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The Economic Surplus, the Baran Ratio, and Long Wave Cycles

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Abstract

This paper briefly outlines the idea and development of the economic surplus concept at the macroeconomic level as opposed to the one in microeconomics often labeled as a Marshallian surplus. Of special interest and focus is the concept as developed and used by heterodox economists. The notion of a residual amount of output or income over and above what is necessary for a society's consumption (education, housing, food, clothing, health care, transportation, and other necessities of life) that can be used either for further consumption by an elite class, used for reinvestment in productive activities, and/or wasted on unproductive efforts is one that has been and continues to be taught and used in heterodox and neo-Marxian economics. The relevancy of the economic surplus view to modern and recent US economic growth is examined especially in light of new ways that have been created to apply the economic surplus concept. Applications using the Baran Ratio and long wave cycles theory are demonstrated, and it appears that the Baran Ratio is a useful concept to help predict long wave movements that are based on the economic surplus.

JEL Codes: B22, B24

Keywords: Baran Ratio, economic surplus, investment, Kondratiev waves, monopoly capital

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Introduction

In macroeconomics, the economic surplus is generally considered as the aggregated sum of all profits, rents, tax revenues, and any residual amount received by businesses left over after labor is paid for its services. This is different from the economic surplus in microeconomics that covers producers' and consumers' surplus in markets. The macroeconomic surplus is often considered as the value of what labor is owed in the aggregate but not paid. The concept of *surplus value* in which a laborer is not paid fully for her/his contribution to production so that the capitalist can earn a surplus can be traced back to the physiocrats and has been developed by Adam Smith, David Ricardo, and Karl Marx with Marx using it as a part of his labor exploitation theory (Blaug 1997). Macroeconomic economic surplus can be considered as the aggregate of labor exploitation that exists in the economy.

Many heterodox economists in recent years have started placing emphasis on making some type of "social surplus" concept as a major principle of an alternative to mainstream, neoclassical economic thinking. The social surplus and social provisioning have been themes of the writings of Lee (1998), Lawson (2003), Lee and Jo (2011), Henry, Jo, and Lee (2015), and Martins (2016, 2022) among others who are drawing upon the works of Marx, Veblen, Gramsci, Sraffa, Kalecki, Keynes, and Robinson. Social position matters when it comes to social provisioning or how the social surplus is allocated. Martins (2022) goes as far as to argue that the keys to the further development of heterodox economics are in these areas of social provisioning of the social surplus through social positioning. Although not quite the same as the economic surplus or a residual amount from total product left after wages and social reproduction, the social surplus is related to it in that if one agrees that what is produced in our economy (the social surplus) is done according to social positioning (class power where

capitalists dominate workers), then the social surplus is allocated according to some type of exploitation wherein higher social positions determine what is produced, how things are produced, and how wages and profits and wages are determined.

In his book *The Political Economy of Growth* (1957) Paul A. Baran develops the idea of a macroeconomic economic surplus, and then later with Paul M. Sweezy (1966) writes about how because not all profits, rents, and taxes can be reinvested or spent on productive activities, these are often spent on unproductive activities, or sometimes “wasted” according to them, on things such as advertising, military goods and war, imperialism, capitalist consumption of luxury goods, and some forms of government spending. Yet these are necessary to “absorb” some of the economic surplus because there are not enough outlets for productive investment or because productive investment is bypassed due to a desire to have production capacity underutilization in order to have higher prices and less output than what would be the case otherwise. To Baran and Sweezy, the economy is characterized by large firms which are members of monopolistically competitive or oligopolistic markets. Instead of being used to provide universal health care, better educational opportunities, and better work lives for most people, the surplus often is used by the leaders of capitalism to pursue other objectives.¹ According to Baran, an economic surplus has always existed throughout human history as an upper class has always exploited a lower class whether during a slave based economic system in antiquity or during feudalism in the middle ages. Even during these epochs surpluses were often wasted on grand palaces, temples, cathedrals, and militarism.

¹ Many of their ideas on the economic surplus and other matters evolved from Sweezy’s *Theory of Capitalist Development* (1942) and Baran’s *Political Economy of Growth* (1957). The book *The Age of Monopoly Capital* (2017) edited by Baran and Foster reveals much of how Baran and Sweezy’s ideas were developed during the course of their friendship and collaboration.

Outside of Marxian and neo-Marxian perspectives, other heterodox economists have written about some form or another of an economic surplus. O'Hara and Sherman (2004) note similarities between the thinking of Sweezy and Veblen regarding the topics of increasing monopolization of different industries, stagnation, and the role of the government in a capitalist economy. Sweezy is influenced by Veblen's writings in that Veblen mentions how a certain portion of a society's total product is often wasted and how the cartelization of different industries leads to restricted output and higher prices even though there should be enough output at lower prices to satisfy a greater level of demand (Veblen 1899, 1904, 1923). Veblen also notes the use of "publicity engineers" and advertising to help create demand for products which exist in saturated markets (Veblen 1899). Such forms of promotion really do not add anything to total product yet are a form of wasting an economic surplus as are luxury spending and "conspicuous consumption", militarism, and other activities which add no value to an economy. Innovations are usually of the type that have little useful such as changes in the design of clothing, automobiles, etc. (Veblen 1899, 1904, 1923). According to O'Hara and Sherman (2004), Veblen (1923) writes that unproductive uses of the economic surplus can lead to economic crises, although Veblen implies that business overproduction or consumer underconsumption during economic down times can be resolved by a certain degree of wasting of the economic surplus, an argument somewhat similar to Keynesianism (Veblen 1904). Finally, Keynes uses an economic surplus concept in that he argues that savings, or essentially the economic surplus, can be greater than the investment needed to keep a macroeconomy at full employment (Keynes 1964).

This paper proceeds as follows. The next section introduces the Baran Ratio as a method to measure investment rates in capitalist economies. After that, the following part discusses how

the economic surplus can be used in long wave cycle analysis. These two concepts have their roots in heterodox economics, and a methods section shows how the two concepts are compatible. In the conclusion, there are some recommendations for further research and some thoughts on how well the Baran Ratio and capital overaccumulation correlate with long wave cycles.

