Recovery from the Great Depression began in March 1933, simultaneous to Franklin Roosevelt’s inauguration. However, the pace of that recovery between that date and the Second World War was extremely uneven with some dramatic starts and stops. Between March and July 1933, manufacturing production rose 78 percent, production of durable goods was up 199 percent, total industrial production rose 57 percent, and the Dow Jones Industrial Average rose 71 percent. Then the economy contracted sharply again beginning in August 1933—the July 1933 level of industrial production was not reached again until August 1935. This paper addresses two questions. What factors were responsible for bringing about the sharp recovery in the spring of 1933 and what factors brought this short-lived economic surge to an end?

I. Introduction

The financial crisis of 2008 has placed renewed interest upon what may be its closest historical president, the downturn of 1929 to 1933. Initially scholars focused heavily on parallels in the causes of the two downturns, but more recent emphasis has been placed on aspects of recovery. While there is general agreement that recovery from the Great Recession since 2009 has been slow and unsteady, the swiftness of the recovery from the Great Depression is a source of debate. Those impressed with the recovery note that 1933 to 1937 saw the fastest four year growth in US history. Others express disappointment in the recovery by noting that the unemployment rate remained between 14 and 20 percent until the outbreak of war in Europe.

But there can be no debate that the start of the recovery, which was almost simultaneous to Franklin Roosevelt’s taking office in March 1933, was spectacular. Between its March nadir and July manufacturing production rose 78 percent, production of durable goods was up 199 percent, industrial production rose 57 percent, and the Dow Jones Industrial Average rose 71 percent. Nearly every aspect of the US economy kicked into a gear that has never been seen before or since. If one calculates the four-month growth rates in Industrial Production and
Manufacturing Production for every month between November 1884 and May 2014, the March to July 1933 period growth rates are by far the largest.\(^1\) Excluding periods containing March to July 1933, the next largest four-month period of growth in the United States since 1884 was September 1934 to January 1935, with growth rates of 21.3 and 23.2 in Industrial Production and Manufacturing respectively—around one-third of the growth rates that occurred during the spring of 1933.

While such a torrid pace of growth could not have continued indefinitely, it is interesting to note that industrial production had risen at the 12 percent per month clip it averaged in April, May, June, and July for 3 more months, it would have exceeded its 1929 peak and reached a level it would not ultimately reach until 1936. Had it grown at this rate for one additional month (i.e. 4 total), industrial production would have exceeded its 1929 levels plus a 3 percent growth trend, a level it would not reach until the Second World War. This is illustrated in Figure 1, where a dashed line extrapolates growth in industrial production at the March to July pace through November 1933. We do not at all mean to imply that the dashed line is a counterfactual—one would strongly expect growth would naturally slow as the economy approached its productive capacity. The line is only meant to show how remarkable these four months of growth were by considering what would have happened had they been duplicated.

\(^1\) For 1884 to 1919, we employed the Miron-Romer seasonally adjusted measure of industrial production and for the post 1919 era we used Federal Reserve Board Industrial Production and Capacity Utilization (G.17), Major Industry Groups, Seies B50001.S (Seasonally Adjusted). Romer, Christina. “Remeasuring Business Cycles.” *Journal of Economic History* 54 (September 1994): 573-609.
Figure 1
Industrial Production, 1929 – 1934

Dashed Line shows August through November 1933
Had Growth Continued at 12 Percent per Month Trend of March to July


Figure 1 also illustrates that a significant plunge in industrial production began in August 1933. From August to November 1933 manufacturing production fell 31 percent, production of durable goods fell 48 percent, and overall industrial production fell 19 percent making this four month downturn more severe than the 18 month “Great Recession” of 2007-2009 and quite comparable to the depression of 1920-1921. Much of the progress that Recovery Spring brought was offset by the sharp contraction of the late summer and fall of 1933. While a slowdown in growth was inevitable, such a dramatic turnaround from speedy growth to rapid decline begs an
explanation. The economy did not again reach its July 1933 level of industrial production until August 1935, at which point it once again began to surge, growing 37 percent over the next 20 months.

This paper has three major goals. First it documents the extent of the recovery that took place in the spring of 1933. Second, it explores potential factors that drove the recovery. Inflationary expectations have been highlighted in the past literature, but there are several additional factors that could have played supporting roles including financial reforms, currency devaluation, increases to consumer and business confidence, and anticipation of cartelization. Third, it analyzes the causes of the downturn that began in August 1933.

II. An Unparalleled Economic Season: Recovery Spring 1933

Hindsight clearly shows that when Roosevelt took office on March 4, 1933, the US economy was at the bottom of a three and a half year slump—the longest and steepest downturn in the nation’s history. One may argue that an unprecedentedly sharp recovery could have been expected given the extraordinary depth of the downturn. For some historical perspective, Table 1 compares the five-month recoveries in industrial production and in manufacturing from the four largest downturns of the last 100 years—1920-1921, 1929-1933, 1981-1982, and 2007-2009. The table shows how far each measure was below its prior peak and how much each had risen five months after the trough. While it is certainly true that the downturn of the 1930s was much more severe—only 1920-1921 even comes close in terms of how far the trough was below peak—it is also clear that the recovery that occurred in the spring of 1933 was unprecedented both in absolute as well as relative terms.
Table 1

5 Month Recovery of Industrial Production and Manufacturing During Four Major Downturns

<table>
<thead>
<tr>
<th>Recession</th>
<th>Industrial Production</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Decline From Previous Peak</td>
<td>% Rise 5 Months After Trough</td>
</tr>
<tr>
<td>1920-1921</td>
<td>32.54</td>
<td>1.42</td>
</tr>
<tr>
<td>1929-1933</td>
<td>52.20</td>
<td>57.45</td>
</tr>
<tr>
<td>2007-2009</td>
<td>17.04</td>
<td>2.98</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Industrial Production and Capacity Utilization (G.17), Major Industry Groups, Series B50001.S (Total Index) and B00004.S (Manufacturing SIC). Both series are seasonally adjusted.

To gain perspectives broader than simply production of manufacturing output, Table 2 shows the percentage movement in the Dow Jones Industrial Index (DJIA), employment in manufacturing (measured in number of workers on payrolls), average hourly workweek in manufacturing, and hours of labor input (number of workers on payrolls * average hours per week) between the peak of August 1929 and the trough of March 1933, the “Recovery Spring” time period of March through July 1933, and the July 1933 peak through November 1933. Additionally, to see whether different types of production markets were affected differently, we include percentage movements in farm marketings, producer goods, and consumer goods. The recovery that began with President Roosevelt’s inauguration occurred across the board, but was particularly strong in producer goods that surged nearly 115 percent in five months.

