

The Effect of Institutional Regime Change Within the New Deal on Industrial Output and Labor Markets

TODD C. NEUMANN
University of Arizona
Department of Economics
tneumann@ucmerced.edu

JASON E. TAYLOR
Central Michigan University
Department of Economics
Taylo2je@cmich.edu

Abstract

Markets during the New Deal operated under a number of different institutional regimes, which were marked by executive orders, the passage of various pieces of legislation, and Supreme Court rulings on their constitutionality. Specifically, we break the New Deal period into the following six regimes: the Hundred Days, the President's Reemployment Agreement, the National Recovery Administration Codes of Fair Competition, the *Schechter* era, the National Labor Relations Act, and the Fair Labor Standards Act. Under these various regimes industrial markets were subject to different regulations relating to hourly wage rates, hours of work, production, and unionization. Using a VAR framework this paper uses data from 11 industries to examine the performance of employment, weekly hours worked, real wage rates, prices, and output during each regime. We use the residuals from these regressions to examine when "unexpected" shocks occur. We find that the timing of these shocks are associated with some of the regime changes even after controlling for changes in fiscal and monetary policy. We believe that this suggests that the uneven pace of recovery during the 1930s can, at least in part, be explained by important policy and legal changes within the New Deal. For example, Roosevelt's first "Hundred Days" policies brought positive institutional change (financial reforms, devaluation), but the National Industrial Recovery Act slowed the nascent recovery.

Key Words: *New Deal, National Industrial Recovery Act, Labor Policy, Wage Rates, Unemployment, Great Depression.*

JEL Classification: *N32, N42, J38.*

Introduction

Recent research has focused on the question of why the Great Depression of the 1930s lasted so long, and, in particular, whether New Deal economic policies sped up or slowed down the nation's recovery. The sharp divergence of conclusions in answer to this question is startling. To illustrate, consider two of the most influential papers on this topic from the past decade: Cole and Ohanian (2004) and Eggertsson (2008). Cole and Ohanian open by noting that "recovery from the Great Depression was weak" (p. 779). Eggertsson, however, notes in his introduction that "1933-1937 registered the strongest output growth (39 percent) of any four-year period in US history outside of wartime" (p. 1477). Of course one's view of whether economic performance during under the New Deal was weak or strong is subjective. Output did grow rapidly during the New Deal, but it also remained well below its potential level until the Second World War. Cole and Ohanian attribute what they view as a weak recovery to President Roosevelt's cartelization and high-wage policies. Eggertsson attributes what he views as a strong recovery during the 1930s to Roosevelt's policy actions, which entailed the elimination of key policy dogmas that constrained the Hoover Administration. While both Cole and Ohanian and Eggertsson employ dynamic general equilibrium models to address the broad question of whether the New Deal promoted or hindered economic recovery, the conclusions that they reach could not be more starkly different. On one side, Roosevelt's policies promoted recovery and on the other side, they stood in its way.

The purpose of the discussion above is not meant to discount the contributions of these scholars as they provide valuable insight into what policies worked and what policies did not work during the Great Depression era. The juxtaposition of these papers does illustrate, however, that those on the two sides of the debate on the New Deal's effectiveness seem to be talking past each other. Our purpose here is to provide a different perspective—one which acknowledges that the question of whether the New Deal promoted economic recovery is far too broad to have a one word answer. Some aspects of the New Deal certainly promoted recovery while other aspects certainly hindered it.

In this paper, we model the New Deal not as one policy, but rather, as a set of several different institutional regimes. To illustrate, consider the institutional changes the

economy experienced between March 1933 and November 1938: A national bank holiday and elimination of the Gold Standard, the first ever federal imposition of minimum wage and maximum hour provisions (first at the firm level and then at a negotiated industry level), a requirement that firms recognize employees' rights to collective bargaining, cartelization, the repeal of wage and hours requirements and repeal of the requirement to recognize union rights, a return to relatively laissez-faire labor and product markets, the re-imposition of employees' rights to collective bargaining, and finally the imposition of economy-wide minimum wage and maximum hour provisions.

Of course the pace of economic recovery was also very uneven between 1933 and 1939. According to Vedder and Gallaway's (1993, p. 77) monthly estimates of the unemployment rate during the time period, unemployment fell 5 percentage points between Roosevelt's inauguration in March 1933 and July 1933 and then stayed relatively steady between July 1933 and May 1935, falling from 23.3 percent to 20.1 percent. In 1936 and early 1937, unemployment experienced a fairly precipitous drop reaching 12.3 percent in May 1937. By May 1938, however, unemployment was back up above 20 percent and remained in the 17 to 20 percent range until outbreak of war in Europe. The swings documented above suggest that the broad question of whether Roosevelt's New Deal helped or hindered recovery misses the mark. The better question is can changes in New Deal policies, and key Supreme Court rulings on the constitutionality of those policies, explain the uneven pace of recovery between 1933 and World War II?

In this paper we estimate 11 separate VAR models, one for each available industry, using indexes of employment, weekly hours worked, wage rates, prices, and output as the endogenous dependent variables. We then use the residuals from these regressions to examine whether "unexpected" shocks occurred in concert with changes in institutional regimes. The exercise suggests that some of the key policy and legal changes were associated with large and statistically significant movements in economic variables.

Historical Background and Literature Review on Various Institutional Regimes

We break the New Deal period into the following six regimes, each of which will be outlined in greater detail in this section:

- 1) *The Hundred Days*. Begins in March 1933 and continues until July 1933.¹
- 2) *President's Reemployment Agreement*. Begins in August 1933 and continues until an industry's "code of fair competition" was passed.
- 3) *National Recovery Administration (NRA) Codes*. Begins with the month the industry passed its NRA code and ends in May 1935, when the Supreme Court ruled the legislation unconstitutional in *Schechter Poultry Corp. v United States*.
- 4) *Schechter Era*. Begins in June 1935 and continues through March 1937.
- 5) *National Labor Relations Act*. Begins in April 1937 with the Supreme Court's surprise ruling that the National Labor Relations Act was constitutional and continues through October 1938.
- 6) *Fair Labor Standards Act*. Begins November 1938 and continues until the end of our sample (December 1939).

Regime 1: The Hundred Days

During his March 4, 1933 inauguration speech, President Roosevelt asked Congress to grant him "broad Executive power to wage a war against the emergency, as great as the power that would be given to me if we were in fact invaded by a foreign foe."² During "The Hundred Days," as the press would later call Roosevelt's frenetic first months in office, the President helped steer 15 major laws through Congress and created an "alphabet soup" of new government agencies known largely by their acronyms. In recent years, several books in the popular press have focused on the Hundred Days that Cohen (2009) contends "created modern America" (in addition to Cohen, see Alter, 2006 and Badger, 2008).

During his first two weeks in office, Roosevelt focused heavily on reforming the financial system as all 48 states had declared bank holidays or had imposed some type of restriction on payments.³ On March 5, Roosevelt declared an immediate national bank holiday and on March 9 the Emergency Banking Act (EBA) was signed into law. Three

¹ We recognize this period—March 4 until July 31 actually consists of 149 days, but the term "100 days" has taken on a special significance historically.

² Text of Roosevelt's inauguration speech is from <http://www.bartleby.com/124/pres49.html>, accessed September 6, 2011.

³ Moley (1966), p. 139.

days later, Roosevelt delivered the first of his “fireside chats” to an estimated 60 million radio listeners in which he explained the banking reforms. The President announced that, after a meticulous examination by government regulators, banks deemed fit would begin to open again. By March 15, the survey of national and state member banks was complete and around half of the banks, which held 90 percent of all bank assets, were reopened while the rest were either designated for conservatorship or permanently closed. Dighe (2011) provides details of the government’s review of roughly 7,000 banks in five days. By the end of March, Dighe (p. 52) notes that over \$1.2 billion, more than half of it in gold, had returned to the banking system as confidence returned.

On April 5, Roosevelt issued an executive order requiring individuals to surrender their gold to the Federal Reserve and on April 19 the government prohibited gold shipments abroad. This began a process of dollar devaluation that culminated in February 1934 with a formal dollar-gold exchange rate of \$35 per ounce versus \$20.67 before the devaluation. Wigmore (1987) concludes that these actions dramatically helped to put the financial system on sound footing. With the banking crisis largely over, Roosevelt turned toward relief for the unemployed with the passage of the Civilian Conservation Corps (CCC) on March 31 and the Federal Relief Emergency Act (FERA) on May 12. To help raise prices for farmers, the Agricultural Adjustment Act (AAA) was signed into law on May 12.⁴ The Tennessee Valley Authority (TVA), which was to bring economic development to the Tennessee River valley through flood control, electricity generation, and fertilizer production, among other things, was created on May 18. On May 27 the Federal Securities Act (which would later be augmented by the Securities Exchange Act of 1934) formed new regulations for stock and bond markets. On June 13, the Home Owners Refinancing Act created the Home Owners Loan Corporation (HOLC), which was charged with helping individuals in need of refinance existing mortgages or attain new home loans. On June 16 the Glass-Steagall Act created the Federal Deposit Insurance Corporation (FDIC) to guarantee bank deposits for middle class Americans. The Act also inserted a wedge between commercial and investment banking and strengthened the Federal Reserve’s influence over interest rates. Also on

⁴ The AAA created a cartel-like allotment system for farmers and paid subsidies for cutting back production (see Alexander and Libecap, 2000).

June 16, the National Industrial Recovery Act (NIRA) was passed. In addition to the wage and cartelization aspects of the legislation, which are discussed in more detail below, the NIRA created the Public Works Administration (PWA) and provided \$3.3 billion to be spent on public works projects throughout the US. After these frenetic 100 days of legislative action, Congress adjourned with much of the New Deal's policy infrastructure in place.

Regime 2: The President's Reemployment Agreement

The NIRA was designed to have industry leaders meet and agree upon industry-level "codes of fair competition." These codes had to contain reductions in hourly workweeks (in hopes of sharing or spreading the work) and increases in hourly wage rates. In addition, the codes had to include a statement recognizing the right of labor to bargain collectively. Codes could also contain cartel-oriented provisions affecting production, pricing, information-sharing, and other business practices.

The process of getting these codes approved was far from instantaneous. Within six weeks of the NIRA's passage only four industries—cotton textiles, coats and suits, shipbuilding, and woolen textiles—had approved codes. To more quickly get the labor provisions of the NIRA in place, the Roosevelt Administration announced the President's Reemployment Agreement (PRA), which was an agreement between a firm and the President rather than a code applying to an entire industry. The PRA had three main facets. 1) Workweeks would be shortened to no more than 35 hours (40 hours for clerical and sales workers). 2) The firm agreed to raise its hourly wages rates, generally to a minimum of 40 cents an hour (wage rates of those workers above 40 cents were to be increased, or, at the very least, not cut to finance the increases to some).⁵ 3) The firm had to recognize employees' rights of collective bargaining.

During the final week of July 1933, generic copies of the agreement were delivered to firms who were then asked to return the signed pledge and to implement the new labor policy beginning on August 1, 1933. In exchange for abiding by the PRA, firms could display the Blue Eagle emblem in their places of business or, where applicable, on their packaging. As President Roosevelt encouraged citizens to only buy from firms displaying the emblem—i.e. those in

⁵ The logic behind wage increases under the PRA and NIRA was that higher wages would boost purchasing power and aggregate demand. See O'Brien (1989) and Taylor and Selgin (1999).

compliance with his economic plan—firms had reason to believe that the Blue Eagle was economically important.⁶ Taylor (2011) shows that compliance with PRA labor policy was high and that wage rates and work hours were significantly affected. Because the PRA was a subprogram of the NIRA, the existing literature generally treats these more broadly as one regime—i.e. the labor provisions of the PRA and the cartel provisions embedded in the industry-specific codes of fair competition. We feel, however, that there is significant value added, both in terms of exposition and empirics, in separating these into two distinct policy regimes.⁷

Regime 3: National Recovery Administration Codes

While the PRA focused on labor policy, the National Industrial Recovery Act's more dramatic attempt to bring about economic recovery centered on the cartelization of American industries. Not only could industrial executives discuss profit-enhancing limits to competition, but the legislation also set up an enforcement mechanism, which included fines and potential imprisonment for code violators.⁸ The third of our six regimes, then, reflects what largely amounted to a continuation of the labor provisions of the PRA, but also includes the ability of firms to collude.

The literature on the NIRA is substantial. Hawley (1966) and Weinstein (1980) conclude that the NIRA's labor and cartel provisions created a negative supply shock that harmed economic recovery. Vedder and Gallaway (1993) show that the persistence of unemployment during the 1930s can be traced to the NIRA and other wage-increasing New Deal policies. Powell (2003, p. 118) likewise emphasizes the role that the high-wage policies of the NIRA played in accelerating the substitution of capital for labor, further exacerbating the unemployment problem. Cole and Ohanian (2004, p. 813) employ a general equilibrium empirical analysis and conclude that the "joint policies of increasing labor's bargaining power and linking collusion with paying high wages prevented normal recovery" from the Great Depression. Eggertsson (2008, 2012) argues, however, that NIRA policies promoting monopoly,

⁶ Taylor and Klein (2008) employ the Blue Eagle's prominence in newspaper advertisements as a proxy for its economic importance and suggest that the emblem did alter economic behavior.

⁷ Some industries passed their codes shortly after the PRA's implementation, and hence were not subject to this regime for long. For example, the Iron and Steel code was passed on August 19, 1933. Other industries, such as Machine and Machine Tools, whose code of fair competition was not passed until March 17, 1934, were subject to the PRA regime far longer.

⁸ See Lyon, et. al., 1935, pages 91-92.

unionization were expansionary given the emergency economic conditions including deflation and zero percent interest rates in 1933.⁹

Regime 4: The Schechter Era

On May 27, 1935, the Supreme Court unanimously ruled the NRA codes unconstitutional on the grounds that Congress could not give the President what Justice Cardozo called “a roving commission” to make laws in the form of industry codes.¹⁰ Additionally, the Court ruled that the NIRA codes illegally attempted to regulate interstate commerce. The *Schechter* ruling invalidated all aspects of the NIRA—the wage and hours provisions, the cartel provisions, and the recognition of labor’s right to collective bargaining. The day after the ruling, *The New York Times* reported that “Leading bankers and industrialists characterized the decision on the NRA as ‘the best thing in years.’”¹¹ The *Denver Post* likewise called it “the most reassuring development this country has experienced in many a year” as it will “loosen the bureaucratic brakes which have been clamped on business and individual initiative.” These statements suggest a belief that the repeal of the NIRA would alter behavior in labor and product markets. On the other hand, the Birmingham, Alabama *Age-Herald* wrote that, “Many of the standards set by NRA are now so well established that a continued widespread observance of them on a voluntary basis may be expected.”¹² It is interesting to note that the dates of the *Schechter* regime correspond with a strong economic rebound.¹³ Of course the federal government and the Federal Reserve were also pursuing expansionary fiscal and monetary policy as this time as well.

⁹ A separate but related literature employs the NRA codes of fair competition as a means to gain insight into various aspects of cartel theory. While the objectives of Alexander (1994, 1997), Krepps (1997), and Taylor (2002, 2007, 2010) are not to assess the NIRA’s impact on the macroeconomy, their conclusions largely support the broad notion that the cartel-enabling legislation created deadweight losses and harmed recovery.

