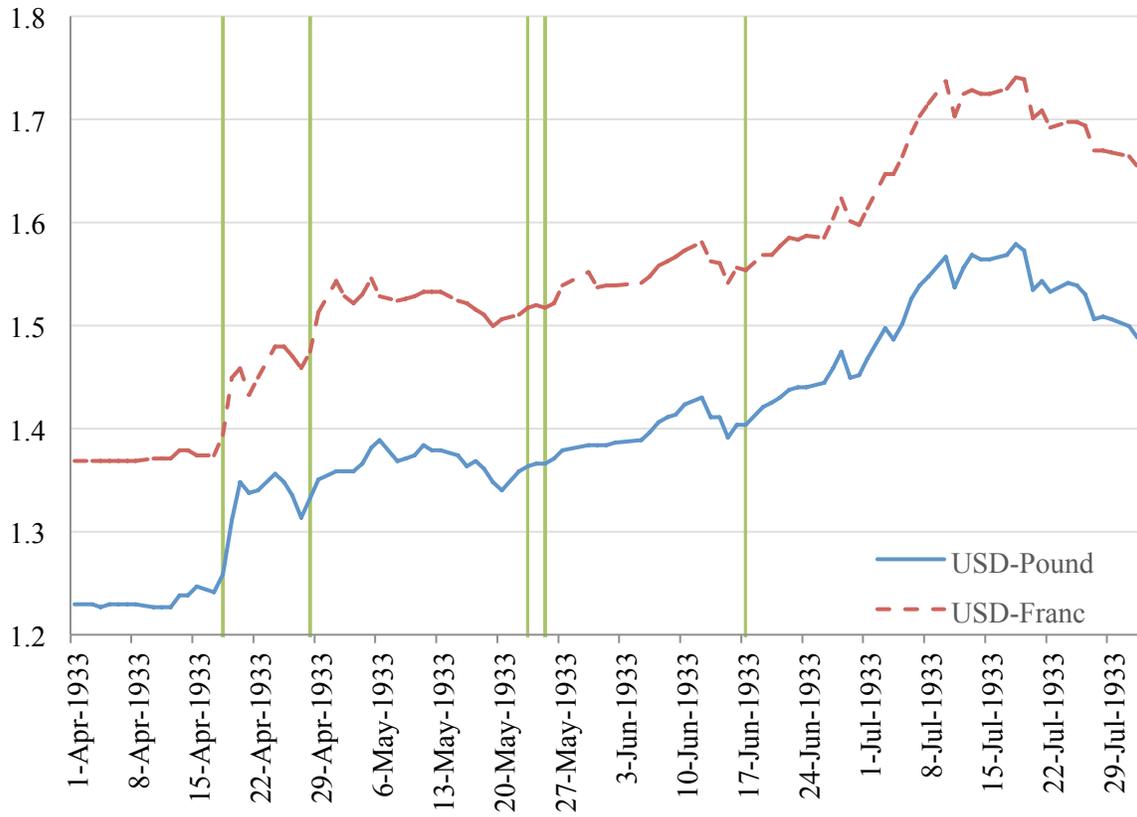
### A.1 Figures

Figure A1. Log Daily Stock Price Index



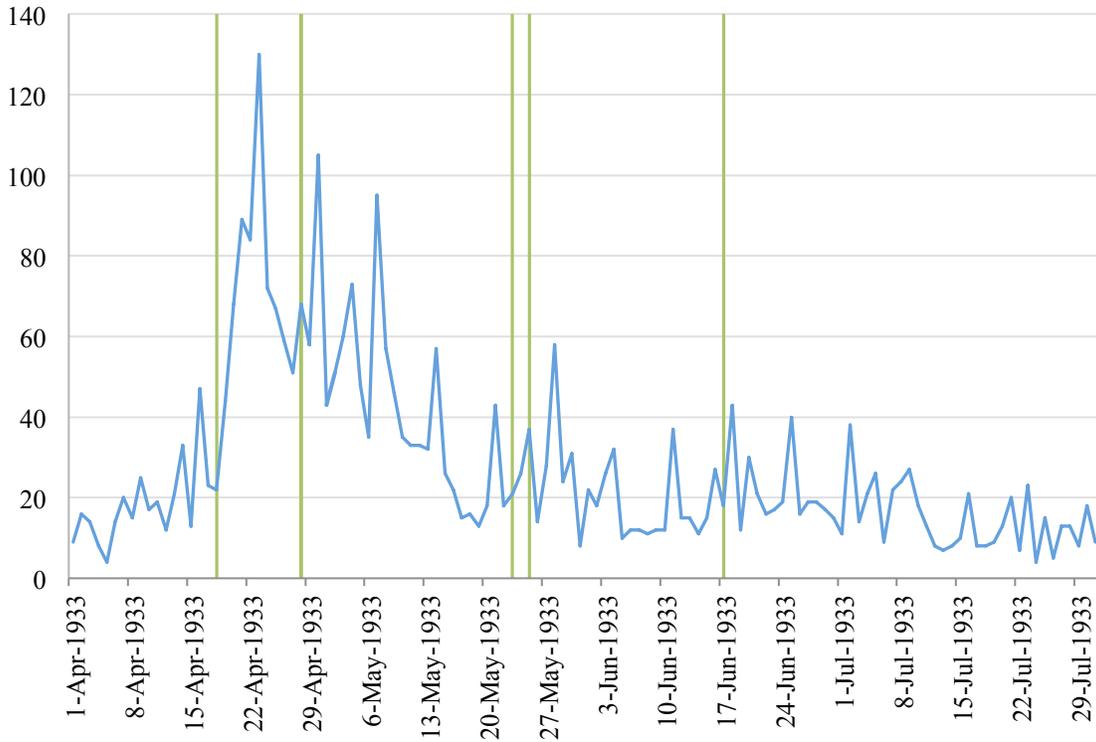
Note: The stock price data come from Standard Statistics Company's *Standard Trade and Securities*. Specifically, we use the Standard's Daily Stock Price Index—a stock price index that reflects 90 composite stocks and that is weighted by the number of shares of each stock outstanding. The index is at a daily frequency and based on daily closing prices. The vertical lines indicate the dates of inflationary news shocks (see text).

Figure A2. Log Daily Exchange Rates,  
 U.S. Dollar to British Pound and U.S. Dollar to French Franc



Note: Data come from daily issues of the *New York Times*. Increases indicate depreciation/devaluation. The vertical lines indicate the dates of inflationary news shocks (see text).

Figure A3. Inflationary News Coverage



Note: The figure displays the daily frequency of the terms “inflation” or “inflationary” across five national daily news sources: the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, the *Chicago Tribune*, and the *Washington Post*. These newspapers are available electronically via ProQuest. The series considers the entire article. The vertical lines indicate the dates of inflationary news shocks (see text).

Source: ProQuest Historical Newspapers.

## A.2 Narrative Evidence that the Inflationary News Shocks Sustained Elevated Inflation Expectations

The inflationary news shocks documented in Section 2 played an important role in influencing expectations. These news shocks reinforced the perception that inflation was on the horizon and had a large impact on financial markets. In