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Journal

Cliodynamics, 8(1)

Author

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Publication Date

2017

DOI

10.21237/C7clio8133347

Supplemental Material

<https://escholarship.org/uc/item/42p5m46m#supplemental>

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Involvement of a Capitalist Crisis in the 1900–30 Inequality Trend Reversal

Michael Allen Alexander

Abstract

This paper proposes a supplemental secular cycle formulation for a modern capitalist society that employs financial, economic, and political metrics in place of population and sociopolitical violence. It makes use of Thomas Piketty's (2014) hypothesis that excess investment return relative to economic growth causes inequality. In a capitalist society, the investing class can be considered as a proxy for elites. Inequality as measured by the ratio of financial to wage gains over time agrees with other economic measures. Rising inequality led to a reduction in capital productivity (output per person per unit of capital). This created instability in financial markets that generated the 1929 stock market crash. Application of a simplified version of the demographic structural theory to inequality trends shows political stress peaking in 1929. The depression that began with the stock market crash in that year resulted in a devastating political defeat for the ruling party in 1932 which brought in the political coalition that engineered the inequality trend reversal. This series of events can be considered as a modern version of the state collapse and reconstitution that was typically a key feature of premodern secular cycles.

Introduction

Economic inequality in the United States has been a topic of rising academic (and political) interest in recent decades, as a Google N-gram for “income inequality” in American English reveals. Research over this time has shown that inequality underwent a dramatic decline from high levels before 1930 to a nadir around 1980, from which it has returned to its level in the twenties, suggesting that inequality may be cyclical (Piketty and Saez 2007; Saez and Zucman 2016). If so, a trend change to falling inequality could happen again, the prospect of which is intriguing politically as well as academically.

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Citation: Alexander, Michael Allen. 2017. Involvement of a Capitalist Crisis in the 1900–30 Inequality Trend Reversal. *Cliodynamics* 8: 18–47.

Inequality cycles associated with secular cycles have been identified in pre-industrial societies (Turchin and Nefedov 2009: 36, 82). A secular cycle is a “demographic-social-political oscillation of very long period (centuries long)” (Turchin and Nefedov 2009: 5). They arise from population cycles (Korotayev et al. 2006). In an agrarian economy, demand for labor is ultimately limited by the maximum amount of arable land, while labor supply is proportional to population. As the fraction of arable land under cultivation approaches one, rising population means a rising labor supply relative to an increasingly fixed labor demand which leads to lower real wages and rising economic inequality. Thus, population and inequality trends are correlated, either can serve to define a secular cycle. Several models that describe how population/economic inequality affects elite number, state strength and sociopolitical instability in agrarian societies have been proposed (Turchin 2003: 123; Turchin and Korotayev 2006: 122; Turchin 2013: 251). Some of these have been shown to give a good fit of historical data (Alexander 2016).

The empirical and theoretical methods developed for agrarian societies do not apply to industrial societies. In an industrial economy, labor demand reflects consumer demand for the goods and services produced by labor. Market interaction between labor supply and consumer demand determine wages, both of which are correlated with population, making real wage trends no longer simply related to population. Inequality is similarly unpredictable. That is, in an industrial economy the economic relations characteristic of agrarian societies are no longer valid; new relations are needed.

Turchin (2016) has recently tried to apply the secular cycle concept to America. Although there are no population cycles, there are still empirical cycles in economic inequality that may be used to define secular cycles. Turchin uses measures of economic, physical, and social well-being: relative wage (wage/GDP per capita), male stature, life expectancy, and age at first marriage as proxies for inequality. A composite of these measures defines the American secular cycles in terms of inequality (Turchin 2016: 73, fig. 3.7). The composite trends show two secular cycles: the first over 1780–1930 the second from 1930 to the present (Turchin 2016: 73).

He develops a modified demographic explanation for inequality in which demand for labor is assumed to be independent of labor supply, allowing separate relations for each to be developed and their ratio used to explain real wage trends. Changes in labor supply, chiefly from changes in immigration, depress real wages, causing rising inequality. Given this, he employs percent foreign born as another proxy for inequality. I question this formulation in this paper. Since workers are also consumers, any increase in employment should translate to an increase in aggregate demand, leading to increased demand for labor, making straightforward demographic explanations for real wage trends problematic.

The transition between one agrarian secular cycle to the next was typically associated with state collapse or transformation, often through civil war or revolution. Nothing like this happened during the early twentieth century secular cycle transition, however. How did American elites in the middle third of the twentieth century come to accept a significant reduction in their income share, as falling inequality requires, without a civil war or revolution? Turchin proposes that a coalition of elites “implemented a series of formal reforms, supplemented by a number of informal measures” that reversed the pre-existing trends in inequality/well-being (Turchin 2016: 171). The principal one of these was the restriction of immigration in the early twenties. This policy was undertaken primarily as a response to sharply rising sociopolitical instability in the second decade of the twentieth century (Turchin 2012), that if left unaddressed, might have led to the war or revolution associated with previous inequality trend reversals. By acting to forestall the loss of wealth and status a revolution would bring, elites ended up with it anyway.

This paper proposes an alternate mechanism for the turnaround in inequality: a crisis in capitalism developed after the Panic of 1907 in which capital ceased to produce as much economic output as it had previously. Capitalism was the process through which the bulk of American elites derived and legitimized their status. Erosion in the productivity of capital undermined the central argument for capitalism and the legitimacy of the liberal capitalist regime upon which elite privilege was based. The capitalist crisis eventually led to an economic and political crisis which prompted drastic actions on the part of elites (at considerable personal cost) to resolve. Before these actions were undertaken, elites experimented with a variety of less-costly measures that addressed symptoms of the malady. Immigration restriction was one of these. None of them solved the underlying problem. When effective measures were finally taken and capital productivity restored, the American state had dramatically changed in ways consistent with previous episodes of state collapse and reformation. The cumulative effect of efforts to solve the capitalist crisis had initiated a new secular cycle. This paper describes the malady, some of its effects, and several remedial attempts. One of these eventually solved the problem and produced a downtrend in inequality.

Theoretical Development

Mechanism for Generating Rising Inequality

Turchin develops a modified demographic formulation that considers how changes in size of the labor force may give rise to changes in real wage and inequality. He develops this idea more explicitly in the following relation (Turchin 2016: 30):

$$W = \left(\frac{GDP}{N}\right)^\alpha \left(\frac{DL}{SL}\right)^\beta * C^\gamma \quad (1)$$

Here W is real wage, N is population, DL and SL are labor demand and supply, and C is a variable for culture. Turchin defines labor demand as GDP divided by labor productivity (PL) while labor supply is simply the labor force (LF). Substituting these into equation 1 gives

$$W = a \left(\frac{GDP}{N}\right)^\alpha \left(\frac{GDP}{PL LF}\right)^\beta C^\gamma = a \left(\frac{GDP}{N}\right)^\alpha \left(\frac{\theta}{LF}\right)^\beta C^\gamma \quad (2)$$

Here θ is the ratio of GDP to labor productivity. Neglecting culture and rearrangement gives:

$$\frac{W}{(GDPpc)^\alpha} = a \left(\frac{\theta}{LF}\right)^\beta \quad (3)$$

The left-hand side of equation 3 reduces to relative wage when $\alpha = 1$, and serves as an inequality proxy for other values of α . In the absence of cultural effects, inequality is directly related to the ratio LF/θ . Assuming steady growth in GDP and PL over time, their quotient θ should show a monotonic trend. Rising and falling trends in inequality would then result from acceleration and deceleration of the LF trend. Ignoring culture, the confluence of baby boomers, women, and immigrants entering the workforce in the 1970's would result in an upwards shift in the LF trend relative to θ , increasing inequality (Turchin 2016: 214), which is what happened. Data on labor productivity is not available for the first secular cycle. Turchin uses percent foreign born as a proxy for labor oversupply (i.e. LF rising faster than θ). He shows that the trend in percent foreign born aligns with the trends in relative wage and other inequality proxies (Turchin 2016: 73).

The argument presented above is problematic. The Bureau of Labor Statistics defines labor productivity as “the ratio of the output of goods and services to the labor hours devoted to the production of that output” (BLS Labor Productivity FAQ). From this, one definition of average productivity per worker (PL) for all the workers in the economy would simply be total output (GDP) divided by total employed workers EW (Investopedia). This gives $PL = GDP/EW$. Substituting this into equation 3 gives:

$$\frac{W}{(GDPpc)^\alpha} = a \left(\frac{EW}{LF}\right)^\beta = a (1 - u)^\beta \quad (4)$$

where u is the unemployment rate. Since there is no long-term trend in unemployment rate, there is no long-term trend in the labor supply/demand

term, and it can be neglected. The error in Turchin's analysis is the assumption that the labor productivity he used applied to all workers in the economy. This is not so, as explained in the BLS Labor Productivity FAQ:

The broadest measure of productivity published by the Bureau of Labor Statistics is that for the U.S. business sector. Business sector output covered about 75 percent of the value of gross domestic product (GDP) in 2010. The business sector excludes many activities where it is difficult to draw inferences on productivity from GDP. These excluded activities are: General government, nonprofit institutions, paid employees of private households, and the rental value of owner-occupied dwellings.