The Baran Ratio

Zhun Xu (2019) introduces the Baran Ratio (BR) as a concept based on Paul Baran's notion of the economic surplus and states that it is equivalent to the total investment undertaken in an economy divided by the total surplus, or

$$\text{BR} = \text{Investment} / \text{Economic Surplus}.$$

The higher the ratio, Xu writes that “relatively high Baran Ratios indicate that the ruling class is interested in capital accumulation, while persistently low and/or decreasing Baran Ratios imply a gradual transition to slow accumulation or stagnation” (page 28). He also shows that a nation's average economic growth is higher the higher its average BR from 1990 to 2015 such as those of India and China whereas some of those of Europe (the UK, France, Germany and Italy) and the US have lower BRs and lower growth rates. Using estimates by economic historians of the British economy from the 13th to the 19th Centuries, Lambert (2019 and 2020b) finds that higher BRs are associated with periods before and during the industrial revolution in Britain. Taking net fixed domestic investment (private and public) as a portion of the net operating surplus, or NOS, (net profits, rents, etc.) plus taxes on production and imports less subsidies and then adding

in local, state and federal income tax revenues, Figure 1 displays the BR in percentage terms for the US from 1929 to 2021.²

(Insert Figures 1 to 4 around here)

As the figure indicates, since the 1970s, there is a lower rate of investment of the economic surplus, and Figure 2 demonstrates a modest correlation between the ratios shown in Figure 1 and the corresponding real GDP growth rates from 1929 to 2021. As the BR increases, generally so does the rate of real GDP growth rate on average, and as Figure 3 illustrates, real net investment has been increasing over the decades. But as Baran and Sweezy would note, there is not enough investment to absorb all of the economic surplus, so a major portion of the surplus must be “wasted” in the form of spending on arms, advertising, packaging and cosmetic changes in the appearance of goods, luxury goods for the rich, etc. Some can argue that the creation of unproductive jobs within different organizations or bureaucracies is a form of wasting surplus revenues that would otherwise go to shareholders or clients (Graeber 2018, Lambert 2020a, Delucchi, Dadzie, Dean and Pham 2021). Increasing foreign direct investment (FDI) may explain some of the fall in the BR over the decades, yet Figure 4 shows that US FDI is only a small percentage of the economic surplus. Therefore, a great deal of the surplus must be channeled into other areas other than investment even though greater rates of reinvesting the economic surplus are associated with greater rates of economic growth.

² The US Bureau of Economic Analysis (BEA) defines net fixed investment as “The sum of gross private domestic fixed investment, the change in private inventories, and government gross investment less fixed capital consumption” and defines net operating surplus as “A profits-like measure that shows business income after subtracting the costs of compensation of employees (received), taxes on production and imports less subsidies, and consumption of fixed capital (CFC) from value added, but before subtracting financing costs and business transfer payments. Consists of the net operating surplus of private enterprises and the current surplus of government enterprises” (US BEA Glossary 2023). Taxes less subsidies and total taxes at the local, state and federal levels are added to NOS in order to approximate more fully the amount that goes to a dominant class after wages and the means of reproduction are paid to a dominated or set of dominated classes.

The Economic Surplus and Long Wave Cycles

Kondratiev (1984) in a series of papers he writes in the 1920s develops a theory of long waves or periods of economic growth (40 to 60 years) which are sometimes slow, sometimes rapid and have within them traditional macroeconomic business cycles (trough, recovery, peak, and recession). Basically, these waves reflect clusters of technological changes and innovations which spur economic growth and advancement, but eventually an economic era runs out of new innovations in which to invest and to help continue to grow the economy. According to Berry (1991) and Berry and Dean (2012), Kondratieff cycles could be thought to contain two Kuznet cycles of around 25 years each, one of which is an upswing period of investment in infrastructure and the other a downswing period when infrastructure spending gradually dries up until replacement of older infrastructure is needed. When either innovations stop developing as before or when infrastructure spending slows down or when fixed investment spending slows dramatically as in a Juglar Wave (Juglar 1862)³, an economic downturn occurs which is usually much worse than the typical recession.⁴ For example, Kondratiev and other scholars claim that long cycles take place in global capitalism from 1790 to 1849 (the industrial revolution and its innovations), 1850 to 1895 (the growth of steam power and the railroads), and 1896 to 1939 (the proliferation of the automobile, radio, and a housing boom in the US). Schumpeter (1939) adopts Kondratiev's long cycle theory and believes that each epoch ushers in a wave of "creative destruction" in which older forms of businesses and technologies are replaced by others. Schumpeter believes that such upheaval and change is a benefit of capitalism advancing

³ Juglar waves are theorized to last anywhere from 7 to 11 years, or the approximate length of a typical business cycle, which most macroeconomics textbooks state is usually 7 to 10 years.

⁴ For a fairly thorough review of different long wave cycle theories, see Bernard, Gevorkyan, Palley, and Semmler (2013).

humanity's progress, although it comes with a price as older industries falter and new ones rise. Sweezy is influenced by Schumpeter at Harvard University yet believes that capitalism will ultimately fail as an economic system because of underconsumption/overproduction of goods and services, something he calls a "realization problem" in which everything produced is not always consumed. He and Baran (Baran and Sweezy 1966) also note that with saturated markets and little growth for different goods and with few or no innovations on the horizon for an economy that it becomes more and more difficult for capitalist enterprises to invest or absorb the surplus (rents, profits, and interest) that has been generated. Despite attempts to restrict output and efforts to "waste" surplus on things like advertising, military expenditures, etc., a recession can occur, or worse, a more severe economic downturn can occur which can usher in the closing period of a long cycle.

