

# The Great Depression as an Energy Transition: Intersection with Keynesian and Monetarist Interpretations

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## Abstract

The energy transition hypothesis suggests that the Great Crash of 1929 was triggered by major oil price cuts and declaration of oil supply certainty following discovery of new oil fields in the US Southwest; and the Great Depression that followed involved breaking the hegemonic power of US railroads. In reviewing intersections of this hypothesis with established Keynesian and Monetarist perspectives on the Depression, we see that Robbins and to lesser extent Keynes came close to recognizing the role of energy transformation and technological change. The energy transition can also potentially explain a missing element in the Monetarist's interpretation of the Depression noted by Gordon & Wilcox, and others. Further economic analysis of the Depression should at a minimum assess the impacts of: i) the collapse of railroad investments due to technological change; and ii) the decline in crude oil prices.

## 1. Introduction

Understanding the Great Depression is, according to Bernanke (2000, p.6), "*the Holy Grail of macroeconomics.*" The Depression was so central to the development of macroeconomics, that the two dominant economic paradigms of the twentieth century – Keynesianism and Monetarism – both sought to explain its proceedings (e.g., Friedman & Schwartz, 1963; Kindleberger, 1973; Temin, 1976; Brunner, 1981). Recent analysis, supported by historical evidence, has produced a new hypothesis that the Great Depression was tied to the socio-technological transformation from coal to oil-based transportation in the US (Kennedy, 2023a,b). Following the oil crises of the 1970s, there has been growth in understanding of the substantial impacts of access to energy supplies on economies (Hamilton 1983, 1985, 2012; Cleveland et al. 1984; Jorgenson 1986; Ayres & Warr 2005; Payne, 2011); this provides an economic perspective that was largely absent at the time of the Depression. The objective of this paper is to review Keynesian and Monetarist interpretations of the Great Depression to identify potential intersections with the energy transition hypothesis.

## 2. Oil Discovery and The Great Depression

The energy transition hypothesis is able to explain both the Great Crash of 1929, and the proceeding Great Depression as being features of the transition from coal to oil-based transportation. Underlying the Great Crash was a major reduction in oil prices and announcement of oil supply certainty, following discovery of huge new oil fields in the US Southwest in 1929. The Depression that followed was long and drawn-out as it involved breaking the hegemonic power of US railroads.

To understand the genesis of the Great Crash it is necessary to recognize that the US had serious concerns about oil scarcity throughout the 1920s. In 1922, the US Geological Survey reported that known US oil reserves would only last for 18 to 20 more years (US Geological Survey, 1922; Dennis, 1985). Furthermore, there was little discovery of new oil fields in the early 1920s (see Figure 3 in Kennedy, 2023a). President Calvin Coolidge was so concerned over oil scarcity – for military and industry reasons – that he created a new Federal Oil Conservation Board (FOCB) in 1924. Acting in response to the FOCB, in 1925, the American

Petroleum Institute (API) published a report claiming that petroleum reserves were almost inexhaustible (API, 1925; Dennis, 1985). The API report, however, was not taken seriously by state geologists (Dennis, 1985) and in 1926, the FOCB released its first report indicating that existing oil wells only had a capacity of about six years of supply. There was a moderate increase in known oil reserves in 1927, but the FOCB's second report, published in 1928, still bolstered the public perception that the US was running out of oil (Olien & Olien, 1993). Moreover, throughout the 1920s, oil companies built up stocks of crude petroleum as a hedge against possible shortages.

Concerns over oil scarcity were dramatically expunged, however, in 1929, with the discovery of huge new oil fields in the US Southwest. Kemp (2015) noted *"In October 1929, U.S. commercial crude stocks peaked at a staggering 545 million barrels, following the discovery of a series of huge new oil fields in Oklahoma, Texas, the rest of the Southwest and California."*

The link between these discoveries and the Great Crash is apparent through two articles in the *New York Times* (Figure 1). On October 22 – two days before Black Thursday – an article reported that Standard Oil of California was making drastic cuts to crude oil prices – averaging 55% – due to *"long-continued, unrestrained overproduction."* California was the leading oil producing state in the 1920s. This drastic reduction in oil prices can be recognized as a possible trigger of the stock market crash; there was a severe competitive shock to the pre-dominantly coal-based economy. The Great Crash continued over several days, with New York banks attempting to revive the market (Galbraith, 1954). On October 29 – Black Tuesday – when stocks lost \$14 billion in value, there was another *New York Times* article which began:

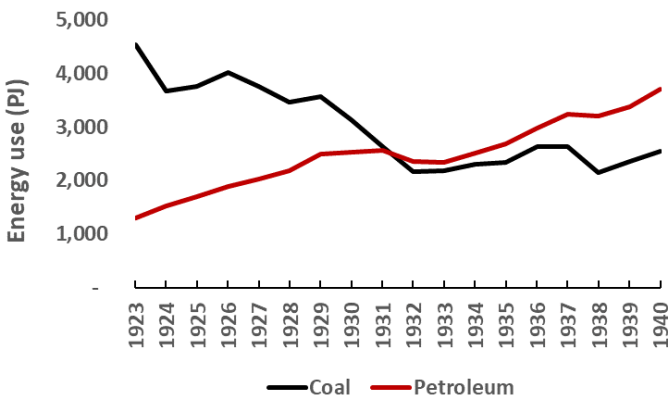
*"Holding that the future supply of crude oil was no longer an uncertainty, the Standard Oil Company of New Jersey yesterday announced a reversal of the long established policy of storage of crude oil against a possible shortage."*

This article essentially announced that the US no longer needed to be concerned about running out of oil – and supports the notion that the Great Crash was a tipping point from the *Coal Age* to the *Oil Age*.

The Great Depression that followed can be seen as a painful transition in what Hughes (1987) called a socio-technological regime. There was a major transition in US transportation from coal/railroads to petroleum/motor-vehicles. Petroleum eclipsed coal as the main fuel for ground transportation in 1931, early in the Depression (Figure 2). Breaking the dominance of the old transportation regime required construction of a new system of capital assets. After plateauing in the 1920s, annual railroad investments decreased by 79% between 1929 and 1933, and remained at low levels throughout the decade (Kennedy, 2023a). In 1929, railroads, including urban systems, had accounted for 24% of the non-residential capital stock – and held a powerful hegemonic position in the US economy. Moreover, the railroads, were more than just the main transportation system, they were also the energy supply system. Kennedy (2023a) showed that in 1929, railroads delivered about 70% to 75% of US energy supply, including approximately 70% of the energy needed for capital formation. US coal delivery was particularly dependent on rail freight cars (Devine, 1925; Hultgren, 1942); so when the number of cars declined by 20%, from 1929 and 1935, the main energy supply system for the US economy was severely impacted. New infrastructure was developed for the emergent petroleum/motor-vehicle regime, but in 1929, the railroads were still transporting 46% of refined petroleum products (Williamson et al., 1963). This further demonstrated the strong hegemonic position that railroads held as the dominant socio-technological regime (Kennedy, 2023a). The slow process of breaking the hegemony of the railroads was the essence of the Depression.



**Figure 1.** Headlines from the *New York Times* pertaining to the petroleum industry at the time of the Great Crash. Cuts in Californian oil prices, averaging 55%, were reported on October 22 – two days before Black Thursday. An announcement that future supplies of oil were no longer uncertain, and thus a policy on storage could be reversed, was made on October 29 – Black Tuesday.



**Figure 2.** Use of petroleum for ground transportation in the United States surpassed coal in 1931 (adapted from Figure 1b in Kennedy, 2023a)

### 3. Robbins

Before re-examining Keynesian and Monetarist interpretations of the Depression, it is useful to start with Lionel Robbins' (1934) book on the *Great Depression*. Robbins displays a high degree of humility, suggesting that there is no single explanation for the Depression and it is not certain that we will ever truly understand its occurrence. Remarkably, he came very close to recognizing the biophysical dimension of the Depression. In explaining how changes to the production of capital assets occurred during the 1920s, he lists several possible causes including: "discovery of new natural resources" (Robbins, p.42 of 2011 version). He ultimately, however, provides a theory on the Depression based on monetary policy. His reasoning is made early in his book (Robbins, p.16; my emphasis added):

*"Money is the one thing common to almost all economic activity in the modern world. Is it not probable that disturbances affecting many lines of industry at once will be found to have monetary causes?"*

Robbins oversight here is failure to understand that energy too is common to most economic activities.

