Long Wave Economic Cycles, Political Realignment Elections, and the Baran Ratio

Thomas E. Lambert, PhD
Applied Economist
College of Business, University of Louisville
Louisville, KY 40292
502-852-7838
Thomas.Lambert@Louisville.edu

Abstract: This exploratory paper briefly outlines the idea and development of the economic surplus concept at the macroeconomic level. The notion of a residual amount of output or income over and above what is necessary for a society's necessary and useful 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 developed, and these two concepts show some parallel but also divergent patterns. The monopoly capital view of overaccumulation of surplus as a cause of long-term stagnation is somewhat supported in the long wave analysis, and this result hints at the prospect of dramatic political changes through possible political realignment elections over the next few years if the US and global economies are at the end of a current long wave cycle or at the beginning of a new one.

JEL Codes: B22, B24

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

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1. 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 ("Marshallian surplus"). 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 also 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, Thorstein Veblen, Antonio Gramsci, Pierro Sraffa, Michael Kalecki, John Maynard Keynes, and Joan Robinson. Social position matters when it comes to social provisioning or how the social surplus is allocated. 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 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 that only help the interests of large businesses. 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 (1966), 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 are often wasted on grand palaces, temples, cathedrals, conquest, 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. A section of Sweezy's 1942 book addresses the question, "Is Fascism Inevitable" to which he gives an answer of not necessarily, but he also cites fascist Germany and Italy as examples of nations which have transitioned from capitalism to fascism due to prolonged economic and political crises after World War I. Many consider the Great Depression as the end of one long wave and the beginning of another.

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 real value to an economy. Innovations are usually of the type that have little usefulness 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 (1964) 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. Insufficient investment can lead to an economic crisis. However, as Baran and Sweezy write, outlets for productive investment are often not pursued, and therefore a portion of the economic surplus is wasted.

This exploratory research paper proceeds as follows. The next section introduces the Baran Ratio as a method to measure investment rates that come from the economic surplus 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 many of their roots in heterodox economics, and an analysis section shows how the two concepts are compatible. Also examined is how closely so-called US political realignment elections coincide with the end of one long-wave and the beginning of a new one. Based on the analyses presented, there is some speculation on whether the next few years will be those of unusual political changes if the US is currently at the end of a long cycle or the beginning of a new one. In the conclusion section, there are some recommendations for further research and some thoughts on how well the Baran Ratio and surplus overaccumulation correlate with long wave cycles, and there is speculation on whether the US recently has experienced or will experience a major political realignment election.

2. 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

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

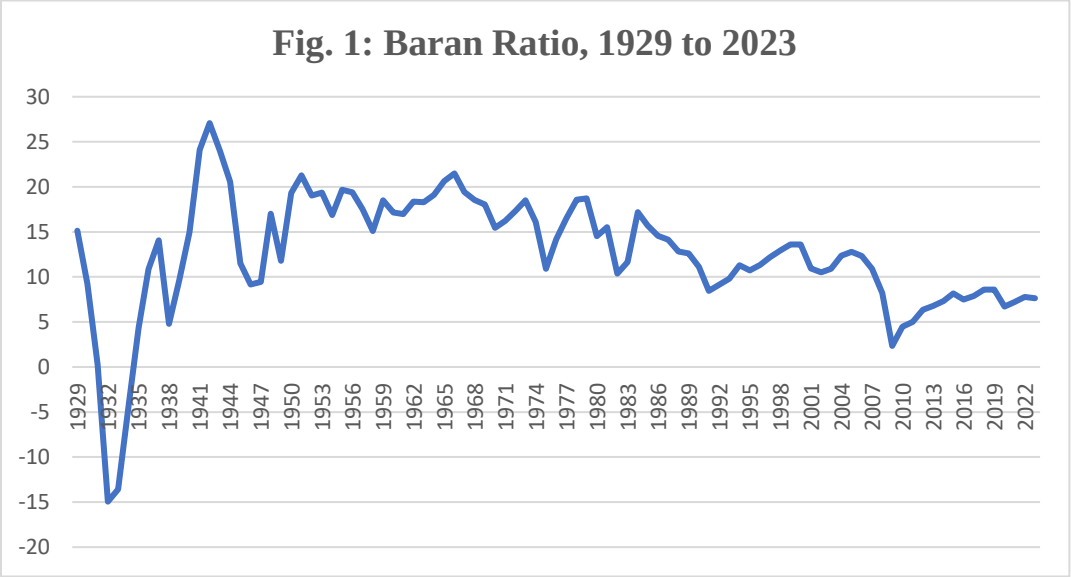
Baran does not arrive at this concept. It is a construct of Xu, and he writes that "relatively high Baran Ratios indicate that the ruling class is interested in capital accumulation, while persistently low and/or decreasing Baran Ratios imply a gradual transition to slow accumulation or stagnation" (page 28). From this premise and his reading of Baran's works, Xu claims that the

Baran Ratio can identify trends toward greater or less accumulation. Any surplus not used for "productive investment" (e.g., housing, manufacturing equipment, roads, bridges, etc.) is surplus that is mostly wasted. Xu also shows that from 1990 to 2015 a nation's average economic growth is higher given a higher BR such as those estimated for India and China. These are compared to those of Europe (the UK, France, Germany and Italy) and the US which 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 a few decades before and during the industrial revolution in Britain. The notion of investment coming from economic surplus as embodied in the Baran Ratio is a Marxian one as opposed to a Keynesian one. The latter school of thought generally believes that investment yields surplus whereas Marxian thought assumes generally that surplus yields investment. The Marxian notion of using money to create a commodity which in turn will yield money but more money than the money invested (M-C-M') illustrates the logic of capitalist circulation.[2]

When net operating surplus (NOS) is added to all government tax revenues (local, state and federal from the US Bureau of Economic Analysis) and in turn when this sum is added to estimates by Joseph D. Phillips from the appendix of Baran and Sweezy (1966, page 389) regarding waste in advertising, legal services, retailing or "waste in distribution" and finance/insurance/real estate industries (F/I/RE)), new and updated estimates from 1964 to 2023 (US Bureau of Economic Analysis 1948 to 1987, 1988 to 1996, and 1997 to 2023, and Galbi 2008) can be used to extend the Phillips work to create an updated listing of Baran and Sweezy's

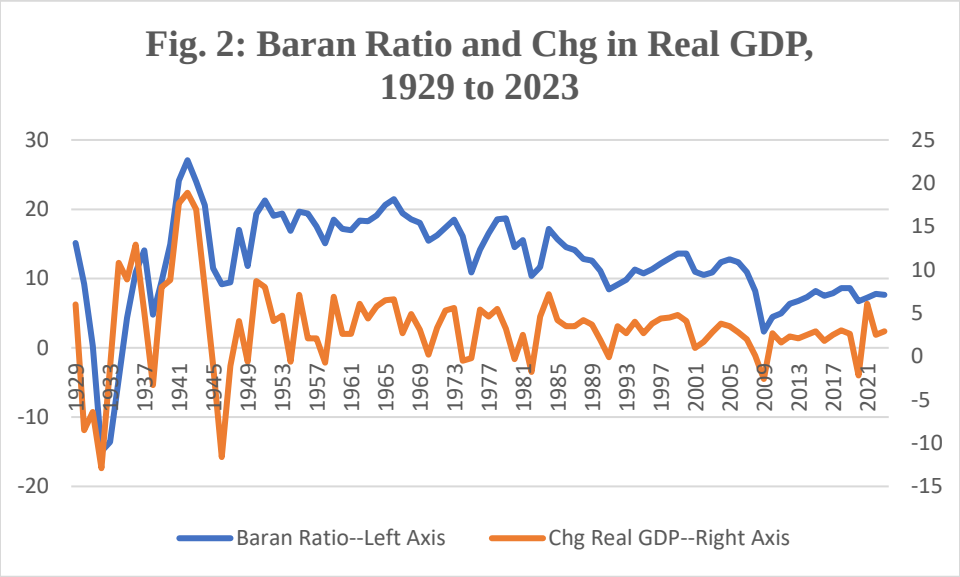
[2] For the purposes of this paper the question of whether investment creates surplus or surplus creates investment is not so important as trying to discover a significant link between the two over long economic cycles and how this linkage may play out in US politics and other matters.

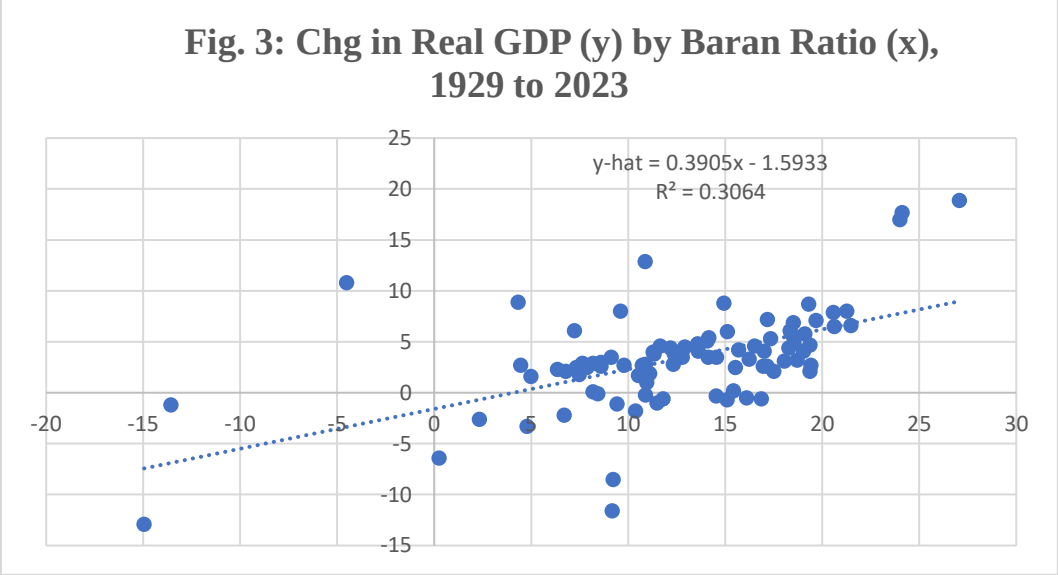
economic surplus. These calculations make calculating a Baran Ratio for the US from 1929 to 2023 possible by taking US net domestic investment (private and public) as a percentage of this economic surplus.[3] The economic surplus of NOS + Total Taxes + "waste" calculations are an attempt to reproduce and update the Baran and Sweezy concept as closely as possible as a comprehensive measure. A list of the estimates for economic surplus as a portion of GDP are provided in the appendix. As one can see, and as predicted by Baran and Sweezy, the economic surplus mostly rises over time.