(Insert Figure 5 around here)

Figure 5 uses the log of the inflation adjusted closing value of the Standard and Poor 500 Composite Price (S&P 500) from 1789 to 2022 (Shiller nd, Scoop.com nd, Federal Reserve Bank of Minneapolis 2023) to show possible and approximate long wave trends in the US economy when it comes to the growth of capitalist wealth. Many other authors have used this chart or similar ones on output, prices, etc. to note long wave patterns in the US economy or other economies (Rostow 1978, Klienknecht, Mandel, and Wallersten 1992, Mandel 1995).⁵ The time

⁵ Mandel (1995) claims that historical and political forces such as class struggle and wars (exogenous factors) play a greater role in long waves than do innovations and investment (endogenous factors). Silver (1992) finds a connection between labor militancy and transitions from one form of world hegemony to another after both world wars, and these time periods would correspond to transitions from one cycle to another. According to Mandel (1992) and Menshikov (1992), class struggle over wages, pay and working conditions often drives innovation in that much of innovation is focused on labor saving types of innovation. In this sense, innovation can be seen as an endogenous factor because it is a result of pursuing profit and within the capitalistic system and logic. Admittedly, however, it is not always easy to discern exogenous and endogenous effects. For example, some may consider

periods in the graph are general ones used for the analysis. Kondratiev (1984), Baran and Sweezy (1966), and others believe that one long wave that starts in the 1850s ends in the 1890s in the US with the saturation of the steam engine, railroads and steel markets with no viable new markets forthcoming for further investment of the nation's economic surplus by the capitalist class. Many economic historians have noted a "Long Depression" in the US and Europe lasting off and on from 1873 to 1896 (National Bureau of Economic Research 2023). Figure 5 shows a low point for the year 1896, and then a rise in the S&P value from 1896 until after the first world war (1919), and this is probably due to the fact that in the first few years of the 20th Century there is a rebound in railroad investment, a boom caused by World War I, and also before and after the war the innovation and growth of the automobile and its supporting industries of petroleum, tire manufacturing, etc. as well as the suburbanization and increase in construction that accompanies the mass consumption and use of motor vehicles (Baran and Sweezy, Chapter 18, 1966). The latter developments of the auto and its related industries are especially important in the 1920s. The strong growth lasts until 1929 with the onset of the Great Depression, and for the next 10 years, this part of an approximate 1896 to 1939 wave suffers a period of stagnation. Baran and Sweezy (1966) do not follow this time period exactly in their analysis since they have the third wave in Figure 5 actually ending in 1907 when railroad expenditures dramatically begin to fall after a rebound from 1900. They also believe that wars are important to waves of capitalist innovation and development and believe that the economic slump caused by the Panic of 1907 is reversed by an economic boom caused by World War I.

that wars are exogenous factors, yet if the war is among competing capitalist nations seeking to add territory and expand markets, then one could argue that the resulting war is endogenous and not exogenous to capitalism.

With the arrival of the second world war, the Great Depression basically ends, and this starts a period of the governments of most nations trying to smooth out business cycles by using Keynesian macroeconomic policies from 1940s to the 1970s. The US economy becomes the dominant one among the capitalist nations. This era is characterized by innovation and growth in the aerospace, defense, and electronics industries. It is in the 1970s, however, disenchantment grows with such policies as economies throughout the globe begin to suffer from stagflation, or simultaneous high inflation and high unemployment. This in turn ushers in another possible wave in the 1980s, that of neoliberalism, and there is great growth with personal computers, the internet, and related industries and technologies. There is also greater concentration in many industries as the number of national and global oligopolies increase (Foster 2014, Grullon, et al 2015, The Economist 2016, Lambert 2019). New economic policies of freer markets and deregulation appear to work until the dot.com burst of 2001 and the Great Recession of 2008-09. Subsequently, there is slower growth in most world economies, and then another economic crash in 2020 with the global Covid-19 pandemic. These events and circumstances could be signaling the closing wave of fifth cycle or the beginning of a new cycle if one follows a pattern of a cycle occurring every 40 to 50 years and with long depression type periods noting the end of one long cycle (Kuczynski 1992).⁶

Using the Standard and Poor's Index as a measure of accumulation or a proxy of the economic surplus over time, the epochs noted in Figure 5 are only offered as approximations of long waves in the US economy. Toward the end of each wave, such as during the Great Depression of the 1930s or the stagflation of the 1970s, there is usually economic slow growth or

⁶ In applying a trend of a polynomial regression equation of degree 5 for the 5 waves, the resulting equation and goodness of fit measurement is obtained below. A pretty strong fit is indicated by the r-squared of 0.9547. $y\text{-hat} = -3E-12x^5 + 3E-09x^4 + 1E-07x^3 - 0.0003x^2 + 0.0539x - 0.1137$; r-square = 0.9547

stagnation in which not enough surplus absorption is occurring. That is, the economic surplus created is not adequately channeled into investment or production, and therefore too many goods are produced, there is “underconsumption” of what is produced, and this results in not price cutting to clear the glut of overproduction, but instead there are layoffs of workers and idling of plant and equipment used in the production process as well as stagnant economic growth until profitability returns. Because the slow or no growth lasts so long such as with the Great Depression or the stagflation of the 1970s, and with no new major innovations appearing soon, a sense of urgency to “get things moving again” toward greater economic growth and output moves to the center stage of political and economic discourse. The economic turmoil of the 1890s can help to explain the bolstering of a socialist political movement and additional anti-trust and other government enacted reforms occurring in the US. As Sweezy (1942) and others have noted, economic turmoil in Germany and Italy in the 1920s and 1930s help the ascendancy of fascist regimes whereas in other situations such circumstances can trigger socialist revolution (Russia after World War I) or left leaning regimes which are more favorable to workers than capitalists, such as the New Deal in the US during the 1930s. Disillusionment with Keynesian “big government” policies and increases in the welfare state in the 1970s and the subsequent rise of neoliberal, “free market” policies throughout many capitalist nations in the 1980s are yet another example of how the last several years of a long wave that have economic stagnation can yield dramatic changes in governmental policies and regimes.