#### 4. Keynesian Perspectives on the Great Depression

Skiddelsky (1996) notes that Keynes made negligible reference to the Great Depression in his *General Theory* – so we have to look to Keynes' other writings and those of other Keynesians to glean their interpretation of the Depression. The paper provides a full review of Keynes' discussion of the Depression in his *Collected Works*.

A question of central interest in the paper is to what extent did Keynes recognize the energy transition, or technological change, in his understanding of how the Depression occurred? There are a few notable places where Keynes partially recognizes the role of technological change. In *The Future of the Role of Interest: Proposals for the Bond Market* (September 1930) Keynes muses over possible deeper, long-term factors underlying the Depression. He states (Keynes, Vol 20, p.391):

*“Without a doubt, the Wall Street slump, and what I should prefer to call unbalanced production, have played a part. But I believe that the economic historians of the future will, when they seek for an explanation, look somewhat deeper and find the ultimate cause in a series of events which have been spread over the whole of the post-War period. Let me explain, therefore, what appears to me to be, if not the root cause of what is happening, at least one of the root causes.”*

He proceeds to suggest that high levels of investment in new industries had contributed to keeping interest rates at overly-elevated levels. Amongst these industries, Keynes recognized the significance of the motor industry and the petrol engine, but he was far short of understanding the implications of an energy transition (Keynes, Vol 20 p.392-93).

Later, on February 6, 1931, in *The Internal Mechanics of the Trade Slump*, Keynes makes a comparison with the depression of the 1890s associated with the end of the UK's “*great age of railway expansion*” (Keynes, Vol. 20, p. 479). He did not investigate the comparison any further, however – and so was not able to uncover the role of the decline in US railroads in contributing to the Great Depression.

Keynes showed glimpses of understanding the physical basis of the Depression, but ultimately was constrained by his strong financial framing. This was apparent in a broadcast he made for the US CBS network on April 12, 1931, in which he stated (Keynes, Vol. 20, p.517):

*“...we have millions of men standing idle, unable to earn a decent week's living. How can this be? It is not the engineers or the technicians who have failed us. It is—I venture to assert— nothing but a breakdown of the mysterious co-ordinating power of banking and finance. How shall I put it? This co-ordinating power has failed to co-ordinate. It has failed to create the environment in which our energies can find their appropriate outlet.”*

The US transportation and energy systems went through what could be described in Schumpeterian terms as severe forms of *creative destruction*, but this was beyond Keynes' framing of the Depression.

#### 5. Monetarist Perspectives on the Great Depression

The review of monetarist explanations for the Depression is aided by the analysis of Gordon and Wilcox (1981), who distinguish between hard-line monetarist hypotheses, in which nonmonetary factors are excluded (e.g., Schwartz, 1981), and soft-line monetarist hypotheses, which allow a secondary role for nonmonetary factors (e.g., Friedman and Schwartz, 1963). Gordon & Wilcox (1981) also assess hard and soft non-monetarist hypotheses. Their analysis suggests that both extreme monetarist and extreme non-monetarist interpretations of the Depression are unsatisfactory.

The energy transition hypothesis is potentially able to explain the missing non-monetary piece of the soft-line monetarist's interpretation of the Depression. Amongst several arguments against the hard-line monetarist position, Gordon & Wilcox (1981, p.50) noted "*the inability of changes in the money supply alone to explain the severity of the initial collapse in income between 1929 and the fall of 1931.*" They also recognized the difficulty in identifying the nonmonetary factors. Later monetary studies also recognized a missing factor in explaining the onset of the Depression. Hamilton (1987, p.168), for example, indicated that "*something besides high interest-rate was leading the economy deeper into depression in 1930.*" Eichengreen (1992, p.18) asked: "*What amplified the destabilizing impulse to the point that a modest monetary correction in 1928-29 gave rise to the greatest economic catastrophe of modern times?*"

## 6. Conclusions

This review highlights opportunities for the energy transmission hypothesis to be incorporated into Keynesian and Monetarist interpretations of the Great Depression – and points to areas where further economic analysis is required. At a minimum future analysis should investigate the impacts of: i) the collapse of investment in railroads due to technological change; and ii) the decline in crude oil prices.

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