¹⁰ *New York Times*, May 28, 1935, “Court is Unanimous. President Cannot Have “Roving Commission” to Make Laws by Code.” P. A1.

¹¹ *New York Times*, May 28, 1935, “Wall Street Hails New Deal Defeats,” p. 1.

¹² The quotes from the Denver and Birmingham papers come from a roundup of views from other news organizations in the *New York Times*, May 28, 1935, “Press Generally Sees Ruling as a Victory for Fundamental Law,” p. 12

¹³ The National Bureau of Economic Research’s Index of Production of Manufacturing, Seasonally Adjusted (NBER Series 1054) output stood at 86.7 in June 1935, six percent *below* its level in June 1933 when the NIRA was passed. However, by June 1936 the index was at 106.4 and by April 1937 it stood at 122—a nearly 41 percent jump in less than two years. Likewise,

Regime 5: The National Labor Relations Act

The National Labor Relations Act (NLRA), also known as the Wagner Act, was signed by President Roosevelt on July 6, 1935. The NLRA continued the NIRA's provision that employees had the right to organize and bargain collectively. Still, the NLRA's constitutionality was questioned to the extent that the legislation was largely inept. The National Association of Manufacturers denounced the NLRA as unconstitutional on the day of its passage and in the months that followed there was widespread non-compliance with the Act and federal courts issued nearly 100 injunctions against the operation of the NLRA (National Labor Relations Board 60th Anniversary Committee, 1995, p. 14).¹⁴ In fact, on December 22, 1935, Judge Merrill E. Otis of the US District Court of Kansas City ruled the NLRA unconstitutional as a violation of the interstate commerce clause.

In February 1937, the same month that President Roosevelt announced a plan to “pack” the Supreme Court with additional judges, the Court heard the five test cases that would determine the validity of the NLRA. A February 9, 1937 article in the *Chicago Tribune* wrote that most lawyers expected the Court to rule against the NLRA, which could create more pressure in Congress to adopt Roosevelt's court-packing plan.¹⁵ On April 12, 1937, the Court surprisingly ruled, 5 to 4, in favor of the NLRA on four of the five cases and unanimously in favor of the NLRA in the other. These rulings, the most important of which was *National Labor Relations Board v. Jones & Laughlin Steel*, combined with its 5 to 4 ruling two weeks earlier in favor of minimum state-level wage laws in *West Coast Hotel v. Parrish* initiated what historians refer to as the “Constitutional Revolution” of 1937 when the Court began to consistently rule in favor of major New Deal reforms.

Vedder and Gallaway's (1993, p. 77) monthly estimates of unemployment show a drop from 20.1 percent at the time of the May 1935 *Schechter* decision to 13.2 percent by April 1937 when the regime ended.

¹⁴ According to a September 1935 article in the *New York Times* (p. 1), “An opinion widely held among lawyers and industrialists is that the Wagner act is unconstitutional for the same reasons that the NRA was ruled unconstitutional by the Supreme Court—that its provisions could not apply to companies that were transacting an interstate business.” (September 13, 1935, *New York Times* “Wagner Act Void, Legal Critics Hold,” p. 1.)

¹⁵ *Chicago Tribune*, February 9, 1937, “Test New Deal Labor Laws in Supreme Court,” p. 9.

Data on union density and the number of recognition strikes strongly support the notion that the NLRA regime should be treated as beginning with the April 1937 rulings rather than the July 1935 date that it officially became law. In 1934, when labor was given the right to collective bargaining by the NIRA, 701,101 workers were involved in recognition strikes, but this number fell to 202,118 and 272,013 in 1935 and 1936 respectively. In 1937, the number of workers involved in recognition strikes surges to 941,802.¹⁶ Likewise, annual data on union membership support the notion that 1937 was a key turning point. Estimates from Freeman (1998, p. 289) show that union membership rose from around 2.60 million to 3.46 million between 1933 and 1935, when labor was given the right to collectively bargaining by the NIRA, and then rose slightly to 3.85 million in 1936. But 1937 and 1938 saw a tremendous spike as the number of union members rose to 6.76 million and 7.76 million respectively.¹⁷ Additionally these two years saw a surge in sit-down strikes, before the National Labor Relations Board and courts ruled them to be illegal. Of course whether specific workplaces became unionized or not, the permanent and court-approved right to collective bargaining put pressure on firms to make concessions to labor in terms of hourly wage rates, workweeks, and working conditions, among other worker objectives. For example, a firm may have granted concessions in hopes of preventing organization. One caveat, however, is that historians such as Fine (1969) view the General Motors sit-down strike in Flint, Michigan as a major turning point in union activity. This strike primarily took place in January and February of 1937, two months before *Jones & Laughlin*. Clearly more work is needed to assess the importance of the Supreme Court's upholding of the NLRA in terms of union activity.

Regime 6: The Fair Labor Standards Act

In May 1937, following New Deal legislative victories in the Supreme Court, Senator Hugo Black and representative William Connery introduced identical bills to the Senate and House labor committees that would provide "fair labor standards," including a 40 hour workweek and a 40 cent per hour minimum wage for all firms engaged in interstate commerce.¹⁸

¹⁶ Recognition strike data are from the US Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*, May 1936-May 1940.

¹⁷ Union density data from the BLS and from Troy (1965) show a similar pattern.

¹⁸ Actually the specific numbers were left blank in the originally proposed bills for hourly workweek and hourly wage rate. President Roosevelt had suggested in a speech days earlier that

The June 1938 passage of the Fair Labor Standards Act (FLSA) made minimum wage rates and maximum hours a permanent part of the US labor market.¹⁹ The FLSA also forbade the employment of workers under the age of 16.

The 40/40 standards were phased in over time rather than instituted all at once. Beginning on October 24, 1938, firms engaged in interstate commerce had to pay at least 25 cents per hour and had to pay time and a half on hours beyond 44 hours per week. The Roosevelt Administration estimated that the FLSA would cause the hourly wage rates of 750,000 workers to rise and the hours of work to be shortened for 1.5 million.²⁰ Still the law was not expected to have anywhere near the impacts upon wages, hours, costs, and prices that the NIRA had five years earlier since most firms were already either in compliance with the new standards or were fairly close to them.²¹ In October 1939, the minimum hourly wage rose to 30 cents per hour and further increases followed until it reached 40 cents per hour by the end of World War II.²² The maximum workweek (without overtime pay) fell to 42 hours in October 1939 and then to 40 hours in October 1940.

Data & Empirical Model

In order to assess the effects of institutional regime change during the New Deal we examine five dependent variables using monthly data from 11 industries between January 1923 and December 1939. These are the size of the workforce (Employment), the average number of

the standards should be 40 cents per hour and 40 hours per week. An article in the *Chicago Tribune* suggested that the specifics were left blank to “remove any suggestion of White House dictation such as accompanied the submission of Mr. Roosevelt’s court packing bill.” (*Chicago Tribune*, May 27, 1937, “Congress Gets Bills to Control Pay and Hours,” p. 1).

¹⁹ The original Black-Connery bill would have created a powerful national board, similar to the National Recovery Administration, which would have had the power to determine what “fair labor standards” were over time and in specific cases. Fears about the creation of a “ghost of the NRA” led to the defeat of the bill in the House in December 1937 (Paulsen, p. 252). The bill was then simplified and the board was eliminated and the measure was approved with little opposition.

²⁰ *New York Times*, October 23, 1938, “Andrews Sets Up New Regulations For Wage Records,” p. 1.

²¹ *New York Times*, October 23, 1938, “Wage Law Causes Few Price Changes,” p. 1.

²² Of course wartime inflation had substantially eaten away the real value of this increase since the overall price level rose nearly 40 percent between 1939 and 1946 (Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers, US City Average, All Items).

hours a worker was employed during a week (Hours), the average hourly earnings of a worker (Wage Rate), the total production of the industry (Output), and the average price (Price) of an industry's output. The industries include Automobiles, Boots and Shoes, Chemical Manufacturing, Iron and Steel, Leather Manufactures, Machine and Machine Tools, Meat Packing, Paper and Pulp, Rubber Products, Silk Rayon, and Wool Manufacturing. There are strong linkages between a couple of these industries. Iron and Steel are clearly major inputs into the production of Automobiles as the correlation coefficient between employment in the two industries is 0.80 while it is 0.74 for output.²³ Machine and Machine Tools also has a strong linkage to Iron and Steel as the correlation coefficients between both output and employment in these two industries are 0.87 and 0.82, respectively. Of course, we would expect to see some co-movement between variables as all are to some extent dependent upon the generally health of the economy—for example, the correlation coefficient between Paper and Pulp and Iron and Steel is 0.54. Overall, the 11 industries provide a fairly nice representation of the industrial economy, as will be shown below in light of Figure 1.

Most of the data set was assembled from the National Bureau of Economic Research's Macrohistory Database.²⁴ Much of this data—particularly employment, hours, and wages—come from the Bureau of Labor Statistics' sample of manufacturing establishments. The BLS canvassed a select group of establishments nationwide that it believed to be representative of the industry as a whole.²⁵ Wallis (1989, p. 47) notes that the sample comprised between 12 and 20 percent of non-farm employment throughout the 1930s. The BLS benchmarked the data to the biannual *Census of Manufactures* trend to overcome biases in the sample selection.²⁶

²³ One may suspect Rubber Products and Automobiles would be similarly linked, however the correlation coefficient in output between these two industries is only 0.2.

²⁴ See the Data Appendix for a detailed description of each series and issues related to their national representativeness.

²⁵ Establishments were asked to provide data covering the pay period ending nearest the 15th of each month.

²⁶ The monthly reports of the BLS are compiled from those firms who supplied information for both the current and the preceding month. Wallis (1989) notes that weakness with this “link relative” method is that if a firm reports in the first month and then goes bankrupt, it is not included in the sample for month two, whereas a firm that operated (and reported) for both months is included. Likewise employees who were hired in the second month by a firm that did not exist in the first month are not included in that month. In short, the sample will suggest less

We convert the data into indices with January 1930 as the base period.²⁷ The top panel of Figure 1 charts the average of each dependent variable across industries, by month, from January 1930 through December 1939. The bottom panel charts manufacturing-sector level measures of the same five variables.²⁸ The pattern of the time series variation in our sample data matches well with movements at the more aggregate level. The vertical dotted lines mark the month that each of the six regimes outlined above begin.²⁹ Visually, there are obvious differences in the levels of Employment, Hours, Wage, Prices, and Output between these periods. The timing of the changes also appears to correspond to many of the periods of regime change.

Employment, Hours, Price, and Output rose significantly in the Hundred Days regime. Then at the month of the enactment of the PRA there is a substantial jump in Wage Rates and a large drop in Output and Hours. Employment continues to rise, but not on the trend that existed before the regime change. Further reductions in Output and Hours followed the passage of the last industry-specific NRA code. There also appears to have been strong changes in the direction of the variables following the Supreme Court's 1937 decision upholding the NLRA as well as

cyclical variation than was actually present. Fortunately, the BLS recognized these biases and adjusted the indices to conform to the averages shown in the biennial *Census of Manufactures*. For details see "Revised Indexes of Factory Employment and Payrolls, 1919 to 1933" *Bureau of Labor Statistics Bulletin No. 610*, US GPO, 1935.

²⁷ The index in the base period is assigned a value of zero.

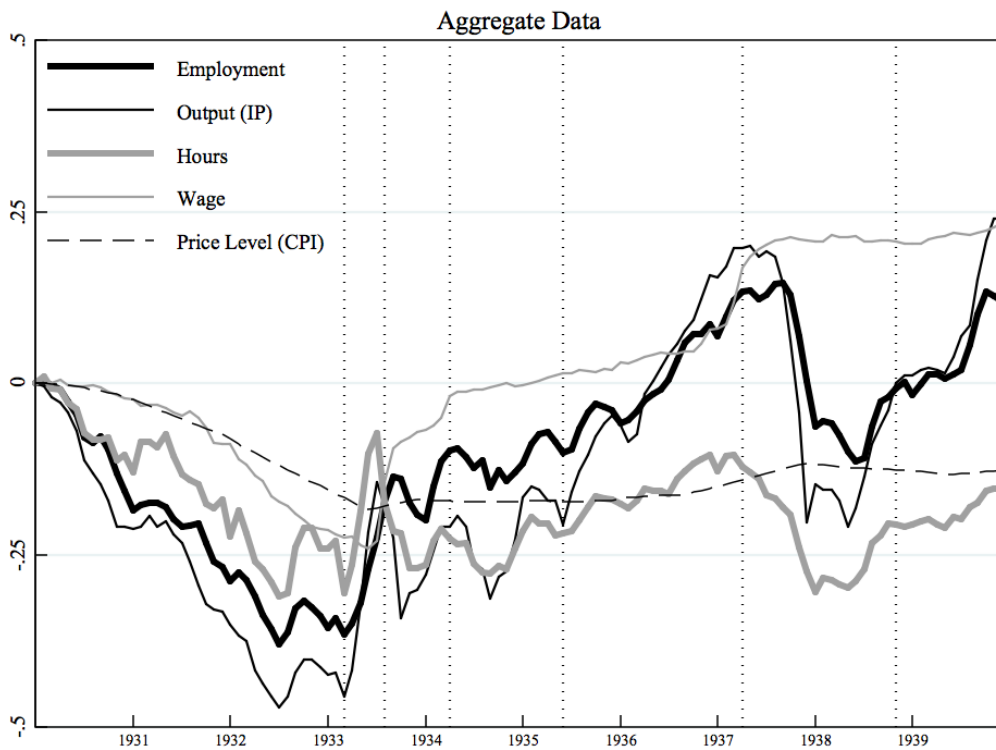
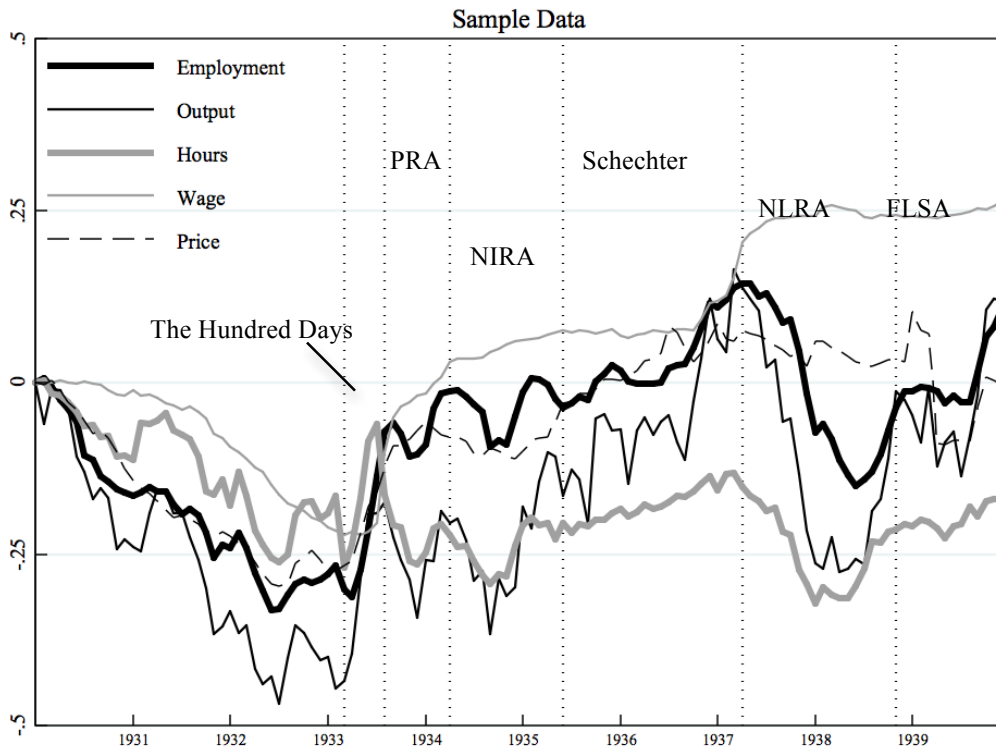
²⁸ The aggregate data in Figure 1 are from the following sources. Employment: NBER Series 8010, "Production Worker Employment, Manufacturing." Output: NBER Series 1054, "Index Of Production Of Manufactures, Seasonally Adjusted." Hours: NBER Series m8029, "Average Hours of Work Per Week, Manufacturing Industries, Total Wage Earners, NICB." Wage: NBER Series m8142, "Average Hourly Earnings, 25 Manufacturing Industries, National Industrial Conference Board." Price: NBER Series 4052, "Consumer Price Index, All Items Less Food, National Bureau Of Economic Research, Bureau Of Labor Statistics."