The BLS also produces a broader labor productivity measure defined as total economy production output divided by total hours worked. Output is given as GDP plus government and non-profit capital income less their consumption of fixed capital. Since 1987, when this series begins, its value has been 63–68% of the more readily measurable business sector productivity. Turchin's calculation of labor demand uses the higher business sector value and so he naturally finds that fewer workers would be needed if the entire economy fell into the business sector. When the contributions from all types of workers are included, the demographic effect on wages cancels out as shown in equation 4. Removing the supply/demand term, a more conventional formulation of equation 1 would be to use GDP per labor force member (a crude measure of labor productivity) in place of the GDP per capita term:

$$W = a \left(\frac{GDP}{LF} \right)^\alpha * C^\lambda \quad (5)$$

For a relatively “pure” capitalist economy like that for the first American secular cycle, the C parameter can be neglected (Turchin 2016: 31). Figure 1 shows that the resulting one-factor model does a reasonable job of representing wage growth during 1870–1930 ($r^2 = 92\%$). As Turchin (2016: 223) notes, a one-factor model does an inadequate job of fitting the data for the second secular cycle (see Figure 1). Adding in the cultural factor, proxied by real minimum wage, produces a good fit of the data with $r^2 = 0.97$. Figure 1 shows it is not necessary to explicitly consider labor supply-demand dynamics to explain trends in real wage (or inequality).

A plausible alternative to the labor supply hypothesis is investment return. The process of economic growth in a capitalist economy amounts to the accumulation of capital. Thomas Piketty (2014) argues that investors can grow their wealth faster than GDP by acquiring capital and reinvesting surplus returns (dividends). Figure 2 illustrates this idea using the performance of a hypothetical

portfolio consisting of a 50:50 mix of stocks and bonds from a starting year of 1871. This portfolio is assumed to turn over once per year. The interest and dividends are subjected to income tax (if any) each year, and the remaining funds reinvested in the portfolio. Capital gains returns are taxed at the capital gains rate. The portfolio value is divided by the production worker wage (Officer and Williamson 2015b) and normalized to a value of one in 1871. This investment/wage index is plotted with inequality in Figure 2, which shows that the two measures tend to move together.

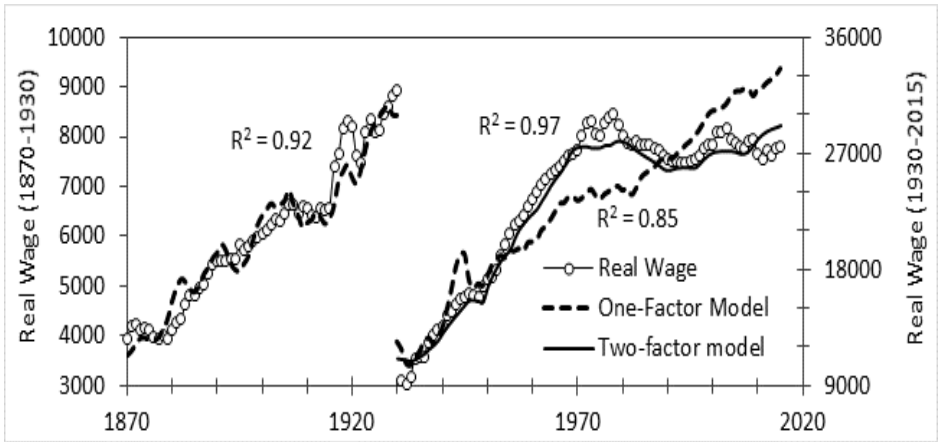


Figure 1. Use of equation 4 to model real wage trends. Real wage was 1.61 times unskilled wage adjusted for inflation (Officer and Williamson, 2015a, b). GDP was obtained from Johnston, and Williamson 2016. LF after 1947 was obtained from the Labor Department. Between 1900 and 1947 LF/N was obtained from the Census Bureau (1975) and for 1870–1900 from Lebergott (1966). Minimum wage was obtained from the Bureau of Labor Statistics.

Figure 2 shows strong portfolio gains until around 1910, when performance fell to zero. Over 1916–20 the investing class suffered serious losses stemming from the rampant inflation associated with WWI. After 1920 there was a return to normality: strong investor returns and rising inequality. This trend ended abruptly with the onset of the Great Depression, which produced wild oscillations in the portfolio value but no sustained decline (bond gains offset stock market losses). Faster declines followed in the 1940's and 1970's, again associated with outbursts of inflation. Figure 2 shows that inflation loomed large as an enemy of wealth. Fear of inflation was an important factor in the inequality trend reversal, as will be seen later.

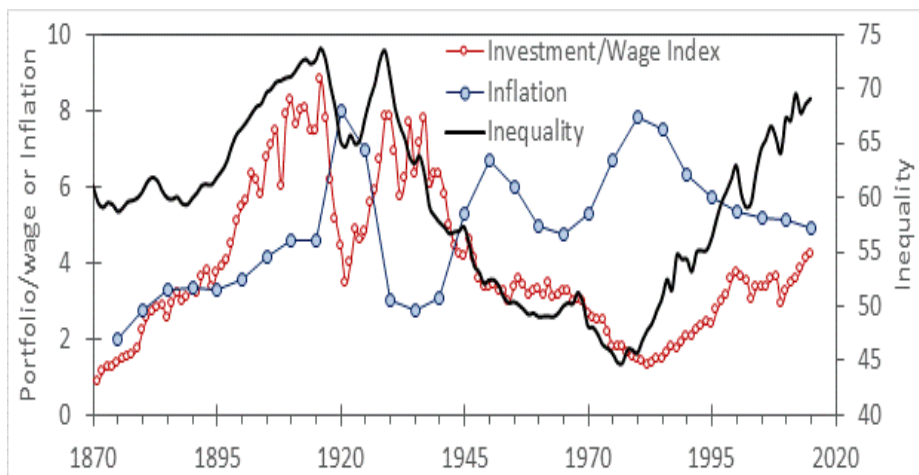


Figure 2. Inequality compared to a 50-50 stock-bond portfolio value/wage. Stock market returns calculated from data from Shiller. Bond returns obtained from a AAA corporate bond yield series (Federal Reserve) back to 1913 and before that from a series from Macauley (1938). Shown is the ratio of this portfolio value relative to wage with the value in 1871 set equal to 1. Inflation rate is a trailing 5-year average normalized to fall into a min-max range of 2 to 8. Two measures of inequality were used. The first is elite fraction (EF) defined as the fraction of GDP that does not go to workers, or $1 - WS\%$. $WS\%$ is workers share, an estimate of the fraction of GDP received by wage labor as compensation. $WS\%$ is annual wage multiplied by labor force as a fraction of population (LF/N) and fraction employed ($1 - u$), plus the employer contribution to social security and pensions ($SS\%$), see eq. 6 in text. Wage, GDP and LF data obtained as in Fig. 1. Unemployment rate (u) was obtained from Vernon (1994) for 1869–1899, Lebergott (1964) for 1900–1947 and the Bureau of Labor Statistics after 1947. Before 1869 it was set at 4%. Employer contributions to Social Security and pensions were obtained from the Bureau of Economic Analysis, which were divided by GDP to obtain $SS\%$. Inequality in 1913 was set equal to EF . Before 1913 the change in inequality was given as a weighted geometric average of the change in EF and the change in the top 1% fraction of wealth (Williamson and Lindert 1980), with a weighting of 3 applied to EF . After 1913 the change in inequality was the geometric average of the change in EF , top 1% income share (Piketty and Saez 2007) and top 0.1% wealth share (Saez and Zucman 2016), with a weighting of 4 for EF . The index was smoothed with an exponential average ($\alpha = 0.2$).

Mechanism for Generating Sociopolitical Instability from Inequality

Goldstone's (1991) demographic-structural theory (DST) describes how in agrarian states rising inequality led to increasing numbers of elites, followed by rising intra-elite competition which culminated in intra-elite conflict and often state collapse. Turchin adapts DST to a modern context in the form of a series of simple relations. Average elite income (ε) is given as a function of relative wage (Turchin 2016: 35):

$$\varepsilon = \frac{1 - \lambda w}{e} = \frac{EF}{e} \quad (6)$$

Here ε is elite number as a fraction of population and λ is the fraction of the population that is employed. EF refers to the fraction of GDP that goes to elites. Turchin approximates λ with a fixed value of 0.5. In this paper, values for λ are estimated from employment data (see Figure 2). I also added employer-provided non-wage income supplements to wages as a fraction of GDP (SS%) in the calculation of EF :

$$EF = (1 - \lambda w - SS\%) \quad (7)$$

Turchin also gives a simple relation to model elite number (e):

$$\frac{de}{dt} = \mu o \left(\frac{w_o}{w} - 1 \right) = \mu o \left(\frac{(1-EF)_o}{1-EF} - 1 \right) \quad (8)$$

Here μ_o , w_o and $(1-EF)_o$ are adjustable constants. I use the worker share of output $(1-EF)$ in place of w to calculate e in equation 8.