addition, we find suggestive evidence in the narrative record that these news shocks were critical in sustaining elevated inflation expectations: When press reports began to suggest a wavering in inflationary enthusiasm, these inflationary events played a crucial role in reinforcing the perception that inflation was on the horizon. We describe this evidence below, period by period. In the process, we provide greater insights into the evolution of inflation expectations from April to July 1933.

### *Period between the Abandonment of the Gold Standard on April 19 (Inflationary News Shock #1) and the Passage in the Senate of the Inflation Amendment on April 28 (Inflationary News Shock #2)*

The narrative evidence indicates that contemporary observers widely interpreted the events of April 19<sup>th</sup> as inflationary. However, in describing market sentiment on April 28, the *New York Times* suggested a waning of inflationary enthusiasm, at least among stock traders: “Commission houses conceded for the first time that the enthusiasm born of the inflation movement in Washington had been partly exhausted.”<sup>136</sup> The next day, however, the overnight news of the passage of the Thomas Inflation Amendment in the Senate caused a speculative frenzy on Wall Street. As a result, the *New York Times* reported, “The boisterous speculative enthusiasm displayed in the share market yesterday as the aftermath of the passage of the inflation measure in the Senate caused an agreeable surprise.”<sup>137</sup>

### *Period between the Passage in the Senate of the Inflation Amendment on April 28 (Inflationary News Shock #2) and the Events at the End of May (Inflationary News Shocks #3 and #4)*