²⁹ For illustrative purposes we begin the NRA code regime in April 1934 in Figure 1. This is the month in which the last industry in the sample adopted an NRA code. The empirical estimation takes into account the specific month that the NRA code begins for each industry. If the code was passed prior to the 16th day of the month, that month was counted as an NRA code month. The month that the NRA Code dummy variable turns on is as follows for each industry: Automobiles, September 1934; Boots and Shoes, October 1934; Chemical Manufacturing, February 1934; Iron and Steel, September 1933; Leather Manufactures, September 1933; Machine and Machine Tools, April 1934; Meat Packing, January 1934; Paper and Pulp, December 1933; Rubber Products, December 1933; Silk Rayon, September 1933; and Wool Manufacturing, August 1933. Date of code passage was obtained from U.S. National Recovery Administration (1933-1935).

the enactment of the FLSA in 1938. Interestingly, the data do not appear to show any pronounced one-time changes around the *Schechter* decision that repealed the NIRA, although output and employment do begin a fairly substantial two-year rise, which is a bit more pronounced in the sector-level data versus that in the sample.³⁰

³⁰ For numerical comparisons of our sampled data versus the aggregate data across key dates, Employment rose 16.4 percent in the sample and 14.2 percent at the aggregate level between March and July 1933. Output rose 24.5 percent in the sample, and 31.3 percent in aggregate data over the same period. Between July and October 1933, hours fell 15.1 percent in the sample and 14.7 percent in aggregate data, while wages rose 16.9 percent in the sample and 14.5 percent in aggregate. Finally, between March 1937 and January 1938, Employment fell 21 percent in the sample and 18.4 percent in the aggregate data, Wages rose 8.8 and 8.9 percent in the two types of data, respectively, and Output fell 42.7 percent in the sample versus 34.4 percent in aggregate.

Figure 1
Average Labor Market and Output Measures



Associating these patterns as causal via the institutional regime changes is, of course, more complicated. A good framework for measuring the impact of different regimes on labor input, wages, prices, and output would be to compare the path of these variables in one industry that was treated with regime change with another industry that was not. Furthermore, one would like to assure that both the treated and non-treated industries were otherwise subject to the same conditions. Unfortunately neither requirement occurred in reality. All industrial segments of the economy were covered by the regime changes. There were also countless other shocks that occurred during the 1930s that surely impacted labor markets and output. We are faced with the further challenge that, with the exception of the industry-specific codes, there is no cross-sectional variation in the timing of regime change. Consequently, rather than try to estimate the effects of different regimes directly (for example with regime dummy variables) we estimate a series of VAR models and use the residuals to provide insight on whether “unexpected” shocks coincided with the regime changes.

We begin by estimating a “single equation” VAR for each dependent variable. The residuals from this model will show unexpected shocks controlling for nothing but past measures of that single dependent variable. We then estimate a traditional 5-equation VAR model which includes the lags of all 5 dependent variables. Finally we estimate the full specification found in Equation 1, which controls for factors such as fiscal and monetary policy that may have affected our dependent variables.³¹ . There is a substantial literature documenting the large increases and fluctuations in government spending associated with various New Deal programs such as the Civil Works Administration, the Works Progress Administration, and the Public Works Administration.³² Additionally, there is a vast literature examining monetary policy during the Depression.³³

$$1) \quad Y_t = \sum_{j=1}^k \alpha_j^E Employment_{t-j} + \sum_{j=1}^k \alpha_j^H Hours_{t-j} + \sum_{j=1}^k \alpha_j^W Wage_{t-j} + \sum_{j=1}^k \alpha_j^O Output_{t-j} + \sum_{j=1}^k \alpha_j^P Price_{t-j} + \\ +M + Acontrols_t + \varepsilon_t$$

³¹ All specifications include month dummies to capture seasonality.

³² See Fishback, Horrace, & Kantor (2005); Fishback, Kantor, & Wallis (2003); Fleck (1999a); Kesselman (1978).

³³ See, for example, Friedman and Schwarz (1963), Hamilton (1987), Wheelock (1990), Bordo, Chourdhi, and Schwarz (2002), Eggertsson (2008), and Richardson and Troost (2009).

This specification regresses each dependent variable on the lagged values of itself and the other endogenous variables; a number of fiscal and monetary measures (*controls*); as well as month effects (M) to control for any seasonal patterns. The vector of controls include indices of the money supply (M-1), non-relief federal government spending, federal government revenue, work and direct relief spending, the Federal Open Market Interest Rate, and the Consumer Price Index.³⁴ A figure charting movements of the controls is in the Appendix. Our sample period begins in July of 1923 and ends in December of 1939.³⁵

The VAR model requires the variables be stationary. For some of our series, depending on the industry, we could not reject the null hypothesis of the existence of a unit root.³⁶ Consequently, we run the VAR on the differenced data. Additionally, if properly specified the residuals from the model should be uncorrelated across time. Thus it is important to select the appropriate number of lagged dependent variables. We find a lag length of 2 minimizes the Hannan and Quinn as well as the Schwarz's Bayesian information criterion, but that a lag length of 6 is required to eliminate serial correlation in the residuals across all 11 industries, and hence a lag length of 6 is employed.

Due to the large number of regressions estimated (3 specifications each with 5 equations over 11 industries) and the large number of coefficients in each regression (as many as many as 78 per equation) the results section will focus on charting the residuals from the above 3 specifications. A regression results appendix is available upon request.

Results

We begin our analysis by estimating a “single equation” VAR, or an AR(6), model for each of our 5 dependent variables. We estimate a separate set of regressions for each of the eleven industries. We initially employed a panel approach, which allowed for greater precision due to the larger number of observations relative to the number of parameters, but also imposed the restriction that the relationships between the variables was the same across the different

³⁴ Because monetary and fiscal policy might act with delay we include the contemporaneous as well as 6 lags of each. See the Data Appendix for source details.

³⁵ The start date is chosen so as not to be influenced by the post-World War I depression while the end date is chosen so as not to be influenced by the start of World War II.

³⁶ Using a Phillips-Perron unit root test.

industries. We eliminated this restriction by estimating the model separately for each industry, although the conclusions of the paper are not significantly different under the panel approach. The coefficient estimates from these regressions are employed to create residuals for each month by industry. Finally, we compute the average residual, by month, for the eleven industries as well as confidence intervals (95 percent) around that mean residual. These are graphed in Figures 2.x. Again, our goal is to use the residuals to infer if any “unexplained” shocks occurred to the dependent variables around the time of institutional regime changes.

Figure 2.a

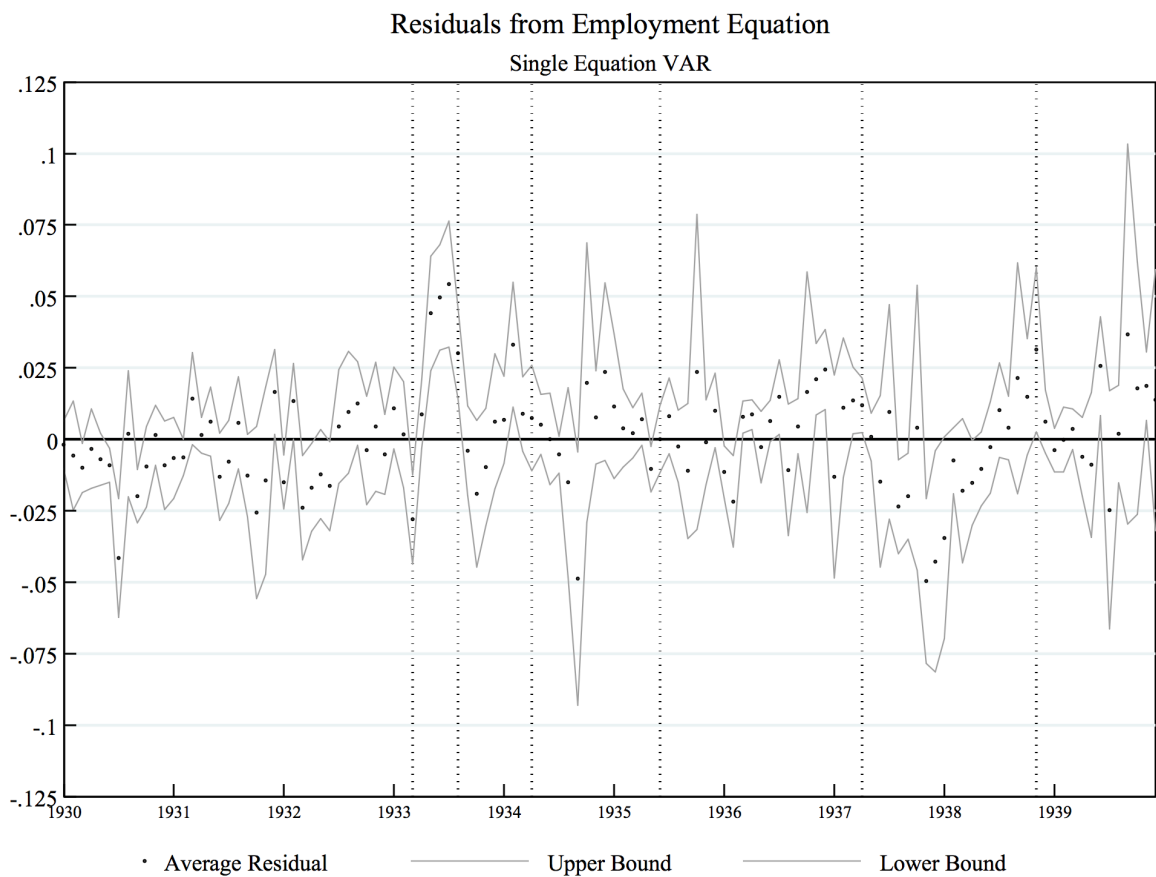
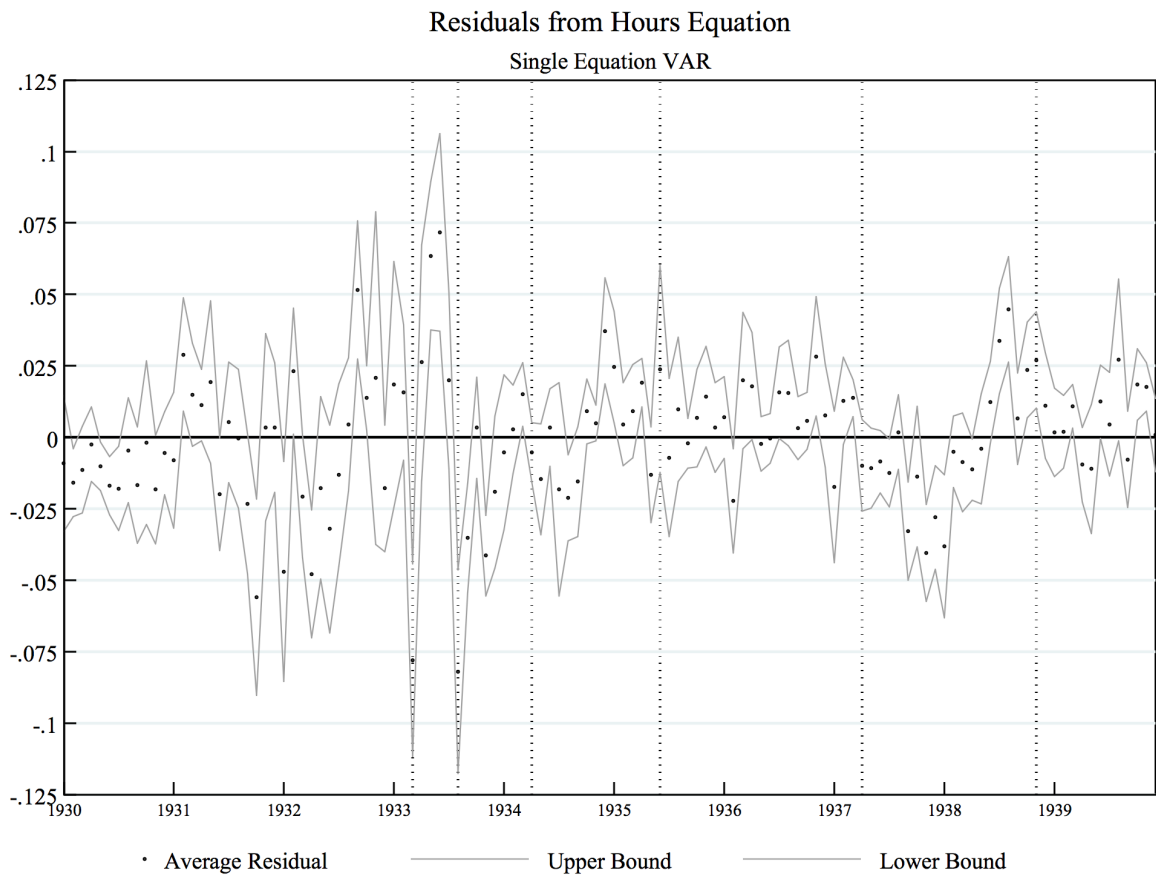


Figure 2.a shows the mean residuals from the Employment equation. As one can see when one does not control for other lagged values of the dependent variables or fiscal and monetary policy there are several months in which the mean residual is statistically different from zero. This pattern is common in most of the other equations as well. Most notably there

are relatively large and statistically significant shocks to Employment in the Hundred Days regime, as large as 5 percentage points. Additionally, during the early NRA Code regime the residuals trend negative and become statistically significant in some months. Following the repeal of the NRA there appears to be no consistent pattern to the residuals. However, in the months just prior to the NLRA regime the residuals trend positive and many become statistically significant. During the NLRA regime the residuals are consistently negative. No pattern is present during the FLSA regime.

