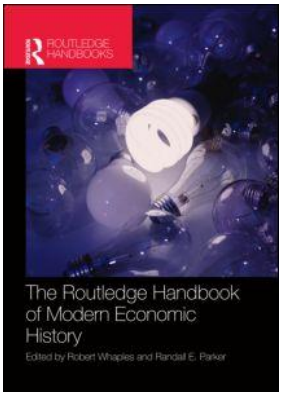

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Robert Whaples, Randall E. Parker

Business Cycles

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Christopher Hanes
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BUSINESS CYCLES

Christopher Hanes

This chapter examines characteristics and causes of American business cycles in the era before the First World War – the "prewar" era – especially the years from 1879 on, which represent a distinct monetary regime. In January 1879, the U.S. Treasury began to redeem legal-tender currency in gold at a fixed rate, placing the U.S. within the international gold-standard system that had developed in the 1870s (Meissner 2005). Unlike most large gold-standard countries, the U.S. had no central bank. In 1914, the American monetary regime changed in two ways: the international gold standard broke down as other countries suspended gold convertibility, and the U.S. gained a central bank in the Federal Reserve system.

To describe the characteristics of prewar business cycles, I compare them with those of the "postwar" era since the Second World War. Thus, in the first section of the chapter, I review some established facts about postwar business cycles. The second section examines evidence about prewar cycles, emphasizing the limits on our knowledge due to lack of historical data. Finally, the third section discusses causes of prewar business cycles – that is, the events exogenous to the American economy (political, natural, or foreign developments) that explain why downturns and upturns occurred when they did. Recent research has identified the exogenous causes of most prewar business cycles.

Facts about post-Second World War business cycles

Many macroeconomic concepts such as unemployment and national income were developed or refined over the 1930s. By the late 1940s, the U.S. had put into place bureaucratic structures to collect the information needed to construct most of the statistics commonly used in macroeconomic research today, such as monthly unemployment rates and quarterly national income and product accounts (NIPAs). Because standard time-series data begin after the Second World War, so do the samples for most macroeconomic empirical work.

A business cycle is often defined as a short-term fluctuation in aggregate employment or aggregate output (real gross domestic product [GDP]) as indicated by variations in annual growth rates or deviations from longer-term trends. The business-cycle dating committee of the National Bureau of Economic Research (NBER) uses a more restrictive definition: a cyclical downturn is an absolute decline in real output across most sectors of the economy, not just a growth slowdown or dip below trend in real GDP. An NBER business-cycle "peak" (trough)

is the point in time that output began to fall (rise again). Using the general definition, a variable can be classed as "acyclical," "procyclical," or "countercyclical" as its fluctuations are uncorrelated, positively or negatively correlated with those in real GDP. Using the NBER definition, it can be characterized on the basis of its behavior in recessions (peak to trough) and recoveries (trough to peak). The following characterizations hold either way.

Real GDP is the sum of various types of real spending: consumption, investment, government expenditure on goods and services, and net exports. Real GDP is also the sum of output (value added) of individual sectors: manufacturing, mining, agriculture, and services. Estimates of real GDP and its components for the postwar era, constructed by the Bureau of Economic Analysis (BEA), are based on an astounding mass of information. Some is about quantities of goods produced or shipped (e.g. number of automobiles sold), but most is about dollar values: of output and shipments, retail sales, receipts of service providers, payrolls, tax collections, exports and imports, and so on. To estimate quantities from dollar values (and vice versa), the BEA applies specialized price indices that match the dollar values in question (U.S. Bureau of Economic Analysis 2005).

In postwar NIPA data, across types of spending, consumption is procyclical; investment is more strongly procyclical; net exports are countercyclical. Across sectors, output is generally procyclical (highly correlated with other sectors' output) with one exception: agriculture. As early business-cycle researchers observed, outputs of crops and livestock "undergo cyclical movements, but they have little or no relation to business cycles" (Burns 1951: 7–8); "the basic industry of growing crops does not expand and contract in unison with mining, manufacturing, trading, transportation and finance" because "farmers cannot control the short-term fluctuations in their output … the factor that dominates year-to-year changes in the harvests is that intricate complex called weather. Plant diseases and insect pests also exert an appreciable influence" (Mitchell 1951: 56–7).

Postwar employment statistics are based on two types of surveys, carried out every month by the Bureau of Labor Statistics (BLS). Surveying firms, the BLS records total numbers and hours of employees. Surveying households, the BLS classifies adults as employed, unemployed, or neither. A person is classified as unemployed if he or she is not employed or self-employed but is actively looking for work or on temporary layoff. The number of unemployed plus the number employed, excluding those employed in the military, make up the "civilian labor force." The civilian unemployment rate is the fraction of unemployed in the civilian labor force.

Outside agriculture, total employment hours fluctuate with real value-added but with smaller amplitude, so nonagricultural output per hour is procyclical. Hours per employee is procyclical, but most variation in total hours is due to changes in the number employed or self-employed. The civilian unemployment rate is highly countercyclical. The civilian labor force is procyclical, which is to say that the number of people *out* of the labor force (not employed, not actively looking for work, not on temporary layoff) is countercyclical.

Postwar price indices include the Consumer Price Index (CPI), which measures prices paid by households for consumer goods and services and housing costs; and producer price indices (PPIs), which measure prices received by the firms that originally produce goods and services, as distinct from prices received by retailers, middlemen, and wholesalers. The price-index counterpart of real GDP is the GDP price index, a Fisher-ideal index for prices of all final goods and services produced in the U.S.

All these price indices show a cyclical pattern known as the "accelerationist Phillips curve" in postwar samples that stretch past the mid-1960s: the change in inflation is positively correlated with the level of real activity (e.g. real GDP deviations from trend), negatively correlated with

the civilian unemployment rate. Across different price indices, the degree of sensitivity to real activity depends on the relative weight given to more-finished goods and services versus less-finished commodities such as farm products, minerals, and raw materials. Prices of less-finished commodities are more procyclical in inflation rates and levels. Thus, inflation in PPIs for crude or intermediate commodities shows more sensitivity to real activity than inflation in finished-good PPIs, CPIs or GDP price indices (Hanes 1999).

