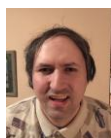


Finicky Consumerism, Volatile Investment, and the Puzzle of Low Wages in the High-Tech Economy

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ABSTRACT

After the 2008 U.S. financial crisis, the largest economic changes in the U.S. and globally were not to inflation and wages, but were to wild swings in unemployment and output, contradicting “rational expectations” economics- why? Some blamed U.S. weather conditions on volatile growth after 2008. This article hypothesizes that the differences between the volatile stagflation of the 1970s, the relatively docile 1980s, the 2008 volatile crash, and, most pointedly, the topsy-turvy, global, low-wage stagnation after, are several fold: first, structural changes to the high-tech economy; second, central bank assertions about monetary policy; third, a finicky consumption and marketing of risky high-tech products, in-part responsible for the United States and Japan entering into liquidity traps, where firms decline to invest; and fourth, all of these factors causing the Phillips Curve to pivot, or move horizontally, particularly over expectations. These differences are hypothesized to create growth instability, swings in unemployment, and flat wages. The article uses conceptual and statistical methods, with new policies for ongoing conditions in high-tech economies such as the United States and Japan.

Keywords: *Finicky consumerism, Investment, Risk, Liquidity trap, Phillips Curve, Great recession.*

JEL Classification: *E21, E22, E27, J38.*

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Highlights of this paper

- This article indicates that lack of investment, and more investment going towards physical capital, rather than labors' pay, in a difficult production period of finicky consumerism, may be partially responsible for the flat wages in the United States and other countries which manufacture complex, high-tech goods.

1. INTRODUCTION

In her concluding remarks before leaving the Federal Reserve, in 2017, Chairwomen Janet Yellen commented that the puzzle of low wages globally in the Phillips Curve relationship at that time, and leading up until today, was a mystery which needed research by future economists. With a lack of relevant research that followed, this article explains the puzzle of low wages and inflation over the global "Great Recession," by focusing on finicky consumption over different iterations of high-tech products: the unstable investment need to make high-tech goods. Investment ultimately depends on consumption; and, the low wages which followed, due to the resultant lower profits, causes "stop-start" growth. This is not to mention, in the low wage puzzle, the structural changes to global labor markets in high-tech workforces, and a change in behavior by firms from focusing on forecasting inflation and wages to expectations of employment, and productivity, needed to meet output, possibly with a Keynesian kinked long-run aggregate supply curve due to low investment. This behavior has been reinforced by central bank statements, leading to different outcomes than those found by Friedman and Lucas, which will be addressed.

Although the great economist John Maynard Keynes "generally" linked such concepts in his time, this paper puts them together by juxtaposing newer methodologies, namely game theory, and a Phillips curve, overlaying both, and statistically regressing many of such structural variables- numerous conceptual techniques largely unavailable earlier on. The lack of investment stands out as the greatest contributor to lower wages, being susceptible to too many risks. This trend lowers profits and directs resources even more towards capital, not workers. Consumption over housing also factors statistically in volatility, with increasing female employment adding to lower wages. The paper offers several original, conceptual models of consumption and investment, and policies, categorizing how wages and employment are affected, which are corroborated by looking at different periods of history, namely the low-inflation era post-the-Great Recession (2007-2009 technically) versus the opposite, inflationary gaps of the 1970s, using as examples two high-tech, highly illiquid states: the U.S. and Japan.

Most specifically, "rational expectations" came about in the 1970s by economists looking for a way to return economics to its laissez faire origins. Business leaders, theoretically reducing risk, focus on possible wage and price changes in the future. Unemployment and growth self-adjust and do not change as much as the price-wage element of the Phillips Curve, created by British economist A.W. Phillips in 1958. However, during the "Great Recession," a global event following the 2008 U.S. financial crisis, the largest change for developed countries were "topsy-turvy" swings in Gross Domestic Product (GDP), such as -1.2% in Q1 of 2013 to 5% in the Q3 of 2014 in the United States (Statista, 2017). Unemployment rates swung too, from 9.4% in Oct., 2010, to 9.8% in Nov., to 9.3% in Dec., and from 7.7% in Nov. 2012, to 8% in Jan. 2013 and 7.5% in May 2013 (United States Labor, 2017b). Inflation and wages stayed low globally, coupled at times with stagnant output, the fluxes of which the U.S. Federal Reserve linked to weather. The interim years of the 1990s, the "New Economy," saw research investment grow 6% per year, and productivity doubled (Samuelson & Varian, 2001).

With all of these introductory observations providing a necessary contextual foundation, this article addresses the following research question. How did the "Great Recession," and its aftermath, with its low wages and inflation, and high, volatile employment, with the topsy-turvy, inconsistent growth stagnation, differ from previous global times of exuberance or "stagflation?" That is, from their mix of high inflation and unemployment? While

unemployment changed markedly in the “Great Recession,” price levels and wages stayed the same, in-part distinctive of liquidity traps, which have low investments due to riskiness of consumerism over new products.

In addressing this question, the article presents and assesses the extent of the validity of the following four hypotheses. First, U.S. and economic structural changes (x variable) have put downward pressures on wages and inflation (y). Second, Federal Reserve assurances and policies (x) have added to low inflation and interest rates (y). Third, a finicky, volatile consumerism related to risky investment in producing high-tech goods (both x), rooted in game theory, has resulted in “stop-start” growth in the Great Recession (y). This relationship has caused the United States and Japan to enter into dangerous liquidity traps (x), where firms and consumers sit on cash and refuse to spend it due to risks, also causing low inflation and growth (y). Fourth, in times of slow or near zero wage increases (x), firms focus on part-time, on-demand jobs, and productivity, rather than wages (y), which, along with low investment, cause the Phillips Curve to pivot its slope (x), affecting the employment-inflation relationship. All of such factors (x) generate lower wages with volatile unemployment and growth (y).

