Contributions to Macroeconomics

Volume 6, *Issue* 1 2006 *Article* 13

Real Business Cycle Theory and the Great Depression: The Abandonment of the Abstentionist Viewpoint

Michel R. De Vroey* Luca Pensieroso†

*Department of Economics and IRES, Université catholique de Louvain, devroey@ires.ucl.ac.be

†Department of Economics and IRES, Université catholique de Louvain, pensieroso@ires.ucl.ac.be

Real Business Cycle Theory and the Great Depression: The Abandonment of the Abstentionist Viewpoint*

Michel R. De Vroey and Luca Pensieroso

Abstract

Is the Great Depression amenable to real business cycle theory? In the 1970s and 1980s Lucas and Prescott took an abstentionist stance. They maintained that, because of its exceptional character, an explanation of the Great Depression was beyond the grasp of the equilibrium approach to the business cycle. However, while Lucas stuck to this view, Prescott changed his mind at the end of the 1990s, breaking his earlier self-imposed restraint. In this paper we document this evolution of opinion and produce a first assessment of real business cycle models of the Great Depression. We claim that the fact of having constructed an equilibrium model of the Great Depression constitutes a methodological breakthrough. However, as far as substance is concerned, we argue that the contribution of real business cycle literature on the Great Depression is slim, and does not gain the upper hand over the work of economic historians.

KEYWORDS: great depression, new classical macroeconomics, real business cycle theory, equilibrium, unemployment

*Paper presented at the "Economic Policy, Growth and Business Cycle" Doctoral Workshop in Matagne-la-Petite, June 17-19, 2005. We thank participants, and in particular Frank Portier and Victor Rios-Rull, for criticisms and suggestions. David de la Croix, Milton Friedman, Lee Ohanian, David Romer and an anonymous referee made useful comments on an earlier version of this work. The usual disclaimers apply. Financial support from the Belgian French-speaking Community (Grant ARC 03/08-302 "New Macroeconomic Perspectives on Development") and from the Belgian Federal Government (Grant PAI P5/21 "Equilibrium theory and optimization for public policy and industry regulation") is gratefully acknowledged.

1 Introduction

Macroeconomics experienced radical changes in the last quarter of the twentieth century. The most important was the dethroning of the Keynesian IS-LM paradigm and its replacement by a new paradigm centered on the study of growth and the business cycle, rather than unemployment. This started as new classical macroeconomics with Lucas's work, to be recast as real business cycle theory by Kydland and Prescott. At present, it also goes under the names of neoclassical growth theory and dynamic stochastic general equilibrium models.[1]

The aim of this paper is to describe and assess one of the features of this approach: the way it deals with the Great Depression, probably the single most dramatic business cycle event of the twentieth century. The new approach started as an equilibrium theory of the business cycle – equilibrium meaning optimizing behavior and market clearing. Can such an approach come to grips with the Great Depression? Our paper does not aim to address this issue straight on. Rather, we want to focus our attention on the evolution of opinion and research activity that took place within the community of real business cycle theorists with respect to the Great Depression. In the 1970s and 1980s Lucas and Prescott, the two towering figures of the new approach in macroeconomics, took what could be called an abstentionist stance. They maintained that, because of its exceptional character, an explanation of the Great Depression was beyond the grasp of the equilibrium approach to the business cycle. However, while Lucas stuck to this view, Prescott changed his mind at the end of the 1990s, breaking his earlier self-imposed restraint. Real business cycle theory, he ended up by stating, had succeeded in its endeavor to elucidate the Great Depression. The authors credited with this breakthrough were Harold Cole and Lee Ohanian.

We shall start our inquiry by exploring the abstentionist stance. In a second step, we shall document Prescott's change of opinion. Next, we examine Cole and Ohanian's work, which led Prescott to this change, and assess its contribution. We continue by drawing a contrast between the real business cycle and the economic history approaches to the Great Depression. Finally, we briefly discuss whether the new developments brought about by Cole and Ohanian have led Lucas to forego the abstentionist viewpoint.

[1] Throughout this paper we shall treat these labels as synonymous. In doing so, we are sticking to the convention of considering the "real business cycle" label as indicative of an "approach to modeling" (Romer 2001) rather than a set of models. We admit that, while terminology is not yet firmly established, it is becoming ever more evident that a distinction should be made between the global approach, for which the name "dynamic stochastic general equilibrium" might be appropriate, and the different classes of models within it (which include real business cycle models *à la* Kydland and Prescott).

2 Lucas on the Great Depression

2.1 The Lucas and Rapping 1969 paper

Lucas and Rapping's (1969) paper, "Real Wages, Employment, and Inflation", which provides the micro-foundations for an analysis of the labor supply, is rightly credited with having initiated the move that led to real business cycle theory. It is also the paper to start with in our attempt to elicit Lucas's position on the Great Depression. [2]

At the time, Lucas and Rapping were barely aware of the full implications of the assumptions they adopted. In particular, they did not view their market-clearing assumption as clashing with Keynesian theory. Nevertheless, they felt the need to reconcile the existence of unemployment with market clearing. Their solution was to question the usual interpretation of census data on unemployment, according to which most unemployment was involuntary, and to declare that, outward appearances to the contrary notwithstanding, these people were voluntarily unemployed (Lucas and Rapping 1969: 748).

No discussion of the Great Depression *per se* is to be found in Lucas and Rapping's paper. They did not claim to have a market-clearing model of the Great Depression. Nonetheless, this was the implicit conclusion of their work, since they tested their model against US time series data covering the years 1930–65 (including the depression years) and claimed that it performed relatively well from an econometric point of view.

2.2 Rees's criticism

The Lucas and Rapping paper made a great stir. One of the economists who reacted against it was Albert Rees, a labor economist formerly at Chicago, and at that time at Princeton. His comment (1970) is of particular interest for our inquiry, because it raised the issue of the relevance of Lucas and Rapping's model for the Great Depression. In particular, Rees was shocked by the implication of Lucas and Rapping's model that unemployment in the Great Depression was voluntary:

> In assessing the reasonableness of [Lucas and Rapping's] view, it should be recalled that it is set forth in a paper that fits an econometric model to U.S. data for the period 1930–65, which includes all of the Great Depression of the thirties. Some measured unemployment may be essentially voluntary in the case of pockets of unemployment during

[2] This paper was a joint venture by Lucas and Rapping. However the latter gradually lost interest in this line of research, so that the authors' rejoinder to Rees (1970), though co-signed by both of them (Lucas and Rapping, 1972), was in fact single-authored by Lucas, as he mentions in his Professional Memoirs (2001). Except when specifically discussing the 1969 paper, we will therefore refer to Lucas's views rather than to Lucas and Rapping's views.

> conditions of general prosperity… However, to extend this view to conditions of general deficiency in demand involves an aggregation fallacy. When all markets are depressed in varying degrees, a few of the unemployed might still be able to find work by shifting their location or trade, but it is surely not true that all of them could do so at once… Though scientific discussion is supposed to be dispassionate, it is hard for one old enough to remember the Great Depression not to regard as monstrous the implication that the unemployment of that period could have been eliminated if only all the unemployed had been more willing to sell apples or to shine shoes (Rees 1970: 308).