There is a debate in the use of Kondratiev waves as to whether the end of one long cycle and the beginning of another is due to endogenous or exogenous factors to the economy. That is, do exogenous factors such as wars or pandemics end one long cycle, or do endogenous factors such as prolonged periods of slack demand that eventually lead to economic recoveries end a

long cycle and begin a new one? Mandel (1995), similar to Baran and Sweezy (1966), believes that exogenous factors such as wars or other cataclysms end and begin long wave cycles whereas shorter “business cycles” with periods of trough, recovery, peak, and recession are due to endogenous factors such as business profitability, interest rates, inflation, etc. Often the periods of decline and long periods of stagnation toward the end of a long wave give the impetus for new innovation as firms try harder to regain profitability and face lower opportunity costs for innovation. There is a tendency as profits decline that attempts at innovation rise, and vice versa. Whether the latter is endogenous or exogenous to capitalism is subject to great debate and often hard to determine. Some argue that discovery and innovation are endogenous in that they are part of a capitalistic system whereas others note that despite best efforts, major innovations are not always like to materialize and that discovery is often serendipitous regardless of economic climate.

Shaikh (1992) argues that stagnation toward the end of a long wave sets in because profit rates decline as investment in capital has peaked despite a rising economic surplus. As the saturation in capital without greater profits persists, slower economic growth exists, wages fall, and due to greater levels of idle capital, overaccumulation of capital has occurred, and this in turn leads to stagnation. This is a tendency of capitalism, according to Baran and Sweezy, and is repeated throughout its history. Finally, Husson and Louca (2012) believe that since 2008 capitalism has been in the last stage of a “neo-liberal” wave that has promoted globalization, deregulation, and austerity. They predict that because of current global stagnation that social regression is possible, a view also held by Mattei (2022) in that she notes that austerity often breeds political movements leaning toward fascism such as what happened in Germany between the world wars.

Methods

(Insert Figures 6 and 7 around here)

To try to see if long waves can be modeled and analyzed using the economic surplus concept, US real, net operating surplus (private sector profits, rent, dividends, etc.) plus production taxes less subsidies added to total direct revenues of local, state, and federal governments (total economic surplus) is used to analyze profitability cycles in the US economy (US Bureau of Economic Analysis 1929-2021a, Chantrill 2023) . No similar method of measuring profit cycles has been found in the literature in the course of developing this paper, and no other paper has tried to establish whether a concept like the Baran Ratio is correlated with long wave cycles. Similar to a method used by Kondratieff (1984), this measurement of real economic surplus is plotted and a linear trendline is superimposed on it so that deviations from trend can be obtained (see Figure 6), and these residuals in turn can be smoothed by using a 9-year moving average⁷. Figure 7 shows these results, and these indicate a long wave cycle where the first wave is coming to an end in the 1930s depression; a second one begins slowly in the 1940s and continues through the 1970s when a period of stagflation closes out that period; and then the next cycle begins slowly in the 1980s as a transition stage; and then it appears to be strong in the mid-1990s and the 2000s until 2008. Figure 7 seems to suggest that that the phase that begins in the 1980s is either in a slow growth / depression stage from 2009 and onward, or that a new cycle has started from 2015 or 2016 perhaps. A polynomial regression equation of degree 6 fits the moving averages of the deviations with an r-squared of approximately 82%.

⁷ Kondratieff uses 9 year moving averages. This makes sense since the average business cycle ends in a recession every 7 to 10 years, and therefore a 9-year moving average would “smooth out” business cycles so that longer cycles or waves can be detected.

To see what correlates with the movement of the moving average of the deviations of the real economic surplus (MA Dev Econ Surplus), the following 3 independent variables are offered with the following hypotheses:

1. Moving Average (9 years) of deviations of the US Baran Ratio, 1929 to 2021 (MA Dev Baran Ratio). This is annual US net fixed investment for each year divided by the total economic surplus, and then this is fitted with a linear trend/regression line so as to find deviations. These deviations are then smoothed over a 9-year period. Figure 1 indicates the sources for creating the Baran Ratio. The hypothesis is that as the Baran Ratio trends upward on average in a long wave cycle, so does economic surplus. As it trends downward, so does the surplus on average.
2. Moving Average of the Deviations of the Ratio of Total Capital to Average, Hourly, Manufacturing Wage, US, 1929 to 2021 (MA Dev K/Wp). Following Shaikh (1992), this variable is created to determine if, as the ratio increases/decreases, how does it correlate with the moving average of the deviations of the economic surplus. Shaikh determines that as a cycle begins, the value of fixed assets is lower/cheaper relative to wages as an economy, which is previously stagnant, now begins to recover. As time goes by, the ratio increases in value as the cycle heads toward a peak, and then during the decline after the peak, it increases even more, which indicates a form of overaccumulation since during this time, the economy is not growing as quickly as it once was. Next, during a depression stage of the cycle, the ratio declines. The average, hourly manufacturing wage is used as a value for labor in this moving average of a capital to labor(K/L) ratio since productive labor is considered more important by Baran and Sweezy (1966) and others in generating economic surplus

than unproductive labor and since this wage rate has data for it going back furthest in time when compared to others. This variable is plotted, a trend line fitted across its graph, and the 9-year moving average of its deviations are calculated. Sources: US Bureau of Labor Statistics, 1939-2022, US Bureau of Labor Statistics (1932-1936), Wolman (1933).

3. Season (A, B, C, or D) of the Long Cycle (Season). This is a variable where A (=1) is the deep recession or depression stage of a long cycle; B (=2) is the turning point and usually a small rebound period from A that starts a new cycle; C(=4) is the boom period of the new cycle where annual economic growth is stronger than in season B; and D (=3) is the descent stage of a long cycle before a period like A is reached and where economic growth, although better than a season like A or B, is not as strong as that of C. Some examples of seasons like A would be the Great Depression of the 1930s to 1941; the stagflation of and 3 recessions during 1974 to 1982; and the Great Recession of 2008-09 and the subsequent slow economic growth of 2010 to 2016 or beyond. For B, some examples could include 1942 to 1946; 1983 to 1993/94; and perhaps the 2021 post Covid 19 growth. With C, this season is often associated with the climb toward a peak of the long cycle, and the years that are good candidates for typifying C would be 1947 to 1959; 1995 to 2000. And for D, the post peak, but pre-depression period, years of growth but not as much of those of C, the years are 1960 to 1973; and 2001 to 2008. Albeit, these are rough classifications, and the seasons are sequenced according to their hypothesized level of economic surplus generation, but are offered as a way to test whether modern day cycles come closer to 40-year cycles rather than 50 or 60 year cycles and to test the hypothesis that a set of “seasons” exist

within each cycle, a pattern which many of the authors cited in this paper have mentioned as parts of a long wave cycle.