For nearly a month after the passage of the Thomas Amendment, the Administration took no additional measures to raise inflation. Perhaps, as a result of this inaction, the *New York Times* described an atmosphere of “speculative apathy” toward the end of May.<sup>138</sup> However, financial markets reacted quickly as soon as rumors that the government would begin to conduct open-market operations (inflationary news shock #3) started to circulate. The *New York Times* reported, “Reinvigorated after its long pause, the stock market gave Wall Street more encouragement yesterday than at any time in the last fortnight. The revival of speculative interest brought out of hiding many traders who had shown no more than a mild curiosity in the last week or so.”<sup>139</sup> The *Wall Street Journal* corroborated this assessment, reporting that the formal confirmation from the Administration of its authorization of open-market purchases of government securities “stimulated a return of inflationary psychology.”<sup>140</sup> In addition, the news on May 26 of Roosevelt’s decision to repeal the gold clause and of a reduction in the rediscount rate of the Federal Reserve Bank of New

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<sup>136</sup> “Topics in Wall Street,” *New York Times*, April 29, 1933.

<sup>137</sup> “Topics in Wall Street,” *New York Times*, April 30, 1933.

<sup>138</sup> “Topics in Wall Street,” *New York Times*, May 24, 1933.

<sup>139</sup> “Topics in Wall Street,” *New York Times*, May 24, 1933.

<sup>140</sup> “Abreast of the Market,” *Wall Street Journal*, May 25, 1933.

York (inflationary news shock #4) further reinforced the perception that the government was taking concrete actions to raise prices. In summarizing market sentiment, the *Wall Street Journal* reported that the Administration's actions on May 26 acted as "another psychological spur to revive inflation talk."<sup>141</sup>

#### *Period between the Events at the End of May (Inflationary News Shocks #3 and #4) and Roosevelt's Message to the World Economic Conference on June 19 (Inflationary News Shock #5)*

Shortly after the World Economic Conference convened, rumors began to circulate that a plan to stabilize the value of the dollar was gaining traction, causing market participants to doubt the government's commitment to inflation. The *New York Times* reported, "The stock market indicated by its actions that it continued to have doubts whether the roseate path of inflation was as clear as it had seemed to be. Bankers, for the most part, felt that if some plan for steadying the exchanges had not yet been settled on, it soon would be."<sup>142</sup> The *Wall Street Journal* also noted a "slackening in inflationary psychology."<sup>143</sup> These accounts suggest that inflation expectations may have been on the verge of wavering due to rumors of dollar stabilization. However, Roosevelt's June 19<sup>th</sup> message to the World Economic Conference (inflationary news shock #5) changed market participants' perceptions. By renouncing the notion of currency stabilization, Roosevelt signaled the Administration's commitment to inflation, leading market observers to conclude that higher prices were on the horizon. The *New York Times* summarized this perception, writing "Apparently, the attitude of the administration, it is pointed out, is that it must be free to use the [inflationary] powers granted to it by Congress... Until the domestic price level is on a satisfactory plane the consensus is that the administration will regard international commerce as of a secondary nature."<sup>144</sup> The *Wall Street Journal* corroborated this assessment, reporting that Roosevelt's message "revived inflationary excitement"<sup>145</sup>

#### *Summary*

To summarize, there is suggestive evidence contained in the historical news record that the five inflationary news shocks were critical in sustaining positive inflationary expectations from April to July. It appears that Roosevelt's actions reasserted his Administration's commitment to raise prices, precisely at the moments when inflationary enthusiasm, as reported in the press, was showing signs of wavering.

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<sup>141</sup> "The Gold Clause Payment Move," *Wall Street Journal*, May 29, 1933.

<sup>142</sup> "Stabilization," *New York Times*, June 17, 1933.

<sup>143</sup> "Looking Ahead," *Wall Street Journal*, June 17, 1933.

<sup>144</sup> "World Economic Conference," *New York Times*, June 20, 1933.

<sup>145</sup> "Abreast of the Market," *Wall Street Journal*, June 20, 1933.

### A.3 Why Did the Recovery Falter During the Second Half of 1933?

After growing rapidly for four months, output fell in August and continued to decline throughout most of 1933. Why did the recovery falter in August? The historical news accounts and forecasts of contemporary business analysts suggest two potential explanations: (1) the implementation of the National Industrial Recovery Act generated uncertainty, causing firms to curtail spending, and (2) mixed messages from the Roosevelt administration regarding its commitment to an inflationary regime caused a change in market participants' inflationary expectations. We consider these potential explanations below.