Beyond doubt, Rees had what seemed at the time a strong point. Lucas and Rapping's model assumed market clearing. That is, it assumed away involuntary unemployment. If it is believed that the voluntary/involuntary unemployment distinction makes any sense, the Great Depression is the period *par excellence* for which the notion of involuntary unemployment is relevant. Arguing that the massive unemployment that existed at the time was composed of voluntarily unemployed persons stretched credibility. Hence Rees's claim that any model excluding market non-clearing as a matter of premise was ill suited for studying the Great Depression.

2.3 Lucas's reaction

Lucas's reaction to Rees's criticism was twofold. On the one hand he refused to enter into a discussion on the voluntary or involuntary nature of unemployment.[3] However he accepted the standard Keynesian argument that the Great Depression was due to a deficiency in aggregate demand.[4] On the other hand, he agreed to delve deeper into the issue of the relevance of Lucas and Rapping's model for the Great Depression. Here, stepping back from their previous conclusion, he admitted that the model failed to explain the data from 1934 to World War II.

> Rees also raises the important empirical question of whether our theory does succeed in accounting for labor-market behavior during the period 1929–39. Further study on our part indicates that Rees's skepticism on this point is well founded: our hypothesis accounts for much, but *not*

[3] Lucas's definitive position on the subject of involuntary unemployment, namely that this notion should be dispensed with altogether, is set out in a later article (Lucas 1978: 242). For a discussion of this point, see De Vroey (2004; 2005).
[4] "The only aggregative economic policy implication we see for events like the Great Depression are the standard ones: if possible, avoid the aggregate-demand shifts which cause them; failing this, pursue corrective demand policies to make them as brief as possible." (Lucas and Rapping 1972: 187).

> all, of the observed labor-market rigidity during this period (Lucas and Rapping 1972: 186).

Lucas was enigmatic about the reasons behind the failure of the model, contenting himself with noting that it considered only one source of rigidity (adaptive expectations), while others might have been at work as well. In a footnote, he hinted at Alchian's (1970) conjecture that recovery was delayed by the succession of New Deal price- and wage-fixing measures, a claim that Cole and Ohanian were to take up again some thirty years later.

2.4 Lucas's subsequent standpoint

Lucas returned to the issue of the Great Depression on several occasions, mainly in interviews or book reviews, although never in any detail. In these pieces he repeatedly expressed the view that real business cycle models, which he otherwise fully endorsed, were unable to explain the Great Depression. This job, he constantly claimed, had been done by Friedman and Schwartz:

> The Great Depression, however, remains a formidable barrier to a completely unbending application of the view that business cycles are all alike (Lucas 1980: 273).
>
> …The magnitude of the Great Depression dealt a serious blow to the idea of the business cycle as a repeated occurrence of the 'same' event… The Depression continues, in some respects, to defy explanation by existing economic analysis (Lucas 1980: 284).
>
> Viewed as positive theory, real business cycle models do not offer a serious alternative to Friedman and Schwartz's monetary account of the early 1930s… There is no real business cycle model that can map these shocks into anything like the 40% decline in real output and employment that occurred between 1929 and 1933 (nor, indeed, does anyone claim that there is). Even if there were, imagine trying to rewrite the Great Contraction chapter of *A Monetary History* with shocks of this kind playing the role Friedman and Schwartz assign to monetary contractions. What technological or psychological events could have induced such behavior in a large, diversified economy? How could such events have gone unremarked at the time, and remain invisible even to hindsight? (Lucas 1994: 13).[5]

[5] Other references are Lucas (1987: 87), Klamer (1984: 41-2), Snowdon and Vane (1998: 125) and McCallum (1999: 284).

In short, Lucas's stance is that the real business cycle method is fine for periods of plain sailing but ill suited to more dramatic events such as the Great Depression:

> In Kydland and Prescott's original model, and in many (though not all) of its descendants, the equilibrium allocation coincides with the optimal allocation: fluctuations generated by the model represent an efficient response to unavoidable shocks to productivity. One may thus think of the model not as a positive theory suited to all historical time periods but as a normative benchmark providing a good approximation to events when monetary policy is conducted well and a bad approximation when it is not. Viewed in this way, the theory's relative success in accounting for post-war experience can be interpreted as evidence that post-war monetary policy has resulted in near-efficient behavior, not as evidence that money does not matter (Lucas 1994: 13).

3 Prescott on the Great Depression

3.1 Prescott's early view

To the best of our knowledge, Prescott's first remark about the Great Depression dates from 1983 and is to be found in a Federal Reserve Bank of Minneapolis Working Paper discussing the methodology of the then nascent real business cycle theory. In this paper, Prescott examined four objections that can be raised to this theory. One of these is directly related to our inquiry: "How can a theory claim to explain the business cycle if it cannot explain the Great Depression?" (Prescott 1983: 11).

Prescott's answer was straightforward. He plainly admitted that the Great Depression was beyond the reach of the equilibrium model of the business cycle. To him, this restraint was virtuous because it showed that the practitioners of the new approach were aware of its limits. Equilibrium models of the business cycle, he argued, worked only for empirical cases where the political and financial context was stable:

> The answer to question (b) is simply that competitive equilibrium theory is not suited to modeling economic fluctuations in periods of great political and financial institution instability. The inability of either the equilibrium monetary or the technology shock theories to explain the Great American Depression is evidence of the discipline of the methodology. If any observation can be rationalized with some approach, then that approach is not scientific (Prescott 1983: 12).

Prescott stood by this point of view for several years.[6] This is witnessed by his reaction to Summers's rejoinder to his "Theory ahead of measurement" paper (Prescott 1986). One of Summers's points was that no equilibrium theory could deal with events like the Great Depression, because of the pervasive disruptions to the exchange system that characterize such periods.[7] In contrast to the generally flamboyant tone of his response, Prescott remained subdued on this point, taking the same line as in his 1983 paper:

> Summers has perhaps misread some of my review of real business cycle research. There I do not argue that the Great American Depression was the equilibrium response to technology shocks as predicted by the neoclassical growth model. I do not argue that disruptions in the payment and credit system would not disrupt the economy (Prescott 1986: 29).

3.2 Prescott's present standpoint

Prescott did not return to the matter of the Great Depression until his 1996 interview with Rolnick for *The Region*, a journal of the Federal Reserve Bank of Minneapolis (Rolnick 1996). Here, he departed from his earlier abstentionist view. While still referring to the political turmoil of the time, he maintained that, after all, the Great Depression was amenable to the real business cycle approach. Moreover, he now distanced himself from Friedman and Schwartz's interpretation (Rolnick 1996: 6).

It did not take long for Prescott to fully turn away from his earlier position. His new views are to be found in two papers, which are commentaries on other authors' work rather than original research. The first is a short piece published in the *Federal Reserve Bank of Minneapolis Quarterly Review* in 1999, entitled "Some Observations on the Great Depression" (Prescott 1999), which comments on Cole and Ohanian's article "The Great Depression in the United States from a Neoclassical

---

[6] Prescott was not alone among the founders of the new approach in holding such an abstentionist view of the Great Depression. For example, Sargent stated, "I do not have a theory, nor do I know anybody's else's theory, that constitutes a satisfactory explanation of the Great Depression" (Klamer 1984: 69).