Turchin's version of DST employs the political stress index (Ψ) as a measure of the pressures leading to a state crisis. Ψ has three components reflecting the degree of arousal amongst the masses and elites and the fiscal weakness of the state. For the first secular cycle, the size of the state was small and the state component can be neglected giving the following expression for Ψ (Turchin 2016: 20):

$$\Psi = \frac{e \cdot \%urban \cdot youth\%}{\varepsilon w s} \quad (9)$$

Here %urban is the urban fraction of the population, youth% is the fraction of the population that is aged 20–29 and s is number of state employees. A proxy for s would be peacetime government spending as a fraction of GDP, which was essentially trendless during the first secular cycle (Turchin 2016: 100). The youth fraction of the population did not change very dramatically and exerted a

relatively small impact on Ψ compared to other measures. Finally, $\%U$ shows a monotonic rise over the entire cycle and so cannot contribute meaningfully to a cyclical measure. These three elements of Ψ will be neglected here. Substitution of eq. 7 for ε and $1-EF$ for w in equation 9 gives a simple expression for Ψ as a function of EF only:

$$\Psi = \frac{e^2}{EF(1-EF)} \quad (10)$$

Results

The Impact of the Capitalist Crisis on Investor Returns (and Inequality)

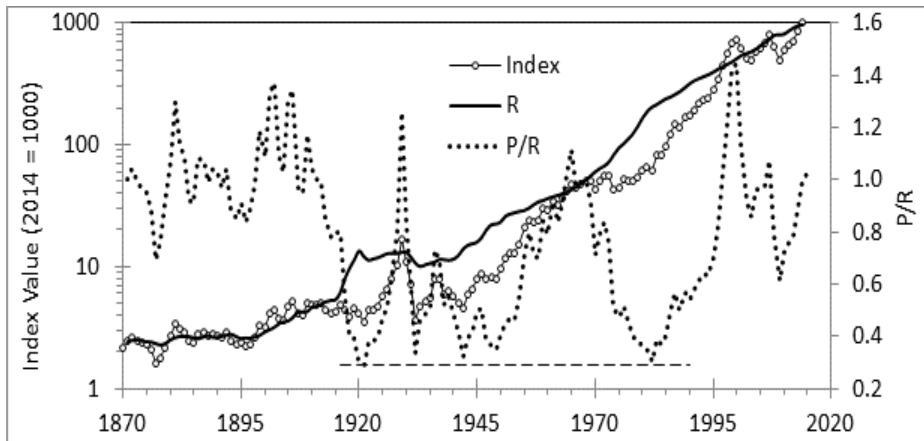


Figure 3. Normalized stock index (2014 = 1000) and R over time. R is accumulated real retained stock market index earnings since 1871 plus the real value of the stock market index in 1871, expressed in terms of current dollars. Index data from Shiller. The pre-1871 index was assembled from indices provided by Smith and Cole (1935) and Macauley (1938).

The dominant factor causing rising inequality according to the investment return hypothesis and Figure 2 was stock market returns. Figure 3 shows a plot of the Standard and Poor 500 index and its precursors since 1870. Also shown is a plot of R , defined as the Resources owned by businesses which are used to earn a profit (Alexander 2000). The real value of R is cumulative real retained index earnings since 1871 plus the real value of R in 1871, which is assumed equal to the index level then. R is cumulative aggregate self-investment by index companies, or collective capital accumulation by the firms represented by the index. Up to 1916 stock index price faithfully represented the equity in the index

(i.e. R was a good model for the index trend). After 1916 the index began to undergo large, semi-regular downside deviations from R that define a cycle. How the index valued R after 1916 is best shown by the ratio P/R , which shows successive falling and rising secular market trends (Ritholtz 2014).

The cause of this transition in 1916 was a downward shift in the return on capital (ROC) represented by the index. Maintenance of strong stock market returns required that the average price of capital (P/R) decline. There is an old Wall Street adage that fear and greed drive the market. Before 1916, the balance between fear and greed maintained P/R at about 1, and investors reaped a return of 7.0% on a ROC of 7.3%. After 1916, the level of fear increased to generate a lower average P/R , enabling the market to give a 6.2% return from a ROC of 4.5% (see Table 1).

Table 1. Estimation of stock market total real return using ROC and P/R

Period	ROC (%)	P/R	ROI = ROC divided by P/R (%)	Total real return (%)
1871–1916	7.3	1.00	7.3	7.0
1916–2010	4.5	0.76	5.9	6.2

Events leading to the stock market transition around 1916 created new conceptions of how financial markets work. During the nineteenth century, the value of shares with an established history of dividend payments showed relatively stable prices whose values fluctuated with interest rates, like bonds. For this reason, they were priced as a percentage of their par value like bonds. Stock prices shot up in the first decade of the 20th century to levels well beyond any previously seen, which persisted into the second decade, revealing as fiction the idea that stocks were like bonds (and could be valued as such). Institutional response came around 1916, when shares began to be quoted in dollars on the stock exchange (Graham 1946).

The idea that the stock market showed a rising trend over the long run meant that the potential for capital gains should be considered as a component of sound investment practice rather than speculation. The mere fact of a rising market did not necessarily imply a higher-than-normal risk; it could be considered as a positive sign. The twenties bull market reflected this new understanding. Although the index rose to nearly triple its previous all-time high, valuations did not seem excessive: P/R had been 15% higher in both 1901 and 1902 than it was in 1929. Yet when the R was adjusted for its reduced profit potential, stock market valuation in 1929 was extraordinarily high, meaning the bull market was in a bubble (Alexander 2015). When it popped, the market fell 85%.

Clearly, the market had become a much riskier place. Greater risk requires compensation, and so the risk premium (the difference between stock and bond returns) increased from 2% over 1871–1916 to 3.8% over 1916–2010. This means that bond returns declined from 5% to 2.4% and the performance of the 50:50 mix I use to proxy investor status declined from 6% to 4.3%. On the other hand, suppose the change in investor behavior implied by the appearance of stock market cycles had not happened? That is, suppose Irving Fisher’s proclamation in October 1929 that “stock prices have reached what looks like a permanently high plateau” (Latson 2014) was correct (i.e. P/R would continue to oscillate around 1)? In this case stock returns would have declined to 4.6%, which with a 2% risk premium implies a bond return of 2.6% and a portfolio return of 3.6%, considerably lower than what happened. It appears that the boom-bust investor behavior that evolved in the 1920’s in response to lower ROC provided a superior outcome.

The post-1929 bear market was financially (as well as economically) traumatic. In a 1932 *Forbes* article, private equity specialist Benjamin Graham noted that a third of the industrial companies on the New York Stock Exchange were trading for less than their liquidation value (Adams and Kichen 2008). That is, a third of America’s top corporations were worth more dead than alive, a state of affairs that called into question the justification for capitalism in the eyes of financial and political elites. It was clearly a crisis for capitalism.

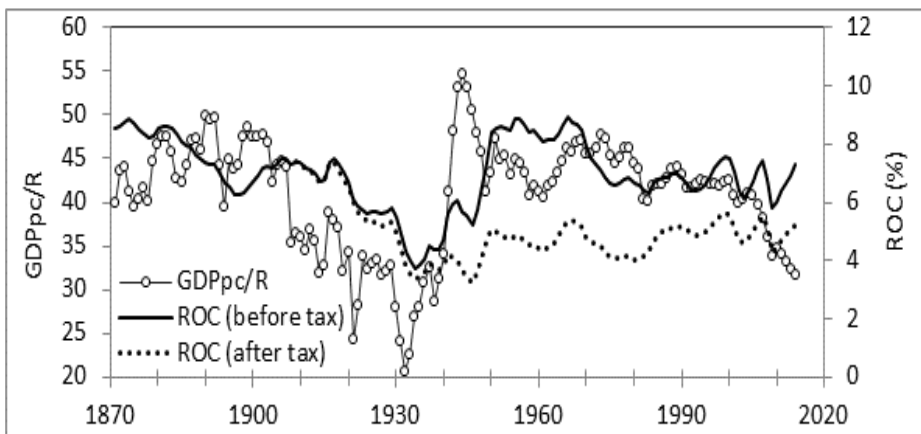


Figure 4. Declining capital productivity (GDP_{pc}/R) led to a decline in after-tax ROC after 1916. After-tax ROC data over 1951–2000 data from Gomme et al 2006 p 12. E/R used as a proxy for the period before 1951 and after 2000. Effective tax rates over 1959–96 derived from data given by Poterba 1998:291. A correlation between the top corporate tax rate and the effective tax rate given by Poterba was used to estimate effective tax rate before 1959 and after 1996.

Cause of the Capitalist Crisis

Assuming the stock index is sufficiently broad-based to be representative of the economy, R can serve as a proxy for capital in the economy. As capital and labor are both factors of production, GDP should be correlated with both. Since the emergence of a modern industrial economy after the Civil War, GDP per capita (GDPpc) has been roughly proportional to R (Alexander 2000: 44). This means the ratio of GDPpc to R should be approximately constant if capital is being used efficiently. Indeed, from 1871 to 1907 GDPpc/ R showed an average value of 45 ± 3 and over 1941–2006 it showed an average value of 44 ± 3 (see Figure 4). Following the Panic of 1907, GDPpc/ R sharply declined to a new level in the low 30's. The ratio GDPpc/ R can be thought of as a measure of net sales per person per unit of capital invested. A decline in the top line must eventually fall to the bottom line and after a decade lag ROC began to decline too (see Figure 4).