2. ARTICLE STRUCTURE

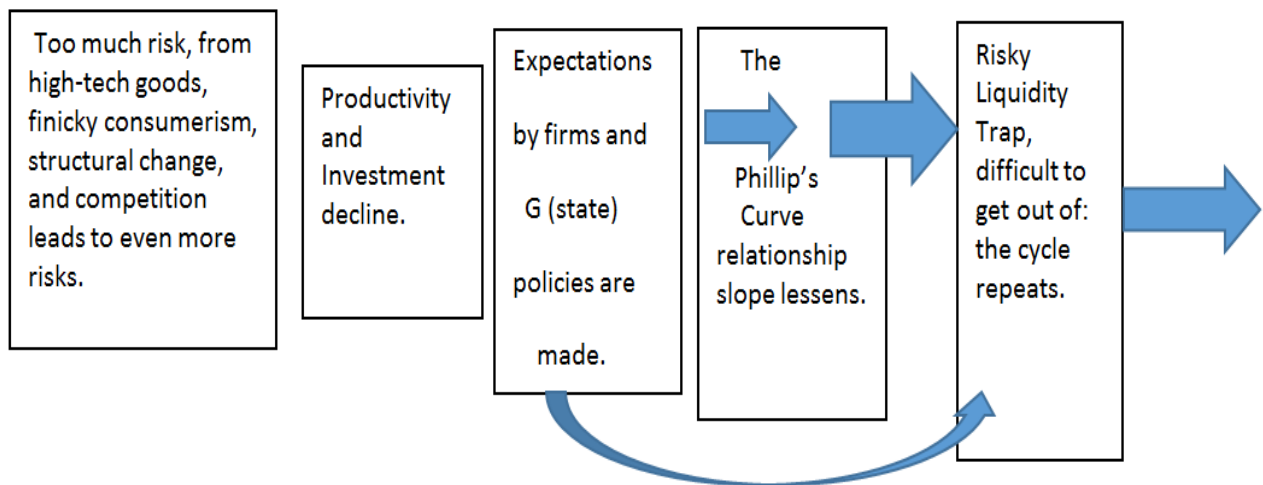


Figure-1. A partial schematic of consumption risk.

3. LITERATURE REVIEW

Consumption is the largest sector in Western and many other developed economies. In explaining inflation, employment, and output volatility, early theories on *unemployment* come from post-World War II British economist John Maynard Keynes, who differed from Classical Economists in that he was the first to consider that a state’s economy could a rate of cyclical unemployment above that of normal times. Keynes also disagreed with Say’s Law in a money economy, that “supply creates its own demand,” because consumers can put money for many uses, including savings (Pressman, 2014). Keynes tied to flow of money to interest rates and to jobs “generally,” but not mathematically, and theorized that even with low interest rates, firms could be slow to borrow and invest, due to low liquidity, the lack of investable prospects. These traits occurred during the U.S. Great Depression, with Japan over the 1990s, briefly with the United States in the early 1990s, and then in the United States following the Great Recession, but sundry definitions of “liquidity traps” exist. The definition here is that while interest rates are near zero, there is no investment, and instead low inflation, all due to risk (Sancya, 2015).

Early theories about *inflation* came from Knut Wicksell in the late 1890s, one of the first “monetarists.” He believed, incorrectly, that there was a “natural rate” of interest. This can only be true if interest rates equal the profit rates of investment, which does not occur in liquidity traps. Additional inflation work was conducted by

Irving Fischer, one of America's first great economists, in the 1920s, who discovered, among other ideas on inflation, that investors are awarded a premium for inflation on asset prices (Pressman, 2014). Keynes disagreed with the quantity theory, or exchange theory of inflation, held true since David Hume in the 1740s, and formalized by Fisher in the 1920s. Rather, Keynes held velocity as volatile, and also spending/saving. Keynes did not address central banks, and the "Investment: Saving- Liquidity: Money" (IS-LM) curve, which was developed shortly afterwards by J.R. Hicks and others to use interest rates to link the financial markets to the household goods markets (Pressman, 2014).

The crisis of economic volatility that began in 2008 in the United States and around the world, which saw huge changes to unemployment but little in the way of inflation, are attributable to a confluence of problems which Keynes foresaw. These ideas were prescient of the 2008 Crash, which was natural to the business cycle, but went beyond normal fluctuations. History will read, in part, that the "Great Recession" was a systemic problem, with many villains and causes. In the 1990s the federal Housing Department and quasi-governmental entities of Fannie Mae and Freddie Mac followed too easy lending policies over a decade, allowing home owners to take out easy loans and mortgages that were converted into complex financial derivatives. Such derivatives were so complex that no one realized how risky they were, similar to the writings beforehand by Minsky (1977) and his later works. There was no trust to provide credit, and the unsold houses, left from demographic change, created immobilized resources. The United States' government faced massive debts, as did private firms, so spending responses were tepid. The Federal Reserve meanwhile pursued too loose of a monetary policy leading up to it, and too strict a policy right before. Everyone was to blame. The U.S. jobless rate rose to 10.4% at its peak, while inflation stayed bizarrely near zero (Zuckerman, 2015).

This author observed that the "Great Recession" truly began, but may not be completely correlated with, a \$1.6 trillion dollar President George W. Bush tax cut in 2001, followed by further tax cuts in 2003, mostly for the wealthy, a credit and confidence crunch a year later, FICA (Social Security) tax rebates to spur consumer spending while usurping long-term funds, and volatile equity markets. The government responded to the crisis with the financial and auto sector bailouts, and then with President Barack Obama's construction stimulus plan.

Next came predictions of a double-dip, a fiscal cliff by the Congressional Budget Office over the expiration of the Bush tax cuts, which President Obama eased, a government shutdown over increased spending budgets, disagreements over raising the debt limit, Executive Orders to circumvent Congress, such as on federal employees' minimum wage, and the budget sequester which saw large cuts to military spending. The United States Federal Reserve responded with three phases of quantitative easing, the largest of which was called "Operation Twist."