Since the economic surplus can also affect the total level of fixed capital, production wages, and the annual amount of investment in an economy, the MA Dev Baran Ratio and MA Dev K/Wp can be considered endogenous variables when economic surplus is used as a dependent variable in a model. Therefore, two-stage least squares regression (2sls) is used to model how MA Dev Baran Ratio and MA Dev K/Wp correlate with the surplus using the following *instrumental variables*:

1. MA (9-year) of the deviations of Wages and Salaries as a percentage of Gross Domestic Income, 1929 to 2021 (MA Dev Wages/GDI). Similar to the other variables, this is plotted and then a trend/regression line is fitted to the plot from which the moving averages of the deviations from the trend/regression line are calculated. This is used as an instrumental variable for the MA Dev Baran Ratio ($r = 0.75$ for MA Dev Baran Ratio and MA Dev Wages/GID). Source: US Bureau of Economic Analysis (1929-2021a).
2. MA (9-year) of the deviations of the ratio of the Operating Surplus of Private Enterprises as a percentage of Gross Domestic Income, 1929 to 2021 (MA Dev OSPE/GDI). This is used as an instrumental variable for MA K/Wp ($r = 0.84$ for MA K/Wp and MA Dev OSPE/GID), and as with other variables, a trend line is plotted against the data and a 9-year moving average is derived from its deviations. Source: US Bureau of Economic Analysis (1929-2021a).

(Insert Table 1 around here).

Table 1 shows the results of 2sls regression using robust standard errors (RSE). No collinearity among the independent variables is found (VIF scores < 2.0), and a test for endogeneity shows MA Dev Baran Ratio and MA Dev K/Wp to be endogenous (robust Chi-square = 24.45, p-value < 0.001, and robust regression score = 22.83, p-value < 0.001), so the use of instrumental variables is appropriate. Each independent variable is statistically significant at $\alpha < 0.05$, and the model explains around 76% of the variation in MA Dev Economic Surplus.

On average, as MA Dev Baran Ratio goes up by 1, the moving average of the deviations of the real economic surplus goes up by \$0.19 billion dollars, and as MA K/Wp goes up by 1, it goes up by \$0.002 billion annually. Each change from one season to another within the cycle after adjusting for sequencing increases MA Dev Econ Surplus by \$0.71 billion per year on average. When the Season variable is arranged chronologically where A=1, B=2, C=3, and D=4 and is plotted against the economic surplus variable on the y-axis, Figure 8 shows the familiar pattern of the seasons over time. This variable seems to classify stages of long cycles correctly and supports the idea of 40 years cycles. The three independent variables appear to correlate well with MA Dev Econ Surplus, therefore as the economic surplus moves above and below trend, so do the Baran Ratio and the K/Wp ratio.

Discussion and Conclusion

The Baran and Sweezy notion of overaccumulation of surplus along with a lack of surplus absorption as causing long periods of capitalist stagnation may have some additional support given the results of this paper. Although most mainstream economists disagree that long wave cycles theory is a useful concept or theory, heterodox economists see it as a valid and somewhat powerful, albeit imperfect, way to explain long term movements in capitalist

economy. For this paper, the Baran Ratio and a broader use of the economic surplus can be added to the literature of long wave cycles as ways of trying to pinpoint trends within a cycle.

The limitations of this paper involve the endogenous nature of the Baran Ratio and the capital to labor ratio used. These are also less than perfect measurements of investment and capital intensity rates. It would have also been useful to have had a longer time series of data, but a lot of US economic data only goes back to the 1920s. Future research should try to use data of longer time periods and those of other nations. The author is currently doing research on other nations. Finally, given Figure 5 and the literature review for this paper, a good question for further research is whether a long cycle is more a matter of 45 years or so rather than 60. The use of the seasons data in the 2sls regression imply this. Nineteenth Century cycles have been claimed to have been longer than those of the 20th. Could this be because of increased government activism and spending and/or debt that has shortened not only the regular business cycle but also the long cycle?

Yet, if the US economy is the largest one in the world, and if we are in the depression stage of the 1983 and on cycle, or in the infancy (startup) of a new cycle (2021 and on?), then low rates of investment or capital levels could explain the current level of stagnation. It is also worth noting, as others cited in this paper have noted, that the amount of political volatility in a nation usually rises during the A or D season of a cycle. Examples that are given usually include the political unrest, labor union struggles and strikes, and the presence of the New Deal in the US and the rise of fascism in Germany in the 1930s, a period of time that most would consider a season D. The 1980s can be considered an A stage, and this is the period of the rise of neoliberalism and a transition from progressive to more conservative politics in the US, UK, and other parts of the globe. According to some, the rise of politicians such as Trump in the US,

Bolsonaro in Brazil, Le Pen in France, and Meloni in Italy signals a new wave of far-right if not neo-fascist politics. If so, this political movement may be in reaction to a stage A or stage D situation that the US and global economies could be facing now. A stagnant economy could be revived by greater levels of public or private investment. If private investment is feasible due to a lack of forthcoming innovations, then public investment in productivity enhancing measure such as building better roads, mass transit systems, ports, and school buildings would be an alternative.⁸ Such an approach would be one that harkens back to that taken in the US in the 1930s. On the other hand, if neoliberalism has outlived its usefulness, then greater austerity through tax and governmental spending cuts to boost the surplus is possible if deemed necessary by the capitalist class. In this case, political repression against any backlash by the public against such tough measures is a possibility. It will be interesting to see in which political direction the economic long cycle may take us.