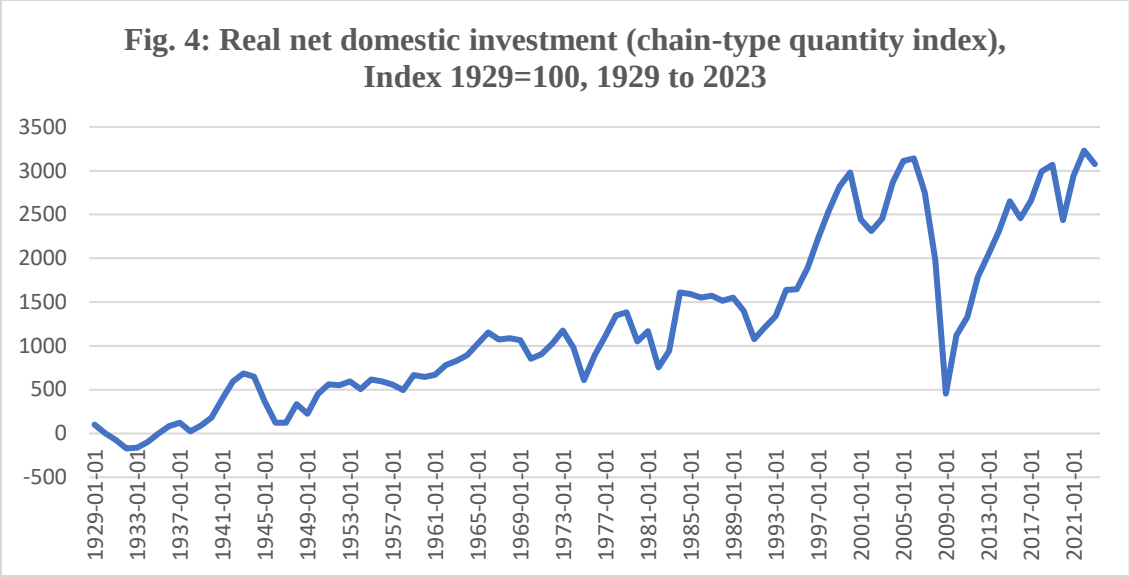
[3] The US Bureau of Economic Analysis (BEA) defines net domestic investment as "The sum of gross private and public domestic investment, the change in private inventories, and government gross investment less capital consumption" and defines net operating surplus as "A profits-like measure that shows 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). 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. Although the measure of total taxes include those for transfer payments, this paper still considers these forms of taxation exploitative of labor in that most of these taxes come from members of the working class to support others of the working class or in some cases the upper class. Instead of such a transfer payment system, a less exploitative system would redistribute a greater share of income from the upper class to lower classes. Total federal, state, and local taxes are also used by Baran and Sweezy in their book as part of the economic surplus. For advertising spending beyond 2007, which is where the Galbi data ends, projections into the future are made using a linear trend line. For retailing and legal services, payroll numbers are used using US BEA estimates just as in the Baran and Sweezy book.

Source: Baran and Sweezy (1966); U.S. Bureau of Economic Analysis, "Table 5.2.5. Gross and Net Domestic Investment by Major Type" (accessed Tuesday, August 5, 2025); "Table 1.10. Gross Domestic Income by Type of Income" (accessed Tuesday, August 5, 2025); US Bureau of Economic Analaysis, Compensation of Employees by Industry, 1997 to 2023; US Census Bureau's County Business Patterns for US Industries, 1964 to 1996; and Galbi 2008.

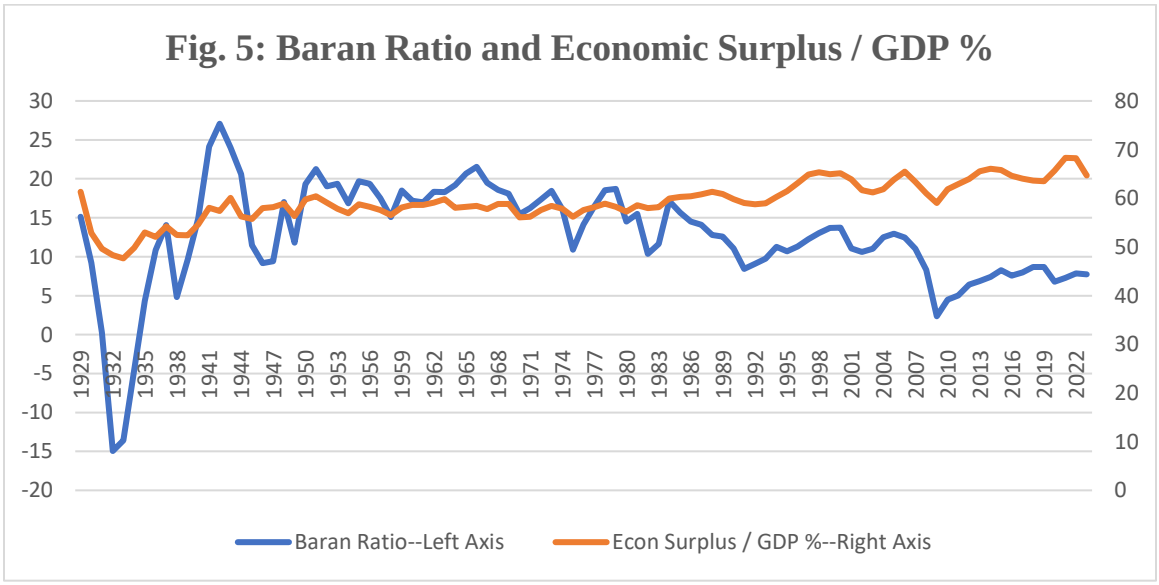




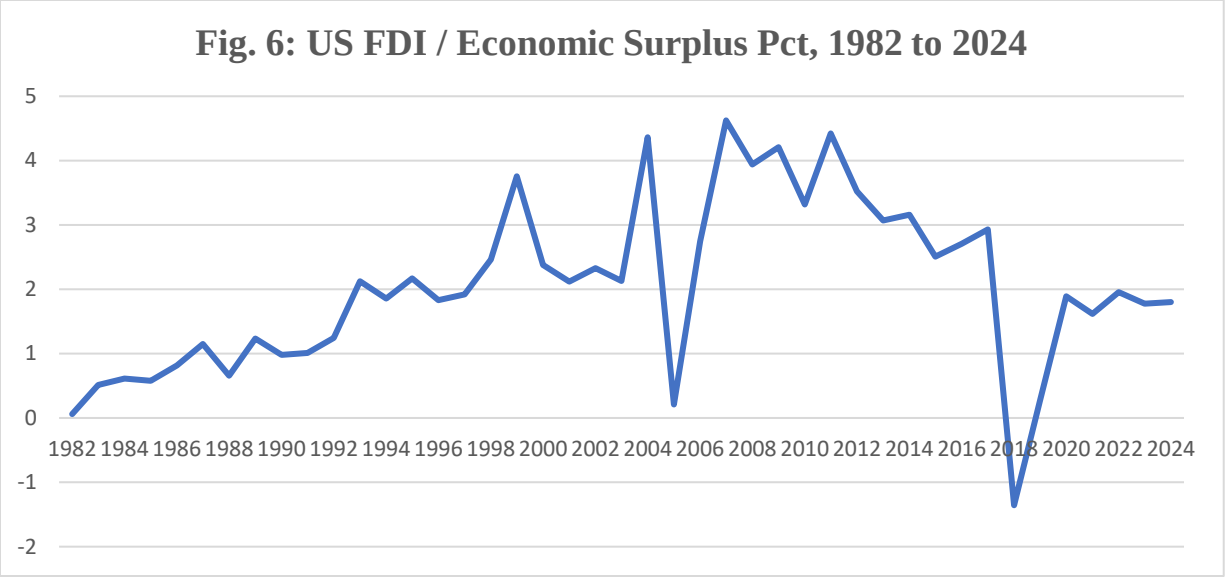
Source for Figures 2 and 3: Estimates from Figure 1 and from U.S. Bureau of Economic Analysis, "Table 1.1.1. Percent Change From Preceding Period in Real Gross Domestic Product" (accessed Wednesday, August 6, 2025).



Source: U.S. Bureau of Economic Analysis, Real net domestic investment (chain-type quantity index) [W171RA3A086NBEA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/W171RA3A086NBEA , August 6, 2025.



Source: Baran and Sweezy (1966); U.S. Bureau of Economic Analysis, "Table 5.2.5. Gross and Net Domestic Investment by Major Type" (accessed Tuesday, August 5, 2025); "Table 1.10. Gross Domestic Income by Type of Income" (accessed Tuesday, August 5, 2025); US Bureau of Economic Analaysis, Compensation of Employees by Industry, 1947 to 1987; 1987 to 1996; and 1997 to 2023; and Galbi 2008.



Source: U.S. Bureau of Economic Analysis, "Balance of Payments and Direct Investment Position Data" (accessed Wednesday, August 6, 2025). https://apps.bea.gov/iTable/?ReqID=2&step=1#eyJhcHBpZCI6Miwic3RlcHMiOlsxLDIsMyw0LDUsNywxMCwxMF0sImRhdGEiOltbIlN0ZXAxUHJvbXB0MSIsIjEiXSxbIlN0ZXAxUHJvbXB0MiIsIjEiXSxbIlN0ZXAyUHJvbXB0MyIsIjEiXSxbIlN0ZXAzUHJvbXB0NCIsIjMxIl0sWyJTdGVwNFByb21wdDUiLCI5OSJdLFsiU3RlcDVQcm9tcHQ2IiwiMSwyIl0sWyJTdGVwN1Byb21wdDgiLFsiMTMsMTQsMTUsMTYsMTcsMTgsMTksMjAsMjEsMjIsMjMsMjQsMjUsMjYsMjcsMjgsMjksMzAsMzEsMzIsMzMsMzQsMzUsMzYsMzcsMzksNDAsNDEsNDIsNDMsNDgsNDksNTIsNTUsNTYsNTgsNjAsNjEsNjUsNjYsNjgsNzEiXV0sWyJTdGVwOFByb21wdDlBIixbIjIiXV0sWyJTdGVwOFByb21wdDEwQSIsWyIyIl1dXX0=

Figure 1 shows that after a spike during World War II and subsequent postwar dip, the Baran Ratio roughly hovers at a percentage close to although not quite as high as that of the World War II portion during the 1950s, 1960s, and 1970s. Beginning in the 1980s, it goes into decline and has continued to decline even more so in the 21st Century. BRs are higher in the post war era and through the 1970s until an overall downward trend develops in the 1980s. Xu would conclude that these trends reflect stagnation, and the preponderance of the economics literature shows that in the US that the economy grew more slowly during the 1980s and afterward when compared to the post-World War II period through the 1970s. Figure 2 shows how Baran Ratio compares to real GDP growth rates from 1929 to 2023, and Figure 3 shows the relationships as a scatterplot. Each figure shows that there is some parallel movement between the Baran Ratio and annual changes in real GDP (RGDP) from 1929 to 2023. Figure 2 also shows corresponding declines between the Baran Ratio and economic growth during the period of the 1980s and beyond, and Figure 3 also demonstrates a positive correlation between the ratio shown in Figures

1 and the corresponding real GDP growth rates from 1929 to 2023. As the BR increases, generally so does the rate of real GDP growth rate on average. Figure 4 illustrates, real net, public and private investment has been increasing over the decades even though over the last 15 years or so it has not reached the levels of what exists before the Great Recession of 2008-09. As Figure 1 suggests, it makes up a smaller and smaller share of the economic surplus as indicated by the Baran Ratio. Figure 5 plots the Baran Ratio on the left axis and the economic surplus as a percentage of GDP from 1929 to 2023 on the right axis, and as can be seen, there begins a divergence between the BR and the economic surplus beginning around the 1980s.