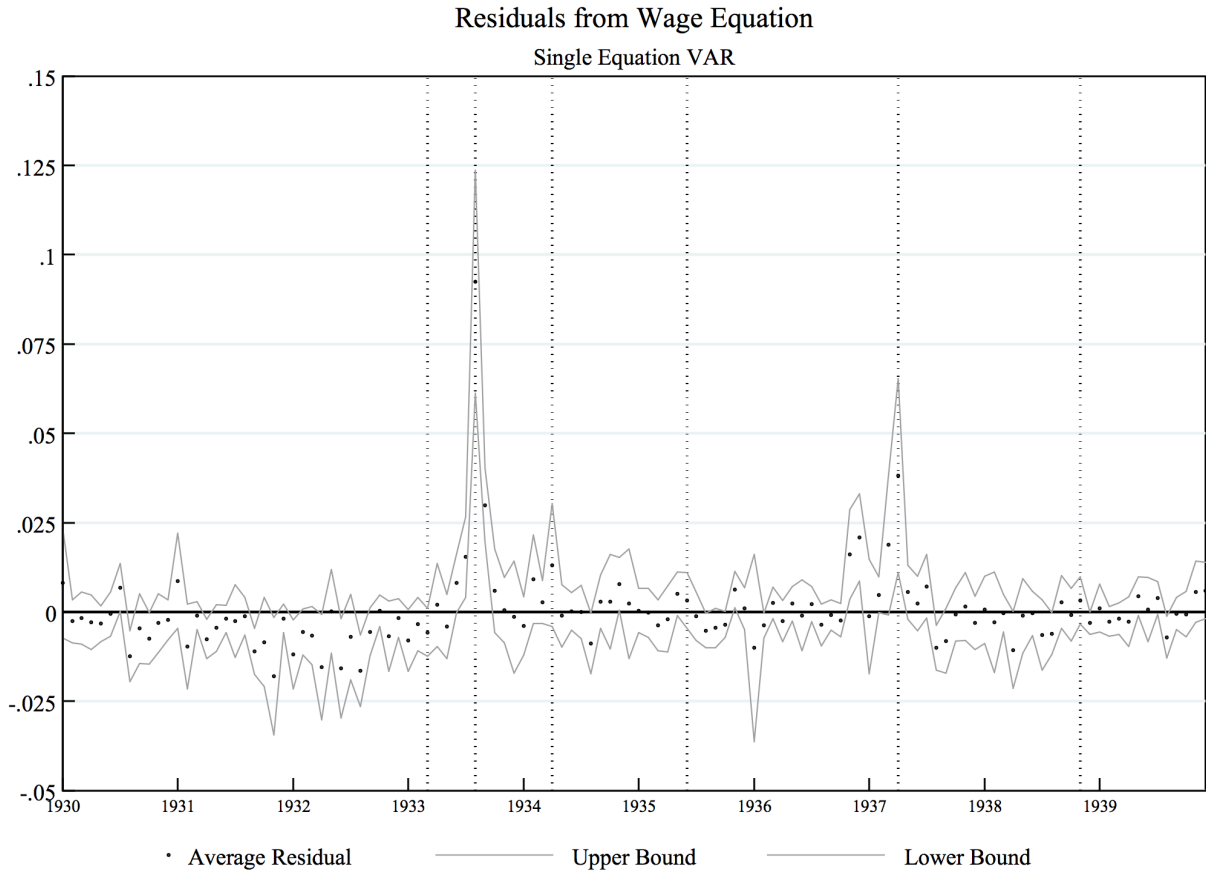
Figure 2.b



When one looks at the residuals from the Hours equation in Figure 2.b a somewhat similar pattern emerges. Like Employment there are large and statistically significant positive shocks to Hours during the Hundred Days regime. Unlike Employment, however, there are equally large and statically significant negative shocks to Hours during the PRA and early NIRA regimes. Following the repeal of the NRA there is no consistent pattern, although, as with

Employment, during much of the NLRA regime the residuals are negative and often statically significant. Again there is no clear pattern around the institution of the FLSA regime.

Figure 2.c

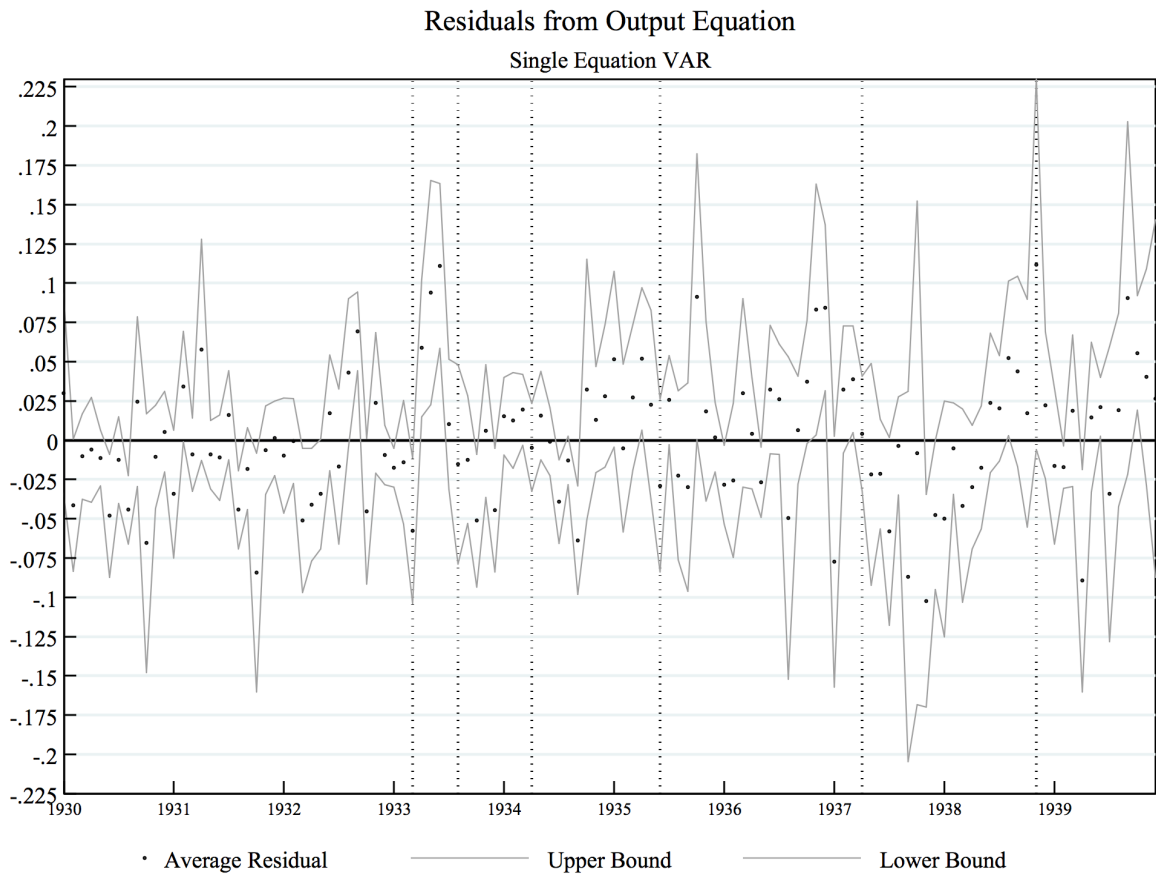


The residuals from the Wage regression found in Figure 2.c are perhaps the most dramatic. There is generally no pattern and they are most often not statistically different from zero. However, following the implementation of the PRA and leading into and following the upholding of the NLRA there are relatively large and statically significant positive shocks to wages.

The residuals from the Output regression are also similar to those of Employment and Hours. There are large and statistically significant shocks during the Hundred Days regime. Like the Hours regression the residuals are generally negative and sometimes statistically significant during the two NRA regimes. Consistent with Employment and Hours, there appears to be no consistent pattern associated with the Schechter decision that repealed the NIRA, but

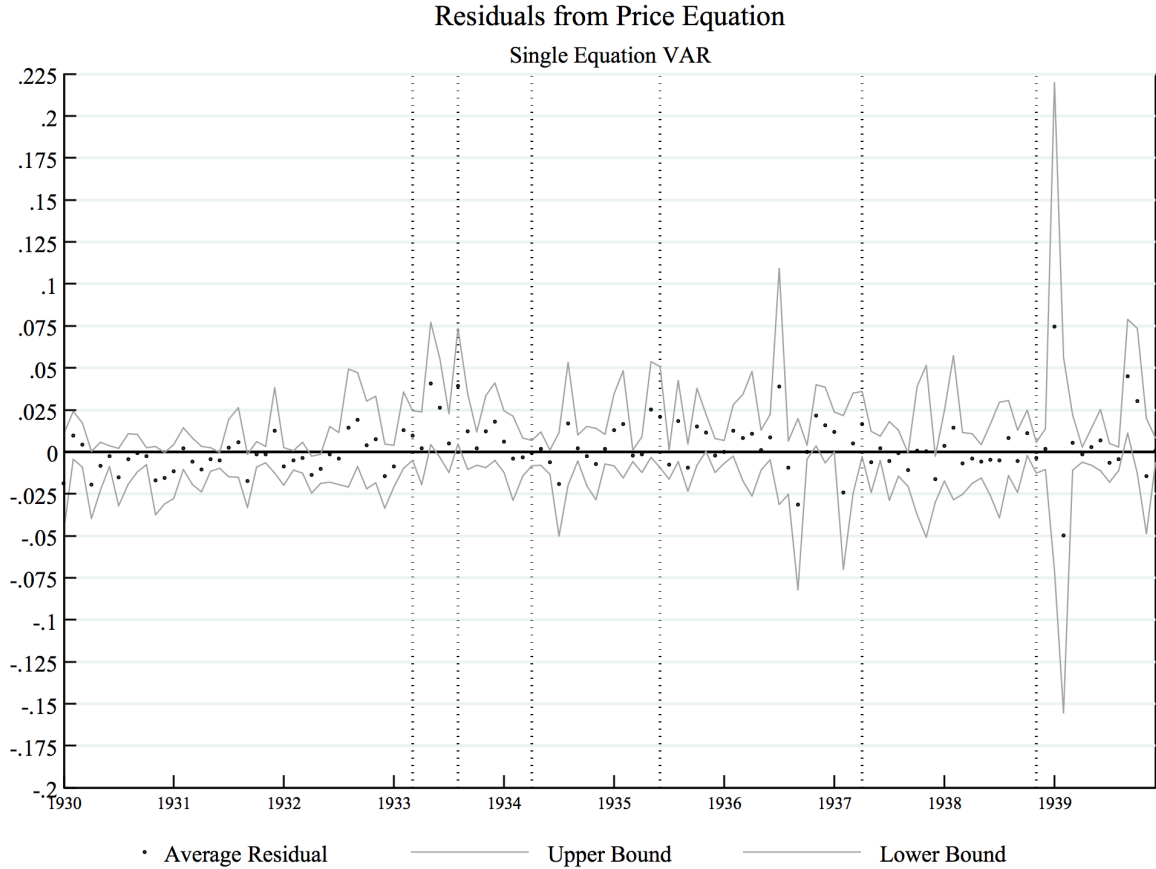
there are unexplained negative shocks during the NLRA regime period. Unlike Employment and Hours, during the FLSA regime the residuals are first negative and statistically significant followed by positive and some statically significant residuals.

Figure 2.d



The residuals from the Price regression are found in Figure 2.e. There appears to be virtually no pattern during any point over the decade, with the exception of some statistically significant price increases late in the Hundred Days regime and right at the implementation of the PRA regime.

Figure 2.e



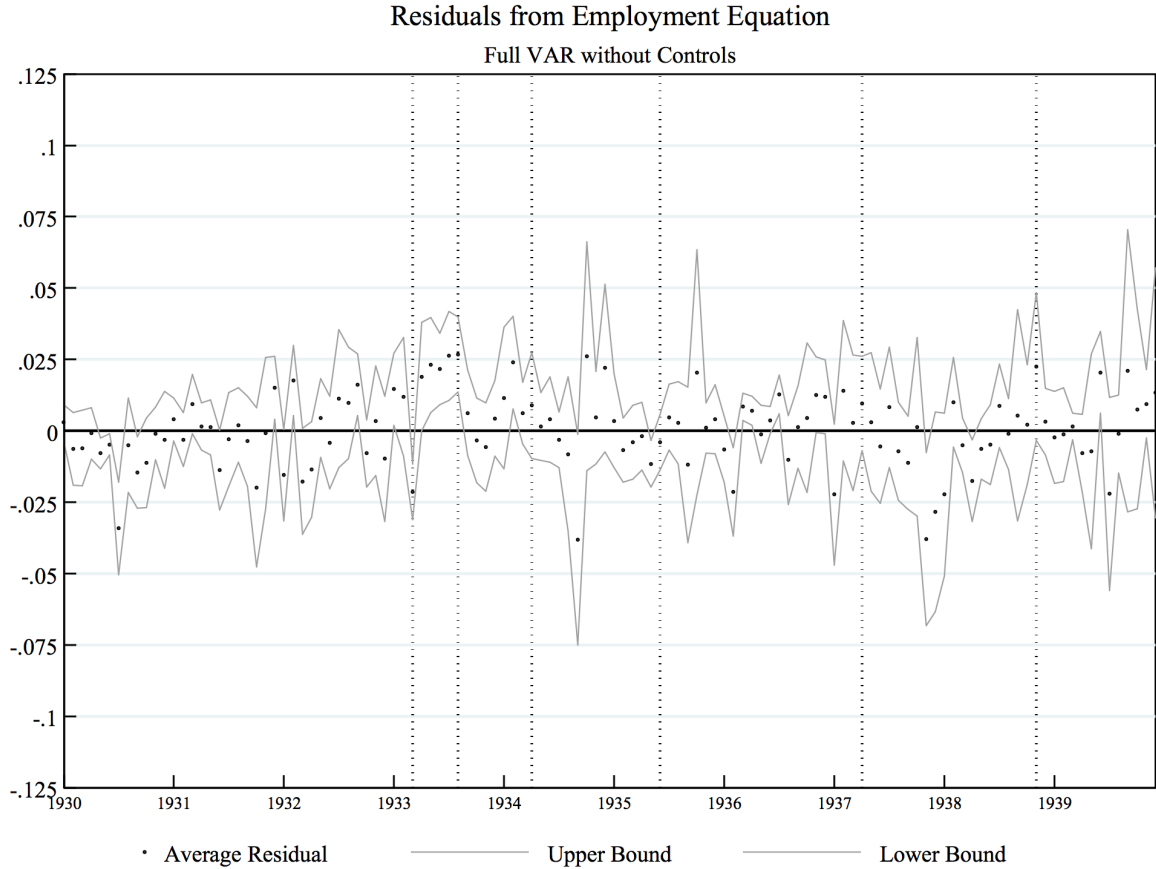
The residuals charted in Figures 2.x come from an AR(6) model of each dependent variable that controls for neither the condition of other measures of the economy and labor market (the other dependent variables) or fiscal and monetary policy. Figures 3.x repeat the exercise, but use the coefficients from a five-equation VAR model. As before we estimate a separate set of regressions for each industry and chart the mean residual and its confidence band by month. Granger Causality tests indicate that for all of the industries at least some of the lagged dependent variables explain movements in Employment, Hours, Wage, Output, and Price. Table 1 summarizes these results. Furthermore, the relationships between the dependent variables and their lags is generally as economic theory would predict. Increases in Wage are followed by reductions in labor input (Hours and Employment) measures. While increases in labor input measures are followed by increases in Output.