Rising economic inequality is hypothesized as the cause of the decline in capital productivity. Increases in economic inequality mean reduced buying power for the working class and increased buying power for the ownership class. This would not be a problem if both groups spent the same fraction of income on consumption, but they do not; saving rates show a strong positive relationship with lifetime income (Dynam et al. 2004). Rising inequality at some point should result in a tendency toward decreased aggregate demand relative to the amount of production possible with the available capital.

At low levels of inequality, the limiting factor for GDPpc should be the amount of capital, and capital productivity should have a fairly-constant (high) value. As inequality rises, a point should come when the income going to the working (and consuming) class becomes limiting. This appeared to have happened around 1907. After the WWII economic recovery from the Great Depression, inequality had fallen well below its 1907 level and capital productivity returned to its pre-crisis level for six decades after the war. When inequality again reached high levels early in the 21st century, capital productivity again began to decline (see Figure 5).

Carvalho and Rezai (2015) demonstrate that more equal distributions always lead to higher output in a standard neo-Kaleckian macroeconomic model, providing theoretical support for the idea expressed by Figure 5. Cynamon and Fazzar (2015) show that the rise in US household income inequality since 1980 can explain the entire magnitude of the Great Recession and the slow and prolonged recovery since. The delayed effect of post-1980 rising inequality leading to poor post-2007 economic performance is explained by massive consumer borrowing until around 2006 (Cynamon and Fazzar 2015: fig. 3). After 2006 real household demand dropped, eventually stabilizing some 16% below its pre-2006 trend (Cynamon and Fazzar 2015: fig. 1). Additional empirical support for this idea comes from the strong negative relation between inequality and

future economic growth found in a recent IMF study employing data from many countries (Ostry et al. 2014: 18).

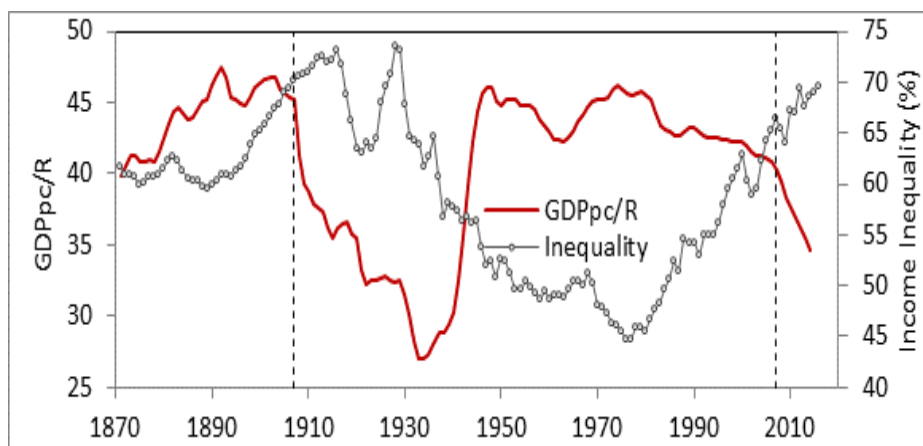


Figure 5. Relation between capital productivity and inequality (1–labor share of output).

Rising Inequality Leads to State Collapse as the Demographic-structural Theory Predicts

Figure 6 shows plots of ϵ and e as given by equations 7 and 9. Between 1897 and 1907 elite number was rising while elite income was near its maximum level for the cycle. This period is consistent with the characterization of the stagflation phase of the secular cycle as a “Golden Age” for elites (Turchin and Nefedov 2009: 33). Elite income had started to fall a few years before 1907 (see dotted line in Figure 6) suggesting that the stagflation phase was coming to an end after which the crisis phase would begin. The next phase is the depression phase, which is characterized by “reduction in elite numbers” and the “collapse of elite consumption levels” (Turchin and Nefedov 2009: 33). Figure 6 shows elite numbers stopped rising around 1930 and the final collapse in ϵ began around the time of the 1929 stock market collapse, supporting the assignment of the 1929–1941 period (see dashed lines) as the depression period. The period spanning 1907–1941, during which the capitalist crisis was ongoing, fits reasonably well with the definition of a disintegrative trend for the first secular cycle.

Ψ as given by equation 10 is also plotted in Figure 6. Ψ shows a peak in 1929 and a shoulder in the late teens. The shoulder corresponds to a major spike in sociopolitical instability (Turchin 2012) that got underway during Democrat Woodrow Wilson’s administration (1913–20). This period saw rising strike

activity and labor-related violence as well as a strong rise in real wages: an annual rate of 3.2% compared to 0.7% and 0.8% over the preceding 1896–1912 and subsequent 1920–29 Republican periods. Elevated union activity during Democratic administrations would become a recurrent pattern for six decades after 1912. Figure 7 shows strike activity rising during Democratic administrations in 1913–21, 1933–53 and 1961–69 and falling during Republican administrations over 1921–33, 1953–61 and 1969–77. Here we see evidence for the development of a Democratic elite-worker alliance that delivered real, if initially temporary, gains for workers in exchange for electoral victories against rival Republican elites.

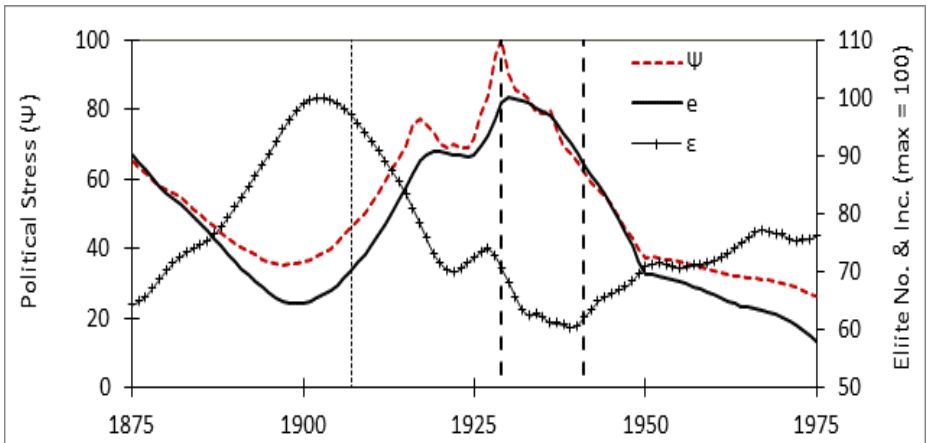


Figure 6. Elite number and income as functions of inequality.

Periodic outbursts in instability during the disintegrative trend of pre-industrial English secular cycles typically led to the monarch being deposed and often killed (Alexander 2016). A peaceful political version of this happened during the crisis phase: a pair of realigning elections in 1918 and 1920 replaced a Democratic-controlled government with a Republican one, which went on to rule for twelve years. The replacement of the President and Congress by the opposing party for a lengthy period might be considered as a modern equivalent to the premature end of a monarch’s reign in premodern times associated with what Turchin (2016: 43) calls “fathers and sons” instability cycles.

The incoming Republicans resolved the “fathers and sons” outburst of instability by restricting immigration. Many of the radical unionists were immigrants, who had brought their radicalism from Europe, or so it was believed (Calavita 1984: 143). Rising unrest, wild swings in financial markets, socialist revolutions abroad and the hysteria of the Red Scare (1919–21) fueled a sense of

social and political insecurity amongst capitalist elites. Some came to realize that “those very conditions that provide for and result from maximization of profit threaten the stability upon which the political and economic system depended” (Calavita 1984: 12). These fears spurred legislation to restrict immigration in the early 1920’s despite the beneficial effect this might have on labor bargaining power. Immigration restriction was apparently successful; labor violence subsided after the early 1920’s as did other kinds of political instability (Turchin 2012: 9).

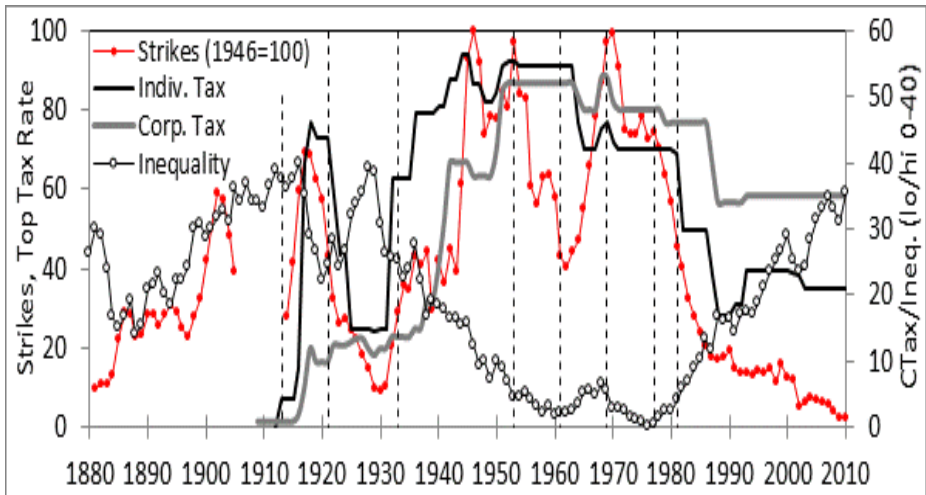


Figure 7. Index of labor disputes (1946 = 100), inequality and top income tax rates. Strike data from Mitchell (1988) and Bureau of Labor Statistics. Tax rates from Internal Revenue Service. Dashed lines denote changes in party control of the White House.