Postwar wage series include average hourly earnings (AHEs) and employment cost indices (ECIs). ECIs are derived from surveys of establishments that record wages and benefits for narrowly defined occupations within the establishment. For ECIs, changes in wages for individual jobs are aggregated up with fixed weights from one period to the next. Thus, ECIs are unaffected by changes in the mix of employees across jobs, firms, and industries: changes in ECIs reflect only changes in wage rates or salaries paid by given firms for given jobs. AHEs are derived from data on firms' total payrolls and hours. They reflect changes in wage rates but are also affected by the distribution of a given firm's employees between high-wage and low-wage jobs, and the distribution of employees between high- versus low-wage employers. Depending on the level of aggregation, AHEs can be affected by changes in the mix of workers across high- versus low-wage industries. For most purposes, ECIs are the more appropriate wage series, but they were not developed until the 1970s, so many older studies relied on AHEs. Rates of inflation in both ECIs and AHEs show the same accelerationist Phillips curve pattern apparent in price indices.

Disaggregated data on wage rates paid for individual jobs show a pattern known as "downward nominal wage rigidity." In any year, some jobs' wage rates rise much more than average while some rise less. Many wage rates are held absolutely fixed from year to year. But absolute *cuts* in wage rates are *extremely* rare even in recessions (Lebow *et al.* 2003).

Ratios of wages to prices are "real wages." "Real consumption wages" are wages relative to prices households pay for consumption goods, services, and housing. "Real product wages" are wages relative to prices received by employers for their workers' output. The obvious measure of real consumption wages is the ratio of ECIs to CPIs. This measure is procyclical. The proper measure of real product wages is not so obvious, because PPIs come in many categories. Using PPIs for more-finished goods, real wages are procyclical or acyclical. Using PPIs for less-finished goods, real wages are countercyclical. This is, of course, another side of the procyclical pattern in less-finished goods' relative prices (Hanes 1996). The goods in postwar CPIs, which is to say the goods postwar households buy, are mainly more-finished goods.

Facts about pre-First World War business cycles

There is a lot that we do not and *cannot* know about prewar business cycles. As Carter and Sutch (1990: 15) observe, research on the topic is like "inferring the shape of some long-extinct animal from bones collected in an ancient tar pit." Many of today's most useful macroeconomic statistics, such as unemployment rates and NIPAs, simply cannot be constructed for the prewar era at frequencies useful for business-cycle research, because no one collected the necessary information. Of course, it is fun to try to answer questions like "What would the civilian unemployment rate have been in 1893?" One can find annual, even quarterly frequency estimates of many standard macroeconomic variables for the prewar era, which were created by combining the scanty historical evidence with reasonable assumptions. But it is important to keep in mind that these estimates are largely distillations of their creators' assumptions. They are not *data* like postwar statistics. To avoid mistaking assumptions for data, it is usually best to work with time series that can be constructed from historical evidence without more assumptions than are required for their

postwar counterparts. Often, that means relying on statistics that have a subsidiary role nowadays, such as indices of industrial production (IP) and wholesale prices.

Fortunately, the most reliable prewar statistics are enough to establish key facts. Prewar cycles were like postwar cycles in that both consumption and investment were procyclical; net exports were not procyclical; farm output was volatile but acyclical.

Prewar cycles were *different* in the behavior of wages and prices. In prewar data, the level of real activity is correlated with inflation, not the change in inflation. Real consumption wages, measured as wage rates over CPIs, were countercyclical or acyclical, not procyclical. The prewar era was also different in that many cyclical downturns were accompanied by national financial crises, with mass withdrawals of funding from key financial intermediaries, choked-off credit supply, and payment-system breakdowns. Such crises have been rare in subsequent eras, occurring only in the 1929–33 downturn of the Great Depression and in 2007–8.

Prewar employment and unemployment

Recall that postwar employment data are based on monthly BLS surveys of firms and households. In the prewar era, the decennial census surveyed households, determining whether people had jobs or were self-employed. It also surveyed businesses, determining the number of employees. Thus, for census years it is possible to estimate the number of people employed using definitions close to those applied by the postwar BLS. Years between censuses are another matter. There is very little annual-frequency, much less monthly, information of any kind about the number of people with jobs. Starting in 1890, the Interstate Commerce Commission (ICC) recorded annual employment in intercity railways (U.S. Census 1975: 726). About the same time, statistical bureaus in a few states began annual surveys of large manufacturing plants, inquiring about employment among other things. Building on the work of Lebergott (1964), Weir (1992) constructed annual estimates of total U.S. nonfarm employment starting with 1890. Weir and Lebergott had to guess at annual employment outside manufacturing and railroads, and employment in manufacturing outside the small number of states with surveys. To do this, they made assumptions about the relation between employment and variables for which they had annual, national data, mainly variables indicating the quantity of manufacturing output and railway traffic.

A variety of evidence from the prewar era shows that there must have been widespread unemployment, on the postwar definition, during depressions (Keyssar 1986). But no prewar survey asked questions like those the postwar BLS has used to categorize a person as unemployed, so it is not possible to estimate the unemployment rate in any prewar year on the postwar definition. Again building on Lebergott (1964), Weir (1992) used his annual estimates of total employment to construct annual figures for an essentially different notion of the unemployment rate, in terms of the "usual labor force." The usual labor force is the number of employed in a "normal" year, estimated from decennial census data and intercensal population growth in relevant demographic categories. The usual labor force is acyclical by construction, while the labor force in postwar BLS statistics is procyclical as noted earlier.

National income and product accounts

Prewar censuses (decennial censuses and additional censuses of manufacturing in 1905 and 1914) surveyed businesses and recorded dollar values of output or sales and most costs (such as wages and salaries and costs of materials) over the year preceding the census. Thus, for census years it is possible to construct estimates of many NIPA variables along the lines of postwar estimates. Using

census data and price indices described later, Shaw (1947) constructed census-year estimates for an important component of GDP – nominal and real values of manufactured goods and other commodities produced for final use by households and firms. Building on Shaw's work, Kuznets (1946) constructed census-year estimates of nominal and real gross national product (GNP) and sectoral value-added, which were improved by Kendrick (1961) and Gallman (1966).

Years between censuses are, again, another matter. Annual-frequency information about dollar values of output or sales is quite limited. It includes merchandise exports and imports, values of shipments of some items in internal trade (for example, flour shipments received at New York City), and estimated value of planned construction in some large cities from construction permits. Starting in the late 1880s, the state surveys mentioned earlier give values of output in large manufacturing establishments in a few states. For manufacturing, mining, agriculture, and transportation services, there is more information about output quantities: measures of traffic on railways and waterways (in weight, volume, or mileage), quantities of manufactured goods produced (e.g. tons of steel) or raw materials consumed in manufacturing (e.g. raw cotton for textiles), output of coal (both anthracite and bituminous), petroleum and many other minerals, annual harvests of most crops (in pounds, bales, or bushels). For services other than transportation, such as wholesale and retail trade, there is practically no useful information on values *or* quantities.