[7] "Between 1929 and 1933, the gross national product in the United States declined 50%, as employment fell sharply… I submit that it defies credulity to account for movements on this scale by pointing to intertemporal substitution and productivity shocks… It seems clear that a central aspect of depressions, and probably economic fluctuations more generally, is a breakdown of the exchange mechanism. Read any account of life during the Great Depression in the United States. Firms had output they wanted to sell. Workers wanted to exchange their labor for it. But the exchanges did not take place. To say the situation was constrained Pareto optimal given the technological decline that took place between 1929 and 1933 is simply absurd, even though total factor productivity did fall. What happened was a failure of the exchange mechanism" (Summers 1986: 26).

Perspective" (Cole and Ohanian 1999). The second article, written jointly with Timothy Kehoe, is an introduction to the 2002 special issue of *The Review of Economic Dynamic*s resulting from a conference held at the Federal Reserve of Minneapolis in October 2000 (Kehoe and Prescott 2002). Both articles start with an expression of surprise:

> Why hasn't growth theory been used to study the Great Depression? Perhaps because economists are reluctant to use standard theory to study an event that historically was treated as an aberration defying an equilibrium explanation (Prescott 1999: 25).

> The general equilibrium growth model is the workhorse of modern economics… Until recently, however, it has been taboo to use the growth model to study great depressions. This volume breaks this taboo (Kehoe and Prescott 2002: 2).[8]

Prescott's earlier argument that real business cycle theory should refrain from trying to explain the Great Depression was now rejected. According to Kehoe and him, the conventional view that "great depressions are unique events that occurred in the interwar period and are of historical interest only" ought to be dismissed. Instead, they claimed that several other "great depressions" occurred in the 20th century, most of them close to the present time.

This claim went along with a definitional change. The standard definition was that the term "Great Depression" designated the period between the end of 1929 and 1933. In contrast, Kehoe and Prescott proposed a quantitative definition resting on two conditions:

> To be a great depression, a negative deviation from trend must satisfy two conditions. First, it must be a sufficiently large deviation. Our working definition is that a great depression is a deviation at least 20% below trend. Second, the deviation must occur rapidly. Our working definition is that de-trended output per working-age person must fall at least 15% within the first decade of the depression (Kehoe and Prescott 2002: 9).[9]

---

[8] The idea that a taboo needed to be broken is also evoked in Prescott's Richard Ely Lecture, "Prosperity and Depression" (Prescott 2002: 1).

[9] Kehoe and Ruhl later added a third condition, that "there is no significant recovery during the period in the sense that there is no sub-period of a decade or longer in which the growth of output per working-age person returns to the trend" (Kehoe and Ruhl 2005: 762).

If this definition is adopted, other twentieth century great depressions emerge:

> Argentina, Brazil, Chile and Mexico had depressions in the 1980s that were comparable in magnitude to those in Canada, France, Germany and the United States in the interwar period… In recent times, New Zealand and Switzerland – rich, democratic countries with market economies – have experienced great depressions. If the current Japanese depression continues a few more years, it will become a great one (Kehoe and Prescott 2002: 2).

The suggested definitional change implied that the Great Depression of the 1930s covered the entire decade 1929-39, since output remained below trend for the whole of that period. As will be seen below, this definition led to two distinct puzzles: first, the onset of the decline, and, second, the weak recovery from it (i.e. the 1929-33 and the 1934-39 periods). The merit of Cole and Ohanian's work, according to Prescott, was to have shifted the attention from the former to the latter issue, now considered the most important (Prescott 1999: 26). Prescott also adhered to their conclusion as to the cause of the weak recovery, as he stated forcefully in the last paragraph of his 1999 article:

> In the 1930s, there was an important change in the rules of the economic game. This change lowered the steady-state market hours. The Keynesians had it all wrong. In the Great Depression, employment was not low because investment was low. Employment and investment were low because labor market institutions and industrial policies changed in a way that lowered normal employment (Prescott 1999: 27).

4 Explaining Prescott's change of mind

A 180 degree turn occurred between Prescott's early remarks pointing to the inability of the real business cycle approach to explain the Great Depression and his later (and present) standpoint. Two related factors may explain this change.

First, Prescott's reversal of opinion must be understood in the broader context of the evolution of the real business cycle research program. The last fifteen years have witnessed a progressive breaking away of real business cycle theory from the strict Walrasian principles which characterized it at its onset. This is a testimony to the resilience and adaptability of the methodology created by Kydland and Prescott. Indeed, as Romer (2001) aptly put it when drawing a distinction between real business cycle models and real-business-cycle-style models, "what distinguishes the real-business-cycle research program is its approach to modeling", rather than the Walrasian/non-Walrasian divide (Romer 2001: 210). This means that categories which were alien to the first generation of real business cycle theorists – imperfect competition, price sluggishness, monetary shocks – are no longer so. This evolution may make the theory more suitable for analyzing periods such as the Great Depression.

The second reason is the fact that Cole and Ohanian just came out and did it: they came to grips with the Great Depression within a real business cycle perspective, and their work enticed Prescott to change his view.[10] It must soon have occurred to Prescott that Cole and Ohanian's breakthrough was good news for the real business cycle approach, which claims to provide a general theory of business cycles. For, Prescott's early opinion to the contrary notwithstanding, the admission that one of the most important depressions in history – and certainly the best publicized one – lay beyond the grasp of the theory could not but appear as a sign of weakness. In Obstfeld and Rogoff's terms "a theory of business cycles that has nothing to say about the Great Depression is like a theory of earthquakes that explains only small tremors" (Obstfeld and Rogoff 1996: 627). After Cole and Ohanian, such attacks lost their sting.

To gauge Prescott's reversal of opinion, we need to assess Cole and Ohanian's work. This is the task undertaken in the next two sections.[11]

5 Cole and Ohanian on the US Great Depression

Cole and Ohanian were the first authors to look at the Great Depression through the lens of neoclassical growth theory.[12]

> We use neoclassical growth theory to study macroeconomic performance during the 1930s the way other economists have used the theory to study post-war business cycles. We first identify a set of shocks considered important in post-war economic declines: technology shocks, trade shocks, and monetary shocks. We then ask whether those shocks, within the neoclassical framework, can account for the decline and the recovery in the 1930s. This method allows us to understand which data from the 1930s are consistent with neoclassical theory and, especially, which observations are puzzling from the neoclassical perspective (Cole and Ohanian 1999: 2).

Cole and Ohanian's central message can be grasped by looking at Figure 1, in which we have graphed de-trended data from their 1999 paper for US output, total factor

[10] In private correspondence both Ohanian and Prescott have upheld this thesis.
[11] See Pensieroso (forthcoming) for a more detailed survey of the real business cycle literature on the Great Depression.
[12] Their main papers on the subject are Cole and Ohanian (1999; 2000; 2002; 2004).

productivity (TFP), total employment and real wages in manufacturing and non-manufacturing sectors.[13]

One of Cole and Ohanian's original claims was that the Great Depression must be viewed as a ten-year episode, because de-trended output (the blue line in Figure 1) remained below the trend line for the whole decade. Figure 1 also illustrates the strong pro-cyclical behavior of TFP (the pink line). After dropping by almost 18% from 1929 to 1933, it returned to its trend level in 1936. Considering a standard real business cycle model, Cole and Ohanian fed in measured TFP as the impulse mechanism of the business cycle. Their growth accounting exercise led to a twofold result.