Interestingly, this was not a jobless recovery simply driven by gains in worker productivity (output per labor hour). In raw numbers, the average number of hours per week rose from 32.1 in March 1933 to 42.9 in July, reducing the nation’s underemployment problem. Likewise number of workers on payroll in manufacturing rose from 5,029,000 in March to
6,155,000 in July. Putting these two forces together, total labor hours in the manufacturing sector increased by over 103 million hours, a 63.57 percent increase, in just five months.

**Table 2**

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>Dow Jones Industrial Index</th>
<th>Employment (# of workers) Manufacturing</th>
<th>Average Hours Per Week, Mfg</th>
<th>Labor Input, Mfg</th>
<th>Farm Marketings</th>
<th>Producer Goods</th>
<th>Consumer Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 29 – March 33</td>
<td>-83.92%</td>
<td>-43.02%</td>
<td>-33.33%</td>
<td>-62.13%</td>
<td>-41.59%</td>
<td>-64.23%</td>
<td>-38.08%</td>
</tr>
<tr>
<td>March 33 – July 33</td>
<td>70.65%</td>
<td>22.39%</td>
<td>33.64%</td>
<td>63.57%</td>
<td>37.88%</td>
<td>114.95%</td>
<td>36.51%</td>
</tr>
<tr>
<td>July 33 – Nov. 33</td>
<td>-3.15%</td>
<td>6.50%</td>
<td>-21.21%</td>
<td>-16.09%</td>
<td>15.38%</td>
<td>-38.55%</td>
<td>-16.57%</td>
</tr>
</tbody>
</table>

*Notes:* Labor Input, Mfg is calculated by multiplying Employment Manufacturing by Hours Per Week, Mfg. Farm Marketings, Producer Goods, and Consumer Goods are seasonally adjusted, while the other four measures are not.

*Sources:* Dow Jones Industrial Average, NBER Series m11009b; Employment Manufacturing, NBER Series m08010; Average Hours Per Week, Mfg, NBER Series m08029; Farm Marketings NBER Series 12009; Producer Goods NBER Series M01055; Consumer Goods NBER Series M01056.

To further address the extent to which the output burst of Recovery Spring was facilitated by either by productivity enhancements or businesses expanding employment, we analyze a few important industries. Industry employment data are reported as indices rather than actual number employed. Still we can roughly approximate productivity growth in an industry by subtracting the labor input growth rate from the growth rate in the industry’s output, where the labor input growth rate is calculated as the monthly growth rate of the product of the employment index and average hourly workweek. Table 3 reports output, employment, and average workweek for three time periods—March 1933, July 1933, and July 1932. The July 1932 data is included for
comparison to July 1933 because some of these industries have strong seasonal movements. The final three columns include percentage growth in output between March and July 1933, percentage growth in labor input between the same period, as well as our approximation of productivity growth between these months.

Table 3  
Performance of Various Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Output</th>
<th>Employment</th>
<th>Average Work-Week (Hours)</th>
<th>% Growth Output March-July</th>
<th>% Growth Labor Input March-July</th>
<th>Estimated Productivity % Growth March-July</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobiles</td>
<td># of cars</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>95,000</td>
<td>56.0</td>
<td>20.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>97,000</td>
<td>50.1</td>
<td>26.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>191,000</td>
<td>66.8</td>
<td>40.7</td>
<td>96.91</td>
<td>103.25</td>
<td>-6.34</td>
</tr>
<tr>
<td>Chemical Mfg</td>
<td>Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>59</td>
<td>77.1</td>
<td>37.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>68</td>
<td>88.8</td>
<td>38.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>84</td>
<td>103.2</td>
<td>41.5</td>
<td>23.53</td>
<td>25.27</td>
<td>-1.74</td>
</tr>
<tr>
<td>Machinery</td>
<td>Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>36</td>
<td>43.4</td>
<td>28.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>34</td>
<td>42.6</td>
<td>28.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>57</td>
<td>49.5</td>
<td>40.9</td>
<td>67.65</td>
<td>68.53</td>
<td>-0.88</td>
</tr>
<tr>
<td>Paper and Pulp</td>
<td>Short Tons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>561,400</td>
<td>78.9</td>
<td>37.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>671,500</td>
<td>78.3</td>
<td>39.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>923,800</td>
<td>88.5</td>
<td>46.6</td>
<td>37.57</td>
<td>34.71</td>
<td>2.87</td>
</tr>
<tr>
<td>Shoes</td>
<td>Pairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>7.52 mil</td>
<td>80.9</td>
<td>40.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>7.26 mil</td>
<td>88.2</td>
<td>39.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>15.07 mil</td>
<td>96.5</td>
<td>49.7</td>
<td>107.58</td>
<td>37.66</td>
<td>69.91</td>
</tr>
<tr>
<td>Steel</td>
<td>Tons per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1932</td>
<td>29.5</td>
<td>54.2</td>
<td>24.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1933</td>
<td>33</td>
<td>57.2</td>
<td>26.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1933</td>
<td>116.4</td>
<td>75.3</td>
<td>42.4</td>
<td>252.73</td>
<td>108.27</td>
<td>144.46</td>
</tr>
</tbody>
</table>

Sources: Automobiles from NBER Series m8144 (employment), m8201a (hours), m1107 (output); Chemical Manufacturing from NBER Series m8216a (employment), m8214a (hours), m1279a (output); Machinery from NBER Series m8224 (employment), m8222 (hours), m1277a (output); Paper and Pulp from NBER Series m8104 (employment), m8234a (hours), m1105 (output); Shoes from NBER Series m8103 (employment), m8199a (hours), m1099 (output); Steel from NBER Series m8015 (employment), m8208a (hours), m1135 (output).
Clearly Automobiles and Steel, industries that are strongly tied together, saw extremely large growth in production during Recovery Spring. This performance was not driven by seasonal factors alone—in both cases July 1932 production was even lower than it was in March 1933. In the case of Automobiles, the labor input (total hours worked) usage grew faster than output between March and July 1933. About two thirds of the growth in labor input can be attributed to longer average workweeks while the remaining one third can be attributed to increases in number of workers. Steel production jumped a remarkable 253 percent between March and July 1933, and in this case productivity increases drove a large portion of this run-up. Still, total labor hours more than doubled during these five months in steel factories and once again about two thirds of this run up can be attributed to longer workweeks.²

Shoe production also more than doubled during Recovery Spring from 7.26 million pairs in March to over 15 million pairs in July. In this industry the employment gains were far less dramatic than those seen in autos and steel as the industry had only a little over 9 percent more workers on payrolls in July than it did in March, although the average workweek did rise over 25 percent. The Machinery, Chemicals, and Paper industries all saw very little change in worker productivity as growth in output and growth in labor inputs closely mirrored each other, each growing between 23 and 68 percent.