Using the state surveys of manufacturing establishments and quantity data, Shaw (1947) constructed estimates for commodity output value in years between censuses, starting with 1889. Because the state surveys give values of products in specific categories, Shaw could estimate values for consumption versus investment goods. Using data on export and import values, Shaw could also estimate the flow of goods for domestic use – that is, production *less* exports plus imports. Kuznets (1946: 90–9) constructed annual estimates of commodity output value for 1880–8 and 1870–8 based on export and import value data (such as coffee imports) and quantity data for a remarkably small set of items.[1]

Kuznets, Kendrick, and Gallman did not believe it was possible to construct estimates of NIPA variables for years between censuses that would be good enough to indicate the magnitude of year-to-year fluctuations. Their only goal was to estimate longer-term trends. But, even for this limited purpose, census-year estimates were not enough. Trends calculated from census-year values would be distorted if a census happened to occur during a recession or boom. To deal with this problem, they created pseudo-annual estimates for real GNP by scaling up annual estimates of the value of commodity output – Shaw's series beginning with 1889, Kuznets's series for earlier years – with fixed coefficients based on the *long-term* relation between commodity output and total output. They produced series for "consumption" and "investment" in the same way, scaling up estimates of values of consumption or investment commodities for domestic use. They then estimated long-term trends in NIPA variables from five- or ten-year averages of the annual series. This was a good way to remove cyclical effects from long-term trends, but Kuznets, Kendrick, and Gallman never claimed it was a good way to estimate annual values. For serious annual estimates, one would want to use the *short-term*, year-to-year relation between commodity output and total output, and available information about annual output in transportation services and construction.

Gallman never published the pseudo-annual estimates, but he did make them available to other researchers on request. (With a few corrections by Paul Rhode, they are available in Carter *et al.* 2006: 23–5.) Gallman often warned that the figures were not suitable for use on an annual frequency. But this was like telling children not to put beans up their noses. Many researchers used the series to make inferences about year-to-year fluctuations – for example, comparing them with year-to-year fluctuations in postwar series.

Christina Romer (1989) pointed out the foolishness of such exercises. To construct a better annual series for prewar real GNP, she estimated the actual short-term, annual-frequency relation between commodity output value and real GNP in reliable data from later eras. She used this estimated relation to project annual figures for prewar real GNP off of the Shaw–Kuznets commodity value series. Balke and Gordon (1989) argued that estimates could be further improved by making use of annual series on transportation and construction, in addition to the Shaw–Kuznets commodity value series. The additional information they used was an annual index of real transportation and communication services that had been constructed by Edwin Frickey (1947), mainly from data on railroad traffic; a series on the dollar value of nonfarm construction by Manuel Gottlieb (1965) based mainly on building permits; and a dubious index of building costs to deflate the Gottlieb series.[2] Neither Romer nor Balke and Gordon constructed series for NIPA components such as sectoral value-added, consumption, or investment.

All three series for prewar real GNP – Kuznets–Kendrick–Gallman, Romer, and Balke–Gordon – are similar with respect to the direction and timing of deviations from trend. Thus, it may be safe to use any of them to observe the sign of correlations between fluctuations in aggregate output and other variables. Using the Kuznets-Kendrick-Gallman series, Backus and Kehoe (1992) observe that consumption and investment were both procyclical, and net exports were not, in the prewar U.S.

But there are substantial differences between the Gallman, Romer, and Balke–Gordon real GNP series with respect to the overall magnitude of fluctuations, and the relative magnitude of different fluctuations within the prewar era. There is no general agreement that one of the series is best. None of the series contains much actual information about cyclical-frequency fluctuations other than production of commodities, transportation services, and construction. Thus, anyone using annual estimates of prewar real GNP or other NIPA variables must think hard about the relative strengths and weaknesses of the various series and their potential biases with respect to the purpose at hand.

Output indices

Fortunately, for most purposes there is an easy out. The relatively abundant quantity of information from the prewar era can be used in the form of *production indices*. Annual indices of IP that cover all of the gold-standard era can be constructed from data on industrial outputs and inputs weighted by census-year estimates of value-added by industry. Many studies have used the indices for manufacturing and industrial production constructed by Frickey (1947). Recently, Davis (2004) constructed annual IP series that are better than Frickey's, incorporating information about more products and industries. Starting with January 1884, Miron and Romer (1990) constructed a *monthly* IP index from the smaller set of data available at that frequency.

Many facts about prewar business cycles can be established using production indices and their components. The uniquely acyclical nature of farm output can be observed in indices of crop production, IP, and transportation: in terms of first differences or deviation from trend, IP and transportation indices are strongly correlated with each other but not with crop production in the same year (Frickey 1942: 229; Calomiris and Hanes 1994). It can also be observed in disaggregated data. Romer (1991) examines fluctuations in output of individual crops (e.g. cotton, wheat), manufactured goods (e.g. steel, cotton textiles) and minerals (e.g. anthracite coal). She finds that mining and industrial products, but not farm products, were subject to strong common shocks in the prewar era.

Since business cycles are essentially fluctuations in nonagricultural output, the magnitude of prewar business cycles can be compared with postwar cycles by comparing prewar IP indices

with the most similar postwar IP indices. In terms of per cent changes or deviations from trend, annual fluctuations in IP were somewhat larger in the prewar era but not a different order of magnitude (Romer 1986). The cyclical behavior of other variables can be observed in their correlations with IP. Hanes (1996) examines the cyclical behavior of consumption using Frickey's IP index and Shaw's series on output of consumption goods. Making comparisons with matching postwar data, he finds that consumption was about as procyclical in the prewar era as in the postwar era.

Wages and prices

Prewar business publications and government reports recorded long series of "wholesale" prices of commodities and standardized manufactured products (such as steel rails) from business publications ("prices current") and government reports. From this type of data, the federal agency that became the BLS constructed monthly-frequency "wholesale price indices" (WPIs) beginning with 1890. Warren and Pearson (1932) constructed monthly series for years prior to 1890 using data and techniques similar to those used by the BLS for the 1890s and 1900s. The Warren and Pearson aggregate or "all groups" WPI for years up through 1890, linked to the BLS aggregate WPI from 1890 on, is a commonly used price index for the prewar era and sometimes compared with postwar PPIs.