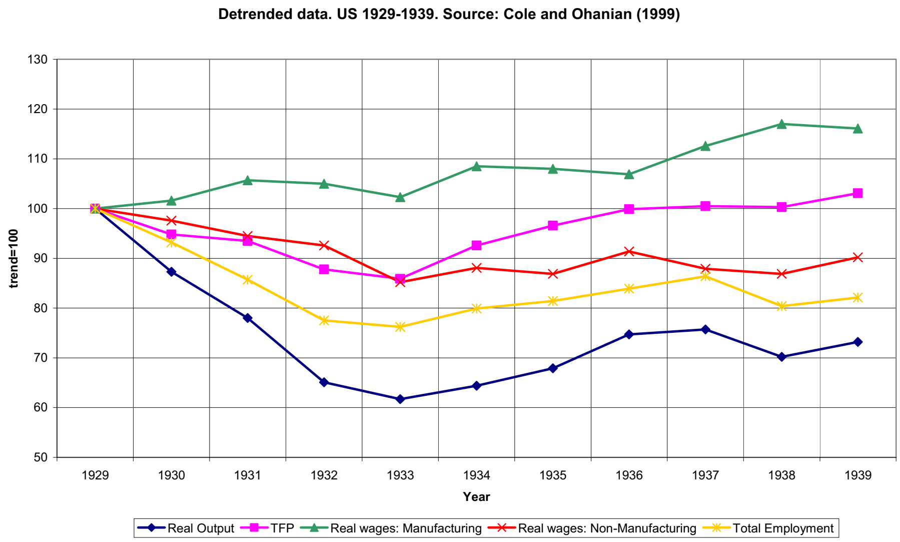

Figure 1

First, the behavior of the measured TFP accounted for about 65% of the initial decline in de-trended output. [14] Second, it had almost no explanatory power for the post-1933 years. Using the same growth accounting technique, Cole and Ohanian examined whether the behavior of output could be traced back to the other variables invoked in competing explanations of the Great Depression – fiscal policy, international trade restrictions, monetary tightening, financial intermediation

[13] TFP is defined as "any exogenous factor that changes the efficiency with which business enterprises transform inputs into outputs" (Cole and Ohanian, 1999: 5).

[14] The actual figure in Cole and Ohanian (1999) is 40%. The 65% figure reported in the text was suggested to us by Lee Ohanian, and appears in a revised version of the paper forthcoming in the Federal Reserve Bank of Minneapolis volume on Great Depressions.

disruptions, changes in reserve requirements, and the rigidity of nominal wages. The result was negative: none of them, they claimed, stands up to scrutiny.

To Cole and Ohanian, the most intriguing result was the lack of a marked recovery in output and employment (the yellow line in Figure 1) from 1933 onwards, despite the normal growth in productivity, rapid growth in money supply, and the end of runs on the banks. That is, while the onset of the Great Depression witnessed strongly negative real and monetary shocks, the post-1933 period did not. Hence their contention that the main puzzle raised by the Great Depression lay in understanding why the US economy remained depressed until the outbreak of WWII rather than in elucidating its onset. They concluded their analysis by suggesting that another negative shock must have hit the economy in the mid-1930s. New Deal labor market legislation was their main suspect.

The aim of Cole and Ohanian's 2002 and 2004 articles was to clinch this last point analytically. Cole and Ohanian (2002) claimed that a distortion occurred in the labor market, driving a wedge between the real wage and the marginal rate of substitution between consumption and leisure, so that the former exceeded the latter. Positing that agents were in individual equilibrium in 1929, Cole and Ohanian investigated whether this was still the case in 1939. Their answer was "no":

> Three of the four [first order] conditions are distorted. The marginal rate of substitution between consumption and leisure is 41 percent below the wage rate, and factor prices differ considerably from their implied marginal products. The wage rate substantially exceeds the marginal product of labor, and the return to capital is below the marginal product of capital… Taken together, these data suggest that some factor raised the wage above its market-clearing level, and that this high wage prevented households from satisfying their marginal rate of substitution condition (Cole and Ohanian 2002: 30).

In their 2004 paper, Cole and Ohanian focused their attention on one specific New Deal policy measure, the National Industrial Recovery Act (NIRA). This allowed firms to set prices cooperatively within the same industry, conditional on their accepting collective bargaining with unions over wages. Moreover NIRA codes of "fair competition" prescribed a minimum wage per industry that was typically above the previous prevailing wage rate. Cole and Ohanian provided evidence that this enhanced high wages in the US economy. As can be seen from Figure 1, the data confirm that wages in manufacturing, which was 80% covered by NIRA, were above the trend line for the whole decade, with a marked increase in 1933, the year in which the NIRA was signed. On the contrary, Figure 1 also shows that real wages in non-manufacturing sectors, which were not covered by the NIRA, remained below the trend line throughout the decade. Cole and Ohanian's 2004 article also provided a quantitative analysis of the role of New Deal policies in causing the weak recovery. To this end they built a multi-sectoral model with imperfect competition and wage bargaining between firms and insider workers. The cartel sector works on an insider/outsider pattern. Insiders set the wage and the employment level, conditional on firms' reservation profits. Whenever firms agree with workers, they are allowed to collude over production. This last assumption, Cole and Ohanian claimed, captures the central feature of the NIRA (Cole and Ohanian 2004: 781). Insiders are thereby able to raise the cartel wage above the market-clearing level.[15] Hence, a distortion occurs in the labor market, with the real wage rate exceeding the marginal rate of substitution between consumption and leisure. Although they did not use the term, this is nothing other than involuntary unemployment according to its standard definition, a state of affairs where agents would like to participate in the labor market yet, for some reason, are unable to do so.[16] Thus, the very result that Lucas and Rapping decided to exclude from their model, incurring Rees's wrath, now re-entered the picture, although hardly to vindicate a Keynesian standpoint.

The main quantitative result of Cole and Ohanian's model was that:

> New Deal cartelization policies are a key factor behind the weak recovery, accounting for about 60% of the difference between actual output and trend output (Cole and Ohanian 2004: 781).

On a broader level, they concluded their 2004 article with the statement that:

> New Deal labor and industrial policies did not lift the economy out of the depression as President Roosevelt had hoped. Instead, the joint policies of increasing labor's bargaining power and linking collusion with paying high wages prevented a normal recovery by creating rents and an inefficient insider-outsider friction that raised wages significantly and restricted employment (Cole and Ohanian 2004: 813).

[15] Cole and Ohanian claim that monopoly *per se* is not responsible for the low level of employment. In effect, whenever monopoly is present without labor bargaining power, the cartel wage turns out to be close to the competitive wage and the reduction in output is small. Thus, the combined presence of monopoly and labor bargaining power is required in order to obtain the weak recovery result.

[16] It is true that in Cole and Ohanian's model agents who are rationed in the cartel sector end up in another activity (search, domestic labor or the competitive labor market), which they choose optimally. However such a result has also been obtained in dual market models (see, for example, Akerlof and Yellen 1986: 3; Hahn 1983: 225).