Table 1
Granger Causality Tests

Hypothesis		Number of Industries can reject the Null at 5 percent significance level
Employment is NOT Granger Caused by	Hours	7
	Wage	7
	Output	11
	Price	8
	ALL	11
Hours is NOT Granger Caused by	Employment	4
	Wage	3
	Output	7
	Price	5
	ALL	10
Wage is NOT Granger Caused by	Employment	6
	Hours	5
	Output	6
	Price	5
	ALL	11
Output is NOT Granger Caused by	Employment	5
	Hours	6
	Wage	5
	Price	6
	ALL	8
Price is NOT Granger Caused by	Employment	6
	Hours	3
	Wage	3
	Output	4
	ALL	7

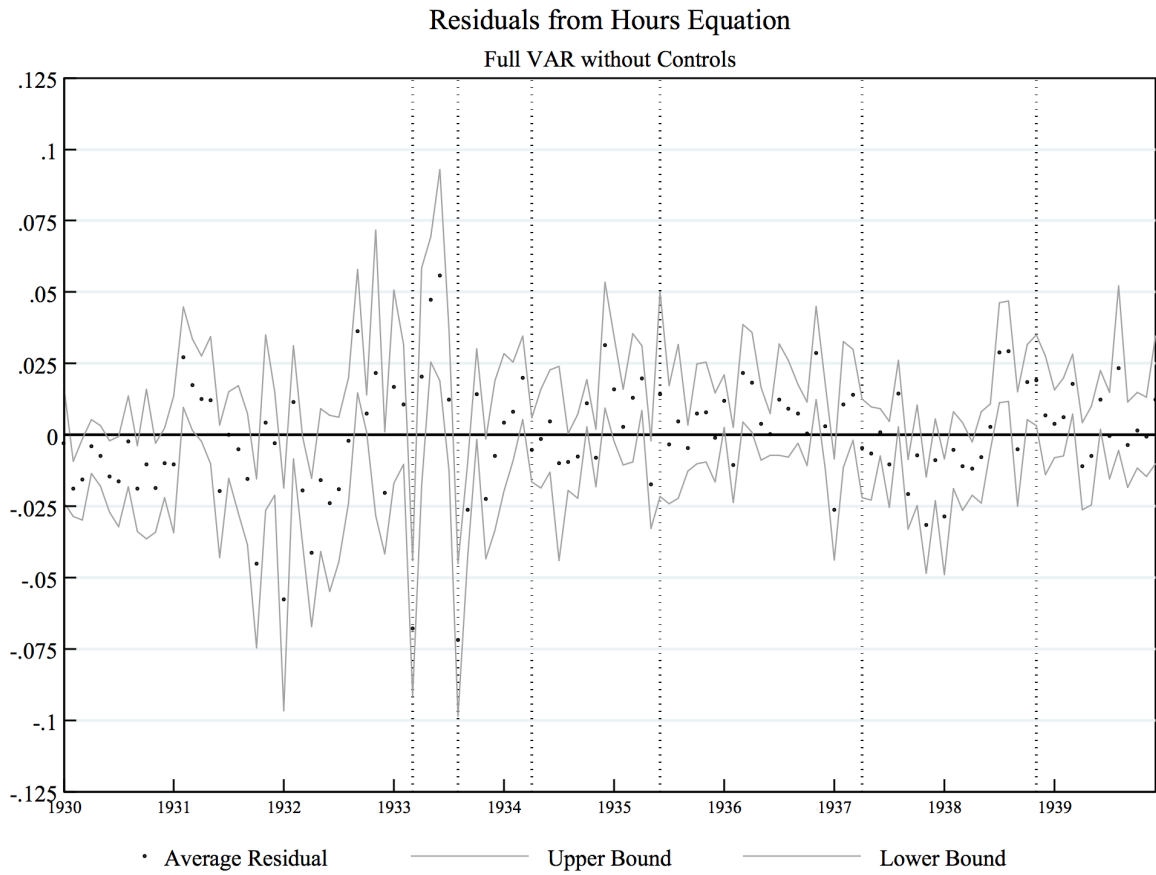
Examining Figure 3.a one can see that the full 5-equation VAR model, which includes lags of all 5 dependent variables in each equation, better fits the data. There are few periods where the model consistently under or over predicts Employment across the 11 industries. There are also relatively few statistically significant mean residuals. A notable exception is the Hundred Days regime. During this period there are unexplained positive shocks to Employment, though the size of the shocks is smaller than in the single equation model. The residuals are also generally negative during the middle of the NLRA regime and a few are statistically significant.

Figure 3.a



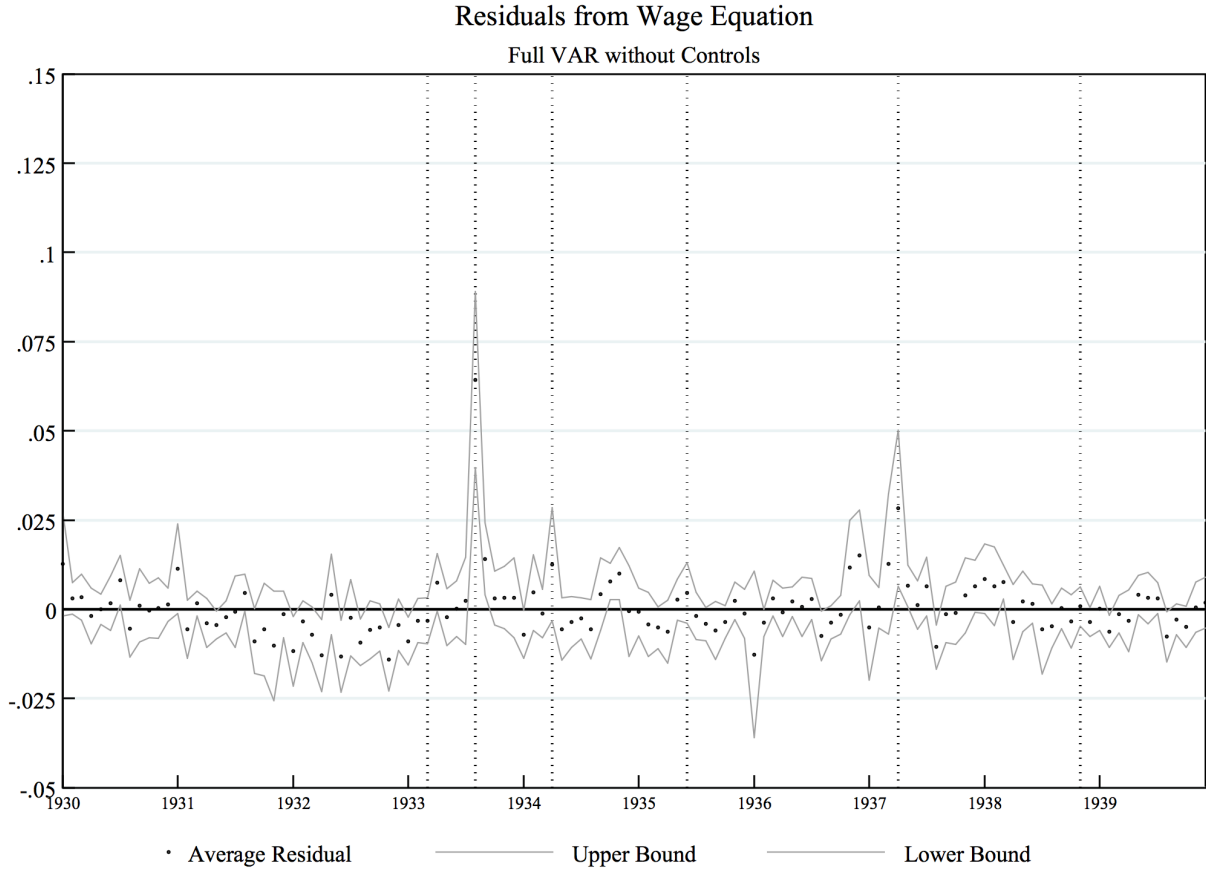
With respect to the Hours equation, Figure 3.b looks similar to Figure 2.b. There are large and statistically significant shocks to hours during the Hundred Days regime, followed by large and statistically significant negative shocks during the PRA and early NIRA regimes. Further the residuals at the end of the NIRA regime are consistently positive and often statistically significant. Like in the single equation model no pattern emerges during the *Schechter* or FLSA regimes but the Hours residuals remain generally negative and often statistically significant during the mid-NLRA regime.

Figure 3.b



For Wages, Figure 3.c is nearly identical to Figure 2.c except the magnitude of the residuals following the PRA implementation and leading into and then following the upholding of the NLRA are smaller.

Figure 3.c



The comparison between Figures 3.d and 2.d is interesting. In some ways they exhibit similar patterns. For example, the Output residuals from both models are positive and statistically significant during the Hundred Days regime, although the magnitudes are smaller in the full VAR model. And there remain negative shocks to Output a few months after the Supreme Court ruling upholding the NLRA. However, in Figure 2.d the residuals following the implementation of the PRA are negative and statistically significant. This is not the case in the full VAR model. This suggests that controlling for the drop in Hours and the increase in Wages that occur during that regime explains the drop in Output during the PRA regime.

Figure 3.d

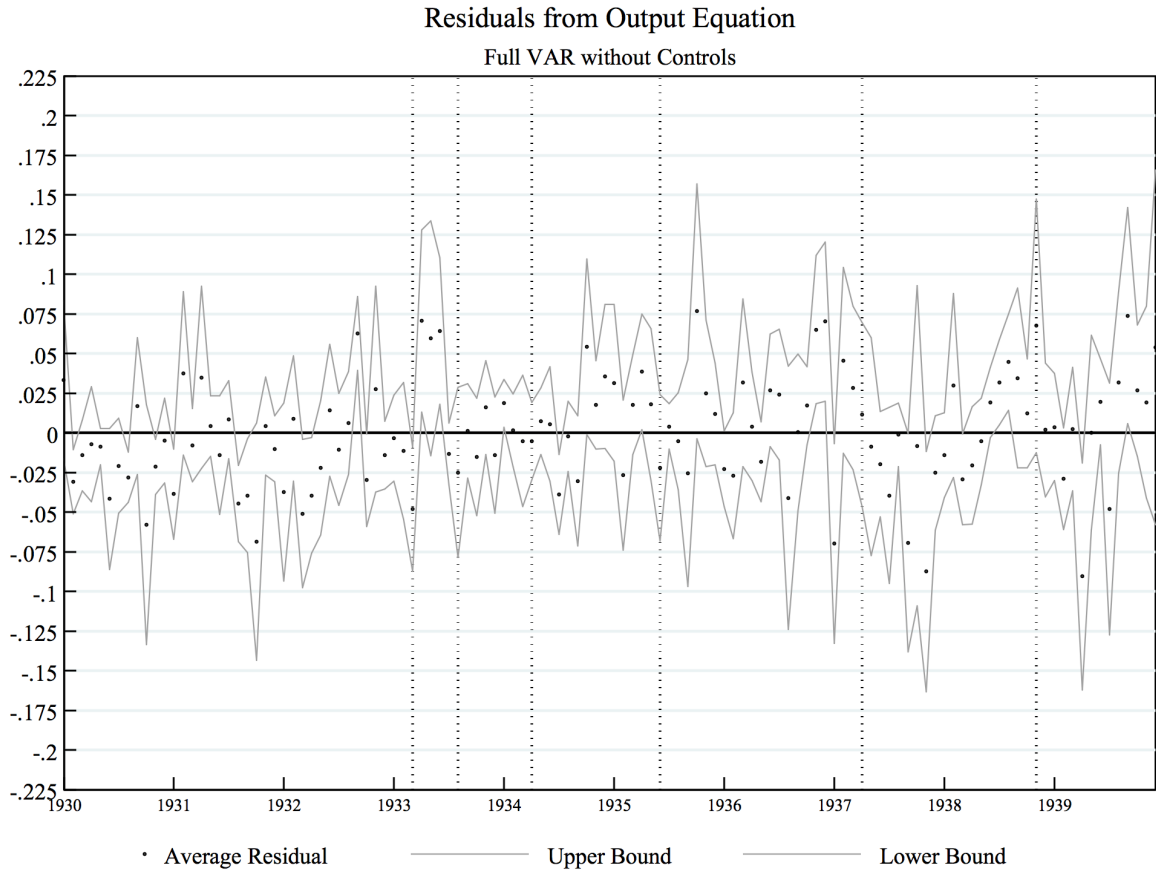
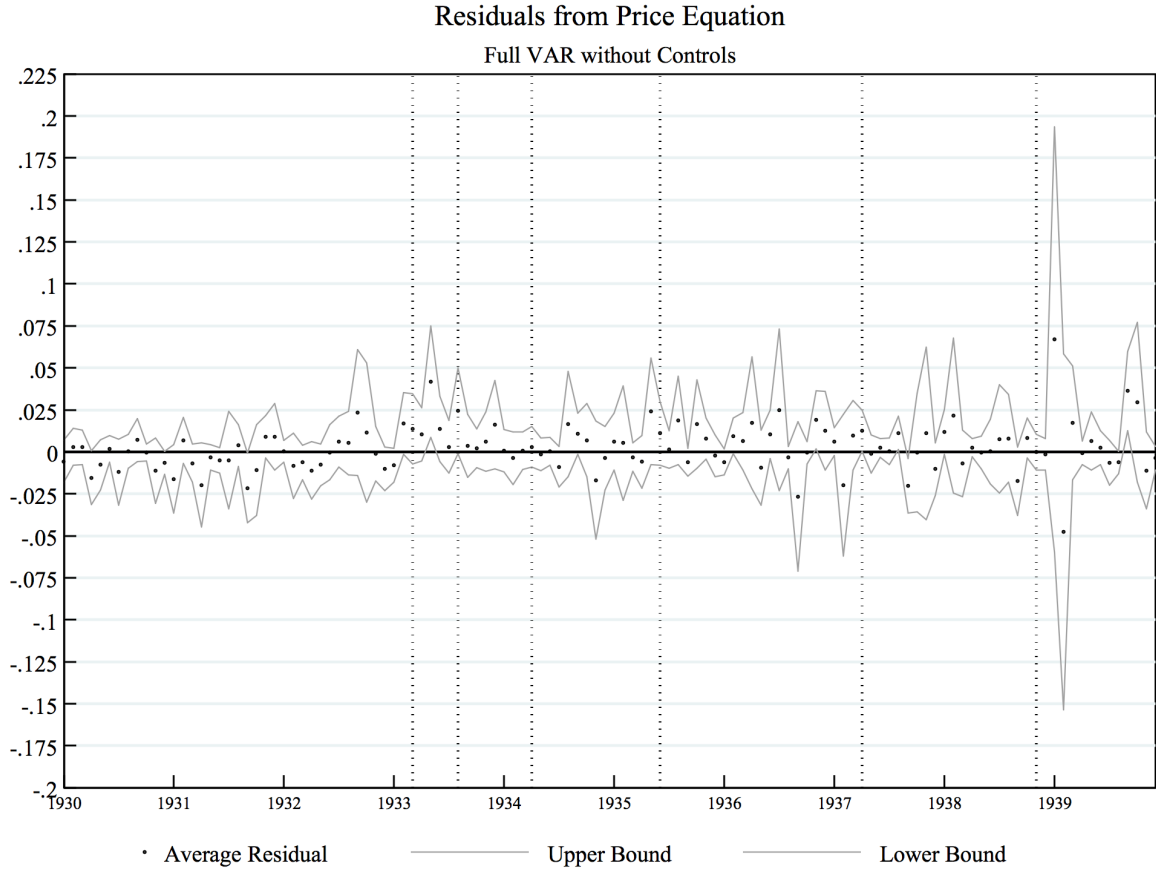


Figure 3.e charts the residuals from the Price equation. Similar to the AR(6) model, the residuals from the five-equation VAR are consistently positive and sometimes statistically significant during the Hundred Days regime.