The 1929 crash began the depression phase of the secular cycle, at which time Ψ peaked (see Figure 6). The reigning Republican elite’s perceived failure to adequately deal with the Great Depression (see later discussion) led to crushing political defeat. From 1930 to 1937 the Republican party lost control of the Presidency and its share of Congress fell from about 60% to 20%. Democrats went on to hold the executive branch for twenty years after 1932. For the next 62 years, they would hold the Senate 84% of the time and the House 94%. The New Deal implemented a fundamental transformation of the American state that has been described as a “new republic” (Lind 1995; DeLong 2009; Coleman 2013). Constitutional restrictions were seen as applying more to political rather than economic liberty, which allowed the government to play a much more active role

in economic management (Coleman 2013). This sequence of events is analogous to previous episodes of state collapse and reformation that occurred near to the boundaries of pre-industrial secular cycles. The post New Deal period saw falling inequality, and elite number (see figures 2 and 6), both of which are consistent with the growth phase of a new secular cycle.

Elite Responses to the Capitalist Crisis

What hasn't been explained is how the results of state collapse and reformation (i.e. inequality trend reversal) could be achieved without an actual armed conflict, as had always happened before. The answer advanced in this paper is that the cause of violence in previous cycles (rising inequality) was also the cause of the capitalist crisis, which directly impacted the capital accumulation process that created and sustained elites. Inequality had helped create the capitalist elites, but now it had become an existential threat, like the abolition movement had been to Southern plantation elites before the Civil War. Unlike abolition, this was a foe that could not be defeated by force of arms; another approach was needed.

As discussed later, resolution of the capitalist crisis would eventually require collective action: individual capitalist elites would have to sacrifice some of their wealth to preserve their ruling class status. A program of status maintenance through shared sacrifice is most easily implemented if there exists an elite population predisposed to cooperation. For this to happen there needed to be an increase in the prevalence of holders of cooperative norms in the elite population. Turchin (2016: 33–42) discusses a cultural multilevel selection framework for explaining how this can happen. This view treats the capitalist crisis as an environmental change, which selects for cooperative economic/political behaviors.

Examples of elite responses to the capitalist crisis can be placed into individualist and cooperative categories. One problem for elites resulting from the crisis was that rising inequality was leading to a shortage of demand for the output generated by capitalist economic activity. An individualist response was the development of scientific marketing to direct consumer demand to one's firm. US Rubber established the first market research department in a manufacturing company in 1916, and the Swift meatpacking company followed suit the next year (McNabb 2016: ch. 12). From 1919 to 1929, advertising costs as a fraction of distribution costs in industry rose from 8 to 14 percent (Blackford and Kerr 1993: 236). The content of advertising changed; prior to around 1910, advertisers mostly sought to provide product information to customers, but by the 1920s, advertising executives recognized their business was to make consumers want products and sought to break down popular attitudes of self-denial and to foster the idea of instant gratification through consumption (Blackford and Kerr 1993: 236).

Another individualist approach was to increase profit margins by finding ways to reduce the worker's share of output. This would serve to maintain ROE in the face of decreased output. This must have happened over the decade following 1907 when output per unit capital fell while earnings did not (see Figure 4). This certainly seems to have happened since the onset of a second capitalist crisis in 2006. Corporate profits as a fraction of GDP have been rising since 2000. Average profits over 2000–15 at 5.7% have been significantly higher than the 4.4% seen over 1984–99 or the 4.5% over 1970–99 ($p < 0.002$ for both).

A modestly cooperative strategy was to boost demand relative to consumer income by promoting the use of installment loans to finance the purchase of consumer durables after the first world war (Murphy 1995). Increased spending on consumer durable goods paralleled a rise in consumer debt during the 1920's; savings rates fell from 6.4% of disposable income over 1898–1916 to 3.8% over 1922–29 (Olney 1990). This increase reflected a real change in consumer demand, not rising household income or changes in the relative prices of durables (Olney 1990).

A fully cooperative response would be to increase sales and profits without beggaring the employees. An example of this came out of problems encountered during Henry Ford's application of assembly line technology to automobile manufacturing. This technology had promised to greatly increase output at lower costs, allowing price reductions that would stimulate sales. Implementation gave rise to issues that prevented the investment from reaping the expected return:

Ford's turnover rate was very high. In 1913, Ford hired more than 52,000 men to keep a workforce of only 14,000. New workers required a costly break-in period, making matters worse for the company. Also, some men simply walked away from the line to quit and look for a job elsewhere. Then the line stopped and production of cars halted. The increased cost and delayed production kept Ford from selling his cars at the low price he wanted. Drastic measures were necessary if he was to keep up this production (Worstell 2012).

To address this issue Ford came up with a counter-intuitive idea, lowering labor cost by doubling workers' pay. By paying a higher wage than other employers, workers would be more likely show up for work, on time and sober, and to work more diligently. Turnover costs could be slashed, potentially producing net savings after subtracting the cost of increased compensation (Worstell 2012). A possible flaw in this idea is that the desired benefits did not come from paying a high wage *per se*, but from paying a high wage compared with other companies (Worstell 2012). Presumably, Ford's competitors would (and did) raise their wages too, canceling out any benefits to Ford, which is why manufacturers

usually follow a wage minimization strategy. Yet Ford's ploy worked; the company sold 308,000 cars in 1914, 501,000 in 1915, and by 1920, a million cars a year (Nilson 2014).

Ford later attributed the success of his program to what might be called economic stimulus today. In his 1926 book, *Today and Tomorrow*, he wrote "the owner, the employees, and the buying public are all one and the same, and unless an industry can so manage itself as to keep wages high and prices low it destroys itself, for otherwise it limits the number of its customers. One's own employees ought to be one's own best customers" (Nilson 2014).

Neither of the two individualist business approaches solved anything. The problem was capitalists *collectively* needed a bigger market to which to sell. From the perspective of the state as manager the collective interests of the bourgeoisie (Calavita 1984: 8), the advertising and consumer finance responses amounted to rearranging the deck chairs. Squeezing worker incomes made the problem worse by depressing consumer demand. On the other hand, Ford's "proto-stimulus" created new demand outright, growing the collective pie (and making out handsomely to boot). It would be the conceptualization advanced by Ford that would be adopted by others (i.e. the more cooperative attitudinal variant that would grow in frequency).

Another problem resulting from the crisis was the immiseration of rank-and-file Americans, which could result in political upheaval affecting elite status. Responses to this threat include movements like the Social Gospel and Progressivism (Reichley 1992: 187). Wisconsin was an early leader in progressive reforms such as workers' compensation, state life insurance, a progressive state income tax, and limited working hours for women and children (Ringler 1934). Similar policies were introduced in many other states. Progressive reforms during the Wilson administration included constitutional amendments establishing the income tax, direct election of senators, and women's suffrage. These policies, and war-time stimulus, likely played a role in the sharp, but temporary, decline in inequality from 1916 to 1920 (see Figure 2). Policies such as immigration restriction and the establishment of the Federal Reserve in 1913 served to allay fears of capitalists and their political allies about future political and economic stability. Accomplishing them required collective elite action, which was the culmination of the consolidation of the American upper class and "the building of consensus among the American elites about the need for, and the nature of, desired change" (Turchin 2016: 171).

These responses reflect collective actions by governing elites that sometimes came at individual cost. Immigration restriction would likely reduce the supply of cheap labor (and presumably boost wages), to the apparent detriment of employers. It was like "Ford stimulus" in this way. The income tax was obviously

a negative to those with the most income to tax, yet it would come to be the most powerful tool in the eventual resolution of the capitalist crisis.

A good example of cultural evolution in action was in economic policy. Holders of individualist norms would typically see GDP as production, the product of labor and labor productivity. Growth resulted from entrepreneurship and investment performed by individual capitalists. Optimal economic policy was to incent investors and entrepreneurs. It also recommended a hands-off approach to the economy including during downturns. Cooperative norm holders would be more amenable to seeing GDP as consumption, the product of consumer income and propensity to spend. They saw growth as an interaction between producers and consumers. Optimal policy takes into consideration the needs of both and government intervention during downturns may sometimes be warranted.

The career of Andrew Mellon, Treasury Secretary from 1921 to 1932, provides an illustration of the evolution of cooperative norms in economic thinking. The government response to the 1920–21 depression was individualist: failing firms must be allowed to fail and be liquidated to make room for more competent firms. Afterward top tax rates were gradually reduced from 73% in 1921 to 25% in 1925 and to 24% in 1929. The business community lionized Mellon for the perceived success of his economic policies; “by 1929 Mellon was regarded with a degree of admiration nowadays reserved for people like Alan Greenspan at his zenith as chairman of the Fed” (*The Economist* 2006). Mellon called for similar policies in 1929:

Two schools of thought quickly developed within our administration discussions. First was the "leave it alone liquidationists" headed by Secretary of the Treasury Mellon, who felt that government must keep its hands off and let the slump liquidate itself. Mr. Mellon had only one formula: "Liquidate labor, liquidate stocks, liquidate the farmers, liquidate real estate." He insisted that, when the people get an inflation brainstorm, the only way to get it out of their blood is to let it collapse. He held that even a panic was not altogether a bad thing. He said: "It will purge the rottenness out of the system. High costs of living and high living will come down. People will work harder, live a more moral life. Values will be adjusted, and enterprising people will pick up the wrecks from less competent people (Hoover 1952: 30).