It is important to keep in mind, however, that WPIs are not the same as PPIs. Wholesale prices were not always the prices received by producers. In many cases they were prices received (or quoted) by middlemen. Also, the aggregate Warren and Pearson and prewar BLS WPIs put very heavy weight on prices of raw agricultural commodities, such as cotton and wheat. Prices received by manufacturers can be better indicated by constructing a WPI that excludes farm products and raw foodstuffs. Even with those components removed, prewar WPIs remain heavily weighted toward less-finished goods, to a degree that greatly exaggerates the actual composition of output in the era. They do not include prices of the more-finished or specialized goods that were produced at the time. Because less-finished goods' prices are relatively procyclical, that makes it hard to compare cyclical price behavior across eras. To facilitate such comparisons, Hanes (1998) constructed an annual WPI that covers the same set of goods (or very similar goods) in all eras, prewar, interwar, and postwar.

Prewar CPIs are tricky, too. A special report for the 1880 Census, known as the "Weeks Report," contains annual records of retail prices and rents from the 1850s through 1880. Hoover (1960) constructed a CPI from these data. Starting in 1890, the future BLS began to collect data on retail food prices. Rees (1961) constructed annual CPIs for 1890–1914 from these data, along with prices of clothing and other goods taken from mail-order catalogs, and rents from newspaper advertisements. That leaves a gap across 1880–90. Published CPIs for that decade (such as Long 1960) are constructed from very spotty data and cannot be relied on to show year-to-year changes.

Reliable GDP price indices or deflators cannot be constructed for any of the prewar era because there is no suitable information about prices of most services, more-processed or specialized manufactured goods, or construction. The deflators used by Shaw, Kuznets, Kendrick, and Gallman to create census-year and pseudo-annual NIPAs were based on WPIs for raw materials and intermediate products, and a lot of assumptions that are reasonable with respect to long-term trends but not annual fluctuations. The alternative GNP deflator constructed by Balke and Gordon (1989) is just an average of the Kuznets-Kendrick-Gallman deflator, the dubious construction cost index and prewar CPIs (including the WPI-based 1880s series).

Prewar wage information is surprisingly good for manufacturing. The Aldrich Report (a special report prepared in the early 1890s for a Congressional committee) gives wage rates paid for jobs in a fairly large set of manufacturing establishments from the 1850s through 1890. The federal agency that became the BLS collected the same type of data from 1890 through 1907. Douglas (1930), Long (1960) and Hanes (1992) present wage indices constructed from these data, which are quite comparable to postwar ECIs for manufacturing. Starting about 1890, there are annual series on weekly or daily earnings in manufacturing, railroads, and mining, based mainly on state surveys of manufacturing establishments and mines, and the ICC (Douglas 1930; Rees 1961). Unfortunately, there is no information on annual fluctuations in hours per day, so it is not possible to construct reliable postwar-style AHE series (Allen 1992). There is almost no annual information about wages outside manufacturing, railroads, and mining.

Many studies have examined the cyclical behavior of inflation of wages and prices in the prewar era. They find a different pattern from that in postwar series: inflation (not the change in inflation) is positively correlated with the level of real activity as indicated by deviation from trend in IP or one of the real GNP series. This is the original (not the accelerationist) Phillips curve that A.W. Phillips (1958) found in pre-1960s British wage series. The difference across eras can be observed by regressing inflation on lagged inflation and output deviation (as in Allen 1992; Gordon 1990: 1130; Hanes 1993, 1999). Postwar data give positive, statistically significant coefficients on output and on lagged inflation. Prewar data give positive and significant coefficients on output, of similar magnitude to postwar coefficients if the data are carefully matched across the eras.[3] But prewar coefficients on lagged inflation are not significantly different from zero and are usually close to zero in size.

Another difference from the postwar era appears in disaggregated data on wages paid for individual jobs. Prewar data show no sign of downward nominal wage rigidity. Nominal wage cuts were fairly common (Hanes and James 2003).

The cyclical behavior of real wages appears similar to the postwar era, or different, depending on the price series in the denominator (Hanes 1996). The cyclical behavior of real consumption wages looks different. As noted earlier, postwar ECIs in ratio to CPIs are procyclical. The prewar ECI-style wage index in ratio to prewar CPIs (available for years before and after the 1880s) is acyclical or countercyclical. Relative to Hanes's annual WPI that covers the same goods in both the prewar and postwar eras, the prewar ECI-style wage index and the postwar ECI are about equally countercyclical.

Business-cycle chronologies

The dates of business-cycle peaks and troughs chosen by the NBER in the postwar era, making up the business-cycle "chronology," are based on its definition of a downturn as an absolute decline in real output. Early NBER researchers developed a business-cycle chronology for the prewar era, but they did not apply the same standard. Romer (1994) shows that the NBER's prewar chronology dates some peaks too early, when output growth had begun to slow but prior to the absolute decline in output. It also incorrectly counts as downturns some occasions when nominal variables fell but real variables continued to grow. Romer developed another chronology for the era to better match the postwar NBER definition, based on fluctuations in the Miron–Romer monthly IP index. Romer's chronology suggests that business cycles were more frequent in the prewar era than in the postwar era she examined. Recessions (peak to trough) were perhaps a bit shorter prewar, expansions a bit longer postwar, with little change in the total peak-to-peak duration of a whole cycle. Watson (1994) came to similar conclusions based on individual production series.

As the monthly IP index begins in 1884, Romer's chronology misses much of the prewar era. Davis (2006) constructs a chronology that is rougher but covers all of the era, by marking turning points in his annual IP index. This may miss some short-lived fluctuations but reliably indicates the biggest fluctuations.

Table 11.1, column 1, gives per cent changes in the Davis (2004) index of industrial production from the previous year. Absolute declines occurred over 1883–5, 1892–3, 1895–6, 1903–4, 1907–8, 1910–11, and 1913–14. Columns 2–5 list months of cyclical peaks and troughs according to the old NBER chronology and the Romer chronology. All downturns in annual IP are associated with recessions in both chronologies, except 1883–4. The NBER chronology places a peak in 1882: this appears to be too early, a case of the inconsistencies noted by Romer. The Romer chronology cannot cover 1883–4 because the monthly IP index begins in January 1884. The Romer chronology includes two downturns, in 1887 and 1900, which were too brief to appear in annual IP; these also appear in the NBER chronology though with slightly different timing. The NBER chronology includes a downturn in 1890 that appears in neither Romer's chronology nor annual IP. IP growth slows down sharply from 1890 to 1891, but there is no absolute decline.