Again, and as Baran and Sweezy 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, exotic financial instruments and insurance, packaging, trademarks, and cosmetic changes in the appearance of goods, and 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). According to many different writings, it is during the 1980s that financialization and speculation in financial instruments begin to overtake many other industries in the US, and industries in finance and insurance do not require high levels of tangible, fixed investments as do, for example, manufacturing and transportation. Increasing foreign direct investment (FDI) may explain some of the fall in the BR for the US over the decades, yet Figure 6 shows that US FDI is only a small percentage of the economic surplus during 1982 to 2024, a period when there has been claimed to be a great deal of "offshoring" of jobs by major US corporations. 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.

3. 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 are supposed to 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), Kondratiev 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)[4], an economic downturn occurs which is usually much worse than the typical recession.[5] For example, Kondratiev and other

[4] 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.

[5] For a fairly thorough review of different long wave cycle theories, see Bernard, Gevorkyan, Palley, and Semmler (2013). Ozouni, Katrakylidis and Zarotiadis (2018) do find empirical support for the existence of long waves among advanced capitalist nations using spectral and cross-spectral analysis. Goldstein (1999 and 2021) also finds support for Kondratiev and Kuznets cycles using advanced econometric methods. Hu, Liu, and Gao (2023) argue that long waves exist and can be seen as changes in the modes of production over time. Moses (1968), Silverberg and Verspagen (2003), and Solomou (1986 and 1998) among others are not so sympathetic to the arguments for long wave theories because of either their irrelevancy in the post-World War II economy or the entire 20th Century (the data do not fit any type of real wave) or in the difficulty of pinpointing clusters of innovation. Schumpeter is claimed as not having enough rigor in his analysis of actually being able to detect clusters of innovation as he suggests. This paper, however, is not interested in the merits of neo-Schumpeterian analysis as engaged in by some more mainstream economists and has a more traditional heterodox focus, especially regarding the neo-Marxian analysis and use of the economic surplus by Baran (1957) and Baran and Sweezy (1966). Whether there

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).

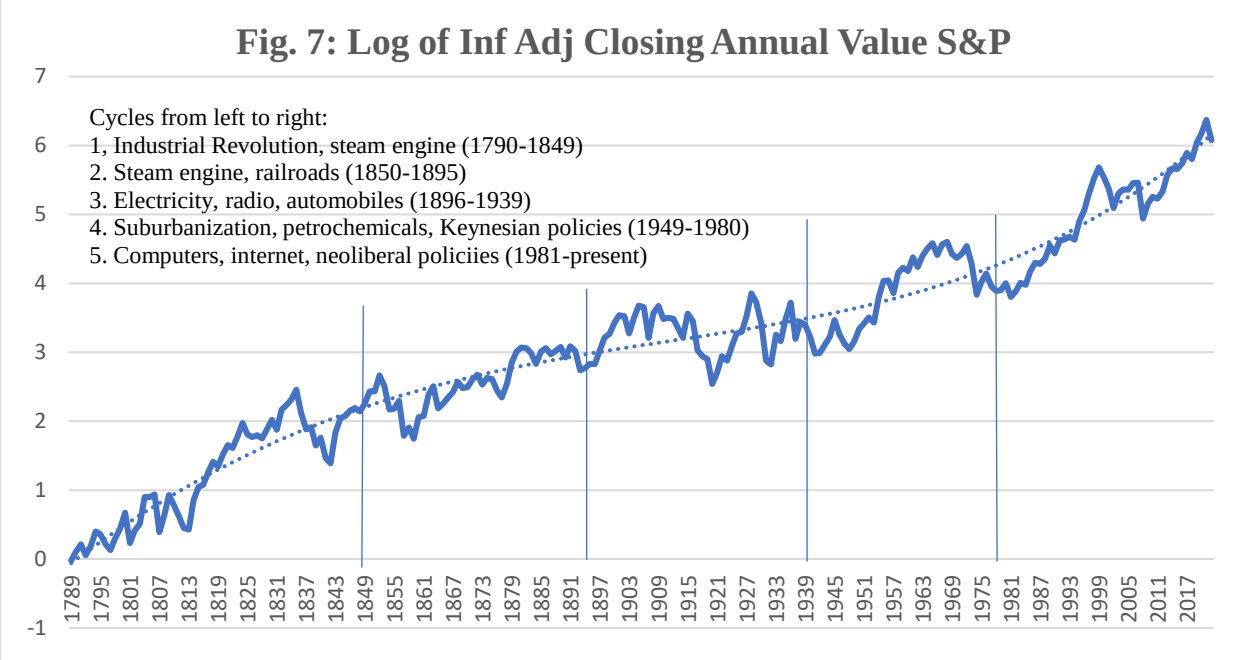
Schumpeter (1939) adopts Kontradiev's long cycle theory and believes that each epoch ushers in a wave of "creative destruction" in which older forms of businesses and technologies are replaced by others. Schumpeter believes that such upheaval and change are a benefit of capitalism advancing humanity's progress, although it comes with a price as older industries falter and shed workers as new industries arise and grow. The transition period can be painful. On the other hand, Kuznets believes that Schumpeter's analysis lacks real proof, and that it is often difficult to find or classify clusters of innovation that lead to a new cycle starting. Yet Kuznets admits that Schumpeter's ideas are somewhat useful and thought provoking.

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. Baran and Sweezy (1966) also write that there is little incentive for many firms to innovate because to do so would be to replace a lot of fixed investment in plant and equipment that has not fully depreciated. The depreciation

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are clusters of innovation or not in long waves is not so much important as finding whether the Baran Ratio is correlated with real economic surplus growth and accumulation in traditionally defined long wave cycles. The changes in economic surplus over a long wave, of course, could be related to the rise, growth, and saturation of clusters of innovation.

expense write-offs created by such fixed investment often outweigh any benefits of developing new products or new methods of production. 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. Although they acknowledge the imprecision of Schumpeter's methods of analysis on long waves, they believe Schumpeter's work is useful as a general framework.



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-).

Figure 7 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 or accumulation. That is, an index which shows the appreciation of capitalist accumulation possibly can act as one indicator of how well the economy is performing. 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,

Kleinknecht, Mandel, and Wallerstein 1992, Mandel 1995).[6] The time 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 use of the steam engine, railroads and steel markets. Yet there are no viable new markets forthcoming for further investment of the nation's economic surplus by the capitalist class. In Chapter 8 of their book, Baran and Sweezy characterize the steam engine, railroads, and automobiles as "epoch making" innovations even though in a footnote on page 230 they write that they do not believe that Kondratiev's long wave cycle has much credibility. Yet their examples of major innovations which eventually reach a saturation point of investment and profitability, which later is followed by stagnation, appear to be some type of long-wave/term cycle theory especially when they draw some inspiration from Schumpeter, a believer in long waves. Figure 7 is created in the spirit of Baran and Sweezy's chronology of epoch making innovations in their book.

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 7 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 possibly can be due to the fact that in the first few years of the 20th Century

[6] 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 long 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 capitalistic logic. Admittedly, however, it is not always easy to discern exogenous and endogenous effects. For example, some may consider 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 in that profit motives of big businesses and imperialism often underly the causes of such wars.

there is a rebound in railroad investment, a boom caused by World War I, and also before and after the war there is further innovation and growth of the automobile and its supporting industries of petroleum, tire manufacturing, etc. as well as suburbanization and increase in housing 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 6 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.

With the arrival of the Second World War, the Great Depression basically ends, and this starts a period of the governments of some nations trying to smooth out business cycles by using Keynesian macroeconomic policies from the 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, that disenchantment grows with such policies as economies throughout the globe begin to suffer from stagflation, or simultaneously high inflation and high unemployment. This in turn ushers in another possible wave in the 1980s, that of neoliberalism, and there is economic growth with the innovations of 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). O'Hara (2002)

characterizes an economy centering on the growth of "financialization" as a way to promote a long wave upswing but does not see it as viable, and in a paper a few years later concludes that neo-liberal policies are not doing much to help increase the accumulation of surplus (O'Hara 2010). New economic policies of freer markets and deregulation appear to work to spur economic growth in the 1980s and 1990s until the dot.com burst of 2001 and the Great Recession of 2008-09. Subsequently, there is slower growth in most world economies from 2009 and forward, and then another economic crash in 2020 with the global Covid-19 pandemic. These events and circumstances could be signaling the closing wave of a 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). In applying a time trend of a polynomial regression equation of degree 5 for the 5 waves shown in Figure 7, a strong goodness of fit measurement is obtained.[7] With the exception of the first wave, note that in Figure 7, the end of a long wave and the beginning of a new one correspond to a downturn and then an upturn in the S&P index.

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 7 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 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

[7] 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-hat = $-3E\text{-}12x^5 + 3E\text{-}09x^4 + 1E\text{-}07x^3 - 0.0003x^2 + 0.0539x - 0.1137$; r-squared = 0.9547

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, and there begins 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 most capitalist regimes, such as the New Deal in the US during the 1930s. The latter can be characterized as some type of an attempt to reform capitalism. Disillusionment with Keynesian "big government" policies and increases in the welfare state in the 1970s and the subsequent rise of neoliberal, "free market" polices 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 likely to materialize and that the discovery of and implementation of new ideas are 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 develops, 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. Nikolaos, Persefoni and Tsoulfidis (2022) develop models and differential equations that show that the growth rate of surplus value is important in deviations from long term economic growth and long cycles. Perez (2002) believes that the new technologies, inventions, and products that are part of new long waves trigger huge investments in those industries which later lead to financial bubbles. She believes that the bubble bursts when the industry begins to run out of steam or when the excessive hype surrounding some new industries or products is made apparent. An example would be the dot.com bust of the early 21st century. She uses the product life cycle to show how technologies go from an introduction to a

maturity stage. If enough products reach the maturity stage, there is some urgency to develop new products/ideas. 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 Italy and Germany between the world wars.

For this paper, pinpointing groupings of innovations that begin and characterize a long wave is not important. The preceding discussion is used for illustrating the concept of long waves. What is important for this paper is to try to determine if real investment as a portion of real economic surplus (the Baran Ratio) correlates with the movements of long waves of economic surplus or profitability. The latter probably could/should be linked to clusters of innovations that characterize a cycle, but trying to determine what are the innovations or whether they exist is not relevant to this paper. If the Baran Ratio correlates with long wave cycles, and if long wave cycles cause political and policy shifts within a society, then increasing or decreasing investment rates can imply possible future and substantive political changes.

4. Exploratory Analysis



Source: Derived from Figure 5 by author.