Hoover rejected Mellon's advice and Mellon resigned in 1932. Instead, Hoover proposed a more cooperative policy to leading industrialists at a conference he called in December 1929:

The very fact that you gentlemen come together for these broad purposes represents an advance in the whole conception of the

relationship of business to public welfare. You represent the business of the United States, undertaking through your own voluntary action to contribute something very definite to the advancement of stability and progress in our economic life. *This is a far cry from the arbitrary and dog-eat-dog attitude of the business world of some thirty or forty years ago* (italics added). And this is not dictation or interference by the government with business. It is a request from the government that you co-operate in prudent measures to solve a national problem (Hoover 1952: 45).

This episode suggests that the prevalence of cooperative norms among Republican business elites had risen over the previous decades, particularly since 1920. Hoover explicitly contrasted the highly individualist business mindset of the 1890's with the more cooperative one of 1929. We can see the first glimmer of what would come to be called the stakeholder theory of corporate management, which holds that business is responsible to constituencies other than just the shareholders (Freeman et al. 2010: 50). In other words, by the early thirties an elite population had evolved that was prepared to support (or at least not oppose too strongly) large-scale government intrusion into the economic sphere.

Hoover urged those attending to maintain wages at current levels and to engage in job sharing, if necessary, to preserve jobs. He got large firms such as General Motors, Ford, U.S. Steel, Dupont, and International Harvester to comply with his requests (Ohanian 2009). These efforts had considerable success; unskilled wage levels fell only 6% over 1929–31 compared to 24% over 1920–22 (Officer and Williamson 2015b). By persuading businesses to hold the line on wage cuts over the first two years of the Depression, Hoover had prevented a significant decline in purchasing power for the 84% of the work force who remained employed in 1931. Hoover's policy reduced the downturn's initial impact on demand: the "spending impact" of 16% unemployment and 6% wage losses in 1931 was 21%, about a third less than the 32% spending impact over 1920–22. Nominal GDP decline over 1929–31 was 16%, slightly less than the 17% decline over 1920–22. But the downturn did not end in 1931 as expected; it continued for two more years over which wages fell by another 12 percentage points and unemployment rose another 9 for a combined spending impact of 38%. By 1933 nominal GDP had fallen 45%.

Unfavorable conclusions about capitalism could be drawn by the broader American electorate because of the Great Depression. Marxists held that capitalism created depressions by its consistent drive toward overproduction, as Communist party leader William Foster testified before Congress in 1930 (Phelps 1996):

Millions of workers must go hungry because there is no wheat.
Millions of workers must go without clothes because the
warehouses are full to overflowing with everything that is needed.
Millions of workers must freeze because there is too much coal. This
is the logic of the capitalist system.

Sentiments such as those expressed by Foster, incoherent as they may seem, offered an alternative which if exploited by a demagogue could pose a political threat to the capitalist system if elites simply ignored them. Clearly, both economic and political elites needed a new approach to resolve the crisis and preserve their status.

Solution to the Capitalist Crisis: New Deal and Keynesian Economics

The formal theory that undergirded the solution to the post-1907 capitalist crisis was developed by J.M. Keynes (1936), who argued from the demand side. He proposed that markets do not always clear; gluts of unsold goods can accumulate. That is, aggregate demand does not necessarily equal the productive capacity of the economy and sometimes falls short (Blinder 2008). If this is true, a straightforward solution would be for the central bank to issue money and distribute it to the public to stimulate aggregate demand.

Giving people money for nothing was politically unacceptable. A more acceptable alternative might be increased government spending (fiscal stimulus), which happens any time there is a major war. This was the method of increasing aggregate demand suggested by Keynes. It was too radical for the Roosevelt administration. The primary tool used in the 1930's was monetary stimulus, in particular, a dollar devaluation resulting from the termination of the gold standard in 1933, which was largely responsible for the subsequent economic recovery (Romer 1991). Monetary stimulus did not solve the capital productivity problem; capital productivity only returned to the still-depressed levels of the 1920's (Figure 4). Pre-1907 productivity levels were finally restored during WWII, during which large amounts of fiscal stimulus was applied to the economy because of war spending. High capital productivity persisted for sixty years after, showing that a long-term solution to the capital productivity problem was achieved by actions taken during the war and not before.

It is unlikely that fiscal stimulus was the sole factor responsible for the long-term restoration of capital productivity. After all, WWI had provided fiscal stimulus but had not solved the problem. Over 1916–1920 nominal GDP grew at a rate of a 16% per year (Johnston and Williamson 2016). This strong growth was associated with a 17% consumer price inflation rate, however (Officer and Williamson 2015a). To deal with the excessive inflation associated with WWI, the Federal Reserve hiked interest rates by three percentage points from December 1919 to June 1920 (Romer 1991), producing a severe deflationary depression and

taking away much of the growth achieved during the war. Real unskilled wage rose 11% over the 1916–20 period, but then lost most of this gain in the 1920–21 downturn. Wage gains in the 1920's were small; by 1929 real unskilled wages had risen only 8% above their 1920 levels (Officer and Williamson 2015b).

In contrast, nominal GDP grew 13% annually over 1940–8 while inflation rose at only 7%. The Federal Reserve took no action during this period or after to suppress inflation with high interest rates (Bernanke 2002). Despite this, inflation averaged a modest 2.5% over 1948–1973. Over the entire 1940–1973 period real growth per capita was 3.0% compared to 1.8% over the 1916–1929 period. Annual real wage growth over 1940–1973 was 2.4% and 2.6% for unskilled and production workers, respectively. The corresponding figures for 1916–1929 were 1.4% and 2.3% (Officer and Williamson 2015b). These data show strong growth with low inflation, which led to broadly-shared wage gains that occurred during and after WWII, consistent with low or falling inequality. In contrast, economic growth was more tepid during and after WWI and wage gains were not broadly shared, consistent with high or rising inequality.

Strong growth with minimal inflation was accomplished with wage and price controls through the National War Labor Board (NWLB) and the Office of Price Administration. The New Dealers designed wage policy so that increasing the wages of low-income workers was easier than increasing wages of high-income workers:

In accordance with this policy, the NWLB decided in February 1943 that wage rates could be raised up to 40 cents an hour without obtaining approval. The permissive minimum was raised to 50 cents an hour in November 1944 and, finally, to 55 cents an hour in August 1945. To make its substandard policy consistent with its wage rate brackets, the NWLB permitted wages below the substandard rate to be increased to that level. However, increases at higher wage rates had to be tapered progressively to zero at 70 cents per hour. In other words, no wage rate increases were permitted on the basis of the substandard policy for rates of 70 cents an hour or more. The net effect of this procedure, as in the case of the Little Steel Formula and the wage-rate bracket policy, was to raise the level of the lowest paid workers relative to others (Miller 1958: 373).

The NWLB set brackets for each occupation and employers were free to raise wages to the bottom of the pay bracket (Miller 1958: 373). Finally, the NWLB allowed increases that eliminated wage differences across plants (Krugman 2007: 53). Figure 8 shows that the ratio of skilled to unskilled wage was little changed from 1907 to 1922 (although it dipped during WWI). It fell sharply during WWII

and more slowly after. In contrast, the wage differential for semi-skilled relative to unskilled labor did not show any accelerated decline during WWII. The secondary goal of NLRB policy to flatten wage differentials appears to have been successful.

Another policy that contributed to inequality reduction was higher taxes. Many businessmen and economists believed that government deficits led to inflation based on the historical correlation between wartime deficit spending and inflation. This belief, combined with elite fear of inflation (see Figure 2), created elite support for tax increases on themselves. In the wake of the post-1929 economic downturn, falling Federal receipts led to deficits and Congress raised taxes in response. Top rates were more than doubled in 1932 under the Republicans and rose still more in 1935 under the Democrats (see Figure 7). After war broke out top rates rose to around 90%. NLRB policies coupled with high taxes pushed income inequality well below the level where it adversely affected capital productivity, restoring it and pre-tax ROC to their previous levels (see Figure 5).

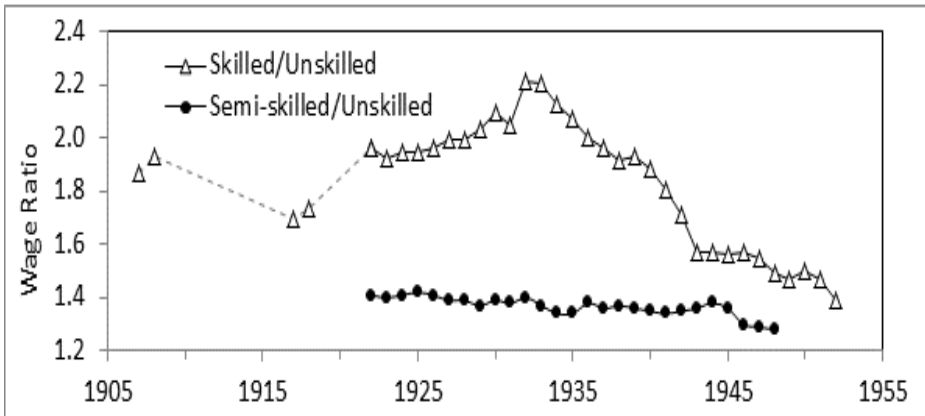


Figure 8. Wage differentials 1907–1952 (data from Goldin and Margo 1991: 35).