If one defines recessions specifically as absolute declines in IP, it still appears that consumption and inflation were procyclical, and net exports were not. Table 11.1, column 6, shows the per cent change in Shaw's (1947) annual series for the flow of real commodities available for domestic consumption (the sum of nondurable, semidurable, and durable commodities for household use); recall this series begins at 1889. Column 7 shows acceleration in consumption – the change in the growth rate. All downturns in IP were accompanied by slowdowns in consumption growth in the same year or the prior year. Column 8 shows acceleration in the ECI-style manufacturing wage index of Hanes (1992). The wage rates constituting the index are from pay periods in the middle of the summer, so it is not surprising that the slowdown in inflation often appears in the year following the IP downturn. Column 9 shows acceleration in a WPI constructed from the standard Warren and Pearson and BLS series but excluding prices of agricultural products. To match the timing of the wage index, inflation is calculated as the change in the average of monthly values for June, July, and August. The WPI shows the same pattern as the wage index. Column 10 shows the change in net exports, measured in dollars. This particular series (Lipsey 1963), begins with 1879 and gives figures on a calendar-year basis. (Other series go further back, but are for 12-month spans ending in June.) Columns 11 and 12 show per cent changes in Lipsey's calendar-year indices for real quantities of imports and exports. There is no clear cyclical pattern in net exports, but imports are clearly procyclical.

Financial crises

In the pre-1914 gold-standard era, America suffered financial crises more frequently than other countries (Bordo 1985). Most studies of prewar American financial crises (e.g. Sprague 1910; Wilson *et al.* 1990; Calomiris and Gorton 1991; Wicker 2000) define them in the same way, as a general run on banks in New York City, and identify these events objectively by the actions of the New York Clearing House (NYCH). The NYCH responded to a general run by issuing clearing house loan certificates (Wicker 2000: 116). Using this standard, nearly all studies say that crises occurred in May 1884, November 1890, May or June 1893, and October 1907 (e.g. Wicker 2000; Calomiris and Gorton 1991). These are the times the NYCH issued clearing house loan certificates. Calomiris and Gorton (1991) identify an additional crisis in October 1896, when the NYCH authorized certificates but did not issue any. Comparing these dates with the business-cycle chronologies in Table 11.1, one can see that nearly all of the crises occurred during

recessions. The crisis of 1890 occurred during a recession according to the old NBER chronology, but not according to Romer's or the annual IP series.

A panic in New York City was a *national* crisis because of New York banks' central role in the financial system. Loans from New York banks were a key source of funds to nonbank financial intermediaries (private banks, brokerage houses, and commercial-paper houses). New York banks arranged most loans to firms and individuals who borrowed short term to finance purchases of long-term securities (Myers 1931: 265–87, 335) – a particularly obvious form of nonbank intermediation. On the liability side, New York banks drew interbank deposits – "bankers' balances" – from all regions of the country. Nearly all banks held deposits in a New York "correspondent" bank, or in a regional money-center bank that held New York balances (James 1978). An increase in banks' demand for cash reserves or the nonbank public's demand for cash anywhere in the country was ultimately covered by withdrawals of bankers' balances and shipments of cash out of New York. Thus, widespread bank runs in the hinterland were quickly transmitted to New York, while a general run in New York triggered suspensions by other cities' banks and clearing houses.

A New York financial crisis must have had real macroeconomic effects that tended to reduce aggregate output. Because New York bankers' balances were the chief medium of intercity payments, a New York run raised real transactions costs of employment and trade as payers resorted to long-distance cash shipments (James *et al.* 2009). As a run on New York hindered many types of financial intermediation, it raised the cost of credit and tightened credit rationing to potential borrowers (Mishkin 1991).

But the timing of financial crises suggests they were not *causes* of business cycles. Rather, they amplified cyclical downturns that were already underway. Crises occurred a few months after cyclical peaks. Calomiris and Gorton (1991) argue that cyclical downturns caused financial crises: depositors withdrew *en masse* when they observed or forecast a recession, because a recession meant defaults on business loans, and this would endanger banks' solvency. As evidence, Calomiris and Gorton point out that all crises, without exception, were preceded by stock-market crashes, which were another symptom indicating the public expected a recession (a recession would depress corporate earnings). Hanes and Rhode (2011) show that a stock-market crash could actually cause a crisis, because it threatened New York banks' solvency, or at least their liquidity. Some New York banks made large unsecured loans to brokerages and other stock "speculators," who could not repay in the event of a general decline in stock prices. Depositors ran on banks rumored to be exposed to stock prices in this way.

A political factor that contributed to the 1884, 1893, and 1896 crises was "silver risk": the perceived danger that the U.S. would link the dollar to silver and float against gold. Silver risk contributed to crises mainly because it reduced international demand for American securities (not by spurring Americans to withdraw bank deposits for conversion into gold [Sprague 1910: 165, 169; Friedman and Schwartz 1963: 108–9]). But silver risk did not trigger the crises. The more-or-less exogenous political events that created silver risk – the 1878 Bland-Allison Act, the 1890 Sherman Silver Purchase Act – occurred years before the crises in question. Existing research does not claim that exogenous hikes in silver risk set off crises but rather that potential silver risk was crystallized by, and amplified, cyclical downturns and financial crises already underway (Sprague 1910: 109–10, 162, 165, 168, 179; Fels 1959: 130–1, 184–7; Friedman and Schwartz 1963: 100–1).