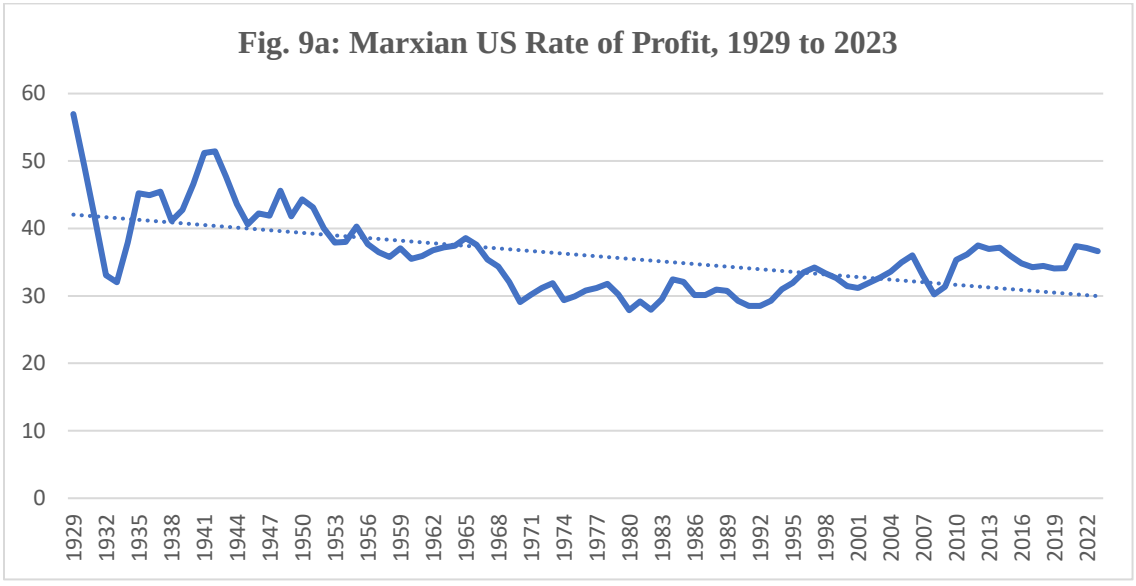
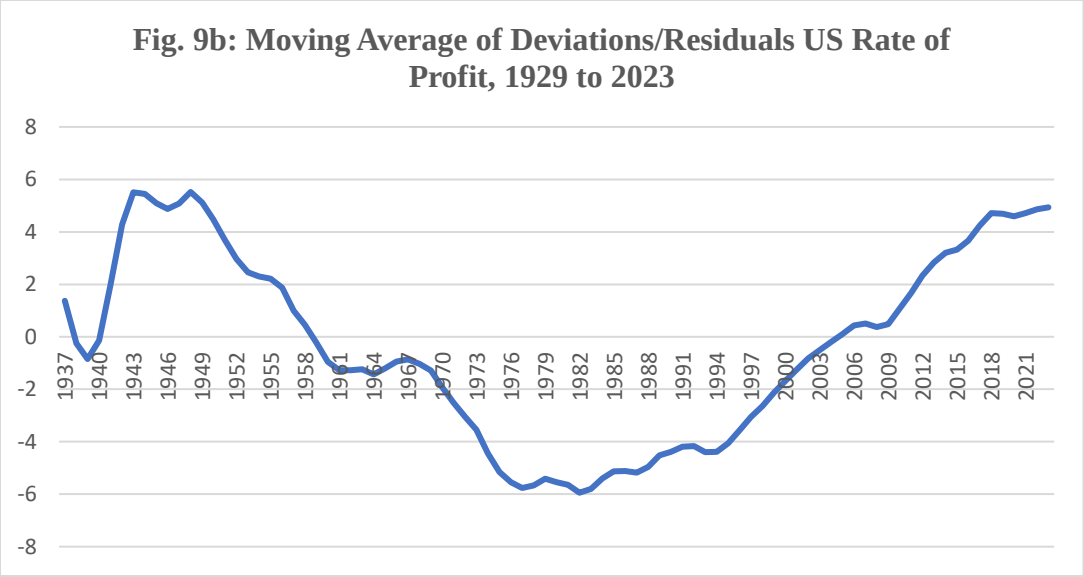
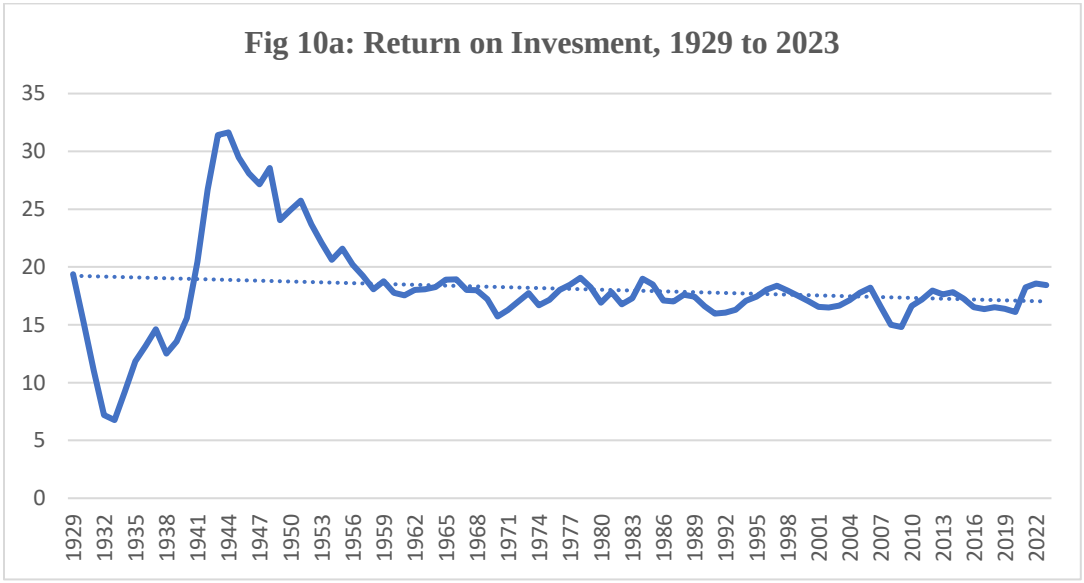


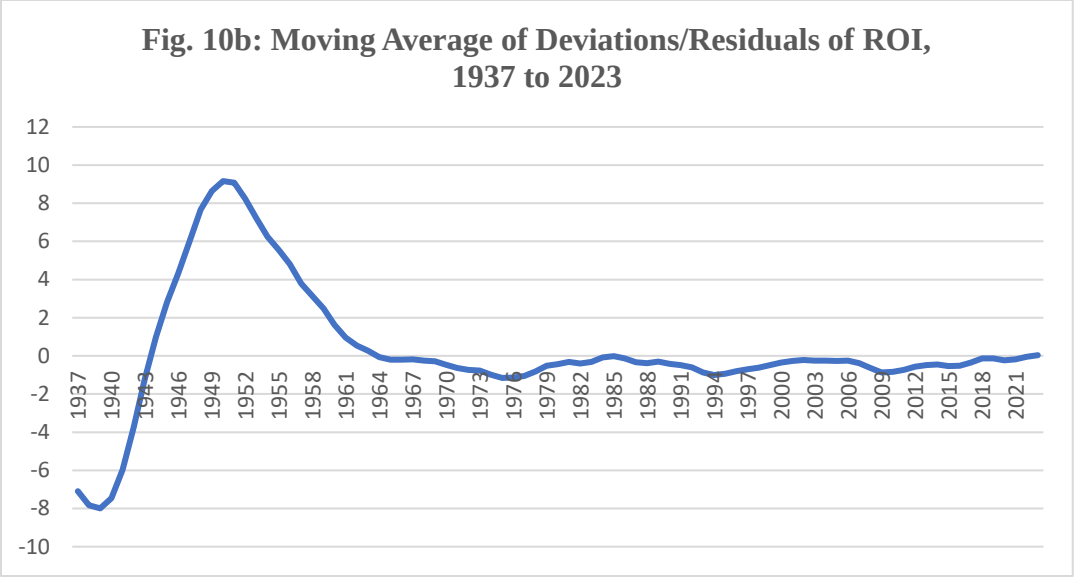
Table 1.10. “Gross Domestic Income by Type of Income” (accessed Tuesday, August 5, 2025); US Bureau of Economic Analysis, 1929 to 2023.



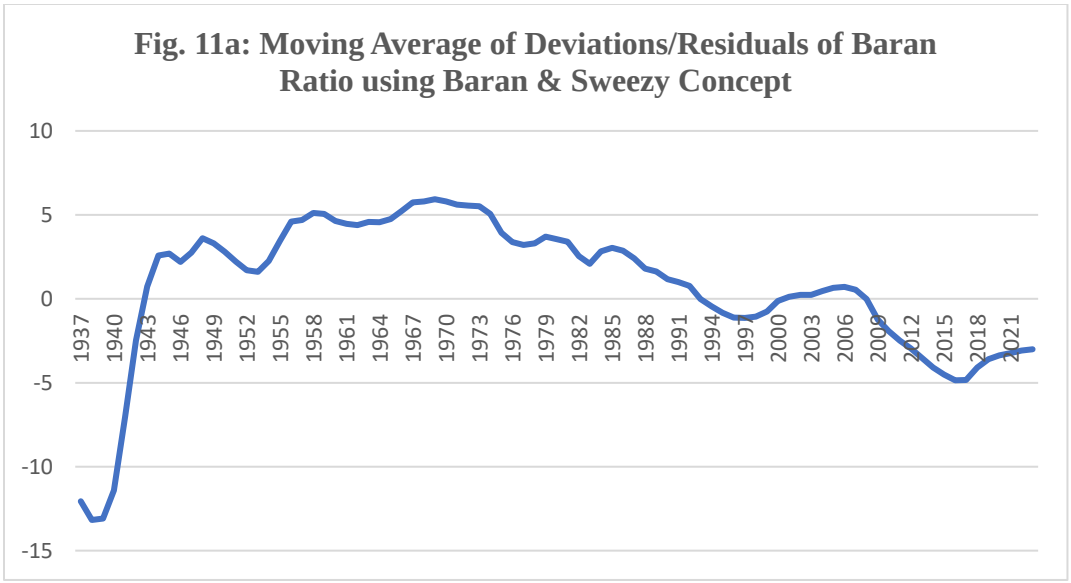
Source: Derived from Figure 9a.



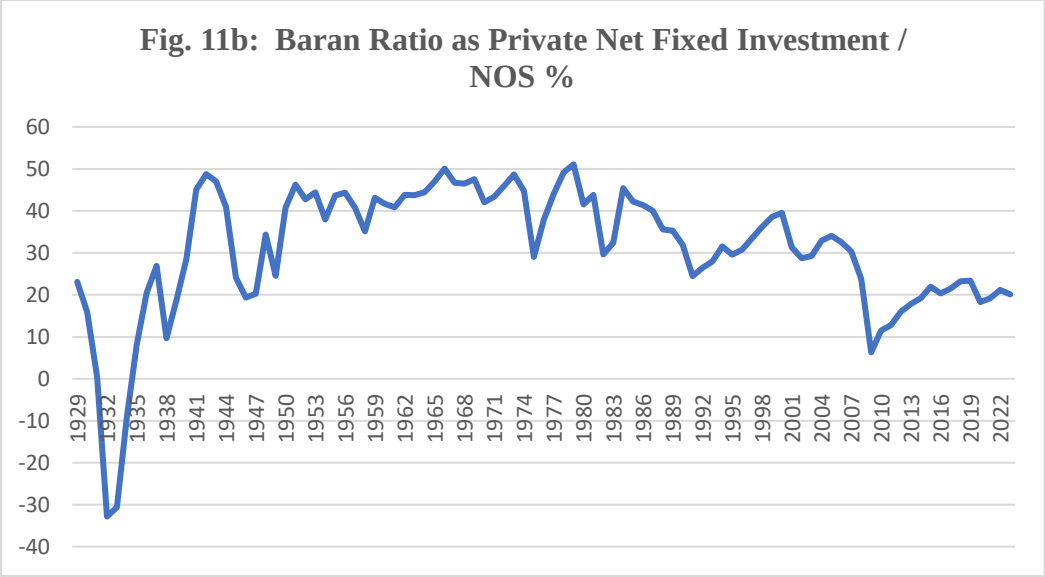
Source: U.S. Bureau of Economic Analysis, "Table 2.3. Historical-Cost Net Stock of Private Fixed Assets, Equipment, Structures, and Intellectual Property Products by Type" (accessed Wednesday, August 20, 2025), and Table 1.10. Gross Domestic Income by Type of Income" (accessed Tuesday, August 5, 2025); US Bureau of Economic Analysis, 1929 to 2023.