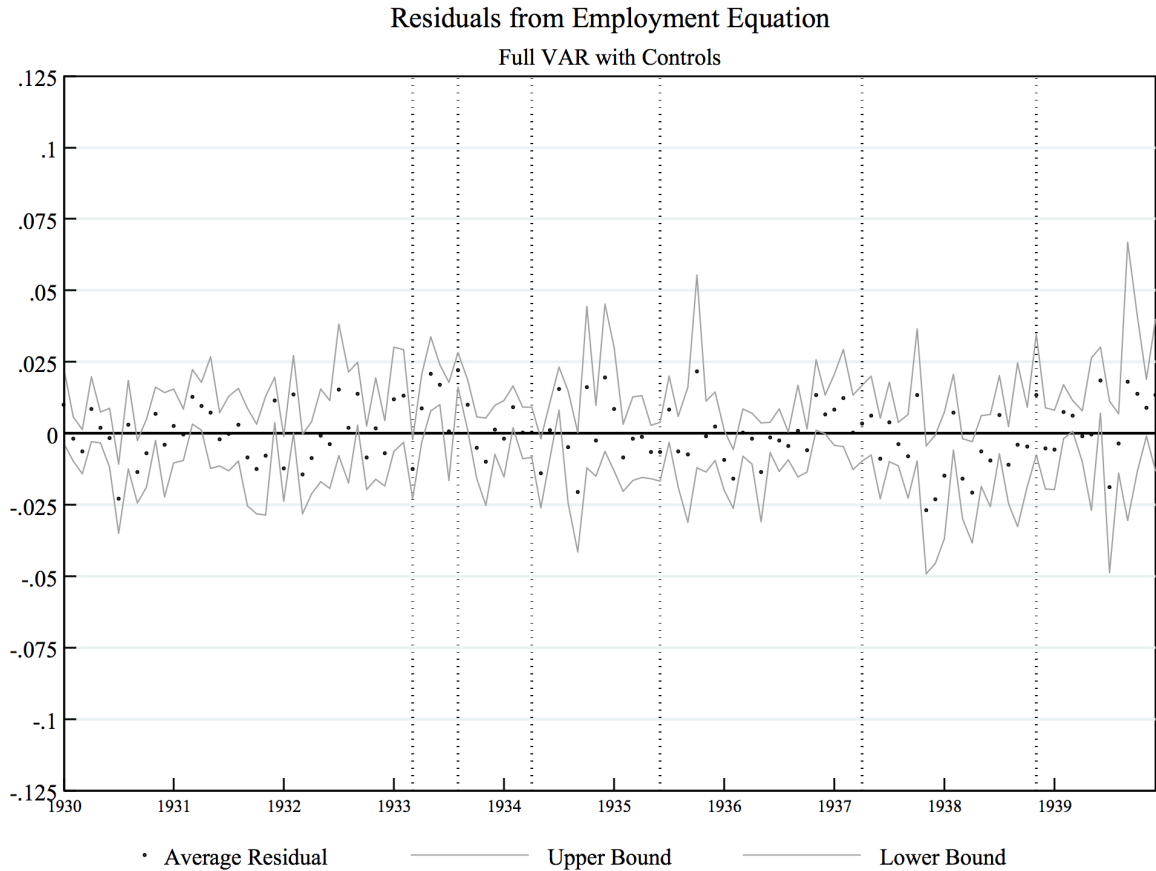
Figure 3.e



Finally we turn to the full specification described in Equation 1, which adds measures of fiscal and monetary policy to the VAR. The mean residuals from these regressions are charted in Figures 4.x. Comparing Figure 4.a to Figures 3.a and 2.a illustrates the importance of controlling for both other past measures of an industry’s labor market and economic conditions thru the VAR model as well as the need to control for fiscal and monetary policy. When this is done there is virtually no pattern to the Employment residuals. Adding the controls reduces the size and significance of the residuals during the NLRA period, suggesting that much of the downturn that occurred during the NLRA period can be explained by changes in fiscal and monetary policy—most likely the reduction in relief spending, tax increases and the change in the reserve requirement ratio that occurred in 1937. There is no pattern during the NIRA, *Schechter*, or FLSA regimes. There remain however, unexplained positive and statistically significant shocks to Employment during the Hundred Days regime and immediately following the PRA implementation. The PRA result is consistent with the program’s objective to reduce workweeks

in order to spread work across workers. The cause of the persistent positive residuals during the Hundred Days is less clear.

Figure 4.a



The residuals from the Hours equation tell a similar story. They are positive and statistically significant during the Hundred Days, suggesting some unexplained recovery and generally negative and in some months statistically significant during the PRA regime, consistent with work sharing. Like the Employment residuals, the Hours residuals are smaller and generally not statistically significant during the NLRA period again suggesting changes in monetary and fiscal policy can explain much of the 1937-38 recession.

Figure 4.b

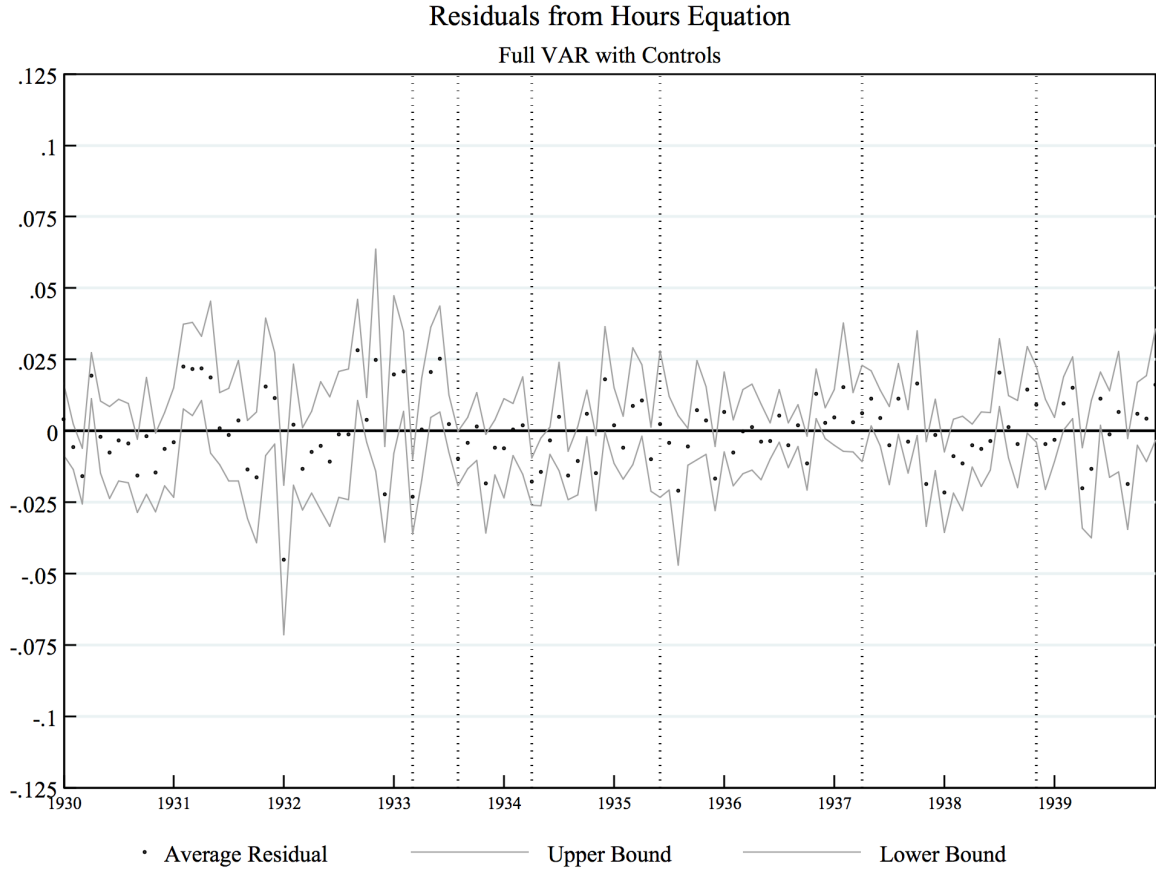
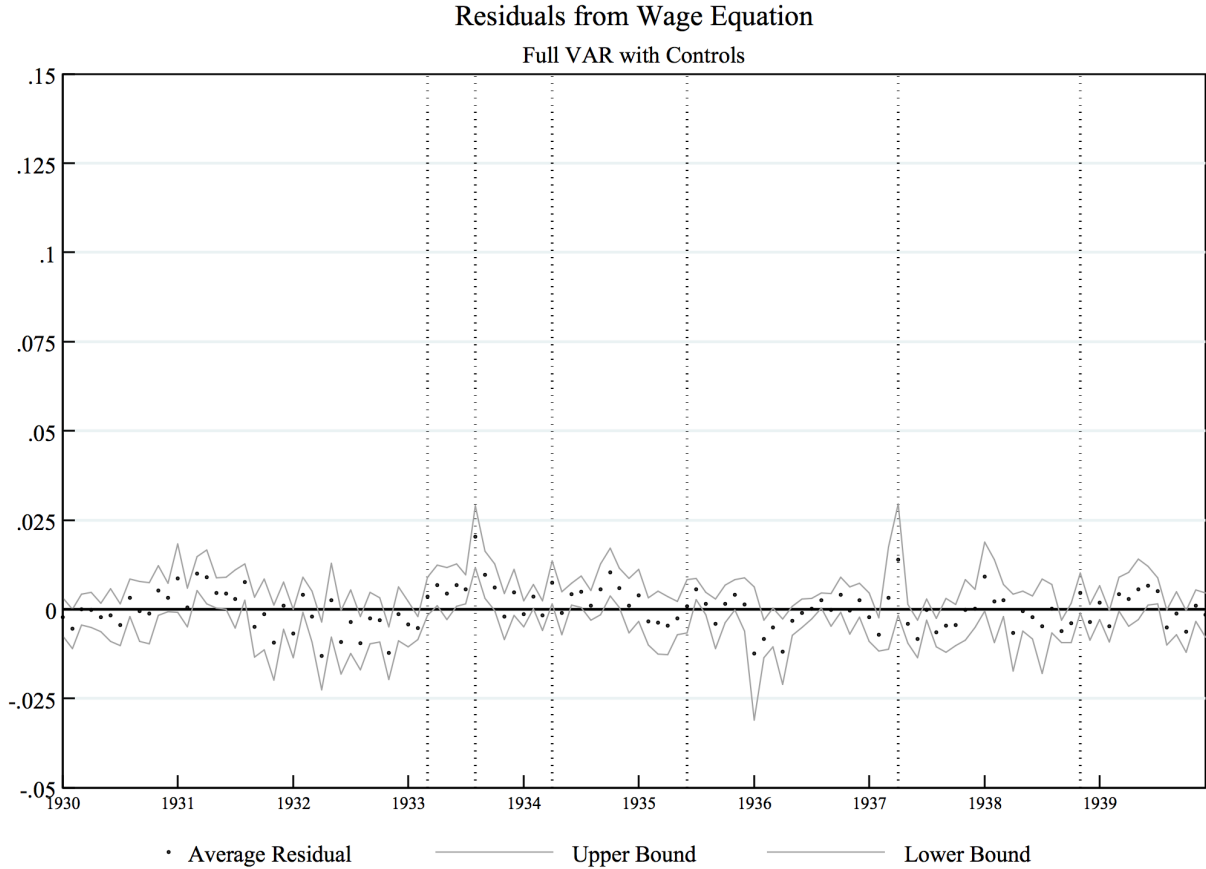


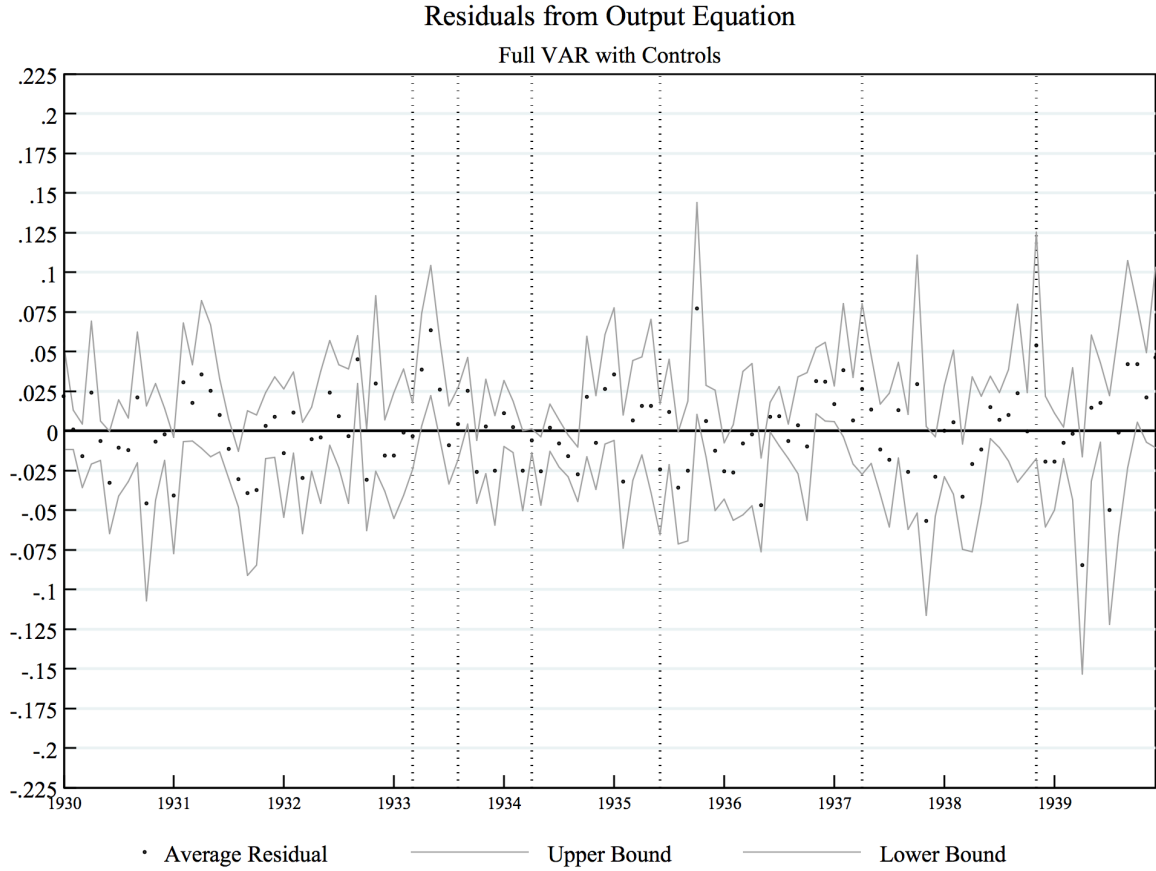
Figure 4.c. demonstrates that after controlling for fiscal and monetary policy there remains an unexplained positive and statistically significant shock to Wages following the implementation of the PRA. The size is smaller than in the first two specifications but is still nearly 2.5 percentage points. Given the lack of any pattern during most of the rest of the period, we believe this strongly suggests that large increases in wages that occurred in August of 1933 were due to the implementation of the PRA. An interesting non-result is the lack of any negative shock following the repeal of the NIRA. Our results are consistent with the high-wage policy becoming locked into the labor market, despite persistently high unemployment in the mid to late 1930s. Still, there is a mild pattern of negative residuals in the first half of 1936, suggesting at least a slowing in the growth rate of wages after *Schechter*. Finally there is an approximate 2 percentage point wage shock immediately following the upholding of the NLRA that is nearly statistically significant at a 95 percent confidence level, suggesting that employers were sensitive to the ruling.