6 An assessment

6.1 The originality of Cole and Ohanian's analysis

Our first task is to ponder the originality of Cole and Ohanian's work. To this end, we shall examine, first, whether their analysis enriches our understanding of the Great Depression (as concerns both its onset and its protracted character), and, second, whether they inaugurated a new way of approaching it.

As far as the unfolding of events leading to the Great Depression is concerned, Cole and Ohanian's positive contribution is, as they themselves admit, almost non-existent.[17] TFP may account quantitatively for 65% of the drop in output, but qualitatively it is highly unsatisfactory, as it traces everything back to an undetermined exogenous shock.[18] Thus, as far as the onset of the Great Depression is concerned, Cole and Ohanian's analysis can hardly compete with the existing historical explanations (Kindelberger, 1973; Friedman and Schwartz, 1963; Eichengreen, 1992; Romer, 1990; 1992; 1993; De Long, 1997, to name but a few).

However, Cole and Ohanian's main investigation bears on the weak recovery from the Great Depression. Two remarks are in order here. First, their characterization of the weak recovery brings out only one side of the picture, as aptly encapsulated by Christina Romer:

> The recovery of the United States from the Great Depression has been alternatively described as very fast and very slow. It was very rapid in the sense that the growth rate of real output was very large in the years between 1933 and 1937 and after 1938… The recovery was nevertheless slow in the sense that the fall in output in the United States was so severe that, despite the impressive growth rates, real GNP did not return to its pre-Depression level until 1937 and its pre-Depression growth rate path until around 1942 (Romer 1993: 34-5).

One aspect of this strong recovery, emphasized by Temin and Wigmore (1990), is the significant increase in investment that occurred from 1933 onwards and which was a distinctive feature of the US economy. Figure 2 illustrates the extent to which this recovery in investment occurred only in the US. In Temin and Wigmore's view, the New Deal and the devaluation of the dollar acted as signals of a regime shift. More optimistic expectations and hence increased investment ensued.

[17] See Ohanian (2002). In the introduction to this paper, Ohanian notes, "The Depression remains one of the most important and enduring mysteries in macroeconomics, and identifying the causes of this productivity decrease may shed new light on this mystery" (2002: 12). Yet at the end of the article, he writes "I conclude that the Great Depression productivity puzzle remains largely unsolved" (2002: 14).
[18] Cole el al. (2005) offer some hints on the possible nature of productivity shocks, but leave the subject for future research.

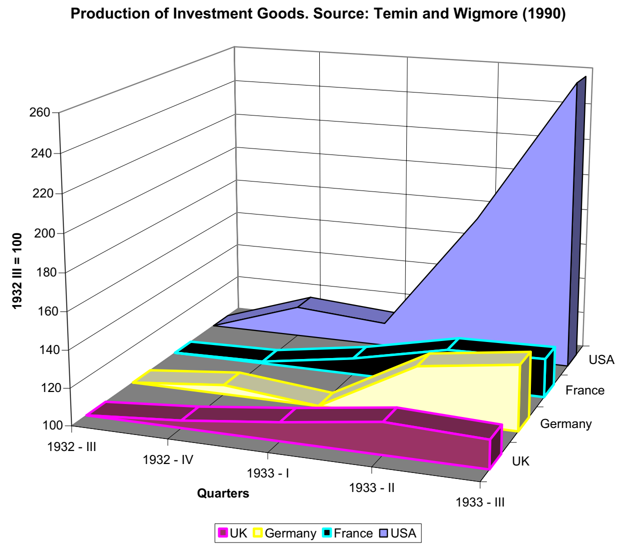

Figure 2

Our second remark is that Cole and Ohanian are hardly the only authors to have criticized the NIRA policy. Attacking the latter has been a staple of defenders of *laissez-faire* from the Chicago economist Simons (1934) to the present day (Powell 2003; Smiley 2002; Hall and Ferguson 1998).[19] Even Keynes (1933) was dismissive of it. Actually, most economists agree that this particular policy, as distinct from other New Deal policies, was inadequate.[20] To limit ourselves to one account, Eichengreen, a leading Great Depression analyst, wrote:

> The National Industry Recovery Act … contributed, perversely, to the slow recovery of American output and employment (Eichengreen 1992: 344).

So, our conclusion on the onset of the Great Depression must be extended to the topic of the protracted character of the crisis: Cole and Ohanian's novelty in terms of substance is slim.

[19] Hawley (1966) is a classical piece assessing the effects of the NIRA.

[20] Weinstein (1981) anticipates both Eichengreen's (1992) and Cole and Ohanian's (2004). Weinstein's main point is that the NIRA produced a threefold negative effect. First, the policy sterilized the large post-1933 gold inflow. Second, it depressed employment by imposing mandatory wages that were higher than the market-clearing equilibrium. Finally it increased inflation, thereby decreasing real balances and therefore consumption and investments.

Their real contribution is methodological. Previous authors had discussed the NIRA policy in a qualitative way. Their view was, typically, that, while the policy in itself was a failure, its impact on the overall recovery was hard to assess, because of the presence of countervailing factors. In contrast, Cole and Ohanian analyzed the policy on the basis of a general equilibrium model geared towards empirical measurement. Hence, they were able to make a quantitative assessment, namely that the NIRA policy accounts for 60% of the slow character of the recovery.

To conclude, Cole and Ohanian's main contribution is to have inaugurated a new way of tackling the issue of the Great Depression. The theoretical breakthrough made by Lucas, Kydland and Prescott consisted of dismissing the view that business cycles were not amenable to equilibrium analysis. Cole and Ohanian's contribution is of the same order. Previously it was believed that no abstract quantitative model of the Great Depression could be constructed. They must be credited with having disproved this view.

6.2 One or several great depressions?

Kehoe and Prescott (2002) claim that several "great depressions" occurred in the twentieth century. This claim follows from their definition of a great depression, according to which a 20% cumulative fall in output below trend, with a 15% fall in the 10 first years, constitutes a great depression.

In our eyes, such a definition has little to commend it. Ten years is too long a period. In the 1930s it took only one year for detrended output to fall by 15% (and the overall fall between 1929 and 1933 was almost 40%). Kehoe and Prescott's definition is too wide. This is particularly clear when it is observed that their criterion leads them to assert that countries such as New Zealand and Switzerland are presently enduring great depressions. A rapid glance at Figure 3 should make it is obvious that the present situation in these countries is not remotely comparable with the situation of the United States in the 1930s.[21] There is something qualitatively different about *the* Great Depression, just like there was something qualitatively different about WWI, WWII, and about stagflation in the 1970s. With Kehoe and Prescott's definition the specificity of the Great Depression is lost.

[21] On this, see Abrahamsen et al. (2005).