Economic inequality continued to decline long after WWII. This was partially because of high taxes which served to depress the return from investment relative to labor. Another factor was union activity (see Figure 7). By the 1950's labor unions were increasingly demanding higher wages in terms of uniform cents-per-hour increases, which tended to reduce the dispersion of wages since they result in greater relative gains for lower-paid workers (Miller 1958: 373). Organized labor shifted its major emphasis to demands for pensions and other benefits and some contracts, such as those in the automobile industry, featured automatic uniform changes in wage rates based in increases in productivity or

changes in the cost of living (Miller 1958: 374). Labor flourished in part because Democratic political elites were favorably disposed to them. The alliance apparently broke down during the Carter administration (1977–81) and organized labor went into a steep decline. Tax rates fell at about the same time and economic inequality began to rise (see Figure 7).

Discussion

This paper proposes a non-demographic mechanism for rising inequality based on Thomas Piketty's (2014) hypothesis that the rate of wealth growth relative to economic growth drives inequality. Here wage growth is substituted for economic growth, but the basic idea is the same. Wealth is represented by an abstract portfolio consisting of stocks and bonds, which is then divided by wage to provide an oscillator that reveals the relative success of the investor class versus the working class. In a capitalist society, the investing class can be considered as a proxy for elites. This oscillator then shows the cyclical trends in the relative financial well-being of elites and serves as good proxy for inequality (see Figure 2). A feedback effect of inequality on investment return created instabilities in financial markets that generated the 1929 stock market crash. Application of a simplified version of DST (equations 7 and 9) shows political stress peaking just before the 1932 election, which brought in the political coalition that engineered the inequality trend reversal.

Turchin (2003: 153) suggests that secular cycle length should be inversely proportional to the growth rate of the driver. In agrarian secular cycles, the driver was the intrinsic rate of population growth for which a value of 2% was suggested (Turchin 2003: 153). Since around 1500 pre-industrial English and French secular cycles have run about two centuries in length (Turchin 2016: 9; Alexander 2016). This suggests that cycle length is about 4 divided by driver growth rate. This paper argues the driver of the cycle in capitalist societies is the differential between return on capital and rate of wage growth, which since 1871 has averaged 4.3%, implying a capitalist cycle length around $4/0.043 = 93$ years long. The reappearance of what looks like another capitalist crisis a century after the last one (see Figure 5) is consistent with this timing.

The end of one republic and the beginning of another in 1932 is consistent with the concept of state collapse and reformation that occurs near secular cycle boundaries. The idea that the American state has operated under a series of republics provides a political approach to supplement the sociological conception of the secular cycle given by DST. This suggests that the field of political science may have useful ways to describe modern historical cycles—at least in America. For example, the 1932 election is considered one of the critical elections (Key 1955) that have recurred about once a generation since the nation's beginning (Burnham 1970: 1). It is possible that the concept of generational political cycles

defined in terms of critical elections (Schlesinger 1939; Elazar 1994) may provide a model for American fathers and sons cycles. These, in combination with the concept of sequential republics, may provide a political system for characterizing the operation of American secular and fathers-and-sons cycles. The qualitative nature of political analysis would benefit from the addition of empirically-measured inequality cycles coupled with the insights from DST concepts of elite proliferation and political stress, for which useful mathematical models have been proposed. Conversely, methods from political science may provide useful additions to cliodynamics.

The capitalist crisis hypothesis suggests some natural experiments. Reduced capital productivity today means that capital markets are more overvalued than standard models imply. This situation implies that when the next recession comes, the associated bear market should be unusually large, on the order of a 55% decline or even more if there is another financial crisis (Alexander 2015). Such a development has historically been rare (only 2 of 44 bear markets since the Civil War have been this large or larger). Whether the forecasted decline occurs can serve as a preliminary test of the validity of the hypothesis.

The recovery from this decline should be hampered by a reduction in the return on capital according to the capitalist crisis hypothesis (see Figure 4). Thus, the stock market could take a very long time to recover to its previous peak, eroding confidence in American capitalism by holders of 401(k) and other retirement accounts. This prediction would unfold over the next business cycle, when the stock market would fail to recover to its previous highs on an inflation-adjusted basis.

Conclusion

This paper addresses the transition from the disintegrative phase of one secular cycle to the integrative phase of a new secular cycle. That is, why does a rising trend in inequality shift to a falling one? Turchin argues that immigration restriction in response to high levels of sociopolitical instability was the key policy that led to the trend change. I proposed that a crisis in capitalism developed after the Panic of 1907 in which capital ceased to produce as much economic output as it had previously which led to a variety of elite responses, one of which (and not the most important) was immigration restriction. The policy that resulted in the shift was implemented after the critical election of 1932, during the New Deal, and particularly during WWII. That is, the timing of the transition from one secular cycle to the next is different from what Turchin proposes. More importantly, the type of policy that “worked” last time was quite a bit more than just immigration restriction. This is particularly salient today since, if the capitalist crisis concept is valid, a new crisis era arose a decade ago.

References

- Adams Susan. and Steve Kichen. 2008. "Ben Graham Then and Now." *Forbes*. October 23, 2008. www.forbes.com/forbes/2008/1110/056.html.
- Alexander, Michael A. 2000. *Stock cycles: why stocks won't beat money markets over the next twenty years*. New York: Writers Club Press.
- Alexander, Michael A. 2015. "10000-point decline in the Dow in the cards over the next three years." *Safehaven*. June 10, 2015. <http://www.safehaven.com/article/37933/stock-cycles>.
- Alexander, Michael. 2016. "Application of Mathematical Models to English Secular Cycles." *Cliodynamics* 7: 76–108. doi: 10.21237/c7cli07128325.
- Bernanke, B. 2002. "Deflation: Making Sure 'It' Doesn't Happen Here. Speech before the National Economists Club." Speech. Washington, D.C., November 21, 2002. <http://www.federalreserve.gov/boarddocs/Speeches/2002/20021121/default.htm>.
- Blackford, Mansel and K. Austin Kerr. 1994. *Business Enterprise in American History*. Boston, MA: Houghton Mifflin Company. <http://faculty.atu.edu/cbrucker/Engl5383/Marketing.htm>.
- Blinder, Alan S. 2008. "Keynesian Economics." In *Concise Encyclopedia of Economics 2nd ed.* edited by David R. Henderson. Indianapolis, IN: Library of Economics and Liberty, Accessed August 2015. <http://www.econlib.org/library/Enc/KeynesianEconomics.html>.
- Bureau of the Census. 1975. "Historical Statistics of the United States, Colonial Times to 1970." *Labor Force Series D1–162*. https://www2.census.gov/library/publications/1975/compendia/hist_stats_colonial-1970/hist_stats_colonial-1970p1-chD.pdf
- Bureau of Economic Analysis. "National Income and Product Accounts." <http://www.economagic.com/em-cgi/data.exe/nipa/A1010-W273RC>.
- Bureau of Labor Statistics. "Labor Productivity and Costs FAQ." <http://www.bls.gov/lpc/faqs.htm>.
- Bureau of Labor Statistics. "Work stoppages involving 1,000 or more workers, 1947-2015." <http://www.bls.gov/news.release/wkstp.t01.htm>.
- Bureau of Labor Statistics. "Labor Force Statistics from the Current Population Survey." <http://data.bls.gov/timeseries/LNS11300000>.
- Burnham, Walter Dean. 1970. *Critical Elections and the Mainsprings of American Politics*. New York: W. W. Norton.
- Calavita, Kitty. 1984. *U.S. Immigration Law and the Control of Labor, 1820–1924*. London: Academic Press.
- Carvalho, L., and A. Rezai. 2015. "Personal income inequality and aggregate demand." *Cambridge Journal of Economics* 40(2):491–505. doi: 10.1093/cje/beu085.