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⁸ As Lambert (2020c) writes, a lot of major innovations have developed due to either direct government research or government sponsored research at universities because governments can afford greater risks in doing lab and testing work. Also, a lot of corporate research is mostly on research on things such as product design (ornamental patents), packaging, or to develop trademarks. The latter often are not considered substantive innovations by most. One can also speculate as to whether the greater level of government involvement in R&D in the 20th Century has shortened the long cycles by accelerating the pace of innovation versus the pace of the 19th Century.

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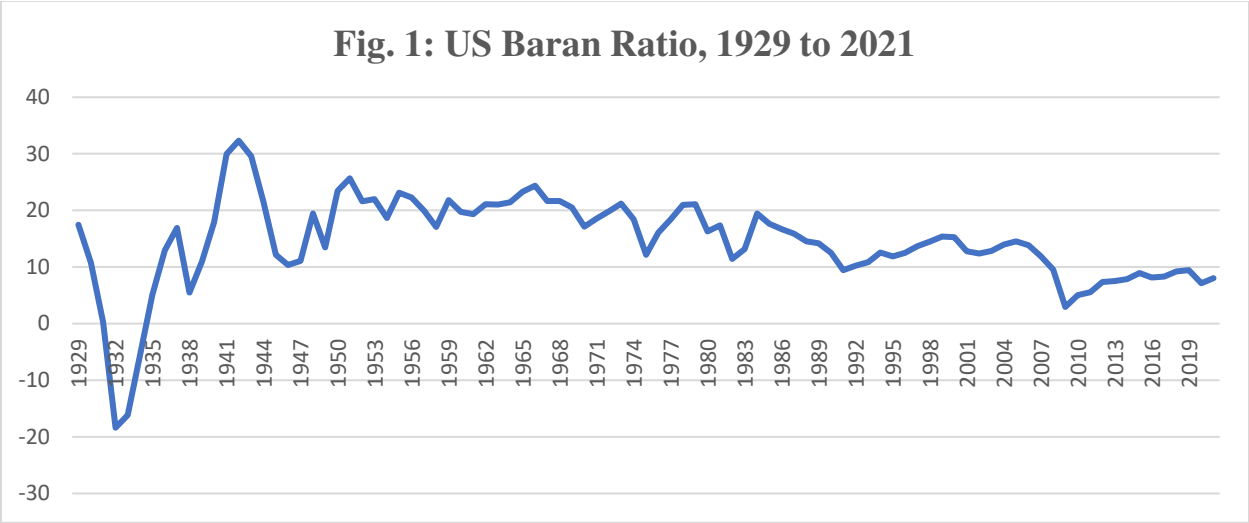
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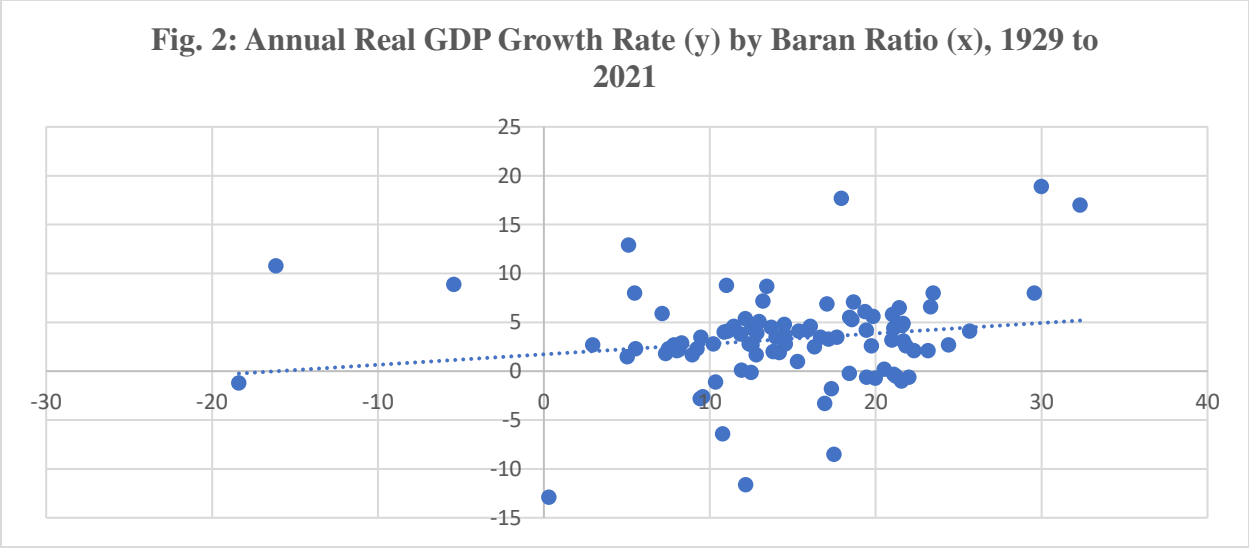
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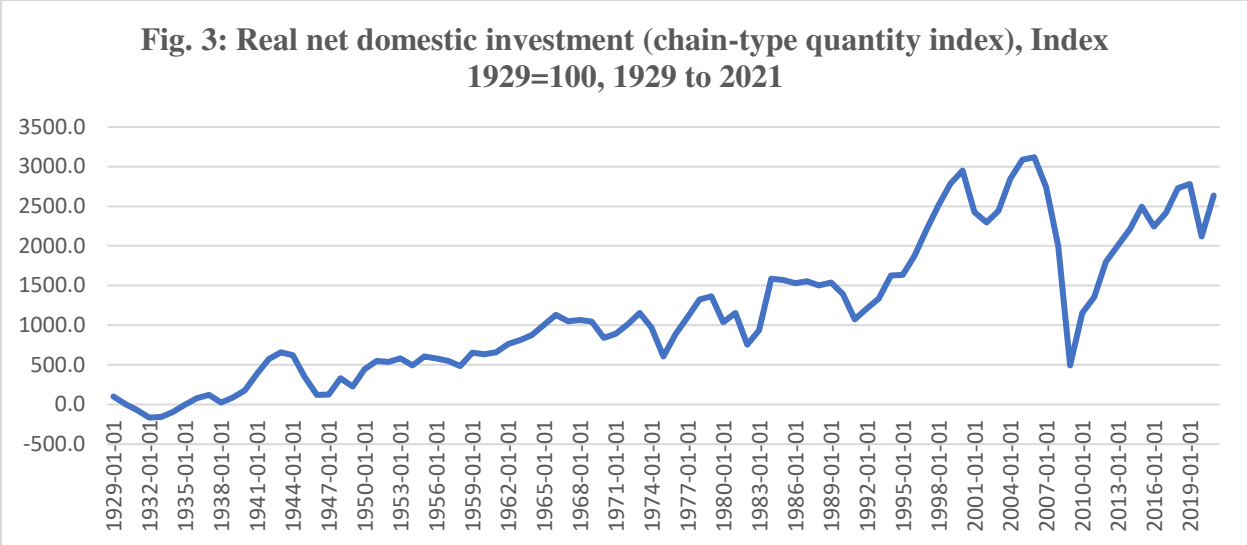
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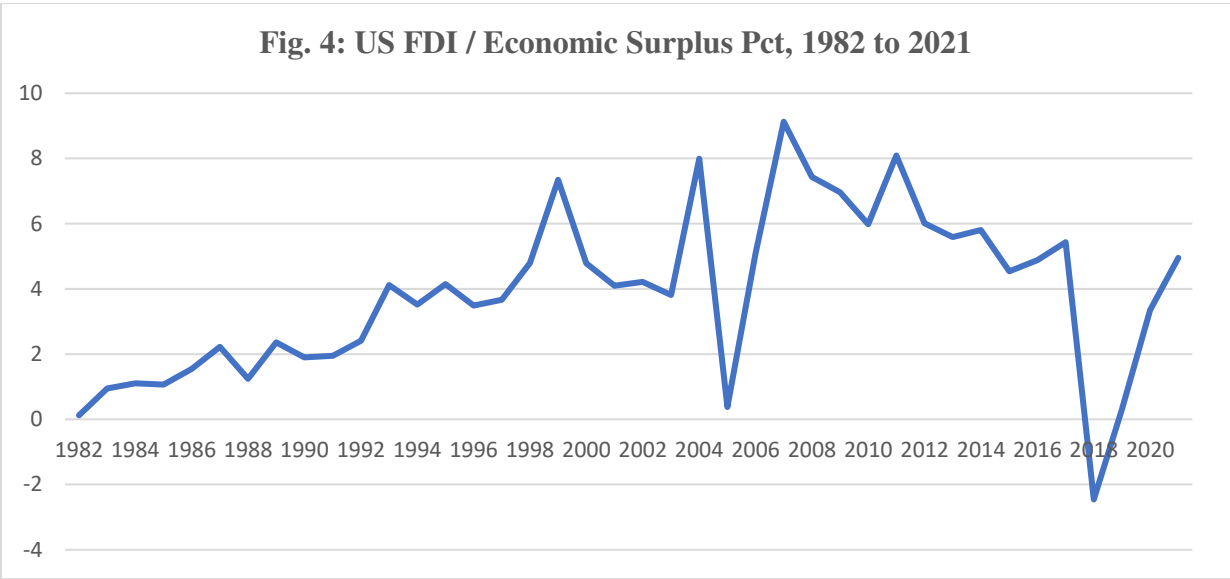
Source: U.S. Bureau of Economic Analysis, "Table 5.2.5. Gross and Net Domestic Investment by Major Type" (accessed Sunday, May 14, 2023); "Table 1.10. Gross Domestic Income by Type of Income" (accessed Sunday, May 14, 2023); and for tax revenues, Chantrill (2023), <https://www.usgovernmentrevenue.com/>.