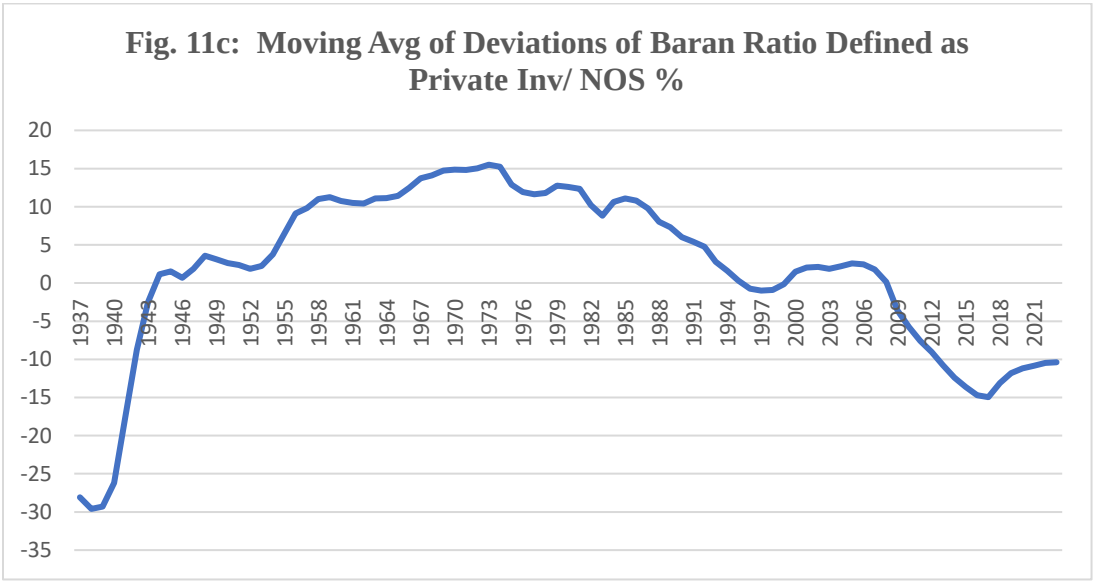
Source: Derived from Figure 10b.



Source: Derived from Figure 1.



Source: "Table 5.2.5. Gross and Net Domestic Investment by Major Type" (accessed Tuesday, August 5, 2025); "Table 1.10. Gross Domestic Income by Type of Income" (accessed Tuesday, August 5, 2025).



Source: Derived by author from Figure 11a.

To try to see if long waves of some type of accumulation can be modeled and analyzed using the Baran Ratio, this paper analyzes three types of accumulation: 1) the economic surplus as a percentage of gross domestic product (GDP) as defined by Baran and Sweezy, 2) rates of profits (a traditional Marxian focus), and 3) return on investment (ROI). The first economic surplus concept is the one that is developed above and shown in Figure 5. This can be labeled as the Baran and Sweezy economic surplus. The second one, rate of profit (ROP), is calculated by

taking net operating surplus (NOS) and dividing it by the sum of capital consumption and compensation to employees on an annual basis (US BEA 1929-2023). In other words, ROP = s / (c + v) where s is the economic surplus, c is organic capital, and v is variable capital using traditional Marxian terms. Michael Roberts and others dispute the Baran and Sweezy notion of an ever increasing economic surplus by claiming that the Marx's notion of the falling rate of profit is a valid one and still relevant, although others disagree (Roberts 2016). ROI is measured as taking NOS as a percentage of total net fixed assets on an annual basis (US BEA 1929-2023), which is what Shaikh calls a return on profit (2016). The higher the ROP or ROI, higher rates of accumulation are assumed, although too much investment can lead to lower ROP or ROI.

Regarding the economic surplus concept, 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 been found in the course of developing this paper that tries to establish whether a concept like the Baran Ratio is correlated with long wave cycles. Similar to a method used by Kondratiev (1984), this measurement of real economic surplus as a portion of national income is plotted, and a linear trendline is superimposed on it so that deviations (predicted minus actual values or error terms of the trendline regression equation using coded years (1, 2, 3, etc.) as predictors) from trend can be obtained (see Figure 8), and these residuals in turn can be smoothed by using a 9-year moving average[8]. Figure 8 shows the moving average of the Baran and Sweezy economic surplus as a percentage of GDP as moving in 3 possible waves. The first wave corresponds to the Second World War and peaks during the 1950s and reaches a minimum in the late 1970s and

[8] 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. At the same time, as others have pointed out, using moving averages can yield long wave cycles from shorter ones through simple mathematics without regard as to whether there is any empirical grounding of the long waves. Yet, using 9- or 10-year moving averages does control for the typical, short term business cycle of 7 to 10 years.

early 1980s. The second wave roughly corresponds to an upward movement in the graph during the 1980s with a peak around 2003 and a low point around 2010 and 2011, years which are somewhat close to an actual GDP peak of 2007 before the Great Recession of 2008-2009. An upswing after 2011 indicates another possible wave beginning.

Figure 9a plots US ROP over time and Figure 9b displays the 9-year moving average of the residuals of using coded year to predict ROP values from 1929 to 2023. Figure 9a shows that overall there has been a decline in the US ROP since 1929 as traditional Marxists would claim. Figure 9b displays a long wave of growth and then decline from the 1940s to the late 1970s and early 1980s similar to Figure 8 with a new wave of growth perhaps starting in the 1980s.

However, unlike Figure 8, there does not appear to be a new wave forming in the 21st Century. Instead, the graph appears to indicate that the neoliberal era is showing some growth in the ROP when compared to trend. And in Figure 10a, it appears that ROI does not change that much after the late 1940s and early years of the 1950s as it becomes almost constant, and Figure 10b does not display any real pattern of waves in the moving averages of ROI. There is only constant and either very low or negative ROI compared to trend after the 1940s.

To see how investment changes with the movement of the moving average of the deviations of the three measurements of accumulation, Figure 11a shows the moving average (9 years) of deviations of the US Baran Ratio, 1929 to 2023 which in this diagram is annual US net fixed investment (private and public) for each year divided by the total economic surplus calculated above, 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 this version of the Baran Ratio which uses an economic surplus concept like the one used in the 1966 book by Baran and Sweezy. The notion is that as the Baran Ratio trends

upward on average in a long wave cycle, so does the economic surplus. As it trends downward, so should the surplus on average. The highest Baran Ratio deviation values appear in the 1940s to the early1970s during the so-called "Golden Age" of capitalism in the US. After that, the moving average of the Baran Ratio deviations fall over the next several decades. This ratio can be labeled as Baran Ratio 1.

In figure 11b, the Baran Ratio as investment in net fixed assets (private only) as a percentage of NOS is displayed. For this paper, this can be labeled Baran Ratio 2 and is a more traditional Marxian way of conceptualizing the Baran Ratio and would be more consistent with the Roberts and Shaikh views on rates or returns on profits. Defining Baran Ratio 2 thusly shows that it is fairly high until it goes into a slow decline after the mid-1980s. Afterward, investment rates never attain their earlier levels. Figure 11c shows the moving average (9-year) of the residuals of predicting another version of the Baran Ratio, Baran Ratio 3, using a linear regression trend line. A possible long wave from the late 1940s to the late 1990s can be discerned with a peaking of investment occurring somewhere around the early 1970s. Afterward investment rates go into decline, and the 21st Century shows consistently low and declining levels of investment rates.

Next, to test to see if long waves in the three Baran Ratios are correlated with long waves in the economic surplus, ROP, and ROI, the first moving average (MA) of the deviations of the Baran Ratio 1 is used to predict the broader (Baran and Sweezy) measurement of the MA of the deviations/residuals of the economic surplus as a percentage of GDP, and then the more narrow definitions of the Baran Ratio are used to predict ROP and ROI with each variable in their MA of the deviations form. Because of non-stationarity in some of the data (economic surplus as % of GDP and ROP) as indicated in Augmented Dickey-Fuller (ADF) tests, the differences, or change

in values, going from one year to the next in the two versions of the Baran Ratio and two of the three measurements of accumulation are used (see Studenmund 2017, pages 382-385 on correcting for non-stationarity) to construct the bivariate regression models. After these adjustments are made, the transformations are stationary and show co-integration implying a non-spurious relationship between each pair of variables. The Baran Ratio 3 and ROI are both stationary, and so differencing is not used in this model where Baran Ratio 3 is correlated with ROI. However, the Engle-Granger test indicates that these two variables are not co-integrated. See the appendix for the results of the ADF and Engle-Granger tests.

Table 1—Regression Analysis

	b **(Newey-West SE)**
Part a:	
Dep. Variable: Differences MA of Deviations of Economic Surplus / GDP %	
Intercept:	0.004 (0.035)
Ind. Variable: Differences MA of Deviations of Baran Ratio 1	0.243* (0.03)
Adj. r-squared:	0.45
Part b:	
Dep. Variable: Differences MA of Deviations of ROP	
Intercept:	0.01 (0.07)
Ind. Variable: Differences MA of Deviations of Baran Ratio 2	0.151* (0.05)
Adj. r-squared:	0.26
Part c:	
Dep. Variable: MA of Deviations of ROI	
Intercept:	0.05 (0.46)
Ind. Variable: MA of Deviations of Baran Ratio 2	0.12* (0.04)
Adj. r-squared:	0.15

***p < 0.05**

Table 1, part a shows a moderate correlation (adjusted r-squared of 0.45) between a change in the economic surplus moving averages and those of the Baran Ratio based on the Baran and Sweezy book, Baran Ratio 1. This implies that a certain level of productive investment out of the economic surplus is correlated with capitalist growth over different waves of time. The annual change in the moving average of the deviations of Baran Ratio 1 as an independent variable in a simple regression model is statistically significant at $\alpha < 0.05$ using Newey West standard errors to correct for serial correlation. A 1% increase in the change in the MA of the deviations of Baran Ratio 1 is associated with 0.243% increase in the economic surplus on average. Admittedly there is endogeneity in the relationship since greater surplus could cause more investment. Yet the main purpose of the regression model is to show a linkage between the two variables. In part b of Table 1, a change in the moving average of the residuals of Baran Ratio 2 is positively correlated with ROP where the adjusted r-squared is 0.26. It appears that over long wave periods that there is a weak but statistically significant and positive relationship between changes in the rates of investment and ROP. This typically could be in the growth stage of a long wave and before capital saturation sets in which in turn detracts from profitability. In this case, a 1% increase in the change in the MA of the residuals of Baran Ratio 2 is associated with a 0.15% increase in change in the MA of the deviations of ROP on average. Finally, in part c, there is a weak but statistically significant correlation between the moving average of the deviations of Baran Ratio 3 and those of ROI where the moving average of the residuals of Baran Ratio 3 is statistically significant. A 1% increase in the MA of Baran Ratio 3 residuals is associated with a 0.12% increase in the MA of ROI deviations on average. Again, these models are exploratory ones, and other factors could be more greatly correlated with economic surplus, ROP, and/or ROI such as labor exploitation, productivity levels, etc. At the

same time, many of these variables such as exploitation, etc. also relate to investment levels through surplus generation to one degree or another.