² Interestingly, the steel industry was viewed early in the recovery as a “weather-vane” for the economy more broadly. An April 20 analysis on the financial pages of the *New York Times* noted that steel had seen “more substantial improvement than any other major industry” in the past few weeks. Steel executives noted that “the next two weeks will determine whether the pick up is a flash in the pan or the forerunner of a broad expansion.” (“Topics in Wall Street,” *New York Times*, April 20, 1933, p. 27.)
III. What Drove Recovery Spring?

Romer (1992) argues that the rapid growth between 1933 and 1937 can be attributed to conventional aggregate demand stimulus in the form of money expansion. However, her work focuses broadly on the four-year recovery—she uses annual data—rather than the turning point. Temin and Wigmore (1990) produced the seminal paper with respect to analyzing the beginnings of the sharp recovery of spring 1933. The authors argue that the recovery that began with Roosevelt’s inauguration was driven by a regime change a la Sargent (1983). President Roosevelt broke dramatically from Herbert Hoover’s deflationary polices by removing the US from the gold standard and devaluing the dollar, promoting fiscal expansion, and championing the virtues of inflation. According to Temin and Wigmore, “the devaluation of April-July 1933 was the proximate cause of the recovery.” The devaluation, the authors note, had direct effects on prices and production throughout the economy—particularly in agriculture where commodities prices such as those on grain and cotton rose dramatically creating a large income effect for farmers who in turn stepped up their purchase of durable goods like cars—and also had indirect effects through its signal of a new inflationary policy regime. Eggertsson (2008) extends Temin and Wigmore by employing a dynamic stochastic general equilibrium model that reaffirms the notion that the regime change that Roosevelt brought generated an endogenous shift in inflationary expectations that stimulated aggregate demand and brought about the end of the Great Depression. Eggertsson’s calibrations suggest that between 70 and 80 percent of the recovery in inflation and output between 1933 and 1937 can be explained by the regime shift.

Hausman (2013), in his dissertation, offers empirical support to the Temin and Wigmore’s hypothesis by showing that auto sales rose much faster between March and July 1933
in rural agricultural states than in urban ones. But Hausman also notes that higher agricultural prices, while creating a positive income effect for farmers, would have had a negative effect on urban manufacturing workers. One way that higher crop prices could have had a simulative effect on the macroeconomy—rather than on just the agricultural sector—Hausman (p. 127) argues, is if they also “raised urban consumption by creating expectations of future prices”—a hypothesis which the author supports through narrative evidence including several newspaper advertisements in May and June 1933 suggesting to that consumers buy now before prices rise further.

In a current working paper, Jalil and Rua (2014) note that while Temin and Wigmore (1990) and Eggertsson (2008) create a “strong theoretical basis and compelling historical argument” for the notion that inflation expectations were behind the turnaround of spring 1933, neither provides much direct evidence that inflation expectations actually changed. In fact, the estimates of inflationary expectation of Cecchetti (1992) and Hamilton (1992) do not generally show strong inflationary expectations occurring until the third quarter of 1933, well after the recovery began. Jalil and Rua note, however, that the time-series methodology of these two studies assumes that market participants form expectations based upon previous trends, and that this assumption may not apply during a major regime shift. Jalil and Rua examine narrative evidence from contemporary media and business analysts. They also perform an event analysis using data on the number of times the word “inflation” appears in newspaper articles and show that financial markets reacted positively when inflationary events occurred. Their findings support the notion that inflation expectations surged in the second quarter of 1933, and thus provide direct evidence for the regime change that Temin and Wigmore and Eggertsson claim. Jalil and Rua also attempt to tease out the macroeconomic effects of the policy regime shift by
including a dummy variable for April to July 1933 in Bernanke’s (1983) regressions in which output is dependent upon money and financial crisis indicators. This exercise suggests that between 48 and 88 percent of the surge in industrial production between March and July 1933 was caused by the regime shift.

*Our Narrative Study of Inflation Expectations*

In the early stages of our research, and prior to knowing of the contemporaneous narrative study of Jalil and Rau (2014), we likewise performed a narrative examination of the *New York Times* and the *Wall Street Journal* to look for evidence as to whether contemporaries 1) reported a clear shift in inflation expectations and 2) whether they attributed the recovery of the spring 1933 to inflation expectations. As we feel that Jalil and Rau have done a careful and comprehensive analysis, we have dropped most of this out of the current paper. It is worth noting, however, that our analysis is largely in agreement with their findings—a shift in inflation expectations clearly did occur in the spring of 1933. However we questioned whether the timing of this change could have been responsible for the turning of the corner, which appears to have happened in mid to late March. It certainly fed the recovery in May, June, and July, but it is less clear as to whether it is responsible for the initial rise out of the trough.

Jalil and Rau’s narrative evidence points to April 19, when the nation abandoned the Gold Standard—importantly, an action that the authors claim was unanticipated—as the first major turning point and the Senate passing the Farm Relief Bill at the end on April 28 as the second—in this case they do not say whether or not this action was anticipated or not. We agree that these
were two major events that shifted inflation expectations.³ We also believe that the narrative evidence suggests that the events of April 28 were not fully anticipated. The New York Times financial pages noted that the surge in markets—the DJIA rose 2 percent on Friday the 28th and then another 6.4 percent on Monday May 1, when markets reopened—clearly suggested that economic actors had not fully anticipated the bill’s passage. There were likewise “violent repercussions” in the foreign exchange market where the dollar fell precipitously against all major currencies.⁴

Importantly, not all reactions to the April 28 “inflation bill” were positive. On May 1, the Times financial pages expressed hope that the “mischievous proposals” would not be as damaging as the “inflation manias of our past history.”⁵ A May 2 editorial proclaimed “the venture of a government ... into currency manipulation, has always led to awkward problems not foreseen” and a fear that “the ancient traditions and principles of public finance are no longer operative.”⁶ Even exporters were not immune to the pessimism. They felt that quotas and tariffs imposed by trading partners would soften, if not destroy, any advantage to exports that devaluation would bring. For these reasons, the Times editorial board argued “the theoretical advantages of depreciated currency in international commerce seldom materialize in practice.”⁷

³ There was a small surge in inflation expectations following the emergency gold embargo of March 9, 1933, but our narrative analysis shows that this abated. For example, when stocks declined significantly on March 21, the New York Times financial section attributed this to views that the ‘inflation scare’ of prior weeks had been overblown. Speculators had been “deluded by the emergency gold embargo applied here at the beginning of the bank holiday” into thinking that this was the first step toward devaluation. The market’s decline reflected a retreat in these inflationary expectations.
The misgivings regarding inflation did not abate in the following weeks. On May 14 it was reported that bankers were advocating more control of the currency markets, fearing that “the unstable condition in the foreign exchange market ... could explode at any time in a violent rally of the American monetary unit.”