Figure 4.c



Like the Employment and Hours results, controlling for fiscal and monetary policy reduces the magnitude of the residuals from the Output equation. Again much of the negative pattern found in the residuals during the NLRA regime from Figures 2.d and 3.d is eliminated. There remain, however, relatively large, unexplained, statistically significant, positive shocks during the Hundred Days regime, suggesting the spring and early summer recovery of 1933 is still largely unexplained by fiscal or monetary factors, or by lags in our labor and product market variables. There are also several negative and significant shocks during the NIRA Code regime that cannot be explained, suggesting that there were negative effects from cartelization.

Figure 4.d



Finally we chart the residuals from the Price equation in Figure 4.e. As in figure 3.e there is no consistent pattern except during the Hundred Days regime.

The above figures allow one to infer whether there was a consistent positive or negative shock in a month across the 11 industries. However, this might obscure a pattern if industries reacted a little more slowly or quickly to the institutional regime changes. In order to test if there was a longer pattern we estimate the following simple regression.

$$2) \quad r_{it} = \beta^H \text{hundred}_t + \beta^P \text{PRA}_{it} + \beta^N \text{NIRA}_{it} + \beta^S \text{Schechter}_t + \beta^F \text{FLSA}_t + \varepsilon_{it}$$

The residual in a given month t for industry i is regressed on dummy variables that equal 1 for the first 4 months of a regime. The results from this regression are in Table 2.

Table 2
Average Residuals in Four Months following Regime Change
(p-values)

	Hundred Days Regime	PRA Regime	NIRA Code Regime	Schechter Regime	NLRA Regime	FLSA Regime
Employment	0.9% (0.017)	0.9% (0.040)	-0.1% (0.754)	-0.2% (0.585)	0.1% (0.817)	0.2% (0.569)
Hours	0.5% (0.192)	-0.6% (0.210)	-0.4% (0.339)	-0.7% (0.076)	0.4% (0.382)	0.3% (0.670)
Real Wage Rate	0.6% (0.002)	1.0% (0.000)	0.3% (0.122)	0.1% (0.428)	0.1% (0.640)	-0.1% (0.662)
Output	3.4% (0.000)	0.2% (0.887)	-0.7% (0.471)	-1.3% (0.162)	0.1% (0.956)	0.0% (0.977)
Prices	2.0% (0.003)	1.0% (0.196)	-0.5% (0.518)	0.6% (0.373)	0.4% (0.569)	0.5% (0.520)

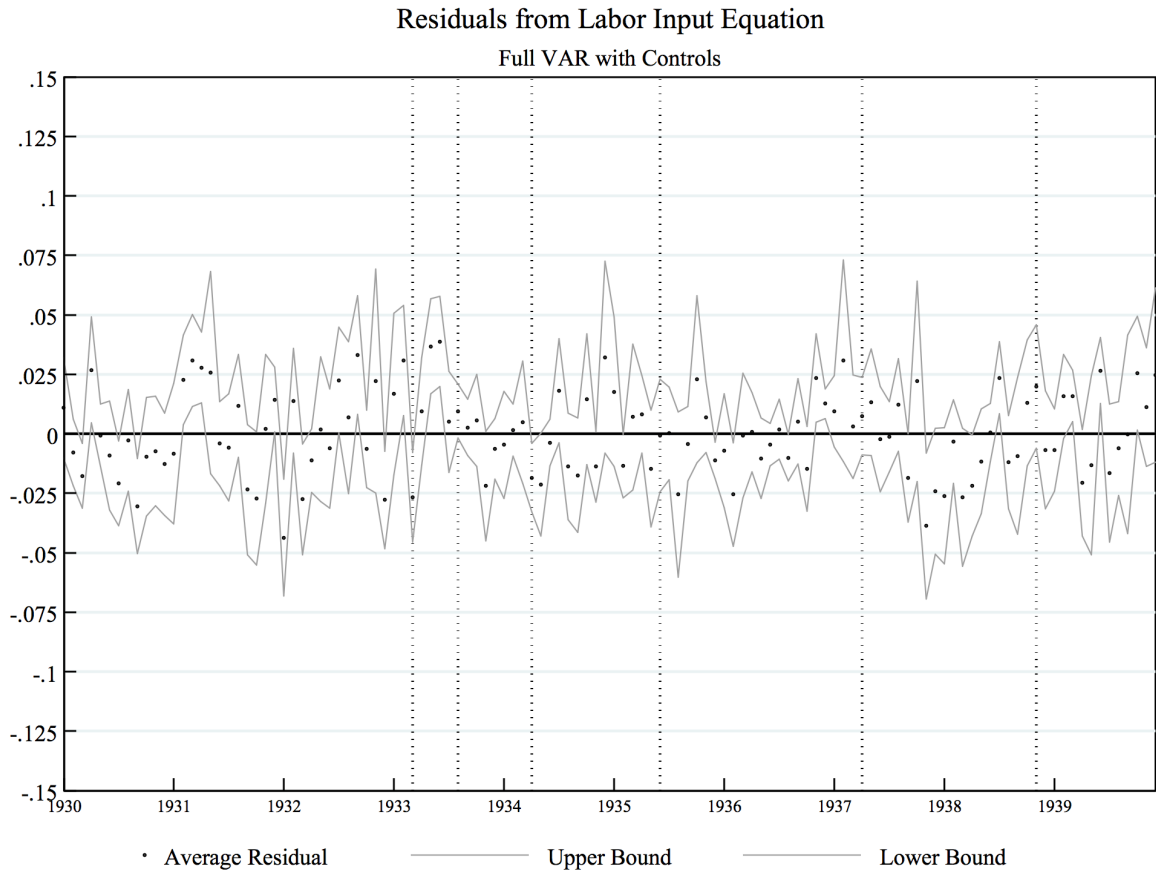
The results largely fit with our observations from Figures 4.x. There are no consistently positive or negative shocks to any of the dependent variables during the beginning of the NIRA, *Schechter*, NLRA or FLSA regimes. During the first four months of the Hundred Days regime, however, Employment residuals are on average 0.9 percentage points per month. Output residuals are over 3.4 percentage points; Price residuals nearly 2 percentage points; while the residuals from the Wage equation are on average .6 percentage points per month—all these results are statistically significant. Meanwhile, immediately following the implementation of the President’s Reemployment Agreement, Employment residuals are on average .9 percentage points and Wage residuals are on average 1 percentage point per month.

Robustness Checks

We were concerned that the structural relationship between Employment and Hours may have changed during the Depression due to work-sharing provisions (shorter workweeks designed to encourage more workers on payrolls). Therefore, as a robustness check, we re-estimated the three specifications discussed above using labor input, that is total hours worked. We create the Labor Input variable by multiplying Employment (number of workers on payrolls)

by Hours (average hourly workweek). The results for the Wage, Output, and Price equations were nearly identical to when Employment and Hours were included separately. Figure 5.a charts the residuals from the Labor equation when the full five-equation VAR with controls is estimated.

Figure 5.a



As one can see there are generally no consistent patterns following regime changes, with the exception of the Hundred Days, where there persists the unexplained positive shocks to the labor market. Also of note is a lack of any consistent negative shocks to Labor Input during the NRA regimes.

In addition to examining the results using labor input, we conducted a number of additional robustness checks and sensitivity analyses. In one exercise we ran the model only using data from 1929 and on to determine if there may have been a difference in the relationships between the 5 dependent variables between the 1920s and 1930s. The results led to similar

conclusions. We also experimented with the dropping of different industries to test whether the results were being driven by any one or two industries in our sample. The conclusions from this exercise fit with those above. We also ran the regressions weighting observations by the employment size of the industry. Again the results were qualitatively unchanged.

Discussion of Results

The results presented above strongly suggest that there were important shocks to industrial labor markets, output, and prices which corresponded to changes in legal or policy regimes within the New Deal. They also raise some important questions. During the Hundred Days regime immediately following Roosevelt's inauguration there was an increase in economic activity that cannot be explained by fiscal or monetary factors, or by lags in our model. At this stage we can only speculate about the cause. Were institutional reforms, such as the Emergency Banking Act, primarily responsible for the rapid recovery? Since a major factor in the downturn between 1929 and early 1933 was a banking system in shambles—around half of all banks in the US failed during this period—one might expect a fairly heady recovery to have occurred once the banking crisis ended. Bernanke (1983, p. 272) claims that it could be argued that “federally directed financial rehabilitation ... was the only New Deal program that successfully promoted economic recovery.” Wigmore (1987, p. 755) likewise views the bank holiday, the government's embargo of gold, and devaluation as a “series of quite effective New Deal policies.” Choudhri and Kockin (1980), followed by several other papers summarized in Bernanke (1995), found that countries who left the gold standard sooner recovered faster from the Great Depression than those who remained on gold.

A related explanation for the boom between March and July of 1933, before the PRA regime was implemented, relies upon inflationary expectations. Hugh Johnson, the NRA's first administrator suggested such a cause in his memoirs, published in 1935, with regards to industry's “rush to speculative production.”³⁷ The cause, according to Johnson, was fear that currency depreciation and increased wages under NRA would cause high inflation. Thus, economic actors “hurried 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

³⁷ Johnson, 1968 (reprint), p. 190.

with a bang.”³⁸ The positive Price residuals in Figures 2e, 3e, and 4e for the months leading up to the PRA regime, combined with the positive Output and Employment residuals for these time periods, are consistent with such a story.

Alternatively, could some aspects of the sharp recovery of the US economy during the spring of 1933 have been artificial? For example, could the anticipation of the NRA cartels have induced firms to boost production? If firms felt that the NRA cartels would impose production quotas based upon market share on the day of their imposition, it would be logical to enter a “race to market share” in the weeks leading up to this date. The first public hints of an NRA-type cartelization plan surfaced only after the April 6 passage of Hugo Black’s 30-hour workweek bill in the Senate.³⁹ Roosevelt felt that the Black bill was dangerously inflexible and had to be defeated, but to do so would require a viable substitute and thus over the next five weeks the NIRA was drafted and presented to Congress on May 17.⁴⁰ If there was a race to market share in anticipation of cartelization, we would expect to see strongly positive Output residuals in April, May, and June of 1933. Figures 2d, 3d, and 4d show just such an outcome.

Another possible cause for the rapid recovery between March and July 1933 simply relies upon the potential gains Roosevelt brought to business and/or consumer confidence. Roosevelt’s fireside chats and policy speeches supposedly delivered a calming influence on the economy. This rise in expectations could have created a major uptick in economic activity, independent of fiscal or monetary policy, as firms began hiring and consumers began spending again. Eggertsson (2008), in an expansion of Temin and Wigmore (1990), suggests that the recovery between 1933 and 1937 was largely driven by a shift in expectations—including, but not limited to inflationary ones consistent with Johnson’s account above. Specifically, Roosevelt discarded three important dogmas—the gold standard, the balanced budget, and commitment to small government—that constrained the Hoover administration. This elimination of these policy dogmas triggered a dramatic change in expectations about future inflation, output, and interest rates. Employing a dynamic stochastic general equilibrium model, Eggertsson’s calibrations

³⁸ Ibid, pp. 190-191

³⁹ While Himmelberg (1976, p. 184) notes that the overall framework for the NIRA was first presented to Roosevelt in May of 1932 by Adolph Berle, and was later presented to the President-elect in January 1933, Roosevelt did not make it a priority and gave no hint of such a policy in his public speeches.

⁴⁰ Himmelberg, 1976, p. 196.

suggest that the regime change—embodied by the elimination of the aforementioned policy dogmas—accounts for between 70 and 80 percent of the recovery in inflation and output between 1933 and 1937. Still, Eggertsson does not attempt to explain the unevenness of recovery during the New Deal, as has been our objective here. Clearly more work is needed to determine what combination of factors was responsible for the sharp recovery that began around inauguration day.

Whatever the cause of the rapid recovery during the Hundred Days regime it is clear from our results that this recovery unexpectedly stalls beginning in August 1933 with the imposition of the PRA regime. Our estimates identify large positive shocks to Wage rates along with negative shocks to Output. Consistent with work-sharing provisions embedded in the legislation, hourly workweeks (Hours) fell, although number of workers on payrolls (Employment) rose under the PRA. When we analyze total labor input (number employed times average workweek), the PRA has no statistically significant effect. Under the NIRA Codes, Output and Employment residuals continued to be negative, although the statistical significance of these results is not as consistently strong as it is under the PRA. During the *Schechter* regime following the repeal of the NIRA we find some unexplained negative shocks to Wages. Given its repeal was, in part, a repeal of an industry-specific minimum wage law this is not surprising. However, what is interesting is the small size of these shocks, when compared to the wage increases that preceded them, which suggest that the NIRA's higher wages became largely entrenched.

Explaining the shocks during the NLRA regime is a bit more difficult. Output and Employment residuals are consistently negative, even after controlling for fiscal and monetary factors, although the largest magnitude decreases tend to occur several months after the *Jones & Laughlin* Supreme Court decision, making it more difficult to argue that they were caused by the NLRA itself. Still, given that the NLRA simply made organization legal, but did not immediately organize industrial labor workers, it is possible the effect of its upholding could have taken some time. More research is required to determine the ramifications of the NLRA, unionization, and strikes during the Depression.

Finally the institution of the FLSA regime is not generally associated with significant shocks to our dependent variables. We are not entirely surprised by this since the FLSA higher

wages and lower workweeks were phased in over time. Additionally for most industries in our sample the new minimum wages, particularly before complete phase in which did not happen until after our time series ends, were not binding.

Conclusion

Markets during the New Deal operated under a number of different institutional regimes, which were marked by Executive orders, the passage of various pieces of legislation, and Supreme Court rulings on their constitutionality. We examine six specific regimes; the “Hundred Days” marking the period immediately following President Roosevelt’s inauguration, the period in which firms operated under the President’s Reemployment Agreement (PRA), the period in which firms operated under industry-specific National Recovery Administration (NRA) codes of fair competition, the year and a half following the *Schechter* ruling where the NIRA was ruled unconstitutional, the months following the upholding of the National Labor Relations Act (NLRA) by the Supreme Court, and finally the months following the enactment of the Fair Labor Standards Act.