Causes of business cycles

The cause of a business cycle may be generally defined as an event or combination of events exogenous to the economic system that is the reason a cyclical downturn occurred in a particular

Table 11.1a Business-cycle data, 1879–1914

	Industrial Production	*Business-cycle chronologies*				*"Consumption"*	
	Per cent Change	*NBER*		*Romer*		*Per cent Change*	*Acceleration*
		Peak	*Trough*	*Peak*	*Trough*		
Year	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1879	13.5			NA	NA		
1880	12.5			NA	NA		
1881	19.3			NA	NA		
1882	6.6	March		NA	NA		
1883	2.8			NA	NA		
1884	−3.5			NA	NA		
1885	−2.9		May				
1886	12.2						
1887	9.8	March		Feb.	July		
1888	8.6		April				
1889	2.8						
1890	15.6	July				−0.5	
1891	1.5		May			8.1	8.6
1892	7.4					4.9	−3.2
1893	−8.7	Jan.		Jan.		1.5	−3.4
1894	−7.2		June		Feb.	−3.4	−4.9
1895	17.3	Dec.				12.8	16.2
1896	−3.1			Jan.		−0.6	−13.4
1897	6.5		June		Jan.	8	8.5
1898	17.8					1.1	−6.8
1899	9.7	June				11.4	10.3
1900	4.6		Dec.	April	Dec.	−0.2	−11.6
1901	8					12.2	12.4
1902	7.2	Sept.				−0.1	−12.3
1903	3.7			July		5.3	5.4
1904	−4.7		Aug.		March	0.3	−5
1905	15.7					4.4	4.1
1906	5.1					11.2	6.8
1907	4.2	May		July		1.2	−10
1908	−15.6		June		June	−8.1	−9.3
1909	17.9					11.9	20.1
1910	4.6	Jan.		Jan.		2.4	−9.5
1911	−3.7				May	5.5	3.1
1912	10.5		Jan.			3.8	−1.7
1913	4	Jan.				4.3	0.5
1914	−10.2		Dec.	July	Dec.	−1.2	−5.5

Sources: Davis (2004), Romer (1994), Shaw (1947), Hanes (1992), and Lipsey (1963).

Table 11.1b Business-cycle data, 1879–1914

	Acceleration in inflation		*Change in Net Exports ($millions)*	*Quantity index*	
	Wages	*Prices*		*Imports*	*Exports*
				Per cent change	
Year	8	9	10	11	12
1879	−1.5	1.1	−50	NA	NA
1880	5.2	18.7	−62	22.8	5.7
1881	−2.6	−18.5	−35	0.9	−9.1
1882	3.9	4.8	−147	11.8	−10.7
1883	−2.5	−5.7	94	−3	9.5
1884	−2.8	−3.7	14	−2.2	−1.9
1885	0.3	0.7	−19	1.4	−1.6
1886	4.8	4.8	−49	13.2	10.3
1887	−1.7	2.7	−43	2.7	0.9
1888	−1.6	−1.6	−39	4.8	−8.1
1889	0.8	−0.6	88	0.5	25.1
1890	0.2	6.5	−20	7.6	5.2
1891	−0.4	−11.6	106	1.7	9.4
1892	−0.3	1.7	−47	5.7	3.6
1893	1.2	2.2	−3	−11.3	−5.5
1894	−4.6	−6.1	55	−0.7	7.4
1895	2.8	15.5	−128	25.5	−1.7
1896	3.3	−10.6	299	−16.3	23.4
1897	−3.4	−2.3	32	15.9	12.4
1898	−0.4	11.6	262	−14.3	15.5
1899	1.2	14.8	−145	16.8	−4
1900	4.7	−18	170	−1.7	3.6
1901	−3.5	−6.1	−66	11.7	1.6
1902	0.5	7.6	−194	12.8	−9.6
1903	0.3	2.1	99	−1.3	2.8
1904	−2.8	−12.4	−73	1.8	−2.6
1905	1.7	10.6	30	7.9	16.4
1906	2.1	5.4	32	7.2	3.2
1907	2.6	−1.4	20	2.8	1
1908		−21.5	141	−11.6	−3.6
1909		15.6	−388	32.2	−6
1910		−2.2	41	−1.4	−0.8
1911		−3.1	259	−3.5	23.1
1912		8.9	20	12.8	12.3
1913		−1.6	110	−0.4	−1.1
1914		−9.9	−373	6.5	−13.4

Sources: Davis (2004), Romer (1994), Shaw (1947), Hanes (1992), and Lipsey (1963).

year. Natural events such as weather and earthquakes are obviously exogenous. For purposes of understanding American economic history, it can also be useful to treat foreign economic developments as exogenous.

To establish that a particular event caused a particular business cycle, one must show that the event occurred with the right timing relative to that business cycle, that events of that type were generally correlated with fluctuations in aggregate output, and that the correlation reflects causation from the events to the economy, not the other way around. The last point is often hard to prove because potential causes of business cycles are rarely as exogenous as earthquakes. Usually, they *might* occur for exogenous reasons but also might be responses to economic developments. The best one can do is show that real activity was affected by a proposed causal event when one can be *fairly* sure that the event occurred for exogenous reasons; that the event *could* be a cause of business cycles in an economic model that depicts a plausible theory; and that the event was accompanied by other outcomes implied by the model. Thus, as Temin (1998) points out, claims about causes of business cycles depend on a theoretical framework. Different theories have different implications as to the type of event that could be responsible for a downturn and the other outcomes that would, if observed, pin the blame on the suspect. In macroeconomic theory there is unfortunately little agreement on frameworks. The monumental study of Friedman and Schwartz (1963) was built on the framework of monetarism. Currently, most macroeconomic research is in the framework of either Keynesian ("old" and "new") or real business cycle (RBC) theory.

In RBC models, wages and prices are perfectly flexible, markets clear continuously, and all decision makers are perfectly rational. In standard RBC models, the only shock that can generate the co-movements in output across nonagricultural sectors, consumption, and international trade that occurred in prewar business cycles is an exogenous, absolute, simultaneous decline in total factor productivity (TFP) across most sectors of the economy (King and Rebelo 1999). According to RBC theorists, real events corresponding to a negative TFP shock in an RBC model include not only deteriorations in production technology *per se*, but also "changes in the legal and regulatory system" that impair microeconomic efficiency (Hansen and Prescott 1993: 281). Ebell and Ritschl (2008) and Ohanian (2009) explain the 1929–33 downturn of the Great Depression this way, as the result of a sudden increase in union bargaining power and Hoover administration policies that forced employers to pay higher real wages. As far as I know, there have been no attempts to account for prewar business cycles in terms of RBC models, but I expect it would be hard to do so. There is no evidence for a general decline in technological *or* regulatory efficiency in 1883–4, 1892–3, 1895–6, 1903–4, 1907–8, 1910–11, or 1913–14. The gold-standard era was notable for a relative absence of government interference in the economy (Hughes 1991).