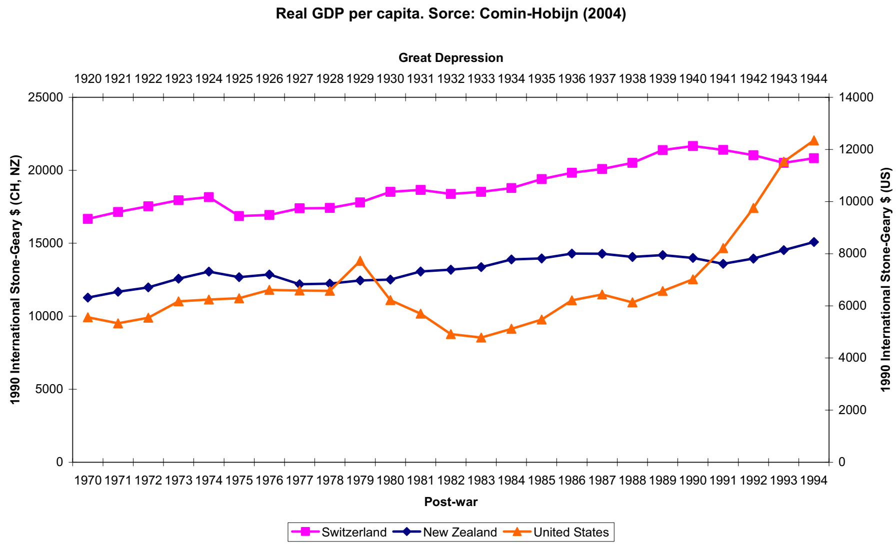

Figure 3[22]

Kehoe and Prescott's (2002) stress on the weak recovery aspect in their definition of a great depression may also lead to a confusion between the explanation of the causes of the Great Depression and the causes of its protracted character. In our view, Prescott falls prey to such a mistake when he says:

> In the 1930s labor market institutions and industrial policy actions changed normal market hours. I think these institutions and actions are what caused the Great Depression (Prescott 1999: 26).[23]

If the changes that Prescott has in mind include the effects of the New Deal, they can in no way be viewed as having caused the Great Depression. Sticking to his definition of a great depression allows him to focus his attention on the causes of the long duration of the depression, thereby neglecting the task of explaining the plunge in output in the early 1930s.

---

[22] The results presented here are not intended to be directly comparable to those used by Kehoe and Prescott (2002), since, unlike theirs, the output data used here has not been detrended.

[23] "From the perspective of growth theory, the Great Depression is a great decline in steady-state market hours. I think this great decline was the unintended consequence of labor market institutions and industrial policies designed to improve the performance of the economy" (Prescott 1999: 27).

6.3 Contrasting the approaches of equilibrium macroeconomics and economic history to the Great Depression

Cole and Ohanian's work has broken the monopoly that economic history had over the Great Depression. Two competing approaches are now on the ground, neither of which can be considered, as a matter of principle, superior to the other. Our aim in this section is to briefly bring out their methodological differences.

The singularity of the Great Depression

The standard view of a depression is that it constitutes a particular phase in the business cycle, characterized by the fact that output remains (significantly) below the trend line. In turn, a business cycle is defined as being composed of four elements: the depression or decline, the trough, the recovery and the peak. In short, a business cycle is a set of peak-to-trough movements. To Cole and Ohanian, the Great Depression is yet another depression, its uniqueness lying solely in its amplitude.

Lucas (1977: 218) claims that the fact that all business cycles manifest the same sequence of movements and time lags is the very feature that allows a general theory of the business cycle, abstracted from the particularities of individual cycles, to be constructed. This is why this literature gives so little attention to the causes of any given depression.[24]

It remains true, nonetheless, that all business cycles – and their components – are a mix of singularity and recurrence. Real business cycle theory just assumes that the singularity dimension can be overlooked for the sake of theoretical analysis. So the appropriateness of applying the real-business-cycle toolbox to the Great Depression hinges on the assumption that in this episode too the recurrence is more important than the singularity. If the reverse is true, the appropriateness of the business cycle framework for tackling the Great Depression has to be questioned.

The alternative viewpoint is that the Great Depression was not a depression in the standard sense (i.e. in the sense that slumps are necessarily followed by recoveries after some "liquidation" has come to an end).[25] A system-failure phenomenon, analogous to that which occurred with the downfall of the former

[24] Moreover, according to Prescott, identifying causes is more or less impossible because "a shock" may consist of the aggregate of a series of small, barely identifiable, events. As he stated in an interview with *The Region*, "We don't have a theory of what causes economy-wide productivity to change. We can measure how big the changes are, and we can use dynamic theory to predict the consequences of these random changes. Now the question is: Can we identify specific shocks? My answer is no. We can't even identify why total productivity of labor and capital is four or five times higher here than in India. Given this, how can we hope to identify why this productivity grew by 2 percent less than expected over some two-year period? Such an occurrence is all that is needed to induce a recession" (Rolnick 1996: 8).

[25] See De Long (1990).

communist regimes, may have been at work. In this view, the 1929-33 events brought the economy to a state of affairs where any speedy recovery through private-sector adjustments was excluded. To vanquish the threat of a system collapse, a strong signal announcing a change in regime was needed. The New Deal constituted such a signal. This anti-liquidationist vision is well captured in the following observation:

> The devaluation of the dollar [by the Roosevelt administration] was the single biggest signal that the deflationary policies implied by adherence to the gold standard had been abandoned, that the iron grip of the gold standard had been broken. Devaluation had effects on prices and production throughout the economy, especially on farm and commodity prices, not simply on exports and imports. It sent a general message to all industries because it marked a change in direction for government policies and for prices in general. The elements of the New Deal emerged in the course of 1933; the devaluation of April-July 1933 was the proximate cause of the recovery (Temin and Wigmore 1990: 485).

The case for and against fully articulated models

Real business cycle theorists are rightly proud of proposing an analysis of the Great Depression based on fully articulated models, which are micro-founded, have a claim to internal consistency and provide quantitative results open to direct contest. In contrast, economic history does not provide such models. Rather it mixes discursive economic reasoning with historic considerations of a different order, including, but not limited to, statistics and econometrics. Even if impressive progress has taken place between the early analyses (such as Kindleberger's 1973 classical book) and modern studies, this hybrid character still remains.

Ohanian pointed out the superiority of the fully articulated modeling strategy when interviewed in the *Economic Dynamics Newsletter*:

> General Equilibrium theory is important for understanding the Depression. There are a lot of stories about the Depression, but without an explicit general equilibrium model you don't know if the stories hold water. One of the benefits of general equilibrium theory is that it forces you to look beyond the direct effects of shocks, and assess the indirect effects. Hal [Cole] and I are writing a paper for the NBER Macro Annual that uses general equilibrium models to study the two most popular shocks for 1929-33: the money stock decline and bank failures. Using general equilibrium models, we found that many of the indirect effects of these shocks offset the direct effects, or were at variance with the data. (Ohanian 2000: 6).

But there is another side to the picture. While presenting undeniable advantages over the narrative approach, the modeling approach also has drawbacks of its own. Ohanian is right in observing that many stories are available. The problem is that not all of them can be translated into models. Models are based on exclusions. But what if the excluded factors are crucial components of the explanation? Let us mention two obvious contenders for explaining the onset of the Great Depression that are absent from Cole and Ohanian's model. The first, which has already been mentioned above, is the idea that the Great Depression witnessed a failure in the exchange mechanism. The second, favored by Eichengreen (1992) and Eichengreen and Temin (2000), is the role played by the gold standard mechanism. As these authors argue powerfully, in the wake of WWI this institutional mechanism ceased to function well, and governments and central banks did not know how to fix it. According to Eichengreen and Temin (2000), any analysis omitting this dimension is doomed to fail to provide a satisfactory explanation of the Great Depression.[26]

The meaning of "explanation"

While both equilibrium economics and economic history aim at explaining the Great Depression, it is evident on reflection that the term "explanation" does not have the same meaning in each case.