While much has been written on the crash's causes, little is yet written on the 2007-2009 "Great Recession's" aftermath, especially compared to earlier eras. The U.S. government probably was wise to solve the short-term growth problems first. Now, longer term problems such as the national debt, income inequality, and tax reforms can better be addressed without as much volatility, presuming another crash does not follow. This article contributes to the literature by combining theories to explain inconsistent growth and low wages.

4. DEFINITIONS OF THE ARTICLE

This article frequently notes a variety of ways how wealthier and poorer classes spend and save differently. The middle-class, those with the flattest wages, are defined as earning between 75% and 125% of the median U.S. income, which is roughly \$45,000 (Hodgson, 2016). The United States and Japan are defined as being "high tech," in that they use industrial (technological) policy to develop resources, and were the first to do so in the 20th Century.

5.THEORY I: CONSUMERISM VERSUS SAVING: THE MONEY MULTIPLIER

The first theory to explain inconsistent, or “topsy-turvy,” growth is consumerism. Keynes, along with Professor A.C. Pigou and others, helped develop the concept that from their income, people either consume or save/invest, the only options in economics, creating a marginal propensity to consume. Keynes gave no explanation why this metric changes other than that of tastes and preferences. From this, though, was born the multiplier- that money expands as it is changes hands, in a chain reaction ([Dornbusch, Stanley, & Richard, 2011](#)).

Keynes believed that consumerism depends on liquidity, the willingness to spend. He disagreed with the monetarists that this concept, when applied in the equation of exchange ($MV=PQ$), derived by Fischer, because the speed money spreads (V , velocity) was not fixed ([Pressman, 2014](#)). Keynes also disagreed with the writings of John-Baptiste Say, an earlier French economist, who had held that supply creates its own demand in this “chicken vs. egg” question. Keynes, who debated with his uncertain rival A.C. Pigou, insisted demand comes first. Today, it seems clear that Say’s “law” would hold true in underdeveloped economies, because producers cannot make all specific items consumers demand. On a desert island, only certain goods can be made, forcing trade and full consumption. But, in more economically developed societies, demand comes first since people can save their money, and are not be forced to buy those goods supplied. Contrarily, in the 21st century, high-tech economies, so much money and time is invested into developing sophisticated products, that by the time they reach the market, the market has changed. Consumers thus face a difficult decision of whether to buy, or save for the next great innovation, which can be called “finicky consumerism.”

Most historical theory suggests consumption is smooth, and not finicky. In the 1950s and 1960s, Milton Friedman, a monetary economist, developed the Permanent Income Hypothesis, similar to this Relative Income Hypothesis, which is supported by empirical data that the wealthy tend to save more proportionately than the poor. More authoritarian states, though, may limit spending and savings choices of their populations through trade policies, so they may save more, as in Asia ([The Committee for the Prize in Economic Sciences in Memory of Alfred Nobel, 2015](#)). Friedman showed that a person does not decide how much to spend daily, but takes a long-term view ([Kosicki, 1987](#)).

Modigliani, however, retorted with a contrasting view, suggesting that these two theories should contain a bequeathing element ([Kosicki, 1987](#)). People should not be viewed to have an infinite life, but to want to leave as much as possible to posterity. Most wealth is bequeathed by the wealthiest 20%, but poorer young individuals tend to spend less, so, the inequality eventually evens out, spoken to in this article’s institution section ([Siilats.com, 2016](#)). Institutionally, many others asserted that the need to “maintain self-esteem” and status, and that minorities have had less wealth to pass on, and have less credit access

In the 1980s, British economist Angus Deaton reconsidered the question of consumerism versus saving. The issue of household spending actually stems from the ancient Greeks, as the word “economics” comes from two Greek words, meaning “households,” and “norms.” Working at times with John Muellbauer, Deaton found, “consumer choice...does not necessarily hold at the aggregate level, even if all individuals are rational” ([The Comm. “Angus” 2015](#)). Deaton, with others like Jorgensen, Lau, and Stoker, hypothesized that demand for risky, luxury goods and necessities, and the make-up and sizes of households, would all affect spending. Adjusting for taxes, Deaton found that individual consumption is rough; household consumption is smooth, but it is again volatile *aggregately*, perhaps due to individuals, a mystery titled the “Deaton Paradox” ([The Comm. “Angus” 2015](#)).

6.THEORY II: LIQUIDITY TRAPS AND THE FEDERAL RESERVE

The United States and Japan, as of 2008, may have entered liquidity traps. The trap is a term coined by Keynes, in his section on money in Keynes (1936) which describes an economy in which there is no place to invest. Keynes includes this as his final section, and traces the ramifications backwards, that is, upon interest rates and investments and then employment. The word “liquidity” itself is an accounting term meaning the ease of spending money. So, Keynes wrote, it is like “pushing on a string”: no matter how low interest rates go, from whatever policies, firms or investors will not take out the loans to spend and invest. The rate of return on such investments will not make them worthy, if investments are too risky. Liquidity traps are risky because they can affect growth for years, because states must use aggressive policies to increase investment, which are often contentious politically. Consider the Asian “tigers” cases, Taiwan, Hong Kong, Singapore, and South Korea (Jones, 2002).

A liquidity trap may result if demand becomes infinitely elastic at an interest rate, fixed, unchanging. An increase in the money supply will not affect interest rates, and GDP will not rise, noted Keynes. According to Harvard economist Lawrence Summers, the current trend could be an indication of greater saving than investment, which was a theory proposed in the Great Depression by Alvin Hansen, the “American Keynes.” Summers says income inequality has produced wealthy citizens who save more than lower classes, lowering interest rates through more saved funds. Technology has lessened physical investment in plants that would increase construction or manufacturing jobs, in favor of software (Summers, 2016). Writes Summers, “these forces push interest rates down” (Summers, 2016).