In both Keynesian and monetarist models, wages and/or prices are *not* perfectly flexible. They are "sticky," subject to nominal rigidity, so that an event affecting aggregate demand can disturb real activity from the level that would prevail under perfectly flexible wages and prices – the "natural rate" of output. (Using this definition, output fluctuations in RBC models are fluctuations in the natural rate.) In most models, wage and price stickiness takes the form of the "expectations-augmented" Phillips curve. In old-fashioned models, this is a structural equation that says inflation is equal to expected inflation *plus* a positive coefficient times the output gap – the difference between actual output and the natural rate. In New Keynesian models, an equation of similar form is derived from "fundamental" assumptions about microeconomic constraints on price adjustment (e.g. Roberts 1995) or information imperfections (e.g. Mankiw and Reis 2010).[4]

The apparent change in inflation behavior from the prewar original Phillips curve to the postwar accelerationist Phillips curve is consistent with an expectations-augmented Phillips

curve of either the old or new-Keynesian variety (Alogoskoufis and Smith 1991; Ball and Mankiw 2002; Hanes and James 2010). An expectations-augmented Phillips curve generates the prewar pattern if expected inflation is uncorrelated with past inflation. It generates the postwar pattern if expected inflation is positively correlated with past inflation. Barsky (1987) shows that, in postwar samples including the 1970s and 1980s, serial correlation in inflation is so strong that inflation is statistically indistinguishable from a random walk – that is, current inflation is a good forecast of future inflation. In pre-1914 data, monthly or annual inflation shows little or no serial correlation – using standard tests, one cannot reject the hypothesis that the price *level* was a random walk. Thus, any roughly rational expectation of inflation would be strongly correlated with past inflation in the postwar era, and uncorrelated with past inflation in the prewar era. The lack of inflation persistence in the prewar U.S. was an outcome of the monetary regime: under the gold standard, a country's aggregate demand growth was subject to a long-term constraint that did not accommodate persistent inflation (Klein 1975).

The apparent change in the behavior of real consumption wages, from acyclical or countercyclical prewar to procyclical postwar, is also consistent with nominal rigidity. Hanes (1996) and Huang *et al.* (2004) show that real consumption wages become more procyclical over time if nominal wages are sticky and consumption goods become more finished, passing through more stages of production and sale prior to purchase by households. Historical evidence on the nature of consumption bundles shows that consumption goods indeed became more finished in this sense. In Hanes's model, more stages make real wages procyclical because firms' desired price markups over marginal cost are countercyclical. In the model of Huang *et al.*, it is because wages and prices are both subject to adjustment costs and more stages make production more roundabout in the sense of Basu (1995).

In the framework of a model with an expectations-augmented Phillips curve, one would say that the cause of a business-cycle downturn is the exogenous event(s) that causes a large decline in aggregate demand to occur in a given year. The distinctive monetarist view was that nearly all fluctuations in aggregate demand were immediately due to changes in the "money stock" – an aggregate of cash and assets that are relatively close substitutes for cash, such as demand deposits. Friedman and Schwartz (1963) analyzed the prewar era in this framework, accounting for money-stock fluctuations in terms of the supply of high-powered money, the fraction of the money stock the public wants to hold in cash versus deposits, and the fraction of deposits banks want to hold in cash reserves – the reserve ratio. It is not always clear whether Friedman and Schwartz view changes in money-stock determinants such as the reserve ratio to be exogenous, but they do propose a clear, causal explanation of the Depression of 1893. They argue that a downturn took place in that year because of fluctuations in wheat harvests.

Wheat and wheat flour were important American exports. The size of the wheat harvest had a big effect on American export revenue. Shocks to export revenue could affect the high-powered money supply because of the gold standard and America's lack of a central bank.

Under the gold standard, an international flow of monetary gold covered a country's balance of payments – the sum of net exports, international capital inflow, and net income from foreign assets – unless the country's authorities managed stocks of foreign assets. An international flow of monetary gold affected the high-powered money supply, unless a monetary authority such as a central bank "sterilized" it with an adjustment to the supply of non-gold currency or central-bank balances. Because the U.S. had no central bank, there was an unusually direct link between the money supply and the balance of payments. The high-powered money supply consisted of monetary gold *plus* non-gold currency issued by the Treasury *minus* cash held in Treasury vaults (removed from banks and the public) (Friedman and Schwartz 1963: 124–34). The net inflow of monetary gold was equal to the balance of payments, as U.S. authorities did

not hold stocks of foreign assets. Non-gold currency growth was unresponsive to economic conditions and mostly out of the Treasury's control.[5] On occasion, Treasury officials deliberately managed vault cash to affect the money supply (Myers 1931: 370–86; Timberlake 1978) but they did not generally sterilize international gold flows.

According to Friedman and Schwartz (1963: 107), the Sherman Silver Purchase Act of 1890 raised fears that the U.S. would leave the gold standard, which tended to reduce the flow of international investment in the U.S., the balance of payments, and hence growth in the high-powered money supply. But this effect was staved off by a bumper wheat harvest in autumn 1891, an "accident of weather," coincident with poor harvests abroad. The positive shock to net exports "fostered a spurt in the stock of money from 1891 to 1892 … This surcease, however, was bound to be temporary," so a downturn occurred in 1893. Wheat export revenues remained relatively low until a "fortuitous" increase in 1897, which contributed to the 1897 upturn.

A recent study in the monetarist spirit of Friedman and Schwartz is Moen and Tallman (1998), who examine the relation between the American monetary gold stock and the Miron-Romer monthly IP index over 1890–1909. They claim that exogenous shocks to gold flow can be distinguished from endogenous variations (e.g. shocks to American demand for gold) by regressing the gold stock on IP, short-term interest rates and a few other variables: the residuals from this regression are the exogenous shocks (that is, they perform a vector autoregression [VAR] with the gold stock as one of the variables). They show that these residual fluctuations in gold flow were positively related to subsequent growth in IP, and that there were large negative shocks prior to the downturns of 1893, 1896, and 1907.

In the Keynesian view, the money stock is not the key intermediate factor for aggregate demand; what matters is the difference between prevailing real interest rates and the "natural rate of interest" – that is, the real interest rate level consistent with the natural rate of output in the IS curve. In many Keynesian models (e.g. Bernanke *et al.* 1999) real effects of interest-rate changes are amplified by their effects on the supply of credit from financial intermediaries.

Within a Keynesian framework, Davis *et al.* (2009) claim that the downturns of 1884, 1893, 1896, and 1910 were caused by fluctuations in cotton harvests. They show that there was a strong, general positive relation between the size of the cotton harvest and the following year's IP, within the 1879–1913 gold-standard era specifically, and cotton harvests were *extremely* poor in the harvest seasons prior to these downturns (autumn 1883, 1892, 1895, and 1909). To establish the direction of causality, they show that there was an effect from cotton harvest fluctuations specifically due to weather, an obviously exogenous factor. (That is, they use weather data to form instruments for harvest fluctuations in two-stage least squares.) Davis *et al.* argue that the apparent effect of cotton harvest fluctuations on IP makes sense within a Keynesian model, and they show that cotton harvest fluctuations were associated with other outcomes implied by such a model.