It appears that Baran Ratio 1, the broader Baran and Sweezy conception of the economic surplus, shows the greatest amount of correlation among the three models, although the other two Baran Ratios have a statistically significant connection to ROI and ROP. Perhaps investment can become saturated and drag down profitability and accumulation as a long wave progresses, but in the initial stages, particularly during an economic boom, the more investment the greater accumulation generated, on average.[9]

5. Political Implications of Cycles: Path to Neo-Fascism, Neo-Socialism, or Bigger Capitalist Welfare State?

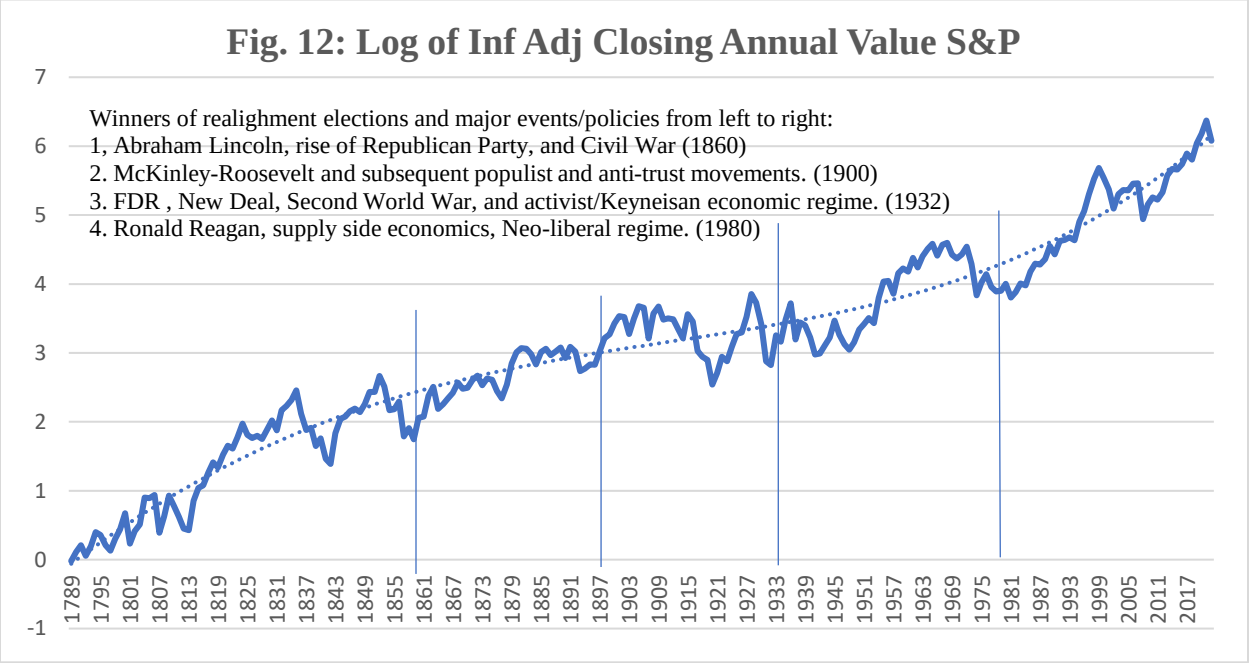
With the previous discussion in mind, it is interesting to speculate as to the political ramifications, if any, of long cycles. Much of the literature indicates that long cycles can be said to have different "seasons" or stages in which usually slow but steady growth occurs in a Spring stage; faster growth that then reaches a peak transpires during a Summer stage; slowing growth and decline occurs in a Fall stage; and then long term stagnation or depression happens in a Winter stage. Each stage can last slightly less than or around a decade. It is worth noting, as others cited in this paper have noted, that the amount of political volatility in a nation usually rises during the Fall and Winter seasons of a long 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, or the rise of fascism in Germany in the 1930s. Most of the 1930s would be a period of time

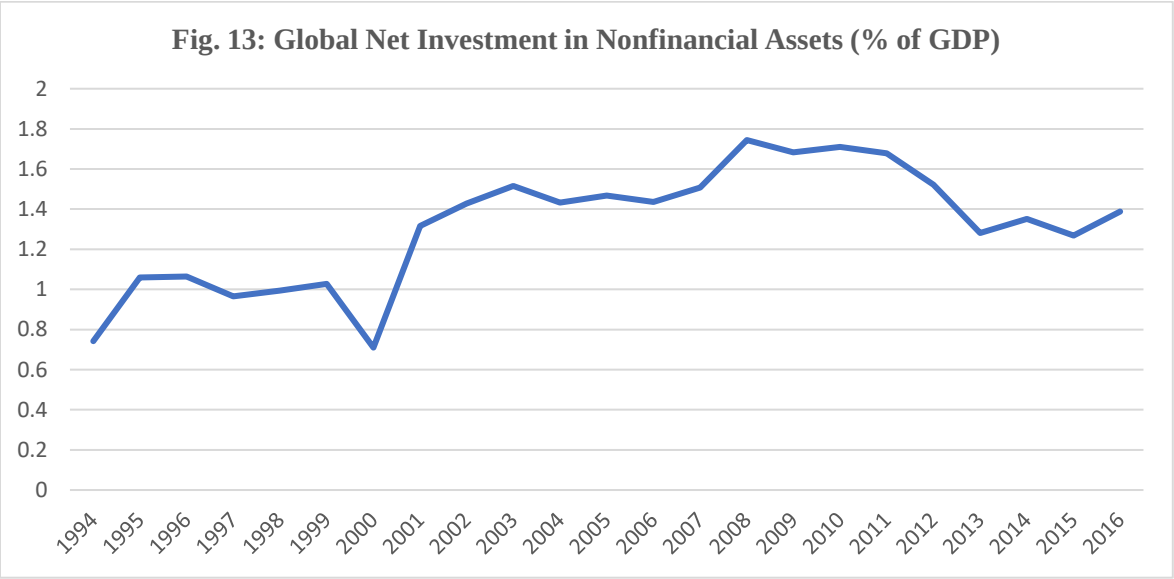
[9] If one just plots Baran Ratio 1 against the B&S economic surplus concept from 1929 to 2023, a scatterplot like the one in Figure A1 in the appendix is obtained. The "best fit" for the scatterplot is a polynomial regression equation of degree 5 for an adjusted r-squared value of 0.32. Although a weak but with a statistically significant F-ration, this suggests, possibly, fluctuations or different levels in this Baran Ratio could correspond to the 1) rise and then decline of the Keynesian period, 2 parts of a wave; 2) the rise and decline of the neoliberal period, 2 parts of a wave; and 3) the rise of a new long wave, 1 part. This would make 5 parts. But this is a conjecture.

that most generally would consider a Winter stage. The 1980s roughly can be considered a Spring 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. Long periods of stagnation often help to usher in political leaders during a Winter or Spring stage (a transition stage) who take an alternative approach to guiding the economy than that which existed during the previous long cycle. The policies that dominate the previous cycle are often discarded as no longer useful or working. These new policies can veer governmental action in managing the economy toward either the left or the right. The Long Depression of the 19th Century in the US supposedly starts economic reform movements. During 1933 and forward and in reaction to public unrest, the New Deal creates a welfare/relief state in order to try to help workers deal with the problems of the Great Depression. In the 1980s neoliberal policies are offered as a way out of the stagflation of the 1970s, and these policies lead to the general rejection of a greater welfare/relief state for workers. In fact, some form of austerity, cuts in government programs, and anti-union initiatives are used to reign in working class movements and to discipline labor. In general, periods that can be characterized as a Winter stage of a long cycle often can be followed by a Spring season wherein government regimes can dramatically shift policy approaches to economic problems.

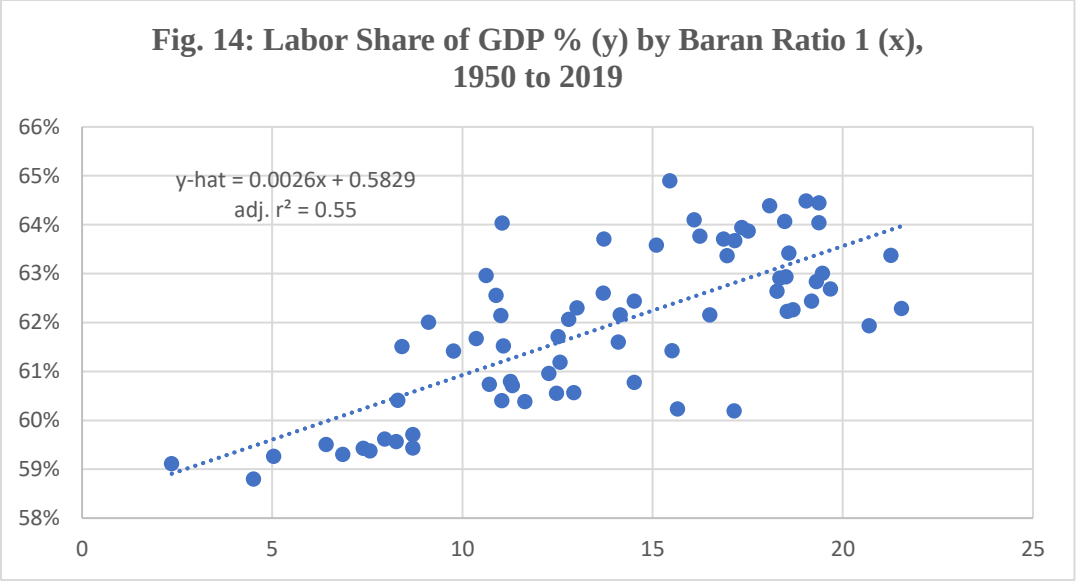
In the US, Presidential and Congressional power often shift back and forth between the two major parties of the Democrats and the Republicans. However, the policy paths chosen by FDR and his fellow Democrats in the 1930s are substantially different than those of previous Democratic party leaders, just as those of Ronald Reagan and the Republicans in the 1980s are more conservative than those of his Republican predecessors. The 1932 election of FDR and the 1980 election of Ronald Reagan are often referred to as "political realignment" elections in

which dramatic political changes are made that break with the previous set of policy regimes and approaches (Key 1955, Burnham 1965, Sundquist 1983, Patterson 2007).