#### *The Implementation of the National Industrial Recovery Act*

The NIRA codes began to be implemented during the summer of 1933—toward the end of July and continuing into August. The reports of contemporary observers contained in both the historical news record and the forecasts of business analysts indict the NIRA as a factor in the slowdown. Specifically, *Standard Trade and Securities* attributes the slowdown in economic activity to uncertainty generated by the NIRA codes:

The codes, coupled with the aggressive campaign being waged by NRA constitute, in our judgment, the most important single cause for the hesitation in activity which is now becoming evident and which the inflationary moves are designed to combat...It is the widespread uncertainty as to the longer term aspects of the codes which is an essential factor in somewhat curtailing activity at the moment. ("NRA the Chief Cause of Uncertainty," *Standard Trade and Securities*, September 1, 1933, p. 390)

*Moody's* also cites the introduction of NIRA codes as "one of the original causes of the recession in business since July,"<sup>146</sup> and the *Magazine of Wall Street* echoes this assessment, reporting, "the problem of price uncertainties during the interim while codes are being formulated and put into effect has caused sharp curtailment of incoming business in several basic lines."<sup>147</sup>

#### *Mixed Inflation Messages from the Roosevelt Administration*

Another explanation for the slowdown is that mixed messages from Roosevelt caused market participants to doubt the Administration's commitment to an inflationary regime—Temin and Wigmore (1990) consider this to be the main force behind the August slowdown. The historical narrative record provides evidence in support of this potential explanation.

During the last week of July and the first week of August, the news accounts reported that Roosevelt was no longer planning to use his powers to generate inflation. On July 31, the *New York Times* published an article, entitled "Money Inflation Declared Unlikely," with the caption: "President's Advisers Say the Recovery Program Will Be Tested to Full Without It." According to the *New York Times*, Administration officials revealed that because the recovery had enjoyed four months of solid growth and the NIRA was about to be implemented, inflation might no longer be necessary to achieve the Administration's aims:

The policy of the administration is to test to the full extent the Industrial Recovery Act program before even seriously considering entrance upon any inflationary currency program, advisers of the President declare... Before he left on his vacation the President privately

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<sup>146</sup> "Position of Industries," *Moody's Investment Survey*, October 19, 1933, p. 409.

<sup>147</sup> "Taking the Pulse of Business," *Magazine of Wall Street*, August 16, 1933, p. 437.

expressed the opinion that inflation of the currency did not appear as a necessary companion of the Recovery Acts. (“Money Inflation Declared Unlikely,” *New York Times*, July 31, 1933)

A few days later, on August 3, the *New York Times* reported that inflation had been ‘called off’: “Talk of inflation has, in the parlance of the markets, been ‘soft-pedaled’ lately. There had been reports that, for the time being, inflation had been ‘called off.’”<sup>148</sup> The next day, the *New York Times* ran an article, entitled, “Inflation Put Off, Officials Suggest.” The article characterized inflation as only a distant possibility:

The government does not contemplate entering upon inflation of the currency at present and will issue cheaper money only as a last resort to stimulate trade, according to a close adviser of the President who discussed financial policies with him this week. This official asserted today that the President was well satisfied with the business improvement and the government’s ability to borrow money at cheap rates. These are interpreted as good signs, and if the conditions continue as the recovery program broadened, it was believed no real inflation of the currency would be necessary. The President’s attitude is represented to be that more money need not be put into circulation if the recovery plan succeeds. If it is apparent after a thorough test of the recovery plans that additional stimulation to trade is necessary, then the President, it was said, will not hesitate to try some form of real currency inflation. But viewing the situation today, this official said that inflation appeared to be far distant and may never be made a part of the Roosevelt administration’s policies. (“Inflation Put Off, Officials Suggest,” *New York Times*, August 4, 1933)

Thus, during the business week of Monday July 31 to Friday August 4, the press accounts interpreted the Administration’s actions as indicating that inflation was no longer likely.