Cotton, like wheat, was an important export. Cotton harvest fluctuations were positively related to export revenue. Davis *et al.* argue that export-revenue shocks affected the non-agricultural economy because of interactions with the monetary regime, but not through the money supply. The key intermediate factor was interest rates. American interest rates were determined by the interaction between the gold standard, net exports, and international capital flows. International demand for American assets was sensitive (but not infinitely sensitive) to the spread between expected returns on American versus European assets (as in models of imperfect international capital mobility). Under the international gold standard, absent a central bank, the balance of payments was equal to the change in the high-powered money supply, so the sum of net exports and capital inflow was constrained by the change in high-powered money *demand*.

Putting these conditions together, a negative shock to American net exports was balanced either by an increase in American interest rates, or by an exogenous negative shock to high-powered money demand. Davis *et al.* hypothesize that a poor cotton harvest tended to reduce American export revenue but had little immediate effect on money demand, while wheat harvest fluctuations had strong effects on high-powered money demand as well as export revenue. This implies that, during the gold-standard regime specifically, poor cotton harvests would be associated with higher interest rates, gold outflows and slow high-powered money growth, as well as a decline in IP. Poor wheat harvests would be associated with gold outflows and slow money growth but not higher interest rates or lower IP. Davis *et al.* show that these patterns are clear in the data.

In a related paper, Hanes and Rhode (2011) argue that cotton harvests were responsible for the financial crises of 1884, 1893, and 1896 in the same way, not only by causing business-cycle downturns but also by reducing international demand for American assets, which had a further effect on stock prices. Their hypothesis implies that poor cotton harvests, but not poor wheat harvests, tended to drain deposits from New York banks, and depress stock prices and bond prices *prior* to IP. These patterns are also clear in the data.

On the same Keynesian argument, monetary tightening by European central banks or other factors reducing Europeans' demand for American assets should have affected American financial markets and real activity like a poor cotton harvest. The financial crisis of 1890, the financial crisis and cyclical downturn of 1907, and the downturn of 1914 can all be accounted for in this way.

1890 was the year of the famous Barings Crisis. Events in Argentina depressed prices of Argentine bonds held by financial intermediaries in London. To raise funds, Barings and other European financial houses began fire sales of assets including American stocks.[6] Meanwhile, a monetary tightening by the Bank of England raised London bill rates, discouraging American finance-bill borrowing (Sprague 1910: 133). These conditions caused the 1890 stock-market crash and financial crisis in New York, according to many contemporaries and modern economists (e.g. Sprague 1910: 132; Fels 1959: 167; Friedman and Schwartz 1963: 104; Bordo 2006; Reinhart and Rogoff 2009: 243). Hanes and Rhode (2011) argue that they did not cause a cyclical downturn only because they were largely counteracted by the financial effects of a large cotton harvest and export revenues in autumn 1890.

The Panic of 1907 followed sharp hikes in European interest rates due to tightening actions by the Bank of England and other European central banks. In addition to raising its discount rate, the Bank blocked American borrowing in London with informal threats (Sprague 1910: 241; Sayers 1976: 54–6). Friedman and Schwartz (1963: 156) and Eichengreen (1992: 51) identify these actions as the cause of the 1907 crisis in the U.S. According to Odell and Weidenmier (2004), European central banks took these actions to counter a persistent international gold drain caused by payments by European insurance companies associated with the San Francisco earthquake of April 1906 – an event that took place within the U.S., but may be viewed as essentially exogenous.

At the end of July 1914, the effects of the First World War's outbreak were initially similar to 1890 and 1907. An increase in European demand for monetary gold and fire sales of American assets by European investors caused hikes in American interest rates and declines in American stock and bond prices. But there soon followed unprecedented disruptions to the mechanisms of international payments and trade finance, demand for American exports, and the closing of the New York Stock Exchange for more than four months (Sprague 1915; Silber 2006). Because these disruptions were unprecedented, it is hard to quantify their real effects, but it is no surprise that they were accompanied by a business-cycle downturn: July 1914 was a cyclical peak (according to Romer).

Conclusion

Deficiencies in historical data may mean the characteristics of prewar business cycles are seen only as through a glass, darkly, but their causes are surprisingly clear. Within the prewar era from 1879 to 1914, there were seven recessions big enough to show up as a decline in annual IP: in 1884, 1893, 1896, 1904, 1907, 1910, and 1914. At least six can be attributed to clearly exogenous events. 1884, 1893, 1896, and 1910 were caused by poor American cotton crops in the prior harvest seasons. 1907 was caused by the San Francisco earthquake of 1906. 1914 was caused by a politically motivated shooting in Sarajevo. All of these events created disturbances in American financial markets equivalent to exogenous hikes in interest rates, through mechanisms created by the American gold-standard monetary regime.

Notes

1 Romer (1989: 5) judged that the data used by Kuznets to estimate annual commodity output prior to 1889 were "similar to those used by Shaw" to estimate output after 1889. I do not agree.
2 The construction-cost index they used, from Blank (1954), is the building materials component of the Warren and Pearson WPI, discussed later, weighted together with a wage series.
3 Some studies found larger coefficients on real activity in prewar eras, concluding that there had been a decrease over time in cyclical "flexibility" (e.g. Cagan 1975; Sachs 1980), but this result was a relic of bad data.
4 Depending on the particular assumptions, the "expected inflation" in the augmented Phillips curve that affects current inflation may be past expectations of current inflation (as in Mankiw and Reis 2010) or current expectations of future inflation (Roberts 1995).
5 Non-gold money consisted of greenbacks, silver notes, national banknotes, and silver coins. The quantity of greenbacks was simply fixed; the rate at which the Treasury created new silver notes was governed by long-standing political factors (Myers 1931: 396–8, 402); and the rate at which banks created national banknotes was remarkably insensitive to variations in interest rates and business activity (Myers 1931: 403; Cagan 1965: 91).
6 Noyes (1898: 157) and Lauck (1907: 64) describe relevant Argentine events. The *Economist* (supplement, February 21, 1891) describes the embarrassments of London financial houses holding Argentine securities; Wilkins (1989: 194, 222, 471) describes the effects of foreign sales of American securities on American financial markets.

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