All of these trends have created what Summers calls, not a liquidity trap, but the “secular stagnation hypothesis” (Summers, 2016) which is different from liquidity traps in that it includes high unemployment, and financial institution instability. He provides explanations from various economists. Robert Gordon has pointed to slow productivity, but Summers says that low inflation and quantity of output is more likely a demand problem than a supply one. Former Federal Reserve Chair Bernanke noted high savings of developing countries. Paul Krugman’s theory involving liquidity traps, says Summers, should only be a temporary problem of stagnation. The only precedents for negative interest rates are Japan, a few European states, and ancient Babylon (Summers, 2016). One would think it possible if investors borrow to earn profits greater than the loaner’s expense, or if they shared profits. Despite cuts by the Fed to the federal funds rate, and that interest rates have remained low, investment has declined sharply.

7.THEORY III: THE PHILLIPS CURVE AND EXPECTATIONS

The Phillips Curve, derived in 1958 by British economist A.W. Phillips, suggests that an economy has a trade-off between inflation and unemployment. More poignantly, it depends on consumerism generating economic activity, creating numerous jobs, but leading to inflation, or vice-versa. Originally, the idea of inflation applied to wages, but was later adapted to prices. The Phillips Curve held true in the U.S. in the 1950s-1960s, but then began shifting outwards.

The simplest way to observe how changes in the economy affect employment and inflation in the Phillips Curve model is that some variable causes supply to change in the economy, the short-run demand curve shifts either to the right or left. Shifts to the right increase employment and GDP temporarily, but raise prices. Shifts to the left reduce employment and GDP temporarily, but lower prices. Despite temporary changes, firms, faced with more or fewer employees, will raise or lower wages, causing the short-term supply curve to shift back to its long-term level (Arnold, 1998). In effect, most economists prefer that wages fall in recessions so firms have more money, shifting the supply curve outwards to reach full employment, as it did, for instance, in the U.K’s 2014 recovery (Pettinger,

2014). Labor is viewed as a “resource,” which economics tries to maximize, whereas wages and prices are not. Supply and demand shift first, then employment, then GDP. A simple multipart figure is below:

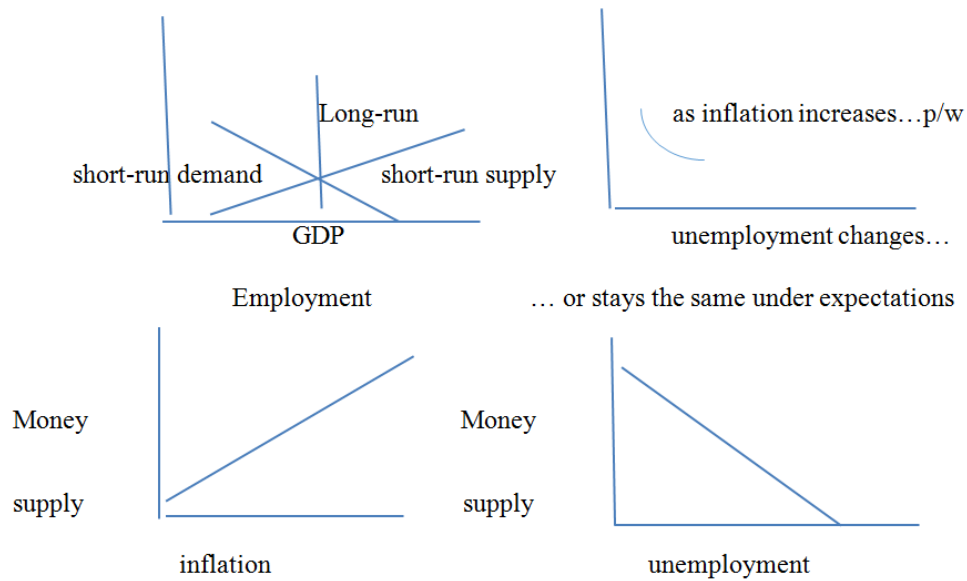


Figure-2. Basic Conceptual Phillips Curve and Its Components.

The Phillips Curve is better understood if broken into wage and unemployment components, in the bottom part. Both parts react differently to what Keynes called “sticky” variables, such as velocity of money, contracts and unions, inflation and the Cantillon Effect of money sticking in sectors, credit ability, employment at will, minimum wages, price/wage controls, regulations, and supply chains. The 1970s had massive amounts of private and public spending, with U.S. federal spending as a percent of GDP increasing from 18.% in 1970 to 20.6% in 1980 (The FRED- Federal Reserve Bank of St. Louis, 2017) due to the long Vietnam War, what Milton Friedman would call temporary, or “one shot,” inflation. Monetary policy was weak, keeping rates high. These policies, along with higher energy costs, and high productivity, as high as a 4% increase in 1974, added to Phillips Curve shifts. Thomas (1977) found in Sweden, declining union rates lowered the slope. Hercowitz (1983) found transactions changes the slope, needing more people. A changing Phillips Curve slope or shift, and their underlying reasons, may affect volatility. Randomly chosen Phillips Curves for the United States and Japan are shown in Figures 3-4 (with data from the U.S. Dept. of Labor, “International Comparisons,” “International Indexes” 2017). The United States has the most reliable curvature shape, likely from better central bank and fiscal policy. Japan’s “linear” graph reflects better expectations.