As a result of these signals, the forecasters began to express doubt about the Administration’s commitment to an inflationary regime. In mid-August, the *Review of Economic Statistics*, one of the early forecasters to predict inflation during the second quarter of 1933, backpedalled, voicing uncertainty about the prospects for inflation:

The government has at its command the power to inflate our currency, an expedient which, so far, it has not actually resorted to and has only threatened to employ. It may be that the President is on this point more conservative than most of his supporters, and will resort to measures of active inflation only as a last resort. (“General Economic Conditions,” *Review of Economic Statistics*, August 15, 1933, p. 122)

Toward the end of August, when the recovery began to show signs of faltering, the Federal Reserve Banks increased their purchases of government securities, and Roosevelt authorized the Treasury to buy newly mined gold at the world price—two actions that were interpreted as inflationary.<sup>149</sup> Nonetheless, shortly thereafter, the Administration continued to indicate a backpedalling from inflation, according to the news accounts. In mid-September, Senator Thomas, the author of the Thomas Inflation Amendment, led a charge in the U.S. Congress, reportedly representing more than one hundred members of Congress, for additional inflationary measures—for what the news accounts termed “outright currency inflation.”<sup>150</sup> However, in response to this movement, Secretary

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<sup>148</sup> “Inflation Rumors Send Dollar Down,” *New York Times*, August 3, 1933.

<sup>149</sup> *Standard Trade and Securities* described these actions as “[inflationary] stimulants” and explained why they were perceived as inflationary: “Treasury purchase of gold for sale at the world price is not, apse facto, devaluation of the American dollar. But it is the one absolutely essential initial step if ultimately the gold content of the dollar is to be officially reduced. To the present owner of dollars, the move is important, therefore, as indicating that the gold value of these dollars will later officially be lowered.” (“The Business Prospect,” *Standard Trade and Securities*, September 1, 1933, pp. 389-90)

<sup>150</sup> “A Week of Confusing Influences,” *Moody’s Investment Survey*, September 25, 1933, p. 461.

of Agriculture Henry Wallace declared that the Administration was “flatly opposed to currency inflation.”<sup>151</sup>

Due to these developments, perceptions regarding the Administration’s commitment to an inflationary regime continued to waver in September. *Moody’s* reported, “the Administration itself appears to act as though it were ‘afraid’ of inflation, at least, of any drastic inflation.”<sup>152</sup> The *Magazine of Wall Street* noted the existence of “inflationary doubts”<sup>153</sup> among the public. In addition, *Moody’s* described Roosevelt’s policies as “confusing”<sup>154</sup> and reported that inflation expectations among farmers—an important subset of market participants—had subsided due to these confusing messages: “The more radical protagonists of higher prices (farmers, for instance) are dissatisfied with the credit inflation steps thus far taken, because they do not understand them.”<sup>155</sup> The forecasters themselves often vacillated, at times expressing the view that Roosevelt’s price level target remained unchanged, but other times expressing doubt. *Moody’s* summarized the confusing situation, by noting, “The Administration has been steering a middle course between these two semi-hostile fronts, and has failed to clarify its monetary policy even for the near future.”<sup>156</sup>

By October, the forecasters began to conclude that the Roosevelt Administration had taken a definite turn toward a more conservative attitude, with respect to inflation. *Moody’s* noted, “the Administration [has turned] for the time being toward somewhat more conservative monetary theories and practices”<sup>157</sup> and concluded, “A clearer shift in the direction of more conservatism in the Administration’s monetary policy was revealed by President Roosevelt’s two addresses, in Chicago and New York.”<sup>158</sup> The *Magazine of Wall Street* corroborated this assessment, reporting “Curiously enough, some of the President’s advisors are telling him that the surest way to get plenty of money into circulation and raise prices is not to print any more but to announce resolutely that none will be printed and to proclaim triumphantly a new gold standard now, once and for all.”<sup>159</sup> A new term for the Administration’s policies—“conservative inflation”—began to appear in the press; however, *Moody’s* reported that it only served to confuse the public:

The Administration’s latest moves have apparently been calculated to reassure long term capital. At the same time, however, Washington is committed to a policy of raising the price level considerably and is pursuing a lavish credit expansion program. These conflicting efforts of the Government at what may be termed ‘conservative inflation’ may well continue to confuse business and capital until either a purely conservative course or one of consistent inflation is determined upon. (“Positions of Industries,” *Moody’s Investment Survey*, October 19, 1933, p. 409)

Toward the end of October, however, Roosevelt appeared to embark on a reversal of a course of action by embracing the notion of inflation once again—perhaps as a result of continued weakness in economic activity. On October 22, Roosevelt gave a radio address, pledging to raise prices by reducing the gold content of the dollar via purchases of newly-mined gold by the Government. The

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<sup>151</sup> “A Week of Confusing Influences,” *Moody’s Investment Survey*, September 25, 1933, p. 461.