While business activity increased in the week following the passage of the bill, analysts at Dun & Bradstreet concluded that “not all of the advances in commodities can be traced to inflationary moves, as the rise of many staples has been supported by a strong statistical base and continued broadening of general business improvement.” A May 2 editorial in the Wall Street Journal agreed with this analysis, stating that in addition to the inflation expectations, “there have also been positive indications, notably the pronounced increase in steel production, of a natural improvement in business conditions not attributable to the prospects for intentional inflation.” On May 10 the Times editorial board explained that “the initiative for better business must have occurred before the talk of currency tinkering began” and that while speculators had “been busy,” it was clear that “prices were already rising for other reasons.” Recovery, at this point, was seen as an inevitability “to be expected under any circumstances.”

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Timing of Monthly Data

The monthly data suggest March saw a decline in industrial production and other economic measures—March was the nadir of the Great Depression. The monthly data suggest that the upswing began in April—for example industrial production rose 7.1 percent in April after falling 6 percent in March. It is important to note that monthly data series, from broad industrial production to specific industry-level measures of output, wages, and employment were collected by the Bureau of Labor Statistics and other government agencies through surveys of firms, whereby these surveys generally reflect the pay period ending nearest the 15\textsuperscript{th} day of the month.\footnote{Today the BLS surveys are to reflect the pay period containing the 12\textsuperscript{th} day of the month.} Regardless of the length of the pay period—typically either one or two weeks—the numbers are adjusted to reflect what they would extrapolate to for a full month. Thus, the monthly data generally reflect conditions in the first half of the month, rather than the full month.

March 15 fell on Wednesday in 1933 and thus it is likely that the pay period ending nearest to that date would have been March 17 or 18. April 15 fell on Saturday and hence the pay period ending nearest that date would likely have been April 14 or 15. Thus the March 1933 data generally reflect economic conditions during the bank holiday rather than the conditions in the two weeks following it. Likewise, the April data reflect conditions prior to the two surprise announcements signaling inflation which occurred on April 19 and April 28. Growth accelerates more rapidly in May when industrial production jumps by an astounding 16.6 percent, and this jump was very likely aided by rising inflation expectations.

To summarize, we agree with the past literature that a jump in inflation expectations occurred in the spring of 1933—specifically it appears that this jump began in late April and accelerated in May. We agree that these had a positive effect on the recovery and were an
enormous driver of Recovery Spring. But the narrative evidence seems to suggest that the corner may have been turned before inflationary expectations took off. In the next section we pursue what other factors may have driven the recovery aside from changing expectations of future prices.

IV. Aside From Inflation Expectations, What Else Could Have Spurred Recovery Spring?

Eggertsson (2008) claims that around three-quarters of the recovery of 1933 to 1937 was driven by a regime shift in inflation expectations while Jalil and Rua (2014) estimate that between half and seven-eighths of the recovery of spring 1933 was likewise driven by inflationary regime change. Leaving inflation expectations, what other factors may have helped account for the economic surge of spring 1933?

First, we believe we can rule out the direct monetary factors that Romer (1992) and Friedman and Schwartz (1963) point toward for the 1933 to 1937 recovery. While the money stock rose 46 percent over these four years, it hit bottom in April 1933 and rose only 1.4 percent between April and July. By the end of 1933, the money stock had risen only 3.6 percent above its April low point.14 We believe we can also rule out direct fiscal factors. Between March and July 1933, the government spent $2.13 billion while collecting only $1.06 billion in revenues. Interestingly, however, between the same months for 1932, the government spent $2.26 billion while collecting only $811 million in revenue—net fiscal expansion was substantially larger

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14 Money Supply data are from NBER Series m14144a, “Money stock, commercial banks plus currency held by public, seasonally adjusted.”
during March to July 1932 than it was during March to July 1933, and thus it is difficult to attribute Recovery Spring to fiscal stimulus.\textsuperscript{15}

\textit{Banking System Reform}

One viable candidate that could have helped drive recovery in the spring of 1933 is the healing of the banking and financial system. On March 5, 1933 a nationwide bank holiday was instituted and four days later the Emergency Banking Act was signed into law. On March 12, Roosevelt provided what Dighe (2011, p. 51) calls “the ultimate boost to public confidence in the banks” with his fireside chat to 60 million Americans about what the Administration was doing to create a stable and effective banking system. Dighe documents the success of the banking holiday—banks began to open in stages beginning March 14—and contends that the policy had a dramatic positive effect on public confidence. On March 14, the \textit{Wall Street Journal} declared the banking crisis over, owing in no small part to the steps taken by Roosevelt and Congress.\textsuperscript{16} When stock markets opened on March 15, after voluntarily suspending trading coincident with the bank holiday, the Dow Jones Industrial Average recorded its largest one-day percentage gain in history of 15.3 percent. Roosevelt advisor Raymond Moley famously said that, “Capitalism was saved in eight days” (Dighe, 2011, p. 41). The following day the \textit{New York Times} wrote, “investors and traders promptly showed their approval of the reconstruction program of President Roosevelt.”\textsuperscript{17}

\textsuperscript{15} Government spending and government revenue data are from NBER Series m15005 and m15004 respectively.
In fact, a large literature beginning with Schumpeter (1911), with more recent important contributions from Levine (1997) and Rajan and Zingales (1999), amongst others, shows that effective financial intermediaries enhance economic efficiency and promote faster economic growth by helping allocate capital to its best uses. Still, measuring the impact of a healthy and effective financial system is challenging. One avenue would be to examine whether credit became more plentiful following the banking reforms of March 1933. Figure 3 shows that while the extension of credit toward the purchase of new automobiles rose sharply in the spring of 1933 relative to the spring of 1932, the seasonal jump was not dramatically out of line from years prior. Figure 4 also shows that while the value of loans issued by Federal Reserve member banks hit its low point in March 1933, the rise that followed was far from inspiring. Consistent with this, Bernanke (1983, p. 272) notes that lenders “emerged from the 1930-1933 episode chastened and conservative.” Friedman and Schwartz (1963, pp. 449-462) note that banks shifted away from making loans of any kind toward holding safe, liquid assets. Both Friedman and Schwartz and Bernanke note that the increase in bank liquidity after the bank holiday of 1933 created the illusion of easy money, even though lending was tight. Of course a similar phenomenon was argued to be at work after the financial crises of 2008.
Figure 3
Automobile Installment Credit Extensions, Millions of Dollars