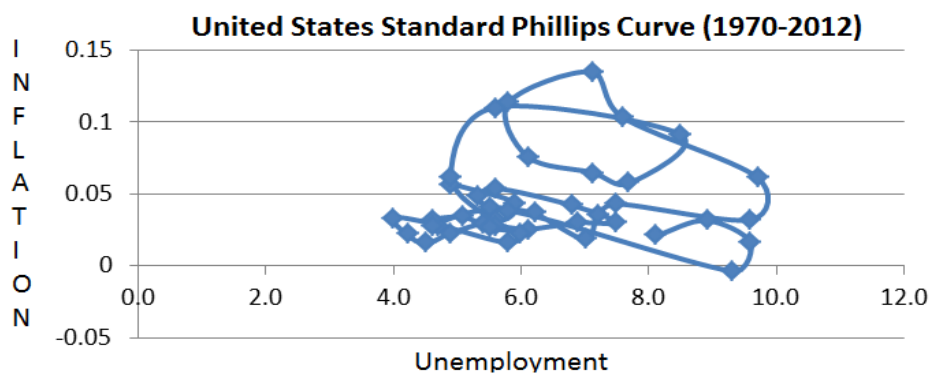


Figure-3. United States Phillips Curve

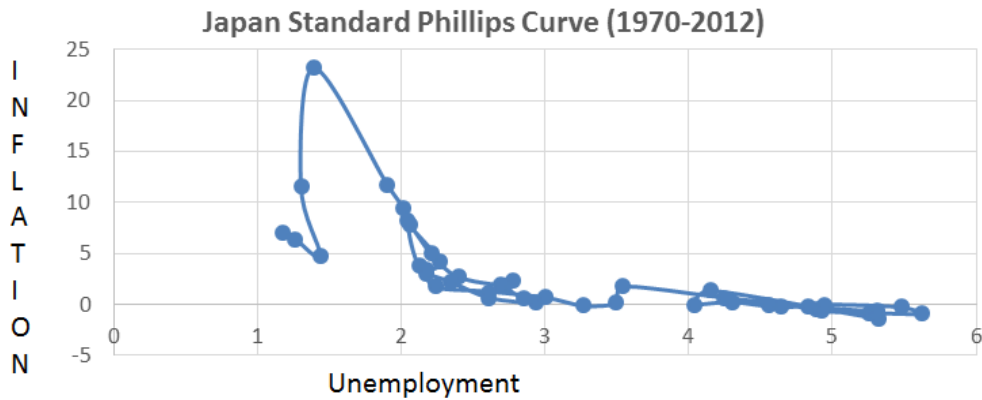


Figure-4. Japan's Phillips Curve

These graphs, elegant by themselves, will be used for the regressions; ideally, if stable, they should look consistently curvilinear as in the upper right of Figure 2 previously. One can infer that inflation is lessening globally, while some nations have seen gains in hiring. Germany's volatile graphs would be attributed to the political upheaval from post-Cold War unification, while France, for instance, not shown here, has had high unemployment from socialist labor regulation. Canada's graphs would reflect sound fiscal policies of surpluses used to pay down debt and for \$80 billion in stimulus in the 1990s and 2000s (Lee, 2011).

In an economic renaissance, the "expectations-augmented" Phillip Curve was conceived by Milton Friedman in the 1960s. He believed that there was a "monetary illusion," inspired by Fisher, which would cause the curve, over several years, to rise directly upwards, from higher prices. Along with Edmund Phelps, Friedman argued that only "real" wages mattered. Wages would render the quantity supplied and demanded for labor to always meet at the natural rate of unemployment. This spot is the "non-accelerating inflation rate of unemployment"- the NAIRU. If unanticipated inflation caused short declines in real wages, workers would demand higher wages, and unemployment would increase to its natural rate (Dornbusch et al., 2011). This idea was developed further by Lucas, Sargent, and others after realizing that the Phillips Curve shifted between the 1950s, 1960s, and 1970s, which they initially theorized was due to structural changes in an economy, for example, oil prices, or pressures from labor unions (Fuhrer, 1995). These scholars composed a "rational expectations theory," that workers and firms negotiate future wages for the next year based on the expectations of inflation for the current year.

The "Lucas critique" revolution that followed, which emphasized expectations, began with a Lucas (1972) contending that investors are aware of possible policy changes. Firms raise wages before interest rate cuts, and skip the processes of supply or demand economic adjustment. These ideas helped explain the "stagflation," or joint high inflation and employment in the 1970s, which from Orphanides (2004) is now believed to have resulted from easy Federal Reserve policy, the already stated Vietnam War spending, the oil crisis, and leaving the gold standard. Stagflation was eased by Federal Reserve Chairman Paul Volcker, appointed by President James E. Carter, Jr., who knowingly drew the United States into recession to control inflation for the long-term good, perhaps costing Mr. Carter reelection to Ronald Reagan. The "Great Moderation" followed from 1984-2008, named for its balanced growth, including balanced inflation (Knotek, 2007).

One flaw with the Phillips Curve thinking, addressed in hypothesis number four of this article, is how the curve may "pivot" in its slope, but not shift, if there is a change in productivity, which is related to wages, and other factors such as investment. A second flaw is always assuming increases in demand, rather than decreases, in which case the resulting equilibrium may be lower along the Phillips Curve. Figure 5 was created from unemployment and inflation data from the Bureau of Labor Statistics, assuming that next year's inflation will be this year's, but it still does not look amply curvy, convex right. Expectations theory says unemployment is at its "natural rate" when

actual inflation equals expected inflation. The second graph is more accurate to theory. The Phillips Curve could change from any of the supply or demand “shifters:” expectations, substitute goods, “acts of God,” import costs, taste and preference changes, or changes in numbers of consumers or suppliers (Arnold, 1998).