<sup>152</sup> “Forces Behind the Stock Market,” *Moody’s Investment Survey*, September 11, 1933, p. 505.

<sup>153</sup> “Bond Prices Hold Firm,” *Magazine of Wall Street*, September 16, 1933, p. 523.

<sup>154</sup> “A Week of Confusing Influences,” *Moody’s Investment Survey*, September 25, 1933, p. 461.

<sup>155</sup> “A Week of Confusing Influences,” *Moody’s Investment Survey*, September 25, 1933, p. 461.

<sup>156</sup> “A Week of Confusing Influences,” *Moody’s Investment Survey*, September 25, 1933, p. 461.

<sup>157</sup> “The Outlook,” *Moody’s Investment Survey*, October 9, 1933, p. 443.

<sup>158</sup> “Review of the Week,” *Moody’s Investment Survey*, October 9, 1933, p. 443.

<sup>159</sup> “‘When, As and If’ We Inflate,” *Magazine of Wall Street*, September 30, 1933, p. 564.

*Magazine of Wall Street* concluded that this action by Roosevelt “re-introduces the factor of inflation.”<sup>160</sup>

These mixed messages differ substantially from Roosevelt’s steadfast embrace of inflation during the second quarter of 1933. Indeed, the *Magazine of Wall Street* summarized the Administration’s post-July communications strategy as “alternating rumors and denials of inflation.”<sup>161</sup> Most importantly, these mixed signals caused market participants to reevaluate the Administration’s commitment to an inflationary regime. By the end of the year, the *Review of Economic Statistics*, which had confidently predicted inflation in its May, June, and July issues, declared that it could no longer venture a forecast: “The great uncertainty created by the Administration’s currency measures renders scientific forecast impossible.”<sup>162</sup> *Moody’s* noted a decline in public discussions about inflation: “Inflation talk may well continue to be subdued.”<sup>163</sup> Indeed, according to the historical narrative record, due to mixed messages from the Roosevelt Administration, inflation expectations declined during the second half of 1933.

Moreover, the narrative accounts identify this decline in inflation expectations as a cause of the setback to the recovery. For example, the *Magazine of Wall Street* connects the evolution of inflation expectations in 1933 to both the recovery during the second quarter of the year and the subsequent slowdown:

In view of the fact that spectacular gains in foreign exchange rates, staple commodities, common stock prices and business activity during the second quarter were prompted largely by expectations of inflation, it is easy to understand why reaction set in as soon as doubts over the imminence of inflation began to appear on the horizon. (“Taking the Pulse of Business,” *Magazine of Wall Street*, October 28, 1933, p. 35)

Thus, according to the narrative accounts, the mixed messages of the Roosevelt Administration, by moderating inflation expectations, curtailed economic activity during the second half of 1933.<sup>164</sup>

## Summary

To summarize, the narrative accounts suggest two potential explanations for the slowdown in economic activity: the implementation of the NIRA and the mixed signals from the Roosevelt Administration regarding inflation. We reserve further evaluation of these two competing explanations for future research and direct interested readers to a recent study by Taylor and Neumann (2014), which sheds important insights into the forces behind the setback to the recovery.

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<sup>160</sup> “The Trend of Events,” *Magazine of Wall Street*, October 28, 1933, p. 5.

<sup>161</sup> “Taking the Pulse of Business,” *Magazine of Wall Street*, September 30, 1933, p. 585.

<sup>162</sup> “The United States: Index of General Business,” *Review of Economic Statistics*, December 15, 1933, p. 201.

<sup>163</sup> “The Outlook,” *Moody’s Investment Survey*, October 9, 1933, p. 443.

<sup>164</sup> It is important to note that the absence of any substantial inflation to materialize by August 1933—four months after Roosevelt pledged to raise prices—might have made market participants particularly susceptible to hints from the Roosevelt Administration that it was retreating from inflation. Indeed, in this kind of climate, the slightest hint from the Administration that it would not pursue inflation may have been enough to shatter the public’s inflationary expectations.