

Did Sunspot Forces Cause the Great Depression?*

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Abstract

We apply a dynamic general equilibrium model to the period of the Great Depression. In particular, we examine a modification of the real business cycle model in which the possibility of indeterminacy of equilibria arises. In other words, agents' self-fulfilling expectations can serve as a primary impulse behind fluctuations. We find that the model, driven only by these measured sunspot shocks, can explain well the entire *Depression era*. That is, the decline from 1929-1932, the subsequent slow recovery, and the recession that occurred in 1937-1938.

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1 Introduction

There has been a recent resurgence in interest among macroeconomists in the Great Depression. Perhaps because of the recent events in two leading industrial economies – the record-long boom in the U.S. and Japan’s continual depression – curiosity about this unique episode has piqued. Of particular relevance to us is the application of neoclassical modelling techniques, which had previously only been applied to postwar episodes, to this historic period. For example, Cole and Ohanian (1999a) examine the efficacy of the real business cycle model at explaining both the decline from 1929 to 1933 and the subsequent slow recovery throughout the rest of the decade. While their model explains 40% of the decline, they are left with the puzzle of how to explain the weakness of the U.S. recovery. They suggest that some other type of shock must be responsible.

In this paper we identify such a shock. In particular, we examine a modification of the real business cycle model in which the possibility of indeterminacy of equilibria arises. The indeterminacy arises when, in the presence of relatively low increasing returns to scale in production, changes in agents’ expectations are self-fulfilling and therefore serve as a primary impulse behind fluctuations. We find that such a model, driven only by these measured sunspot shocks, can explain well the entire *Depression era*. That is, the decline and subsequent slow recovery as well as the recession that occurred in 1937-1938. Because of this, we believe that we have found the “other shock.”

Most popular theories of the Great Depression stem from Friedman and Schwartz’ (1963) monumental work blaming inept monetary policy, or reprehend bank failures for deteriorating the effectiveness of financial intermediaries (Bernanke, 1983). These findings are related to the often stressed viewpoint that the United States’ adherence to the Gold Standard was a crucial element of the economic decline (Eichengreen, 1992). In more recent work, Bordo, Erceg and Evans (2000) identify a sequence of negative shocks to money growth dating from 1930:I to 1933:I, which coincides with the U.S. administration completely abandoning the Gold Standard in April of 1933. They evaluate these shocks in a model with nominal wage stickiness and find that these money growth innovations help to explain a large share of the decline in output experienced over that period.

However, both Bordo et al. (2000) and Cole and Ohanian (1999a) find that their models predict a swift recovery as well, when in fact output stayed depressed for the complete decade: per capita output still remained more

than twenty percent below trend in 1939. In Bordo et al. (2000), expansionary policies by the Federal Reserve, in which money supply grew at spectacular rates after 1932, induce a quickly rebounding economy.¹ In Cole and Ohanian (1999a), it is total factor productivity that started to return to trend very quickly.

This all suggests that important nonmonetary, domestic forces kept the economy off track. Correspondingly, Bordo et al. (2000) and Cole and Ohanian (2001) shift attention to New Deal labor policy that facilitated inflating real wages. Still, Cole and Ohanian's (2001) technology-driven cartel-model closes the reported gap between the perfect markets real business cycle model and U.S. output by only a half. Perhaps even more important, it appears to miss the 1937-1938 recession – the third largest recession in American history in terms of output loss – altogether.²

Here, we look towards shocks to confidence as an alternative explanation for the entire Depression era, as we have defined it above. Of course, ours is not the first approach that highlights the effects of changes in confidence during the Depression. For example, Temin (1976) emphasizes a sudden contraction of aggregate demand after 1929. In conventional Keynesian jargon, he classifies this drop as a collapse of autonomous spending. Romer (1990) picks up on his observation and reports an increasing state of uncertainty following the October 1929 stock market crash. Indeed, she finds that this uncertainty led to delaying expenditures on durable goods. Both Temin (1976) and Romer (1993) note that expectations turn from uncertain to pessimistic during 1930. Temin writes:

“Sometime in the fall of 1930, then, businessmen became convinced that prosperity was no longer just around the corner. The timing of this change is not known with precision, but it came approximately one year after the stock market crash [...], and not everyone appears to have been conscious of it as it happened. Nevertheless, it would appear that businessmen's and probably also consumers' expectations built up during the 1920s about the normal state of business activity were not shattered immediately by the stock-market crash; they only dissolved a year after the crash.” [Temin, 1976, p. 79]

¹Cole and Ohanian (2000), however, claim that the macroeconomic effects of the money and banking shocks of the 1930s appear to be small in general equilibrium.

²Cole and Ohanian also do not provide a theory for the years 1929 to 1934 but rather simply calibrate their model to be 24 percent below its steady state in 1934.