Using the residuals from 11 separate industry-level VAR regressions, we identify shocks to measures of industrial Employment, Hours, Output, Wages, and Prices that are unexplained by changing fiscal and monetary policy. Many of these shocks correspond to the timing of the different regime changes. Specifically there were large positive shocks to Employment, Hours, Output, and Prices during the Hundred Days—Roosevelt’s early policies, or perhaps just the confidence that he brought to the economy, seemed to have sparked a swift recovery. However, there were generally negative shocks to measures of Employment, Hours, and Output, accompanied by large positive shocks to Wages, following the implementation of the PRA and NRA codes. The timing of these shocks and their direction strongly suggest that NIRA played a significant role in delaying what was shaping up to have been a healthy recovery. Among other findings of note, we estimate only small negative shocks to Wages associated with the repeal of the NIRA, suggesting its high-wage policies had become entrenched. Additionally, we find negative shocks to Employment and Output beginning about six months after the Supreme Court’s upholding of the NLRA. These may be attributable to unionization and strike activity

that followed, with some lag, the *Jones & Laughlin* ruling, although this conjecture is in need of further study.

New Deal research often seems to fall into one of two camps—either the New Deal was bad and slowed recovery, or the New Deal was good and helped save capitalism. Our findings suggest that the uneven pace of recovery during the 1930s, sometimes moving swiftly forward and sometimes going backward, can be explained by changes in institutional regimes, which dramatically altered the economic rules that firms faced.

References

- Alexander, Barbara. "Failed Cooperation in Heterogeneous Industries Under National Recovery Administration." *The Journal of Economic History*, 57 (1997): 322-344.
- Alexander, Barbara. "The Impact of the National Industrial Recovery Act on Cartel Formation and Maintenance Costs." *The Review of Economics and Statistics*, 76 (1994): 245-254.
- Alter, Jonathan. *FDR's Hundred Days and the Triumph of Hope*. New York: Simon & Schuster, 2006.
- Badger, Anthony J. *FDR: The First Hundred Days*. New York: Hill and Wang, 2008.
- Bernanke, Ben S. "Employment, Hours, and Earnings in the Depression: An Analysis of Eight Manufacturing Industries." *American Economic Review*, 76 (1986): 82-109.
- Bernanke, Ben S. "The Macroeconomics of the Great Depression: A Comparative Approach." *Journal of Money, Credit, and Banking* 27 (1995): 1-28.
- Bordo, Michael D., Chourdhi, Ehsan U., Schwarz, Anna J. "Was Expansionary Monetary Policy Feasible during the Great Contraction? An Examination of the Gold Standard Constraint." *Explorations in Economic History* 39 (2002): 1-28.
- Choudhri, Ehsan U. and Levis A. Kochin. "The Exchange Rate and the International Transmission of Business Cycle Disturbances: Some Evidence from the Great Depression." *Journal of Money, Credit, and Banking* 12 (1980): 565-574.
- Cohen, Adam. *Nothing to Fear: FDR's Inner Circle and the Hundred Days that Created Modern America*. New York: Penguin Press, 2009.
- Cole, Harold L. and Ohanian, Lee E. "New Deal Policies and the Persistence of the Great Depression: A General Equilibrium Analysis." *Journal of Political Economy* 112, no. 4 (2004): 779-816.
- Dighe, Ranjit "Saving Private Capitalism: The U.S. Bank Holiday of 1933." *Essays in Economic and Business History* 29 (2011): 41-58.
- Eggertsson, Gauti B. "Great Expectations and the End of Depression." *American Economic Review* 98 (2008): 1476-1516.
- Eggertsson, Gauti B. "'Was the New Deal Contractionary?'" *American Economic Review* 102 (2012): 524-55.
- Fine, Sidney. *Sit-Down: The General Motors Strike of 1936-1937*. Ann Arbor: University of Michigan Press, 1969.

- Fishback, Price V., William C. Horrace, and Shawn Kantor. "The Impact of New Deal Expenditures on Local Economic Activity: An Examination of Retail Sales, 1929-1939." *The Journal of Economic History* 65, no. 1 (2005): 36-71.
- Fishback, Price V., Shawn Kantor, and John Joseph Wallis. "Can the Three R's be Rehabilitated? A Comprehensive Analysis, Program by Program, County by County." *Explorations in Economic History* 40, no. 3 (2003), 278-307.
- Freeman, Richard B. "Spurts in Union Growth: Defining Moments and Social Progress." In Michael D. Bordo, Claudia Goldin, and Eugene N. White (Eds.) *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*. Chicago: University of Chicago Press 265-296, 1998.
- Friedman, Milton and Schwarz, Anna J. *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University Press, 1963.
- Hamilton, James D. "Monetary Factors in the Great Depression" *Journal of Monetary Economics* 19 (1987): 145-169.
- Hawley, Ellis W. *The New Deal and the Problem of Monopoly*. Princeton: Princeton University Press, 1966.
- Kaufman, Bruce E. "Why the Wagner Act? Reestablishing Contact with its Original Purpose," in David Lewin, Bruce E. Kaufman, and Donna Sockell (eds.), *Advances in Industrial Relations Volume 7*. Greenwich, Conn.: JAI Press, pp. 15-68.
- Kesselman, Jonathan. "Work Relief Programs in the Great Depression." In *Creating Jobs: Public Employment Programs and Wage Subsidies*. edited by John L. Palmer. Washington, DC: Brookings Institution, 1978, 153-229.
- Krepps, Matthew B. "Another Look at the Impact of the National Industrial Recovery Act on Cartel Formation and Maintenance Costs." *Review of Economics and Statistics*, 79 (1997): pp. 151-154.
- Lyon, Leverett S., Homan, Paul T. Lorwin, Lewis L., Terborgh, George, Dearing, Charles L., and Marshall, Leon C, *The National Recovery Administration: An Analysis and Appraisal*. New York: Da Capo Press, 1972 (Reprint of 1935 first edition).

- Maddala, G. S., and Wu, S. "A Comparative Study of Unit Root Tests with Panel Data and New Simple Test." *Oxford Bulletin of Economics and Statistics* 61 no. 4 (1999): 631-52.
- Moley, Raymond. *The First New Deal*. New York: Harcourt, Brace and World, 1966.
- National Labor Relations Board 60th Anniversary Committee, *The First Sixty Years: The Story of the National Labor Relations Board, 1935-1995*.
- O'Brien, Anthony Patrick. "A Behavioral Explanation for Nominal Wage Rigidity during the Great Depression." *Quarterly Journal of Economics* 104, no. 4 (1989): 719 - 735.
- Paulsen George E. "Ghost of the NRA: Drafting National Wage and Hour Legislation in 1937." *Social Science Quarterly* 67 (1986): 241-254.
- Powell, Jim. *FDR's Folly: How Roosevelt and His New Deal Prolonged the Depression*. New York: Crown Forum, 2003.
- Richardson, Gary and Troost, William. "Monetary Intervention Mitigated Banking Panics during the Great Depression: Quasi-experimental Evidence from a Federal Reserve District Boarder, 1929-1933." *Journal of Political Economy* 117 (2009): 1031-1073.
- Taylor, Jason and Selgin, George. "By Our Bootstraps: Origins and Effects of the High-Wage Doctrine and the Minimum Wage." *Journal of Labor Research* 20 (1999): 447-62.
- Taylor, Jason E. "The Output Effects of Government Sponsored Cartels During the New Deal." *Journal of Industrial Economics* 50, no. 1 (2002): 1-10.
- Taylor, Jason E. "The Welfare Impact of Collusion Under Various Industry Characteristics: A Panel Examination of Cartel Theory." *The B.E. Journal of Economic Analysis & Policy* 10 (Contributions), Article 97 (2010).
- Taylor, Jason E. "Work-Sharing During the Great Depression: Did the 'President's Reemployment Agreement' Promote Reemployment?" *Economica* 78 (2011): 133-158.
- Taylor, Jason E. and Klein, Peter G. "Anatomy of a Cartel: The National Industrial Recovery Act of 1933 and the Compliance Crisis of 1934." *Research in Economic History* 26 (2008): 235-271.
- Temin, Peter and Barrie A. Wigmore. "The End of One Big Deflation." *Explorations in Economic History* 27 (1990): 483-502
- Troy, Leo. *Trade Union Membership, 1897-1962*. New York: Columbia University Press, 1965.
- U.S. National Recovery Administration, *Codes of Fair Competition, Volumes 1-23*: United States Government Printing Office, 1933-1935.

- U.S. National Resources Planning Board, Committee on Long-range Work and Relief Policies, *Security, work, and relief policies*, United States Government Printing Office, 1942.
- Vedder, Richard K., and Lowell E. Gallaway. *Out of Work: Unemployment and Government in Twentieth-Century America*. New York: Holmes and Meier, 1993.
- Weinstein, Michael M. *Recovery and Redistribution under the NIRA*. Amsterdam: North-Holland, 1980.
- Wheelock, David C. "Member Bank Borrowing and the Fed's Contractionary Monetary Policy during the Great Depression." *Journal of Money, Credit, and Banking* 22 (1990): 409-426.

Appendix

Data Sources, Arranged by Industry

Automobiles

Employment: NBER Series m8144, U.S. Index of Factory Employment, Automobiles

Hours: NBER Series m8201a, U.S. Average Actual Hours of Work Per Week, Automobile Manufacturing, Nicb

Wage Rate: NBER Series m8207a, U.S. Average Hourly Earnings, Automobile Manufacturing

Output: NBER Series m1107, Automobile Production, Passenger Cars, Factory Production

Price: NBER Series m4180b, U.S. Index of Wholesale Prices Of Passenger Automobiles, Bureau Of Labor Statistics

Boot and Shoes

Employment: NBER Series m8103, U.S. Index of Factory Employment, Boots and Shoes

Hours: NBER Series m8199a, U.S. Average Actual Hours of Work Per Week, Boot and Shoe Manufacturing, Nicb

Wage Rate: NBER Series m8205a, U.S. Average Hourly Earnings, Boot and Shoe Manufacturing

Output: NBER Series m1099, Total Shoe Production

Price: NBER Series m4133a, U.S. Wholesale Price of Mens' Black Vici Kid Shoes, Goodyear Welt, Manufacturer

Chemical Manufacturing

Employment: NBER Series m8216a, U.S. Index of Factory Employment, Chemicals

Hours: NBER Series m8214a, U.S. Average Actual Hours of Work Per Week, Chemical Manufacturing, Nicb

Wage Rate: NBER Series m8215a, U.S. Average Hourly Earnings, Chemical Manufacturing

Output: NBER Series m1279a, U.S. Index of Production Of Chemical Products, Seasonally Adjusted

Price: NBER Series m4096a, U.S. Index of Wholesale Price Of Chemicals and Drugs, Bureau Of Labor Statistics

Leather Manufactures

Employment: NBER Series m8102, U.S. Index of Factory Employment, Leather

Hours: NBER Series m8198a, U.S. Average Actual Hours of Work Per Week, Leather Tanning and Finishing, Nicb

Wage Rate: NBER Series m8204a, U.S. Average Hourly Earnings, Leather Tanning and Finishing

Output: NBER Series m1211, Cattle Hide and Kip Leather Production

Price: NBER Series m4088a, U.S. Wholesale Price of Leather, Sole, Oak, Scoured Backs

Paper and Pulp

Employment: NBER Series m8104, U.S. Index of Factory Employment, Paper and Pulp

Hours: NBER Series m8234a, U.S. Average Actual Hours of Work Per Week, Paper and Pulp Manufacturing, Nicb

Wage Rate: NBER Series m8235a, U.S. Average Hourly Earnings, Paper and Pulp

Output: NBER Series m1105, Paper Production, All Grades

Price: NBER Series m4165a, U.S. Index of Wholesale Prices Of Paper, Bureau Of Labor Statistics

Rubber Products

Employment: NBER Series m8220a, U.S. Index of Factory Employment, Rubber Products

Hours: NBER Series m8218a, U.S. Average Actual Hours of Work Per Week, Rubber Products Manufacturing, Nicb

Wage Rate: NBER Series m8219a, U.S. Average Hourly Earnings, Rubber Products Manufacturing

Output: NBER Series m1180, Crude Rubber Consumption

Price: NBER Series m4077b, U.S. Wholesale Price of Rubber, Para Island; Plantation, New York

Machine and Machine Tools

Employment: NBER Series m8224, U.S. Index of Factory Employment, Machine and Machine Tools

Hours: m8222, U.S. Average Actual Hours of Work Per Week, Machine and Machine Tools Manufacturing, Nicb

Wage Rate: m8223, U.S. Average Hourly Earnings, Machine and Machine Tool Manufacturing

Output: m1277a, Index of Production Of Machinery

Price: m4066a, U.S. Wholesale Prices of Metal and Metal Products, Bureau Of Labor Statistics. 01/1890-12/1951

Meat

Employment: NBER Series m8087, U.S. Index of Factory Employment-Slaughtering and Meat Packing

Hours: NBER Series m8196a, U.S. Average Actual Hours of Work Per Week, Meat Packing, Nicb

Wage Rates: NBER Series m8202a, U.S. Average Hourly Earnings, Meat Packing, National Industrial Conference Board

Output: NBER Series m1064, Total Meat Consumption

Price: NBER Series m4166, U.S. Index of Wholesale Prices Of Meats, Bureau Of Labor Statistics

Iron and Steel

Employment: NBER Series m8015, U.S. Index of Factory Employment, Iron and Steel Products, Seasonally Adjusted 01/1919-09/1942.

Hours: NBER Series m8208a, U.S. Average Actual Hours of Work Per Week, Iron and Steel Manufacturing, Nicb

Wage Rate: NBER Series m8210a, U.S. Average Hourly Earnings, Iron and Steel Manufacturing

Output: NBER Series m1135, Steel Ingot Production

Price: NBER Series m4134, U.S. Wholesale Price of Structural Steel

Wool Manufacturing

Employment: NBER Series m8232, U.S. Index of Factory Employment, Wool, Nicb

Hours: NBER Series m8230a, U.S. Average Actual Hours of Work Per Week, Wool Manufacturing, Nicb

Wage Rate: NBER Series m8231a, U.S. Average Hourly Earnings, Wool Manufacturing

Output: NBER Series m1098, Total Wool Consumption, Scoured Basis

Price: NBER Series m4087, U.S. Wholesale Price of Wool, Eastern Markets, Boston 01/1917-04/1942

Time Series Controls

Interest Rates: NBER Series m13030, U.S. Weighted Average of Open Market Rates, New York City

Government Spending: NBER Series m15005, U.S. Federal Budget Expenditures, Total

Government Revenue: NBER Series m15004, U.S. Federal Budget Receipts, Total

Relief Spending: U.S. National Resources Planning Board, Committee on Long-range Work and Relief Policies, *Security, work, and relief policies*, United States Government Printing Office, 1942

Money Supply: NBER Series m14144a, U.S. Money Stock, Commercial Banks Plus Currency Held By Public, Seasonally Adjusted

Controls