To practitioners of equilibrium macroeconomics, "to explain" means to be able to construct an artificial model economy which, when subject to a suitable exogenous shock and properly simulated, behaves like the observed real-world economy. This is what Cole and Ohanian have in mind when they claim that TFP explains 65% of the observed data.

To the economic historian, however, the "explanation" term has a stronger meaning. It implies drawing causal inferences, digging out the possibly inter-related fundamental causes of an event. This causal perspective may mean resorting to an array of factors which are not always suitable for inclusion in a formal model. Think for instance of Friedman and Schwartz's (1963) claim that the course of the Great Contraction in the United States might have been different had Governor Strong not died prematurely. Whenever explaining in this sense is at stake, the discourse is bound to be loose. Yet what is lost in rigor can be compensated for in ability to address the heart of the matter.

This difference in the meaning of an explanation is related to the contrast pointed out above. Some commentators praise Cole and Ohanian for having produced good results while excluding many variables that *a priori* might be considered important, such as the gold standard. Such praise is only justified if the less demanding definition of explanation has been adopted. Against the more demanding conception, another conclusion emerges. The fact that a model fares well without

[26] This point is also made by Gertler (2001) in his discussion of Cole and Ohanian's 2000 paper.

taking into account the factor that is deemed crucial for a causal explanation casts doubt on the basic adequacy of this model.

7 Lucas after Cole and Ohanian

A final point to be tackled relates to Lucas's standpoint. We have seen that Prescott has fully endorsed Cole and Ohanian's work, becoming 100% positive about the amenability of the Great Depression to the real business cycle methodology. But what about Lucas? Has he followed suit?

A recent interview with Lucas by Randall Parker on the subject of the Great Depression sheds some light on this question (Parker forthcoming).[27] The first impression conveyed by this interview is the contrast between the attitudes of Prescott and Lucas. While the former is bluntly assertive, the latter has no qualms about expressing his hesitations.

Lucas is highly complimentary about Cole and Ohanian's work. He praises them for having quantified the effects on the real economy of measures taken under the New Deal. He also praises them for "having the guts to just look at this [New Deal] period and say 'none of these theories I can take off the shelf make any damn sense here. Let's start over'".[28]

Lucas also agrees with Cole and Ohanian's explanation of the protracted character of the Great Depression. However, we do not think that this amounts to an abandonment of his earlier abstentionist viewpoint. In spite of his agreement with their analysis of the second period of the extended Great Depression, Lucas parts company with Cole and Ohanian as to the possibility of explaining the onset of the Great Depression within the real business cycle framework. To him, the monetary explanation *à la* Friedman and Schwartz remains compelling, and he finds the idea that productivity shocks caused the depression hard to swallow:

> I told Prescott I'd hate to have to rewrite the Friedman and Schwartz book where the role Friedman and Schwartz assigned to monetary collapses is assigned instead to productivity shocks. Where is the productivity shock that cuts output in half in that period? Is it a flood or a hurricane? If it really happened, shouldn't we be able to see it in the data?

---

[27] We are grateful to Professors Parker and Lucas for having provided us with the text of this interview in advance of its publication.

[28] We agree with the first of these assessments yet disagree with the second. That the NIRA might have had harmful effects is a view that many authors have put forward, Friedman and Schwartz among them. Therefore, it would be more correct to state that Cole and Ohanian improved on an existing discursive claim by transforming it into a fully articulated model and quantifying it without introducing a new explanatory factor.

Lucas admits that Prescott and real business cycle economists have pushed him "a way over to thinking that a lot of the more *modest* recessions can be accounted for in real terms" (our emphasis). Yet he believes that this conclusion does not extend to the Great Depression. For him, the latter "stands out as a kind of singular economic event". This is the same position as he held in 1994 (see Section 2.4 above). Thus, we are led to conclude that Lucas still holds an abstentionist viewpoint.

8 Conclusions

Cole and Ohanian must be credited with having started to use the tools of modern economic theory to investigate the Great Depression. The task was worth a try, and having been able to construct a model is no mean feat. However, as far as substance is concerned, we must reserve judgment. As far as the onset of the Great Depression is concerned, Cole and Ohanian's model has not gained the upper hand over the complex and subtle explanations to be found in the writings of the many economic historians who have studied this event. As far as the recovery is concerned, it seems to us that the matter remains open. At this juncture, we are unable to decide whether their weak recovery claim is stronger than the opposing claims.

At stake in the assessment of real business cycle models of the Great Depression is a territorial dispute between new classical economic theory and economic history, hinging on whether there are limits to the modeling strategy in economics. If Prescott's standpoint amounts to a claim that the work of economic historians is prescientific and should be replaced by abstract models, we definitely disagree with him. However, we feel that the clash between the two approaches can have positive effects. On the one hand, it is beneficial that historians will be forced to react to Cole and Ohanian's quantitative results. On the other hand, the confrontation of their work with that of historians may help modelers to become more aware of the limits of the modeling approach.

References

Abrahamsen Y., R. Aeppli, E. Atukeren, M. Graff, C. Muller and B. Schips (2005) "The Swiss Disease: Facts and Artefacts. A Reply to Kehoe and Prescott", *Review of Economic Dynamics*, vol. 8, pp. 749-758.

Akerlof G. and J. Yellen (eds.) (1986) *Efficiency Wage Models of the Labor Market*, Cambridge University Press, Cambridge, UK.

Alchian A. A. (1970) "Information Costs, Pricing and Resource Unemployment", in Phelps E. (ed.), *Microeconomic Foundations of Employment and Inflation Theory*, Norton and Company Inc., New York.

Comin D. and B. Hobijn (2004) "Cross-Country Technological Adoption: Making the Theories Face the Facts", *Journal of Monetary Economics*, vol. 51, pp. 39-83.

Cole H. L. and L. E. Ohanian (1999) "The Great Depression in the United States from a Neoclassical Perspective", *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 23, pp. 2-24.

-- and -- (2000) "Re-Examining the Contributions of Money and Banking Shocks to the U.S. Great Depression", *Research Department Staff Report 270*, Federal Reserve Bank of Minneapolis.

-- and -- (2002) "The US and UK Great Depressions through the Lens of Neoclassical Growth Theory", *American Economic Review*, vol. 92, pp. 28-32.

-- and -- (2004) "New Deal Policies and the Persistence of the Great Depression: A General Equilibrium Analysis", *Journal of Political Economy*, vol. 112, pp. 779-816.

Cole H. L., L. E. Ohanian and R. Leung (2005) "Deflation and the International Great Depression: A Productivity Puzzle", *Working Paper 11237*, National Bureau of Economic Research.

De Long J. B. (1990), "'Liquidation Cycles': Old-Fashioned Real Business Cycle Theory and the Great Depression", *Working Paper 3546*, National Bureau of Economic Research.

-- (1997) *Slouching Towards Utopia? The Economic History of the Twentieth Century*, available online at http://www.j-bradforddelong.net/TCEH/Slouch_Old.html.