Figure 4
Total Loans (Including on Securities), All Member Banks of Federal Reserve System, Billions of Dollars

To test the extent of direct effects that a healthy financial system may have had on Recovery Spring, we employ a two-step model whereby we use time-series regressions in the “first stage” to generate coefficients that are then used in a “second stage” cross-sectional regression. The goal of the first stage is to create a proxy for the extent that each industry’s growth had in the past generally been affected by the availability of credit. To do this, we run the following time-series model for 62 separate industries for which we have output data:

\[ \text{OUTPUT}_t = \beta_0 + \beta_1 \text{TOTALLOANS}_t + \beta_2 \text{GOVSPD}_t + \beta_3 \text{GOVREV}_t + \beta_4 \text{CPI}_t + \varepsilon_t \]  

(1)

where

\( \text{OUTPUT}_t \): growth rate of production (in units, not dollar amounts) at time \( t \).
\( \text{TOTALLOANS}_t \): growth rate of the dollar amount of loans extended nationwide, minus loans for securities, in month \( t \).
\( \text{GOVSPD}_t \): growth rate of government spending in month \( t \).
\( \text{GOVREV}_t \): growth rate of government revenues collected in month \( t \).
\( \text{CPI}_t \): growth rate of the Consumer Price Index in time \( t \).

The model is run using monthly data from July 1921 to February 1933, which is trough to trough in the business cycle.\(^{18}\) All variables are year over year growth rates to control for seasonality. The coefficient of interest is the one on TOTALLOANS as this coefficient tells us how sensitive each industry’s output is credit. These coefficients can be thought of elasticities between the relationship between changes in loans and output for each industry. Coefficients from the first stage are generally positive and rage between -1.4 and 3.9 with a median of .79. These coefficients are then used in a 62 industry cross-sectional regression as follows:

\(^{18}\) White Standard errors are used.
\[ RECOVERY\ SPRING\ GROWTH_i = \beta_0 + \beta_1 CREDITSENSITIVITY_i + \epsilon_i \]  \hspace{1cm} (2)

where

\[ RECOVERY\ SPRING\ GROWTH_i = \text{Percentage Change in Output between March and July 1933 in industry } i \text{ minus percentage change in output in industry } i \text{ between March and July 1932}. \]

\[ CREDITSENSITIVITY_i = \text{The coefficient by industry on TOTALLOANS from the first stage regression above}. \]

The results suggest that the healthier financial system—and the (albeit modest) increases in credit extensions that came with it—may have contributed to the recovery. The coefficient on credit sensitivity is .50 with a bootstrapped standard error of .06.\(^{19}\) This indicates that industries where historical growth was more dependent on credit saw a more pronounced recovery during the spring of 1933.

Improve Consumer and Business Confidence

Another factor that could have helped drive Recovery Spring is improved consumer and business confidence. Economic theory suggests that expectations/confidence can affect current spending and this contention has found broad, though not universal, empirical support (Matsusaka and Sbordone, 1995, Carroll, Fuhrer, and Wilcox, 1994). Roosevelt’s fireside chats and policy speeches, not just those about the bank holiday and the financial system, clearly delivered a calming influence on the economy. This rise in general expectations—inflation

\(^{19}\) Bootstrapped standard errors computed by estimating the first stage separately for each industry and collecting the coefficients of interest. We then use those coefficients in the second stage. To get standard errors we replicate this process over 1000 random draws.
expectations aside—could have created a major uptick in economic activity as firms began hiring and consumers began spending again.

In fact narrative evidence from the *New York Times* and *Wall Street Journal* suggests that confidence improved almost coincident with Roosevelt taking office. In the weeks after Roosevelt’s inauguration, the *Times* consistently reported that an undertone of hope and confidence was percolating throughout the nation and that this was brought about by the public’s views of the new administration. The editorial board declared Roosevelt a “strong tower of hope” for Americans and noted that even his declaration of the bank holiday came with “a ring of confidence. Instead of alarming the country, it seemed to cheer it up.”20 A March 12 editorial from the *Times* board noted that “A study of Mr. Roosevelt’s first week as president may hereafter be required of classes in government..... Taking office amid the crash of a country’s whole financial system, he moved swiftly and surely to set it up again, and the people rose to his support with extraordinary unanimity.”21

By April 14, conditions had improved enough for the *Wall Street Journal* to conclude that there was “evidence [that] business is on the upgrade.”22 Citing an unexpected increase in demand, the April 13 *New York Times* reported that the automobile industry “has been making repeated upward revisions in production schedules [and consequently] demand for steel has increased sharply in the last two weeks, and the increase has been reflected promptly by heavier steel mill operations.”23 Two days later a *Times* business article attributed “improved sentiment” for an expansion of business in basic industries, including automobiles and steel. The article also

hinted that the Cullen-Harrison Act, also known as the “beer bill,” which allowed the production and sale of beverages under 3.2 percent alcohol beginning on April 7, 1933, could have played some role. The “chief evidence of improved business since the bank holiday has been quickening of trade in consumer goods. Beer seems to have loosened up the purse strings and the public feels better.”

On April 8, analysts at Dun & Bradstreet remarked that “the expansion is more than seasonal and [there are] multiplying evidences of definite confidence” among merchants. “Better buying interest on the part of the public is observed,” noted a *Times* business article on April 9, which also speculated that “the Easter spurt” could carry forward into continued recovery. On the same day, the “Financial Markets” column noted “security markets [are] registering the confidence which recent developments in domestic business and finance have inspired.” It is worth noting that all of the sentiments expressed above occurred at least 10 days prior to what Jalil and Rua deem to be the first major even shifting inflation expectations.

Of course, aside from narrative evidence presented above, changes in confidence may be more quantitatively approximated through movements in the stock market. The DJIA rose 26.9 percent between the end of the Bank Holiday and April 19, the day before the first major shock to inflation expectations outlined by Jalil and Rua (2014). Between April 19 and May 31 the DJIA rose another 29 percent and it is reasonable to assume that much of this jump reflected enhanced inflationary expectations causing economic actors to wish to turn cash, whose value would fall in the face of inflation, into securities.