- Coleman, Nathan. 2013. "The United States as Three Republics: An Unorthodox Constitutional History." *Nomocracy In Politics: Liberty, Prudence, Imperfection, and Law*. December 13, 2013. <http://nomocracyinpolitics.com/2013/12/13/the-united-states-as-three-republics-an-unorthodox-constitutional-history>.
- Cynamon, Barry Z. and Steven M. Fazzar. 2015. "Rising Inequality, Demand, and Growth in the US Economy." *SSRN Electronic Journal*. doi: 10.2139/ssrn.2570506
- DeLong, James V. 2009. "The Coming of the Fourth American Republic, American Enterprise Institute." *American Enterprise Institute*. <http://www.aei.org/publication/the-coming-of-the-fourth-american-republic>.
- Dynan, Karen E., Jonathan Skinner, and Stephen P. Zeldes. 2004. "Do the Rich Save More?" *Journal of Political Economy*. 112(2). 397–444. doi: 10.1086/381475.
- Elazar, Daniel J. 1994. *The American Mosaic: The Impact of Space, Time and Culture on American Politics*. Boulder, CO: Westview Press.
- Freeman, Edward R., Jeffrey S. Harrison, Andrew C. Wicks, Bidhan L. Parmar, and Simone de Colle. 2010. *Stakeholder Theory: The State of the Art* New York: Cambridge University Press. doi: 10.1017/cbo9780511815768.
- Goldin. C. and Robert. A. Margo. 1991. "The Great Compression: The Wage Structure in the United States at Mid-Century." *NBER Working Paper No. 3817*. doi: 10.3386/w3817.
- Goldstone, Jack A. 1991. *Revolution and Rebellion in the Early Modern World*. Berkley: University of California Press.
- Gomme, Paul, B. Ravikumar and Peter Rupert. 2006. "The Return to Capital and the Business Cycle." *FRB of Cleveland*. Working Paper No. 06-03. doi: 10.2139/ssrn.890353
- Graham, Benjamin. 1946. "Current Problems in Security Analysis." *New York Institute of Finance*. Lecture No. 4. www.wiley.com/legacy/products/subject/finance/bgraham.
- Hoover, Herbert. 1952. *The Memoirs of Herbert Hoover, Volume 3: The Great Depression 1929–1941*. New York: MacMillan Company. [PDF](#).
- Johnston, Louis and Samuel H. Williamson. 2016. "What Was the U.S. GDP Then?" *MeasuringWorth*. <https://www.measuringworth.com/usgdp>.
- Key, V. O. 1955. "A Theory of Critical Elections." *The Journal of Politics* 17(1): 3–18. doi: 10.2307/2126401.
- Keynes, John M. 1936. *The General Theory of Employment, Interest and Money*. London: Macmillan. (Reprinted 2007).
- Korotayev, Andrey, Artemy Malkov and Daria Khaltourina. 2006. *Introduction to Social Macrodynamics: Secular Cycles and Millennial Trends*. Moscow: Kom Kniga. [Chapter 1 PDF](#). [Chapter 2 PDF](#).
- Krugman, P. 2007. *The Conscience of a Liberal*. New York: W. W. Norton.
- "Labor Productivity." *Investopedia*. <http://www.investopedia.com/terms/l/>

labor-productivity.asp.

- Latson, Jennifer. 2014. "The Worst Stock Tip in History." *Time*. September 3, 2014. <http://time.com/3207128/stock-market-high-1929/>.
- Lebergott, Stanley 1964. *Manpower in Economic Growth, the American Record Since 1800*. New York: McGraw-Hill.
- Lebergott, Stanley. 1966. Labor Force and Employment, 1800–1960. In *Output, Employment, and Productivity in the United States after 1800*, edited by Dorothy S. Brady. 117–204. <http://www.nber.org/chapters/c1567>.
- Lind, Michael. 1995. *Next American Nation: The New Nationalism and The Fourth American Revolution*. Free Press
- Macauley, F. R. 1938. "Some Theoretical Problems suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States Since 1856." *National Bureau of Economic Research* A142–A161.
- McNabb, David E. 2016. *A Comparative History of Commerce and Industry, Volume II: Converging Trends and the Future of the Global Market*. New York: Palgrave Macmillan. doi: 10.1057/9781137503305.
- Mellon, Andrew. 2006. "Made it, bought it, ran it, gave it." *The Economist*. October 26, 2006. <http://www.economist.com/node/8077461>.
- Miller, Herman P. 1958. "Changes in the industrial distribution of wages in the United States 1939–1949." In *An Appraisal of the 1950 Census Income Data: Studies in Income and Wealth, Vol. 23*. 357–430. Princeton: Princeton University Press. doi: 10.1515/9781400875412-013.
- Mitchell, Brian R. 1998. *International Historical Statistics: The Americas 1750–1993*. New York: Stockton Press.
- Murphy, Sharon. 1995. "The Advertising of Installment Plans." *Essays in History*. Corcoran Department of History, University of Virginia. <http://www.essaysinhistory.com/articles/2012/155>.
- Nilson, J 2014. "Why Did Henry Ford Double His Minimum Wage?" *The Saturday Evening Post*. January 3, 2014. <http://www.saturdayeveningpost.com/2014/01/03/history/post-perspective/ford-doubles-minimum-wage.html>.
- Officer, Lawrence H. and S. H. Williamson. 2015a. "The Annual Consumer Price Index for the United States, 1774–2014." *MeasuringWorth*. <https://www.measuringworth.com/usdpi/>.
- Officer, Lawrence H. and S. H. Williamson 2015b. "Annual Wages in the United States, 1774–Present." *MeasuringWorth* <https://www.measuringworth.com/USwages/>.
- Ohanian, L. E. 2009. "What—or who—started the great depression?" *Journal of Economic Theory* 144(6): 2310–2335. doi: 10.1016/j.jet.2009.10.007.
- Olney, Martha. 1990. "Demand for Consumer Goods in 20th Century America." *Explorations in Economic History* 27(3): 322–349. doi: 10.1016/0014-4983(90)90017-s.

- Ostry, Jonathan D., Andrew Berg, and Charalambos G. Tsangarides. 2014. "Redistribution, Inequality and Growth." *International Monetary Fund*. <http://www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf>.
- Piketty, Thomas. and Saez, Emmanuel. 2007. "Income and Wage Inequality in the United States 1913–2002." In *Top Incomes over the Twentieth Century. A Contrast Between Continental European and English-Speaking Countries*, edited by A.B. Atkinson and T. Piketty. 141–225. Oxford: Oxford University Press. [PDF](#).
- Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge, MA: Harvard University Press. doi: 10.4159/9780674369542.
- Poterba, James M. 1998. "The rate of return to corporate capital and factor shares: new estimates using revised national income accounts and capital stock data." *Carnegie-Rochester Conference Series on Public Policy* 48 (21): 211–246. doi: 10.1016/s0167-2231(98)00022-0.
- Reichley, A. James. 2000. *The Life of the Parties: A History of American Political Parties*. Lanham, MD: Rowman and Littlefield. [PDF](#).
- Ringler, H.P. 1934. "Chapter of Wisconsin History Ends as Progressive Faction Disappears." *Milwaukee Journal*. Accessed April 24, 2016. <http://www.wisconsinhistory.org/turningpoints/search.asp?id=778>.
- Ritholtz, Barry. 2014. "Significance of secular market should not be underestimated." *Washington Post*. http://www.washingtonpost.com/business/get-there/significance-of-secular-market-should-not-be-underestimated/2014/11/06/c7955fac-646f-11e4-9fdc-d43b053ecb4d_story.html.
- Romer, Christine. D. 1986. "Spurious Volatility in Historical Unemployment Data." *Journal of Political Economy* 94(1): 1–37. doi: 10.1086/261361.
- Romer, Christine D. 1991. "What Ended the Great Depression?" *National Bureau of Economic Research*. http://paper.ssrn.com/sol3/papers.cfm?abstract_id=226730.
- Saez, Emmanuel and Gabriel Zucman. 2016. "Wealth Inequality in the United States Since 1913: Evidence from Capitalized Income Tax Data." *The Quarterly Journal of Economics*. 131(2): 519–78. doi: 10.1093/qje/qjw004.
- Schlesinger Arthur M. 1939. "The Tides of American Politics." *Yale Review* 29: 217–230.
- Shiller, Robert. "Online Data." <http://www.econ.yale.edu/~shiller/data.htm>.
- Smith, W. B. and A. H. Cole. 1935. *Fluctuations in American Business*. New York: Russell & Russell, New York.
- Steckel, Richard. 2002. "A History of the Standard of Living in the United States." In *EH.Net Encyclopedia*, edited by Robert Whaples. <http://eh.net/encyclopedia/a-history-of-the-standard-of-living-in-the-united-states>.

- Turchin, Peter. 2003. *Historical Dynamics: Why States Rise and Fall*. Princeton, NJ: Princeton University Press.
- Turchin, Peter. 2012. "Dynamics of political instability in the United States, 1780–2010." *Journal of Peace Research* 49(4):577–591. doi: 10.1177/0022343312442078.
- Turchin, Peter. 2013a. "Return of the Oppressed." *Aeon*. February 7, 2013. <http://aeon.co/magazine/society/peter-turchin-wealth-poverty/>.
- Turchin, Peter. 2013b. Modeling Social Pressures Toward Political Instability. *Cliodynamics* 4: 241–280. <http://escholarship.org/uc/item/6qp8x28p>.
- Turchin, Peter. 2016. *Ages of Discord: A Structural-Demographic Analysis of American History*. Chaplin, CT: Beresta Books.
- Turchin, Peter and A. V. Korotayev. 2006. "Population dynamics and internal warfare: a reconsideration." *Social Evolution and History* 252: 112–47.
- Turchin, Peter and S. A. Nefedov. 2009. *Secular Cycles*. Princeton, NJ: Princeton University Press.
- Vernon, J. R. 1994. "Unemployment rates in postbellum America: 1869–1899." *Journal of Macroeconomics*, 16(4): 701–714. doi: 10.1016/0164-0704(94)90008-6.
- Williamson J. G. and P.H. Lindert. 1980. "Long-Term Trends in American Wealth Inequality." *Modeling the Distribution and Intergenerational Transmission of Wealth*, edited by James D. Smith. 9–94. Chicago: University of Chicago Press. doi: 10.7208/chicago/9780226764603.001.0001.
- Worstell, T 2012. "The Story of Henry Ford's \$5 a Day Wages: It's Not What You Think." *Forbes*, March 4, 2012. <http://www.forbes.com/sites/timworstell/2012/03/04/the-story-of-henry-fords-5-a-day-wages-its-not-what-you-think/>.