Source: Estimates from Figure 1 and from U.S. Bureau of Economic Analysis, Real Gross Domestic Product [GDPC1], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/GDPC1>, May 14, 2023.

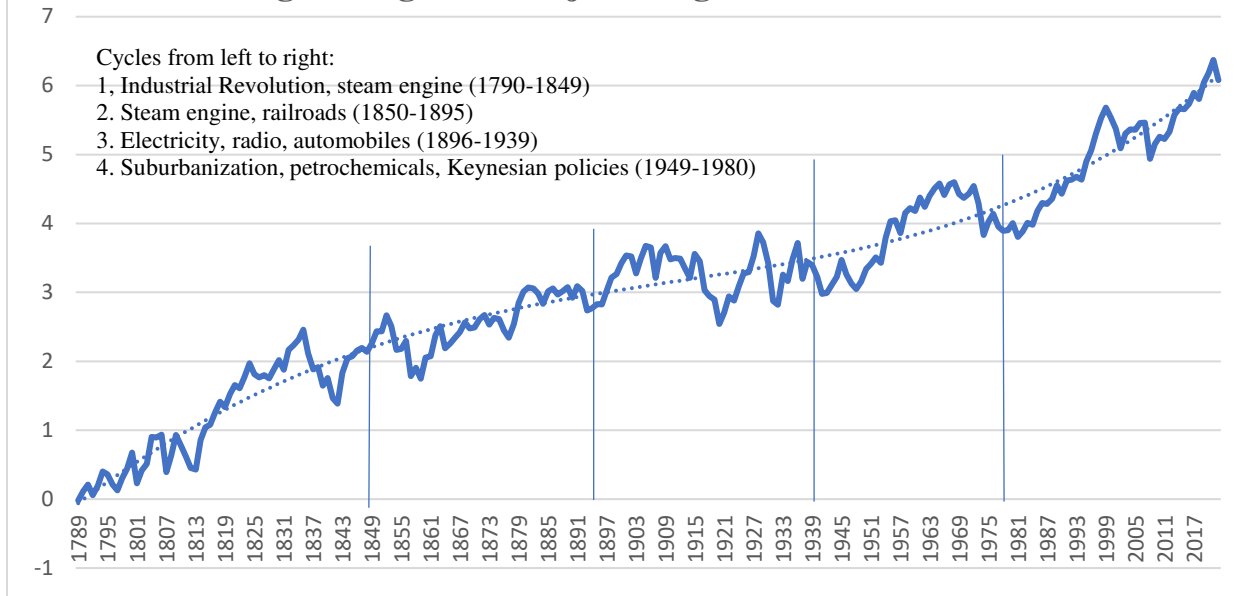


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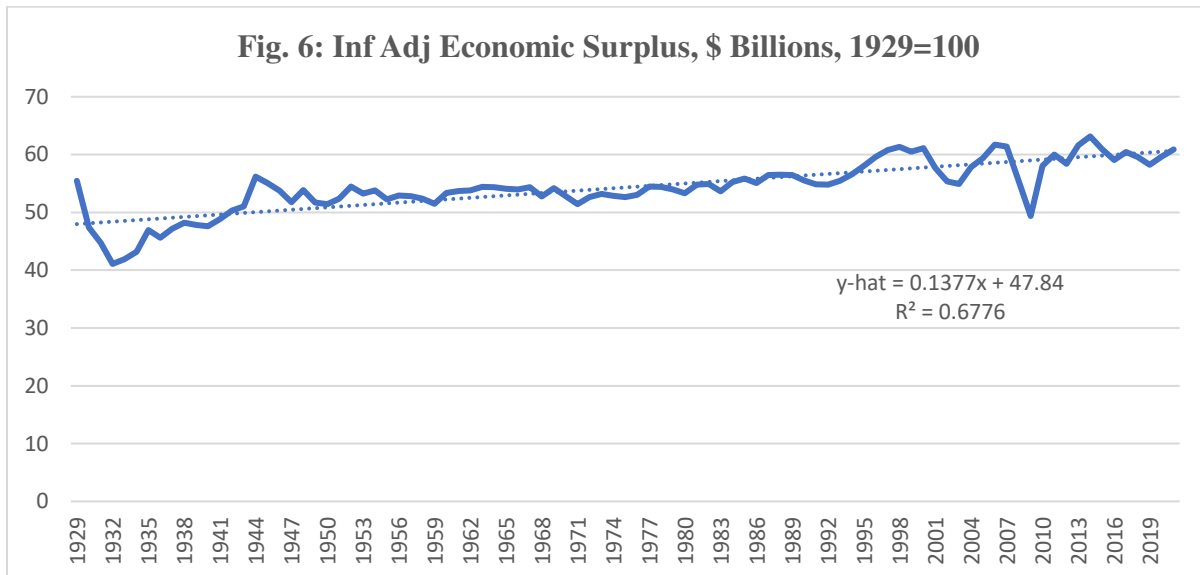
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Fig. 5: Log of Inf Adj Closing Annual Value S&P

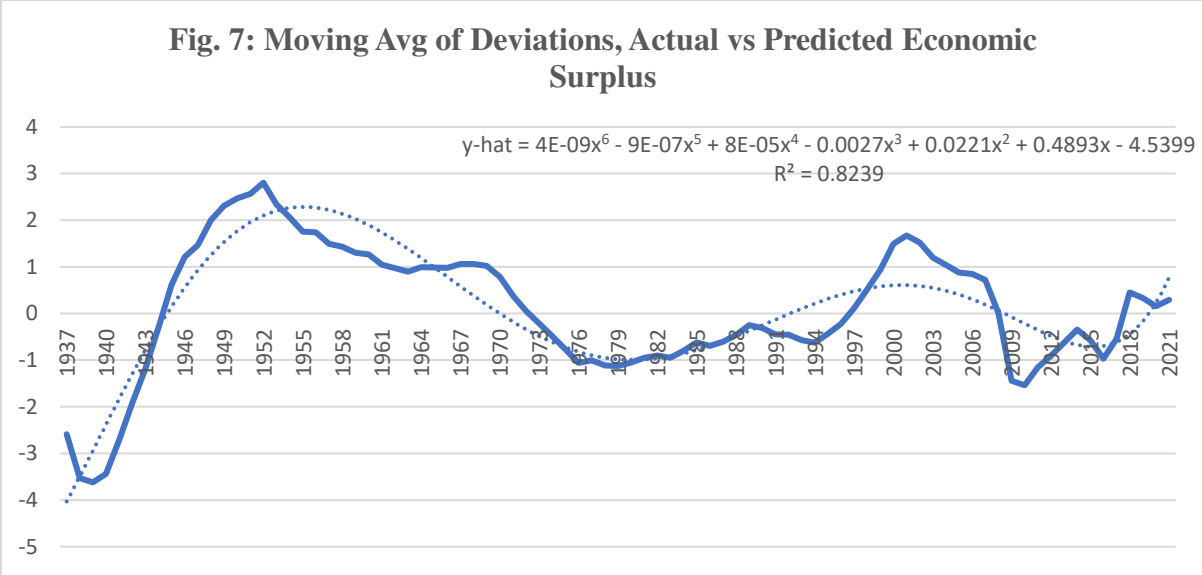


Source: S&P Composite Price Historical Data, 1895 to 2022, from Robert Shiller's datasets site (<http://www.econ.yale.edu/~shiller/data.htm>) and Stooq.com (<https://stooq.com/q/d/?s=^spx&i=y&l=6>) adjusted for inflation by CPI estimates from the Federal Reserve Bank of Minneapolis (<https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1800->).

Fig. 6: Inf Adj Economic Surplus, \$ Billions, 1929=100



Source: U.S. Bureau of Economic Analysis, "Table 1.10. Gross Domestic Income by Type of Income" (accessed Sunday, May 14, 2023); and for tax revenues, Chantrill (2023), <https://www.usgovernmentrevenue.com/>.



Source: Derived from Figure 6 by author.

Table 1—2SLS Regression

Dependent Variable: Moving Average of Deviations of Real Economic Surplus

Independent Variables:

| | b (RSE) |
|--------------------|---------------------|
| MA Dev Baran Ratio | 0.19** (0.022) |
| MA Dev K/Wp | 0.002** (0.0003) |
| Season | 0.71** (0.06) |
| Constant/Intercept | -1.67 |

r-squared = 0.76

**p<0.01

*p<0.05

Fig. 8: MA Inf Adj NOS + Total Taxes (y) by Season (x) Rearranged Chronologically