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26 Hughes, C.F. “The Merchant’s Point of View,” *New York Times*, April 9, 1933, p. 15N.
Devaluation and Trade

Temin and Wigmore claim that, in addition to its indirect effects on inflation expectations, devaluation played a direct role in Recovery Spring by making US exports cheaper overseas and foreign imports more expensive. To test this hypothesis, we follow a similar empirical strategy to that which we carried out with respect to the effect of banking reforms. The analysis is identical except that in the first stage regressions we replace TOTALLOANS\(_t\) with TRADE\(_t\) and we add the money supply as a control variable as follows (money supply was not used in the Loans regression because of fear that these two variables are too strongly correlated):

\[
OUTPUT_t = \beta_0 + \beta_1 \text{TRADE}_t + \beta_2 \text{MONEYSUPPLY}_t + \beta_3 \text{GOVSPD}_t + \beta_4 \text{GOVREV}_t + \beta_5 \text{CPI}_t + \epsilon_t
\]  

(3)

where

\[
OUTPUT_t = \text{growth rate of production (in units, not dollar amounts) of industry } i \text{ at time } t.
\]

\[
\text{TRADE}_t = \text{growth rate of the value exports and imports summed together in month } t.
\]

\[
\text{MONEY}_t = \text{growth rate of the money supply in month } t.
\]

\[
\text{GOVSPD}_t = \text{growth rate of government spending in month } t.
\]

\[
\text{GOVREV}_t = \text{growth rate of government revenues collected in month } t.
\]

\[
\text{CPI}_t = \text{growth rate of the Consumer Price Index in time } t.
\]

Again we employ regressions from July 1921 to February 1933 for 62 separate industries. The coefficient of interest is the one on TRADE\(_t\) as this coefficient acts as a proxy for the extent that each industry’s output is affected by international trade. In this regression coefficients on trade growth ranged between -.02 and 2.43 with a median of .41. Again, we use the 62 coefficients generated from these 62 regressions in a cross-sectional analysis as follows:
\[ RECOVERY \ SPRING \ GROWTH_i = \beta_0 + \beta_1 \ TRADESENSITIVITY_i + \epsilon_i \]  

where

\[ RECOVERY \ SPRING \ GROWTH_i = \text{Percentage Change in Output between March and July 1933 in industry } i. \]

\[ TRADESENSITIVITY_i = \text{The coefficient on TRADE from the first stage regression above.} \]

These results are consistent with the devaluation playing some direct role in recovery by disproportionately helping those industries who benefited from greater trade. The coefficient on trade sensitivity is .71 with a boot strapped standard error of .11. In addition to looking at total trade (exports plus imports), we also performed the analysis just looking at exports in the first stage regression. The Coefficient on trade sensitivity (as measured by simply exports) is now 1.3, close to twice as high as when exports and imports are included, with a boot strapped standard error of .33. This suggests that industries where exports were important experienced a more pronounced recovery in the spring of 1933 than otherwise. Our findings are consistent with Temin and Wigmore’s views that devaluation played some direct a role in recovery.

*Anticipation of NIRA*

The National Industrial Recovery Act (NIRA) was passed on June 16, 1933. The Act required industries to form “codes of fair competition” in which firms could draw up rules for pricing, data-sharing, and, in some cases limits on production or new productive capacity. Additionally these codes had to include wage rate increases and reductions in workweeks. Friedman and Schwartz (1963, p. 493) note that the economic spurt the followed the reopening of banks in mid-March was “intensified by production in anticipation” of the NIRA codes which
were expected to raise wages and prices. Hugh Johnson, the National Recovery Administration’s first administrator similarly suggested in his 1935 memoirs that the rapid recovery in the spring of 1933 was caused by a “rush to speculative production.” Both the anticipation of currency depreciation and expectations of higher wages and prices under the NIRA codes caused economic actors “to turn their money into goods to take advantage of this expected [price] rise … Everybody was stocking up on all staples and a false industrial activity started with a bang.”

Additionally, to the extent that firms were considering the possibility of production quotas based on market share under NIRA, it is possible that firms engaged in a race to gain market share in the weeks leading up to the NIRA’s passage. One simple way to examine whether anticipation of the NIRA created a “false” or “speculative,” to use Johnson’s words, boost in industrial production is by examining inventories. If firms were producing ahead of demand in anticipation of higher costs or in a race to market share, we would expect to see a large jump in inventories. Figure 5 shows that inventories remained constant between March and July 1933, and were well below their level during more normal economics times.

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29 Ibid, pp. 190-191
This alone does not rule out the hypothesis that anticipation of the NIRA created a temporary and “false” boom. Consumers and downstream firms, for example, could also have been piling up purchases of final goods in anticipate of higher future prices. But it does show that the increase in industrial production during the spring of 1933 was driven by, or at least coupled with, strong increases in purchases rather than firms engaging in a speculative increase in inventories.

The other important issue is timing. The first hint of the NIRA was reported in the April 30 New York Times, which cited “news from Washington that a ‘national industrial recovery act,’ which seems to be one of the most ambitious legislative projects yet undertaken on behalf of the
administration, was speedily being prepared.” It was speculated that the act could provide price fixing and the abrogation of antitrust laws, as well as emergency control of industry. The same article also noted that end of the week summaries of industrial activity “were more encouraging than at any time since the ‘Spring revival’ started.” A May 5 Journal front page sub-headline read “To Plan or Not to Plan No Longer Seems To Be the Question,” and the first industrial action taken in anticipation of the new bill was reported as the garment industry’s drafting of an “agreement for stabilization” in the belief that Roosevelt’s “program for industrial control would make such action advisable.” Still, the lack of contemporary accounts of the NIRA before early May suggest that anticipation of cartelization likely had little to do with the increase in business activity which had been “visibly under way since the middle of March.” The recovery seemed self-sustaining well in advance of the hints of NIRA cartelization—anticipation of the NIRA could have further fed into the surge, but it does not appear that it could have been its root cause.

Discussion

Eggertsson (2008) and Jalil and Rua (2014), following the work of Temin and Wigmore (1990), show that somewhere between half and seven-eighths of the sharp recovery from March to July 1933 was caused by an increase in inflationary expectations. In this section, we have attempted to evaluate candidates for what could have explained the other 12 to 50 percent of the recovery. Additionally, the narrative analysis suggests that inflation expectations did not

accelerate until after April 19, but it appears that the economy had already begun a solid recovery before that date so we are particularly interested in factors that could have driven recovery during the second half of March and the first half of April.