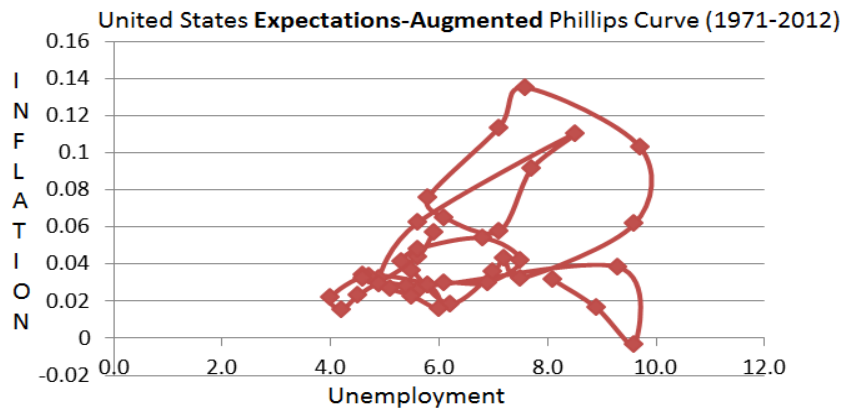


Figure-5. U.S. Expectations Phillips Curve

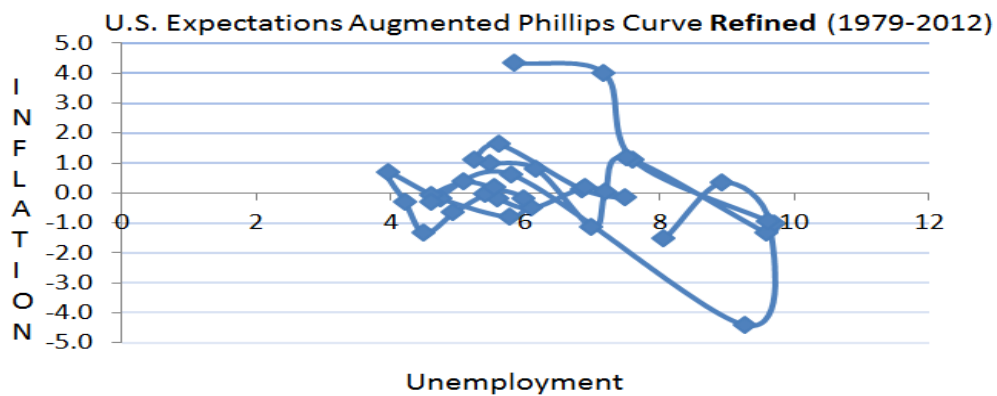


Figure-6. U.S. Refined Phillips Curve

In Figure 5, the author used expected rates of inflation. In Figure 6, entitled “refined,” the author used the difference between actual and expected rates of inflation, which is a more accurate measure of how inflation affects the Phillips Curve. The negative inflation is from low actual inflation. The data for both graphs comes from the Federal Reserve Bank of St. Louis, using average annual unemployment rates, with inflation calculated from the University of Michigan Survey Research Center. Figure 6, highlighted in blue, shows more of an inflation-unemployment tradeoff, although it appears more linear than curvilinear, across several point at a time, because the curve is not shifting, but demand may be moving along a horizontal, long-term supply curve. Wages do not change more than 1%, short-term, settling to the long-term average. Expectations remove the in-between points, yielding a visually smoother, linear, less risky curve.

With prices/wages staying the same during the “Great Stagnation,” what some call the period after the “Great Recession,” it is possible that employers focus on hiring, which is the fourth hypothesis of this article, in which unemployment and GDP would vary, but not wages/prices Figure 8 in App.. But, wages are easier for employers to foresee than hiring. This alternative model would more likely only happen under wage/ inflation stagnation, a complete lack of productivity, in which employment is easier to forecast than wages, also due to central bank assurances. In such cases, temporary workers are valued, demonstrated in Results I.

8. METHODOLOGY

The article analyzes structural changes, Federal Reserve transparency in the 2010s, and a game theory model of a liquidity trap with finicky consumption and volatile investment. Then, the article regresses these variables, with variables for the Phillips Curve changes, for the United States' and Japan's economy to find causes of volatility and why inflation/wages remained low.

9. BACKGROUND STATISTICS

9.1. *Online/Technology/Productivity/Investment*

The U.S. is undergoing structural changes. Productivity rose in some sectors in 2014-2015, up-ticking 2.6% in wholesale trade, 1.9% in retail trade, and 0.3% in food services, partly from technologies and global competition. Still, productivity gains were slow since 2007-2008 crash and the subsequent Great Recession, and much slower than the New Economy of the 1990s (Sancya, 2015). Compensation growth has been declining, from a U.S. high of 13.8% in 1979, to -5.8% in 2009, back to only 5% in 2014 (Trading Economics.com, 2017). Productivity is always important to wages: marginal revenue must equal marginal costs. America is still one of the world's most productive nations, fifth after five small European states (Johnson, 2017).

American investment, according to the Bureau of Economic Analysis, rose from the 1960s to the 1980s, then fell slightly in the early 1990s, rose until 2000, then fell slightly until around 2007, when plummeted to 1.4%, and then began rising again around 2010. This corresponds with the U.S. business cycle (Matthews, 2015). According to Alan Blinder's calculations, weak investment is to blame for 70% of the productivity slowdown after 2010, but only 25% of the slowdown after 2005 (Blinder, 2015). Gordon says that investment, largely from the state, helped lead the U.S. out of the 1930's Great Depression (Phillips, 2016).

9.2. *Part-Time Work*

The "On demand" economy allows for more part-time hiring. Part-time work is substituting full-time work; 53 million American workers are "freelance" (The Economist, 2015). Part-time workers rose 84% after the start of the Great Recession, and their jobs often paid less. This created uncertainty and risk for individuals in how to smooth and spend their income (Zuckerman, 2015). More hiring as of 2020 is done via social media and networks. This reflects that firms want high-skilled labor, but flexibility. In the writings of Hagerty and Jeff (2015) it is the inflow of low cost foreign parts, or intermediate goods, lowering wages (Hagerty & Jeff, 2015). In others' views, like Yellen (2006b) it is globalized competition of workers in different countries that lessens prices/wages, causing the Phillips Curve relationship to flatten (The Economist, 2016a).