Source: World Bank, World Development Indicators, 1994 to 2016. https://databank.worldbank.org/source/world-development-indicators .



Source: Baran and Sweezy (1966); U.S. Bureau of Economic Analysis, "Table 5.2.5. Gross and Net Domestic Investment by Major Type" (accessed Tuesday, August 5, 2025); "Table 1.10. Gross Domestic Income by Type of Income" (accessed Tuesday, August 5, 2025); US Bureau of Economic Analysis, Compensation of Employees by Industry, 1948 to 1987, 1988 to 1996, 1997 to 2023; Galbi 2008; University of Groningen and University of California, Davis, Share of Labour Compensation in GDP at Current National Prices for United States [LABSHPUSA156NRUG], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/LABSHPUSA156NRUG, September 5, 2025.

Going back to the S&P Index numbers in Figure 7 but now relabeling the cycles according to what many (although not all) political scientists (Key 1955, Burnham 1965, Sundquist 1983, Patterson 2007) consider as major, political realignment elections, Figure 12 shows how the outcomes of these major elections compare to phases of the long wave cycles. These major elections and their outcomes usually occur during low periods of the index and the years correspond roughly to the changes in the years for the long cycles in Figure 7. Whether a major political realignment election occurs in 2008 or 2016 can be debated. The Barak Obama administration is seen as one that comes into power with a big agenda but leaves office with only a few items accomplished. And Donald Trump, who is seen as a big departure from past Republican presidents due to his anti-immigrant and anti-trade liberalization policies, loses reelection after his first term. However, he succeeds in regaining the White House in 2024, the first former president to do so since Grover Cleveland in the 19th Century.

Table 2--Attitudes toward Immigrants Taking Away Jobs

		How likely immigration will take away jobs?				
		Extremely likely	*Very likely*	*Somewhat likely*	*Not at all likely*	*Total*
Out of work	*1. Yes*	8.8%	16.4%	38.7%	36.1%	100.0%
or laid off	*2. No*	6.6%	14.6%	39.3%	39.5%	100.0%
in last 6 months	*Total*	7.1%	15.1%	39.1%	38.6%	100.0%

Note: Chi-square statistic = 12.113, p-value is .007006. Result is significant at $\alpha < 0.05$. Actual numbers are in table A2 in the appendix.

Table 3--Attitudes toward Free Trade Agreements

		Favor/oppose free trade agreements?							
		Favor a great deal	*Favor moderately*	*Favor a little*	*Neither Favor/Oppose*	*Oppose a little*	*Oppose moderately*	*Oppose a great deal*	*Total*
Out of work	*1. Yes*	10.7%	19.7%	4.5%	44.9%	1.4%	4.7%	3.1%	100%
or laid off	*2. No*	12.7%	23.0%	6.9%	39.1%	1.3%	3.2%	2.4%	100%
in last 6 months	*Total*	12.7%	22.8%	5.4%	40.6%	1.2%	3.5%	2.7%	100%

Note: Chi-square statistic = 37.052, p-value < 0.001. Result is significant at $\alpha < 0.05$. Note: Actual numbers are in table A3 in the appendix.

Table 4--Whether Immigration Should be Increased or Decreased

		Increase or decrease immigrants to US?					
		Inc Lot	**Inc Little**	**Same**	**Dec Little**	**Dec Lot**	**Total**
Unemp.	*1.Yes*	3.3%	6.6%	32.0%	26.6%	31.6%	100%
in Last	*2.No*	2.8%	3.3%	41.5%	24.5%	28.0%	100%
10 Years?	*Total*	2.9%	4.3%	38.4%	25.2%	29.2%	100%

Note: Chi-square statistic = 21.9, p-value < 0.001. Result is significant at $\alpha < 0.05$. Actual numbers are in table A4 in the appendix.

Table 5--Vote According to Whether One Thinks Immigrants Will Take Jobs Away

		2020 Presidential Vote		
		Joe Biden	Donald Trump	Total
How likely immigration will take away jobs?	1. Extremely likely	2.7%	14.9%	**7.9%**
	2. Very likely	6.8%	27.3%	**15.4%**
	3. Somewhat likely	34.5%	44.6%	**38.8%**
	4. Not at all likely	54.8%	11.9%	**36.7%**
	Total	100.0%	100.0%	**100.0%**

Note: Chi-square = 1475.944, p-value = 0.0004 and statistically significant at alpha 5%. Actual numbers are in table A5 in the appendix.

Table 6--Vote and Whether One Favors/Opposes Free Trade Agreements

		2020 Presidential Vote		
		Joe Biden	Donald Trump	Total
Favor/Oppose Free Trade Agreements	Favor a great deal	16.6%	13.4%	15.2%
	Favor moderately	32.6%	20.3%	27.4%
	Favor a little	7.5%	4.6%	6.3%
	Neither favor/oppose	38.9%	49.0%	43.1%
	Oppose a little	0.9%	1.9%	1.3%
	Oppose moderately	1.9%	5.9%	3.6%
	Oppose a great deal	1.6%	4.9%	3.0%
	Total	100.0%	100.0%	100.0%

Note: Chi-square statistic = 274.605, p-value < 0.001, and statistically significant at alpha 5%. Actual numbers are in table A6 in the appendix.

If economic circumstances change according to long waves, then perhaps what some call a neo-fascist movement in the US and elsewhere (Foster and Chowdhury 2019) can be explained by the US economy and the economy of other nations being in a Fall or Winter long wave stage.[10] The same can be said for a so-called rise in the popularity of socialism given the electoral success of Bernie Sanders who campaigns as a democratic socialist in the 2016 and

[10] Neocleous (1997) and Foster (2022) write that fascism basically embraces irrationalism in its philosophical approach as opposed to rationalism or positivism.

2020 Democratic Party Presidential primaries. Sanders does not win the nomination but makes it farther in the primaries than what pundits expect especially since to campaign as a socialist is unthinkable in previous elections.

Voting for candidates who are not considered part of the political mainstream is a possible sign of voter anxiety about current and future economic conditions. Using American National Election Study (ANES) results (2021), Tables 2, 3, and 4 illustrate that among those who have been unemployed within the last 6 months or within the last 10 years, that there is strong support for greater immigration restrictions, a belief that immigrants take jobs away, and a greater dislike for more "free trade agreements." Furthermore, there is greater support for Trump than Biden (who went on to win the 2020 election) among those who believe that immigrants will take jobs away and those who have less support for "free trade," and this is probably because of Trump's support of greater immigration restrictions and rhetoric against global economic competitors such as China and its imports to the US (American National Election Study 2021). See Tables 5 and 6. Chi-square tests indicate that these results are statistically significant at the 5% level. Finally, using arrest records, Komlos (2023) finds that most of the charged January 6th rioters/insurrectionists in Washington, DC come from zip codes that indicate that they come from neighborhoods which are mostly lower to middle-income and working-class areas that are close to or in regions where many blue collar, non-college level jobs are located in industries such as mining and manufacturing. With stagnant economic growth, it can be argued that such workers may fear future job losses and displacement, and blaming free trade and immigration for job instability, instead of a lack of investment or reinvestment in their industries, may resonate with such workers and lead them to vote for far-right, populist candidates (Lambert 2024).

Figure 13 displays the decline in global investment as a portion GDP that has occurred since the Great Recession, and this in turn could imply stagnation throughout the global economy (World Bank 1994-2016). Finally, Figure 14 shows that in the US there is a relationship from 1950 to 2019 between Baran Ratio 1 and labor's share of income (University of Groningen and University of California, Davis 2025). A linear regression equation fits the scatterplot with an r-squared of around 55%, and although both sets of data are non-stationary, an Engle-Granger test shows them to be co-integrated (tau-statistic with a p-value < 0.05). As the ratio increases, so does labor's income share, but this also works in reverse. As investment as a share of the surplus has dwindled so has labor's share of income because less investment has corresponded to slower economic growth, which in turn has led to less investment in high paying industries such as manufacturing, construction (private and public), and government infrastructure. Despite the strong belief that many political scientists have in the "median voter" theory to explain election outcomes as usually favoring moderate candidates (center-left or center-right candidates), perhaps prolonged economic crisis and downward mobility for workers are driving many voters to embrace non-traditional candidates such as Trump or Sanders.

6. 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, many heterodox economists see it as a valid and somewhat powerful, albeit not perfect, way to explain long term movements in a capitalist economy. For this paper, the Baran Ratio and a broader use of the economic surplus concept can

be added to the literature of long wave cycles as ways of trying to understand trends within a cycle.

The limitations of this paper involve the endogenous nature of the Baran Ratio. It is also a less than perfect measurement of investment 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. Since Silver (1992) finds a link between labor strife and the seasons of a wave going back to the 19th Century in the US, it would have been useful to have tested to see if this relationship still holds. Unfortunately the data she uses in her study now stops at 1996 (World Labor Group Database nd), and other databases such as the one offered by the International Labor Organization (ILO) or the US Bureau of Labor Statistics do not measure labor strife the same and only go back for several decades (ILO nd, US BLS nd). Finally, given Figure 7 and some of the other graphs in this paper as well as 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. 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? Further research on this question appears warranted.

Yet, if the US economy is the largest one in the world, and if we are in the depression stage of the neoliberal cycle, or in the infancy (startup) of a new cycle (2008 or 2016 and on?), then low rates of investment out of the economic surplus could explain the current level of stagnation. 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.[11] If so, this political movement may be in reaction to a Winter stage 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 not feasible due to a lack of forthcoming innovations, then public investment in productivity enhancing measures such as investing in cleaner and renewable energy and building better roads, mass transit systems, ports, and school buildings would be an alternative.[12] Such an approach would be one that harkens back to that taken in the US in the 1930s and could be considered some attempt to reform capitalism. 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 and 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. Another possibility would be an entire overhaul of the economic system through greater worker ownership of the means of production and the democratization of the economic surplus, a form of socialism of neo-socialism. This could come through either peaceful or confrontational resistance and revolt. It will be interesting to see in which political direction the economic long cycle may take us.

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[11] Just as during the 1930s and 1970s in the US, two periods of stagnation, the Trump administration has decided to carry on trade wars that were designed to help US domestic production and output.