The direct effects of having a rehabilitated banking system as well as increases in consumer and business confidence—inspired by Roosevelt—likely played some role, independent of inflationary expectations. We also find some evidence that devaluation, which began at the end of April, may have played some direct role (as opposed to the indirect role through inflation expectations) since our analysis of 62 industries shows that those industries who were more positively sensitive to trade—particularly exports—saw faster growth during Recovery Spring than otherwise. Data on inventories do not appear consistent with the notion of anticipation of the NIRA causing firms to produce in advance of demand—either to race to gain market share before cartel codes were put in place or to try to produce ahead of demand before production costs rose.

IV. Faltering Fall: August to November 1933

Between the peak in July 1933 and trough in November 1933, Industrial Production fell 19 percent while Manufacturing Production fell 31 percent, making this four-month downturn one of the sharpest in US history. What could cause the unprecedented recovery of March to July to turn on a dime and bring such a severe downturn? Weinstein (1980) contends that the NIRA, passed on June 16, obstructed the recovery. Temin and Wigmore (1990) argue that this is unlikely since the NIRA would have further fed into inflationary expectations. They instead point to Roosevelt’s threat to backtrack on devaluation in the late summer and early fall of 1933. Jalil and Rua (2014) provide narrative evidence consistent with the notion that inflation became
far less certain in August. For example, Moody's described Roosevelt’s inflation policies as “confusing” in September and by October noted that a “clearer shift in the direction of more conservatism” with regard to inflation had occurred (Jalil and Rua, 2014, p. 54). However, Jalil and Rua (2014, p. 51) also note that Moody’s also cited the NIRA as “one of the original causes of the recession in business since July,” a contention that was echoed by the Magazine of Wall Street. Jalil and Rua conclude that further research is necessary to distinguish between the two competing explanations for the downturn.

We put forth a somewhat modified hypothesis—that the downturn was at least partially brought about from sharp hourly wage rate increases brought about by the President’s Reemployment Agreement (PRA), which was a subprogram within the NIRA. The PRA, which went into effect on August 1, 1933—aligning with the economic turning point in the data—had two major prongs. First firms that signed onto the PRA agreed to pay a minimum wage that was generally 40 cents per hour. Roosevelt also encouraged firms to raise hourly wage rates of those workers already making above this minimum. Second, to promote work-sharing, firms agreed to a maximum workweek of 35 hours (40 hours for sales or clerical workers). According to Taylor (2011), the logic behind the PRA was to promote reemployment by spreading scarce work amongst more Americans—approximately three workers could be employed at 35 hours per week where previously only two would have worked for 48 or 50 hours. The increases in hourly wage rates ensured that workers take-home pay would not fall dramatically even though they were working fewer hours.

According to the Roosevelt Administration, these labor restrictions covered 85 percent of all employers in the US by September 1933 (Taylor, 2011, p. 138). Although signing the PRA was voluntary, the program had high uptake because signing firms were able to display the Blue
Eagle emblem, which could be obtained at local post offices once the agreement was signed, on their products, advertisements, or in their store windows—and Roosevelt strongly encouraged Americans to reward merchants bearing the Blue Eagle by shopping only at these establishments. Firms who violated their signed PRA agreement could have the right to display the Blue Eagle taken away. Taylor (2007) and Taylor and Klein (2008) demonstrate that the Blue Eagle affected economic behavior.

Table 4 shows monthly movements in hourly earnings, average work weeks, number of workers on payrolls, and total labor hours worked—all in the manufacturing sector—for 1933. The effects of the PRA seem clear as hourly wage rates rise around 20 percent and workweeks fall around 21 percent in the two months after the program begins in August. Furthermore, despite the steep drop in production, the number of workers employed actually rises thanks to the work-sharing induced shorter workweeks. Taylor’s (2011) empirical analysis suggests that changes in wages and hours were caused by the PRA rather than other factors.
Table 4: Monthly Movements in Labor Data, 1933
Months Following the President’s Reemployment Agreement in Italics

<table>
<thead>
<tr>
<th>Months</th>
<th>Average Hourly Earnings (Cents), Manufacturing</th>
<th>Average Work Week (Hours), Manufacturing</th>
<th>Employment, # of Workers on Payrolls, (Thousands) Manufacturing</th>
<th>Total Labor Hours Worked (Millions) Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1933</td>
<td>46.6</td>
<td>35.1</td>
<td>5110</td>
<td>179.4</td>
</tr>
<tr>
<td>February 1933</td>
<td>46.2</td>
<td>35.6</td>
<td>5227</td>
<td>186.1</td>
</tr>
<tr>
<td>March 1933</td>
<td>45.9</td>
<td>32.1</td>
<td>5029</td>
<td>161.4</td>
</tr>
<tr>
<td>April 1933</td>
<td>46.0</td>
<td>34</td>
<td>5160</td>
<td>175.4</td>
</tr>
<tr>
<td>May 1933</td>
<td>45.3</td>
<td>37.6</td>
<td>5399</td>
<td>203.0</td>
</tr>
<tr>
<td>June 1933</td>
<td>45.0</td>
<td>41.5</td>
<td>5781</td>
<td>239.9</td>
</tr>
<tr>
<td>July 1933</td>
<td>45.6</td>
<td>42.9</td>
<td>6155</td>
<td>264.0</td>
</tr>
<tr>
<td>August 1933</td>
<td>50.7</td>
<td>38.2</td>
<td>6570</td>
<td>251.0</td>
</tr>
<tr>
<td>September 1933</td>
<td>53.6</td>
<td>36.3</td>
<td>6860</td>
<td>249.0</td>
</tr>
<tr>
<td>October 1933</td>
<td>54.2</td>
<td>36.1</td>
<td>6827</td>
<td>246.5</td>
</tr>
<tr>
<td>November 1933</td>
<td>54.6</td>
<td>33.8</td>
<td>6555</td>
<td>221.6</td>
</tr>
<tr>
<td>December 1933</td>
<td>55.0</td>
<td>33.8</td>
<td>6413</td>
<td>216.8</td>
</tr>
</tbody>
</table>

To examine the extent that the PRA wage increases could have contributed to the sharp reversal in recovery that began coincident to its August implementation, we employ cross-sectional regressions for 25 industries. The dependent variable is the growth rate in an industry’s output between July 1933 and November 1933, the peak to trough of the downturn that occurred in the late summer and fall of 1933, minus the growth rate of the same industry’s output between July and November 1932. By looking at the change in the growth rates between these months across two different years, we help control for any seasonal variation that might otherwise bias the results.\(^34\) The key independent variable of interest is the industry’s hourly earnings in July

\(^34\) To illustrate the Paper Production industry saw output grow by 16.33 percent between July and November 1932, but fall by 14.98 percent between July and November 1933. Thus the dependent variable takes on a value of \(-14.98 - 16.33 = -31.31\) for Paper Production. As a robustness check, we took an alternative approach and employed the growth in industry output between July and August 1933 as the dependent variable and included the growth in the same measure between July and August 1932 as an independent variable. The results reported in Table 5 are essentially unchanged.
Taylor (2011) shows that the wage rates of those industries already paying high wages were less affected by the PRA since the wage guideposts were less binding for them. We therefore hypothesize that high-wage industries would have experienced smaller output drops than otherwise if the downturn was caused by exogenous wage increases from the PRA.