10. RESULTS I: FEDERAL RESERVE AND LIQUIDITY TRAPS IN THE UNITED STATES

1. In the aftermath of the 2008 Crash, the Fed signaled that inflation would be kept low. Beyond structural changes, which will be included in the regressions, the evidence collected suggest that central bank assurances have kept wages down, and put emphasis on employment, (Arnold, 1998). The U.S. Federal Reserve may have held inflation low, despite rate cuts, because "the Fed was very explicit that it expected to 'unwind' the new purchases [of bonds]. So, the increased supply was viewed as largely temporary" (Dornbusch et al., 2011). Firms reacted to these reports and "moral suasion" signals from the Fed, and focused more on hiring (Appelbaum, 2014). Inflation can also have a Keynesian slow-adjustment (Bernanke, 2003).

Transparency at the Federal Reserve has increased greatly in several decades. In 1994, it began a post-meeting press release; in 2000 it started issuing a "balance of risks" sheet; in 2002, releasing individual members' votes; in

2003, giving a forward-guidance statement; and in 2005, releasing its minutes sooner (Yellen, 2006a). In 2006, the President of the San Francisco Bank, Janet Yellen, who would become Fed Chair in 2014, blamed the 1970's stagflation on communication (Yellen, 2006a). She followed: "it is only when the Fed's commitment to low inflation is credible that people will expect low inflation ... and set prices accordingly" (Yellen, 2006a). By 2013, in his final years, Mr. Bernanke spoke about the Federal Reserve's plan to keep inflation "well anchored" (Fed.res, 2013). Since 2013, the reserve bank holds press conferences after meetings (Yellen, 2006a) and has considered showing meetings live on t.v., despite potential volatility in equity markets. The table below compares inflation, via the Consumer Price Index (CPI), not just after Fed moves, with new hires (United States Department of Labor, 2017c; United States Labor, 2017b) rather than unemployment, for greater insight.

Table-1. Central bank effects and expectations.

Hiring (in thousands) During Low Inflation- (GDP, CPI) in trillions, in % change					
Jan. 2013	Feb. 2013	Mar. 2013	Apr. 2013	May 2013	June 2013
(16.52, 0.0)	16.46, 0.7	16.53, -0.2	16.58, -0.4	16.55, 0.1	16.64, 0.5
200 employ.	275 employ.	140 employ.	205 employ.	200 employ.	200 employ.
July 2013	Aug 2013	Sept 2013	Oct 2013	Nov 2013	Dec 2013
16.65, 0.2	16.73, 0.1	16.81, 0.1	16.86, 0.0	17.01, 0.1	17.01, 0.2
150 employ.	205 employ.	165 employ.	225 employ.	325 employ.	75 employ.
Jan 2014	Feb. 2014	Mar. 2014	Apr. 2014	May 2014	June 2014
16.91, 0.1	16.98, 0.1	17.07, 0.2	17.17, 0.3	17.28, 0.4	17.35, 0.3
170 employ.	180 employ.	225 employ.	335 employ.	240 employ.	280 employ.
July 2014	Aug. 2014	Sept. 2014	Oct. 2014	Nov. 2014	Dec. 2014
17.43, 0.1	17.56, -0.1	17.57, 0.1	17.59, 0.1	17.66, -0.3	17.60, -0.3
250 employ.	220 employ.	150 employ.	225 employ.	425 employ.	335 employ.
Jan. 2015	Feb. 2015	Mar. 2015	Apr. 2015	May 2015	June 2015
17.58, -0.7	17.72, 0.2	17.65, 0.2	17.81, 0.1	17.92, 0.4	18.00, 0.3
255 employ.	265 employ.	85 employ.	250 employ.	275 employ.	230 employ.

In recessions, with no expected price/wages changes, as policies increase demand, there should be new hiring. With the hypotheses, in a low inflation environment, firms should have been hiring based on demand expectations, but, while this appears true to a degree, it seems that rather than hire long-term based on future expectations about inflation, which is low, firms were and are deciding to hire ad hoc based on very short-term combinations of other changes, which will be looked at later. In the "big box stores," there is a dogma called "on-call" shift scheduling, which employees have to ready within one hour to arrive to work promptly. Some states are mulling a 24 hour notice law to ease worker planning (Norton, 2016).

11. RESULTS II

2. Liquidity Traps: A Game Theory Model and Annual Reports Micro-Analysis

In this section, finicky consumption is evaluated in light of investment that tries to meet its demands, which is unique in high-tech economies. In looking at early American families, there is some evidence that bequeathing wealth to multiple children diversified wealth to create greater consumption and investment, but in a cursory study performed amongst the Rockefellers, Vanderbilts, DuPonts, Astors, Strohs, and Woolworths, only one family, the Rockefellers, succeeded in diversifying their wealth to contribute to these two factors of GDP. Money left to multiple children lowers unsystematic risk, but says nothing about the risks taken by each child (Scott, John, William, & Arthur, 1999).

Here, we focus on the modern day Annual Reports of Apple, IBM, and Samsung, in high-tech economies. Examining sales from 4th Quarters, one of the most volatile quarters, Apple's and other firms' cell phones sales fell in the 4th quarter of 2011. In 2014's 4th quarter, sales were slightly higher than the third quarter, but at \$39.27