De Vroey M. (2004) *Involuntary Unemployment: The Elusive Quest for a Theory*, Routledge, London.

-- (2005) "Involuntary Unemployment: The Elusive Quest for a Theory", *Discussion Paper 2005-4*, Department of Economics, Université catholique de Louvain, available online at http://www.ires.ucl.ac.be/CSSSP/ home_pa_pers/devroey/recent.html.

Eichengreen B. (1992) *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939*, Oxford University Press, Oxford.

Eichengreen B. and P. Temin (2000) "The Gold Standard and the Great Depression", *Contemporary European History*, vol. 9, pp. 183-207.

Friedman M. and A. J. Schwartz (1963) *A Monetary History of the United States, 1867-1960*, Princeton University Press (for NBER), Princeton.

Gertler M. (2001) "Comments on Cole and Ohanian", in Bernanke B. S. and K. Rogoff (2001) (eds.), *NBER Macroeconomics Annual 2000*, National Bureau of Economic Research, MIT Press, Cambridge, Massachusetts.

Hahn F. (1983) "Comment on Axel Leijonhufvud's 'Keynesianism, Monetarism and Rational Expectations: Some Reflections and Conjectures'", in Frydman R. and E. Phelps (eds.), *Individual Forecasting and Aggregate Outcomes: Rational Expectations Explained*, Cambridge University Press, Cambridge, UK, pp. 223-230.

Hall T. E. and J. D. Ferguson (1998) *The Great Depression: An International Disaster of Perverse Economic Policies*, University of Michigan Press, Ann Arbor.

Hawley E. (1966) *The New Deal and the Problem of Monopoly*, Princeton University Press, Princeton.

Kehoe T. J. and E. C. Prescott (2002) "Great Depressions of the 20th Century", *Review of Economic Dynamics*, vol. 5, pp. 1-18.

Kehoe T. J. and K. J. Ruhl (2005) "Is Switzerland in a Great Depression?", *Review of Economic Dynamics*, vol. 8, pp. 759-775.

Keynes J. M. (1933) "The New Deal", *The New York Times*, December, 16th 1933, (reprinted in *Collected Writings of Keynes*, London 1981-1982, vol. XXI, pp. 289-297, or available online at http://newdeal.feri.org/ misc/keynes2.htm).

Kindleberger C. P. (1973) *The World in Depression*, University of California Press, Berkley.

Klamer A. (1984) *The New Classical Macroeconomics: Conversations with New Classical Economists and their Opponents*, Harvester Press, Brighton.

Lucas R. E. Jr. (1977) "Understanding Business Cycles", reprinted in Lucas R. E. Jr. (1981), pp. 215-239.

Lucas R. E. Jr. (1978) "Unemployment Policy", reprinted in Lucas R. E. Jr. (1981), pp. 240-247.

-- (1980) "Methods and Problems in Business Cycle Theory", reprinted in Lucas R. E. Jr. (1981), pp. 271-296.

-- (1981) *Studies in Business Cycle Theory*, MIT Press, Cambridge, Massachusetts.

-- (1987) *Models of Business Cycle*, Basil Blackwell, Oxford.

-- (1994) "Review of Milton Friedman and Anna J. Schwartz's *A Monetary History of the United States, 1867-1960*", *Journal of Monetary Economics*, vol. 34, pp. 5-16.

-- (2001) *Professional Memoir*, mimeo available online at http://home. uchicago.edu/%7Esogrodow/homepage/memoir.pdf.

Lucas R. E. Jr. and L. A. Rapping (1969) "Real Wages, Employment, and Inflation", *Journal of Political Economy*, vol. 77, pp. 721-754.

-- and -- (1972) "Unemployment in the Great Depression: Is there a Full Explanation?", *Journal of Political Economy*, vol. 80, pp. 186-191.

McCallum B. (1999) "An Interview with Robert E. Lucas Jr.", *Macroeconomic Dynamics*, vol. 3, pp. 278-291.

Obstfeld M. and K. Rogoff (1996) *Foundations of International Macroeconomics*, MIT Press, Cambridge, Massachusetts.

Ohanian L. E. (2000) "Economic Dynamics Interviews Lee Ohanian on the Great Depression", *Economic Dynamics Newsletter*, *Review of Economic Dynamics*, vol. 1 (2).

-- (2002) "Why Did Productivity Fall So Much During the Great Depression?", *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 26, pp. 12-17.

Parker R. (2006) *The Economics of the Great Depression: A Twenty-First Century Look Back at the Economics of the Interwar Era*, Edward Elgar Cheltenham, forthcoming.

Pensieroso L. (2007) “Real Business Cycle Models of the Great Depression: A Critical Survey”, *Journal of Economic Surveys*, forthcoming.

Powell J. (2003) *FDR's Folly: How Roosevelt and His New Deal Prolonged the Great Depression*, Crown Forum, New York.

Prescott E. C. (1983) (in collaboration with A. Guenther, P. Kehoe and R. Manuelli), “Can the Cycle Be Reconciled with a Consistent Theory of Expectations? Or, a Progress Report on Business Cycle Theory”, *Working Paper 239*, Federal Reserve Bank of Minneapolis.

-- (1986) “Response to a Skeptic”, *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 10, pp. 28-33.

-- (1999) “Some Observations on the Great Depression”, *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 23, pp. 25-31.

-- (2002) “Prosperity and Depression”, *American Economic Review*, vol. 92, Papers and Proceedings, pp. 1-15.

Rees A. (1970) “On Equilibrium in Labor Markets”, *Journal of Political Economy*, vol. 78, pp. 306-310.

Rolnick A. J. (1996) “An Interview with Edward Prescott”, *The Region*, September 1996, available online at http://www.minneapolisfed.org/ pubs/region/96-09/prescott.cfm.

Romer C. (1990) “The Great Crush and the Onset of the Great Depression”, *Quarterly Journal of Economics*, vol. 105, pp. 597-624.

-- (1992) “What Ended the Great Depression?”, *Journal of Economic History*, vol. 52, pp. 757-784.

-- (1993) “The Nation in Depression”, *Journal of Economic Perspectives*, vol. 7, pp. 19-39.

Romer D. (2001) *Advanced Macroeconomics*, McGraw-Hill, New York.

Simons H. C. (1934) “A Positive Program for Laissez Faire: Some Proposals for a Liberal Economic Policy”, in Simons H. C., *Economic Policy for a Free Society*, Chicago University Press, Chicago, 1948.

Smiley G. (2002) *Rethinking the Great Depression*, Ivan R. Dee, Chicago.

Snowdon B. and H. R. Vane (1998) "Transforming Macroeconomics: An Interview with Robert E. Lucas Jr.", *Journal of Economic Methodology*, vol. 5, pp. 115-145.

Summers L. H. (1986) "Some Skeptical Observations on the Real Business Cycle Theory", *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 10, pp. 23-27.

Temin P. and B. A. Wigmore (1990) "The End of One Big Deflation", *Explorations in Economic History*, vol. 27, pp. 483-502.

Weinstein M. M. (1981) "Some Macroeconomic Impacts of the National Recovery Act, 1933-1935", in Brunner K. (ed.), *The Great Depression Revisited*, Martinus Nijhoff, Boston.