Consistent with this hypothesis, specification (1) of Table 5 shows that an industry whose July 1933 wage rate was one cent higher, grew 2.87 percent faster (or more correctly, fell 2.87 percent less) during the downturn of July to November of 1933 than otherwise. In other words, low-wage industries like clothing and shoe production experienced a larger downturn in the fall of 1933 than did high-wage industries like automobile and machine tool manufacturing. This evidence is consistent with a story whereby wage increases helped trigger the slowdown since the wage increases would have had their largest impact upon the industries that performed worst during this period.

Specification (2) introduces two control variables; how close the industry was to its productive capacity in July 1933 (measured by dividing output in July 1933 by output near the peak of the prior business cycle in July 1929—again the same months are used to control for seasonality) and how quickly did the industry’s output grow between March and July 1933? Interestingly, there is strong evidence that the industries that experienced the most rapid growth during the spring of 1933 were also the ones who saw the largest decline in the fall of 1933—this is true even holding wage and capacity utilization constant. Additionally, those industries that were operating closer to capacity generally saw larger declines in output during the downturn of fall 1933, other factors constant. Most importantly, the coefficient on the wage in July 1933 remains positive and significant when these control variables are introduced, consistent with the notion that those industries which were most affected by the PRA saw the largest downturns.
Table 5
Causes of Faltering Fall, July to November 1933

Dependent Variable:
(Growth Rate Output July to November 1933) – (Growth Rate Output July to November 1932)

(P-values in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-172.28</td>
<td>-70.63</td>
<td>59.92</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Wage July 1933</td>
<td>2.87</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.01)</td>
<td></td>
</tr>
<tr>
<td>Capacity Utilization, (Output July 33/July 29)</td>
<td>-20.01</td>
<td>-23.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.10)</td>
<td></td>
</tr>
<tr>
<td>Percent Output Growth</td>
<td>-0.227</td>
<td>-0.209</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>Spring 1933</td>
<td></td>
<td></td>
<td>(0.00)</td>
</tr>
</tbody>
</table>

Wage Growth
July to November 1933 | -1.26 |
Adjusted R-squared    | .181  |
F-statistic           | 5.07  |
Observations           | 25    |

Notes: All regressions employ White heteroskedasticity-consistent standard errors and covariance. Specifications 2 and 3 have one less observation since output data for the rayon industry is not available for July 1929. The variable “Output Growth Spring 1933” is the growth rate in output between March and July 1933 minus the growth rate in output between March and July 1932, following the same logic as the dependent variable.
Specification (3) employs a different wage variable—the growth in the wage rate between July and November 1933. The use of this variable would seem to create an endogeneity issue since one would generally expect output and wage growth to move endogenously. The inclusion of wage rates as an independent variable would be valid, however, if wage rate changes under the PRA were exogenous, which is our contention. In fact, the negative and statistically significant coefficient on wage rate growth offers strong—and more direct—evidence that those industries where the PRA caused wages to rise the most in the four months after the agreement went into effect also saw the largest drops in output during that time. The endogeneity issue, to the extent that it exists, should bias the coefficient upward, making the evidence of a negative relationship all the more compelling. A one percent increase in nominal wage rate growth was associated with a 1.26 percent decline in output growth during the fall of 1933. The results in Table 5 are consistent with the view that the wage-raising PRA played a role in the nascent recovery’s abrupt reversal in August.

On the other hand, the negative and statistically significant coefficient on growth during Recovery Spring is consistent with the notion that the same factor that drove the recovery between March and July reversed itself and brought the slowdown between August and November. More specifically, it is consistent with Temin and Wigmore’s (1990) story that inflation expectations were on the rise during the spring and early summer—causing output to rise in the industries most sensitive to such expectations—and then fell in the later summer and fall and caused output to decline in these same industries. We feel that the mostly likely scenario is that the economy’s reversal in fortune was caused by both a waning of inflation expectations and the sharp hourly wage increases that went into effect on August 1, 1933 under the President’s Reemployment Agreement.
V. Conclusion

There can be no doubt that the surge in recovery that occurred immediately after Roosevelt took office was extraordinary. No five-month period in US history has seen a jump in industrial production even half as large as that which was experienced between March and July 1933. Temin and Wigmore (1990) and Eggertsson (2008) credit the recovery of 1933 to 1937 to a major positive “regime change” which brought a significant change in inflation expectations. Roosevelt devalued the dollar and brought an end to the “one big deflation” that had preceded it. Still, the recovery ended abruptly in August 1933 and the drop in output over the following four months was one of the sharpest in US history.

This paper focuses on two questions—what factors lead to the sharp recovery between March and July 1933 and what factors caused the economy to revert back into a four-month freefall beginning in August 1933? With respect to the first question, Temin and Wigmore (1990), Eggertsson (2008) and Jalil and Rua (2014) have suggested that the lion’s share—between half and seven-eighths—of the recovery can be explained by a jump in inflation expectations. We agree that inflation expectations played a major role in the growth between March and July. Still, Jalil and Rua (2014) suggest that the first major shocks to inflationary expectations did not occur until late April and we show that the recovery was well under way by this date—although it clearly did accelerate along with rising expectations of higher prices. Furthermore, we are interested in explaining what factors could have been responsible for the other one-eighth to one-half of the rapid growth in output between March and July. Our examination of the historical narrative as well as our empirical results suggest that a relative return to health of the financial system after the Emergency Banking Act, increased consumer confidence, and currency devaluation (independent of devaluation’s effect on inflation
expectations) each played important supporting roles in the recovery and that some combination of the first two are likely responsible for the turning of the corner in late March and early April.

With respect to Faltering Fall—the severe downturn between August and November of 1933—our analysis suggests that the introduction of the President’s Reemployment Agreement on August 1, 1933, which sharply raised hourly wage rates, is likely at least partially responsible for the nation’s reversal in economic fortune. We also find evidence consistent with Temin and Wigmore that a reversal in inflation expectations in the fall played a role in the downturn.

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