[12] 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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APPENDIX

Economic Surplus Components ($ Billions) and Economic Surplus as % of GDP

Year	NOS	Taxes	Adv	Retailing	F/I/RE	Legal	GDP	Econ Surplus / GDP %
1929	42	10.5	2.85	5.714	2.989	0.124	104.6	61.35468451
1930	28.3	10	2.45	5.05	2.808	0.131	92.2	52.86225597
1931	20.5	8.7	2.1	4.477	2.527	0.132	77.4	49.65891473
1932	13.1	8.2	1.62	3.572	2.145	0.126	59.5	48.34117647
1933	12.1	8.6	1.325	3.177	1.939	0.118	57.2	47.65559441
1934	16.3	9.7	1.65	3.473	2.031	0.116	66.8	49.80538922
1935	20.9	10.5	1.72	3.988	2.111	0.121	74.2	53.01886792
1936	23.4	11.9	1.93	4.488	2.313	0.126	84.8	52.07193396
1937	26.4	14.3	2.1	4.982	2.524	0.135	93	54.23763441
1938	22.8	13.9	1.93	4.636	2.46	0.138	87.4	52.47597254
1939	25.1	14.2	2.01	4.946	2.522	0.142	93.4	52.37687366
1940	29.5	16.6	2.11	5.288	2.599	0.144	102.9	54.65597668
1941	40.1	23.8	2.25	5.991	2.752	0.151	129.3	58.03866976
1942	52.9	31.2	2.16	6.028	2.864	0.15	166	57.41084337
1943	62.3	47.6	2.49	6.547	3.013	0.149	203.1	60.11767602
1944	63.5	49.4	2.7	7.423	3.166	0.159	224.4	56.30481283
1945	60.7	51.4	2.84	8.507	3.436	0.169	228	55.7245614
1946	62.6	50.4	3.34	11.012	4.307	0.184	227.5	57.95296703
1947	67.6	55.4	4.26	13.097	4.722	0.209	249.6	58.20833333
1948	80	56.8	4.87	14.458	5.295	0.228	274.5	58.88925319
1949	73.8	53.6	5.21	15.059	5.554	0.242	272.5	56.31743119
1950	84.9	66.1	5.7	16.05	6.159	0.265	299.8	59.76450967
1951	96.4	81.9	6.42	17.928	6.747	0.294	346.9	60.44652638
1952	96.7	86.4	7.14	19.049	7.344	0.325	367.3	59.06833651
1953	98.1	90.8	7.74	20.088	7.991	0.358	389.2	57.83067831
1954	98.9	85.9	8.15	20.28	8.72	0.386	390.5	56.9362356
1955	112.6	96.7	9.15	21.635	9.535	0.421	425.5	58.7640423
1956	114.4	104.1	9.91	22.391	10.393	0.459	449.4	58.22274143
1957	117.3	109.8	10.27	23.946	11.134	0.496	474	57.5835443
1958	117	108.2	10.31	24.191	11.905	0.542	481.2	56.55610973
1959	130.1	122.5	11.27	25.608	13.006	0.601	521.7	58.09564884
1960	131	133.9	11.96	26.636	13.948	0.67	542.4	58.64933628
1961	137	138.5	11.86	26.469	14.972	0.73	562.2	58.61454998
1962	149.4	150.1	12.43	28.38	15.835	0.809	603.9	59.10813049
1963	159.3	161.6	13.1	29.749	16.78	0.87	637.5	59.82729412
1964	171.6	166.1	14.15	29.6	14.8	0.962	684.5	58.02951059
1965	190.4	179.8	15.25	31	15	1.042	742.3	58.26377475
1966	204.5	202.2	16.63	34	16.8	1.151	813.4	58.43139907
1967	207.2	217	16.87	36.84	18	1.26	860	57.81046512

1968	221.2	251.4	18.09	40.8	20.3	1.442	940.7	58.8106729
1969	227.4	282.7	19.42	44.48	22.8	1.664	1017.6	58.81132075
1970	221.2	285.8	19.55	48.16	25	1.979	1073.3	56.05972235
1971	245.6	302.3	20.7	57	27	2.229	1164.9	56.21332303
1972	278.3	345.6	23.21	56	31	2.74	1279.1	57.60691111
1973	315.9	388.8	24.98	64	36	3.393	1425.4	58.44485758
1974	321.6	430.2	26.62	71.8	39.5	4.008	1545.2	57.83898524
1975	355	441.2	27.9	76.2	42.4	4.752	1684.9	56.23194255
1976	402.9	505.7	33.3	84.8	46.3	5.508	1873.4	57.56955268
1977	454.1	567.4	37.44	93.5	52.5	6.41	2081.8	58.18762609
1978	522.3	646.1	43.33	105.4	60.01	7.256	2351.6	58.87038612
1979	559.6	729.3	48.78	115.3	68.2	8.611	2627.3	58.22673467
1980	571.7	799.9	53.57	123.6	77.4	10.342	2857.3	57.27476989
1981	665.3	919.1	60.46	133.8	86.6	12.444	3207	58.5501715
1982	679.1	940.9	66.67	141	96.02	15.088	3343.8	57.98127878
1983	759.9	1002.1	76	150.9	107.7	17.698	3634	58.18101266
1984	913	1115	88.01	165.1	118.4	20.479	4037.6	59.93632356
1985	970.5	1217	94.9	178.4	130	23.615	4339	60.25386034
1986	972.2	1292.9	102.37	192.8	180.5	27.337	4579.6	60.44429645
1987	1040.2	1406.6	110.27	192.5	170.3	32.85	4855.2	60.81562037
1988	1155.3	1507.1	118.75	215	177.2	38.925	5236.4	61.34510351
1989	1223.2	1632	124.77	228.9	184.5	42.027	5641.6	60.89401943
1990	1238.6	1713.3	129.968	241.8	197.4	46.286	5963.1	59.82381647
1991	1250.2	1763.6	128.352	247	200.26	47.882	6158.1	59.06519868
1992	1320.1	1848.6	133.75	256.6	221.02	50.879	6520.3	58.75418309
1993	1412.6	1953.1	140.956	265.3	222.3	52.298	6858.6	58.9997084
1994	1569.5	2097.3	153.024	282.3	239.03	52.778	7287.2	60.29657482
1995	1699.9	2223.5	162.93	300.04	256.1	54.25	7639.7	61.47780672
1996	1874.2	2388.2	175.23	317.6	285.03	56.683	8073.1	63.13489242
1997	2036.9	2565.5	187.529	339	376.3	60.01	8577.6	64.88107396
1998	2130.7	2738	206.697	362.7	418.1	65.575	9062.8	65.341528
1999	2223.2	2908.9	222.308	380.6	448.6	68.814	9631.2	64.918411
2000	2318.1	3138.2	247.472	405.7	490.9	75.132	10251	65.12051507
2001	2383.8	3124.4	231.287	416.7	526.6	81.044	10581.9	63.9188709
2002	2490.8	2968.3	236.875	428.5	529.4	85.176	10929.1	61.66153663
2003	2642.7	3044.6	245.477	444.8	547.3	89.874	11456.5	61.2294418
2004	2872.4	3274.1	263.766	459.4	592.8	93.974	12217.2	61.85083325
2005	3165.9	3677.8	271.074	477.7	636.2	98.602	13039.2	63.86339653
2006	3464.4	4012.2	281.653	492.2	687.2	103.978	13815.6	65.44508382
2007	3337.6	4209.6	279.612	506.4	729.6	110.025	14474.2	63.37370632
2008	3153.8	4125	398.92	500.9	722.5	113.302	14769.9	61.03238501
2009	3179.4	3698.5	429.431	474.3	651.6	109.776	14478.1	59.00641088
2010	3648.9	3932.7	462.276	478.9	677.1	108.576	15049	61.85428737

2011	3871.9	4128.3	497.632	495.7	712.9	112.361	15599.7	62.94219321
2012	4178.6	4309.6	535.693	510.1	744.3	115.473	16254	63.9458972
2013	4259.1	4829.6	576.665	526.7	760.2	117.227	16880.7	65.57483981
2014	4490.1	5054.1	620.771	545.5	807.5	118.965	17608.1	66.08853607
2015	4539.3	5285.5	668.249	573.6	852.4	122.863	18295	65.8207839
2016	4519.4	5329.2	719.36	587.7	874.8	126.066	18804.9	64.64552153
2017	4656.2	5456.9	774.379	606.9	936.3	131.525	19612.1	64.05333467
2018	4919	5643.7	833.607	628.2	978.2	137.272	20656.5	63.61183409
2019	5086.3	5883.9	897.364	651.9	1021.2	143.7	21540	63.53000888
2020	5196.2	5969.6	965.998	669.2	1081.7	146.773	21354.1	65.69918997
2021	6149.8	6900.3	1039.88	747.9	1180.6	158.921	23681.2	68.31326924
2022	6592.8	7862.6	1119.41	768.4	1229.8	168.096	26006.9	68.21693847
2023	6888.5	7584.1	1205.03	804.7	1276.8	176.101	27720.7	64.69978426

Augmented Dickey Fuller and Engle-Granger Test Results

Baran Ratio 1 = Moving Average of Deviations/Residuals of Baran and Sweezy Baran Ratio of Total Net Fixed Investment / (NOS+Tot. Taxes+Waste). Used to predict broadly defined economic surplus which includes waste.

Baran Ratio 2 = Moving Average of Deviations/Residuals of Private Net Fixed Investment / NOS %. Used to predict ROP and ROI as defined in paper.

ADF Tests

	Baran Ratio 1	Econ Surplus	Baran Ratio 1 diff	Econ Surplus diff
tau-stat	-2.970395503	-1.552825373	-3.268944715	-4.61931
tau-crit	-1.944484518	-1.944484518	-1.944529143	-1.94453
stationary	yes	no	yes	yes
aic	2.629210348	0.642945626	1.748987834	-0.16695
bic	2.65774927	0.671484548	1.777724908	-0.13821
lags	0	0	0	0
coeff	-0.066928788	-0.041702172	-0.217321083	-0.33088
p-value	< .01	> .1	< .01	< .01

Engle-Granger Test—after differencing

alpha	0.05
type	0

max lags	0
criteria	none

tau-stat	-4.77197
tau-crit	-3.4081
cointegrated	yes
lags	0
p-value	< .01

ADF Tests

	Baran Ratio 2	ROP	Baran Ratio 2 diff	ROP diff
tau-stat	-2.6217821	-0.1367065	-3.2329525	-4.1024911
tau-crit	-1.9444845	-1.9444845	-1.9445291	-1.9445291
stationary	yes	no	yes	yes
aic	4.1094897	1.7265305	3.2347362	0.771688
bic	4.1380286	1.7550694	3.2634733	0.800425
lags	0	0	0	0
coeff	-0.0482132	-0.0023374	-0.2177859	-0.2760312
p-value	< .01	> .1	< .01	< .01

Engle-Granger Test—after differencing

alpha	0.05
type	0
max lags	0
criteria	none

tau-stat	-3.6315238
tau-crit	-3.4081002
cointegrated	yes
lags	0
p-value	0.029939

ADF Tests

	Baran Ratio 2	ROI	Baran Ratio 2 diff	ROI diff
tau-stat	-2.6217821	-2.2452348	-3.2329525	-1.9373446
tau-crit	-1.9444845	-1.9444845	-1.9445291	-1.9445291
stationary	yes	yes	yes	no
aic	4.1094897	2.0343794	3.2347362	0.1152624
bic	4.1380286	2.0629183	3.2634733	0.1439995
lags	0	0	0	0
coeff	-0.0482132	-0.049483	-0.2177859	-0.0782117
p-value	< .01	0.0246038	< .01	0.051087

Engle-Granger Test

alpha	0.05
type	0
max lags	0
criteria	none

tau-stat	-1.3139293
tau-crit	-3.4072625
cointegrated	no
lags	0
p-value	> .1

Fig. A1: Econ Surplus / GDP % (y) by Baran Ratio 1 (x)