million, still very low by Apple’s standards during that year (Statista “Apple iPhone sales” 2016a, 1). In the 4th quarter of 2015, Apple’s smartphone sales in North America fell by 6%. These were the periods the Federal Reserve blamed on weather. As one article says, “[The] Market is saturated with high-end smartphones, and customers are keeping them longer” (Hamblen, 2016). Says analyst Kevin Walsh, “More contract free packages are coming to market, encouraging consumers to hold on to their handsets for longer” (Hamblen, 2016). Jack Rasmus, a banker, attributes the decline in the in the first quarter of 2014, originally set at -1.0%, but later revised to -2.9%, not to weather, but consumerism (Harlan, 2015). But, inventories grew for a sales surge that did not occur. The decline in GDP hypothetically would have been greater: -3.2% (Rasmus, 2014). Rasmus calls the era since the U.S.’s financial crisis a “stop-go” trajectory, very erratic, with periods of high and low growth, moderation and stagnation (Rasmus, 2014). Samsung lost billions in 2016 when the product of its research bombed (The Economist Group, 2016c). One of the reasons firms are having difficulty estimating demand is that, today, consumers “delay their phone upgrades to take advantage of the lower monthly service prices carriers offer to consumers who wait to upgrade phones at the end of their two-year contracts” (Entner, 2015). The “handset replacement cycle” increased from an average of consumers holding phones for 22.4 months in 2013, to 26.5 months in 2014, the largest such change in approximately four years. In the words of analyst Roger Entner, “consumers’ phone purchase have changed significantly” (Entner, 2015). About ½ upgrade it every year, while over 1/3 wait until it becomes outdated in use (Entner, 2015). Consumers must consider their own families, as 68% of smart phone owners belong to a group or family plan (Smith, 2015) which might suggest an addendum to Deaton’s paradox from theory 1 that household spending on technological goods is not always so smooth. The economists at PNC, a banking firm, say that going forward, the Federal Reserve is more likely to evaluate macro factors than “wild swings” in inventories or “finicky” consumers (Craig, 2016).

Game theory, first developed by von Neumann and Nash, analyzes competition versus collaboration. Consumers compete with producers, consumers wanting better deals, producers wanting higher profit. Investments in high tech goods, which need massive investments, may not meet consumer satisfaction Figure 9, App., assuming the market stays the same. This is a near Neo-Ricardian model: Pierre Sraffa, writing in Italy in the 1920s, argued that firms compete for resources (Pressman, 2014). Consumers cooperate by buying, in effect telling what they want made, but compete by saving, awaiting better “deals.” Observe the following game, building off Edmund Phelps’ idea of holding money versus spending (Conrad, 2013):

		Business producer	
		Held/or spent operationally	Invest
Consumer	Save	(1) liquidity trap dangerous	(2) low growth, but high growth for the future
	Spend	(3) balanced, but low future growth	(4) Exuberance: high growth, but risky

Figure-7. A Game of Consumption vs. Investment.

Consumers collaborate with producers for the goods they want through their previous purchases, which providing information about prices, as well as via brand loyalty developed with marketing. They compete with producers for lower prices, also saving money. Producers, meanwhile, collaborate by investing in new products they believe the market will want, but sometimes compete by deciding to hold onto money for the future, due to excessive risks, leading to liquidity traps. The games' terms rest on expectations of prices, utility, and profit.

With respect to the United States, consumption and investment data from the St. Louis Federal Reserve Bank, which only goes back until approximately 1959-1960, shows that such a situation for the first quadrant (liquidity trap and risky low growth) occurred around 1967, 1980, late 1981-1982, and 1991. In the second quadrant (low growth but high future growth), we see such activities occurring in the 1960s until 1967, the early-mid 1970s, the late 1980s, and 2014 until today (except for the 2nd Quarter of 2016: then, investment plummeted). The third quadrant (balanced growth but low future growth) occurred in the mid-to-late 1970s, the early 1990s, and the 2000s. The fourth quadrant (exuberance with high, but risky growth) occurred, strangely, in the late 1970s, and, as would have been expected, the mid-1990s. Of course, there are other aspects not covered by the model, such as international trade and government spending, but in general, this overall scenario meets anticipations (St. Louis Fed 2016 data) See [Figure 10](#), App. The caveats are that traditionally, according to the National Bureau of Economic Research, a recession occurred in 1960, which was not identified by this schematic, as well as in 1969-1970, which came two years later than expected here, and from late 1973-1975, which only corresponds with low growth in this case. In Japan, while investment had a steady decline, saving rose from 1979-1981, and GDP fell slightly. Near 1988, both investment and saving rose, and growth improved. In 1992, both factors fell again, and growth turned negative; each has been low since then, as has growth, signifying a liquidity trap. As [The Economist \(2016d\)](#) writes, tech companies today are pursuing marketing and branding more, to link consumption with investment, and collect information about consumers ([The Economist, 2016b](#)). Firms are using technology to form better relationships with customers, trying to discern what customers want to invest and manufacture to their needs, often lowering prices to do so. In fact, Amazon and Uber keep prices down, while Google and Twitter provide many services for free, to some \$280 billion dollars per year one expert calculates ([The Economist, 2016b](#)).

12. RESULTS III: REGRESSION OF THE PHILLIPS CURVE

The author tests the macroeconomic economic changes in the United States and Japan from 1970-2014, using variables discussed in the preceding sections, to analyze their effects on inflation, unemployment, the Phillips Curve, and volatility (risk). The caveats are: a minimum wage, union data, and Innovation/technology index did not date to 1970. The data is from:

Bo/Dependent: Volatility- calculated from St. Louis Fed.

Bo/Dependent: Phillips Curve Slope: dummy variable analyzed from the St. Louis Fed.

Bo/Dependent: Phillips Curve Shift: dummy variable analyzed from the St. Louis Fed.

B1: Inflation over unemployment: calculated from the St. Louis Fed.

B2: Saving: from the OECD.

B3: Female workforce: St. Louis Fed.

B4: Capital Investment: Index from the World Bank.

B5: Trade over GDP: World Bank.

B6: GINI inequality: OECD, Chartbook, UN Inequality Spreadsheet.

B6: Housing: from the St. Louis Fed.

B7: Part-time work: Bureau of Labor Statistics and Houseman and Osawa.

B8: Productivity: calculated from the St. Louis Fed.

B9: Demographics: Dependency Ratios from the St. Louis Fed.

B10: Energy Prices: St. Louis Fed.

MV= PQ, LWV= GDP, M= LW, where L= labor, M= money supply as via the Federal Reserve V= velocity, P= prices, quality, Q= quantity of goods, as in fiscal policy, W= wages. Whether M affects L or W depends on productivity and investment see Figure 9, App.. Although there is no high-tech variable, it is created by investment, and it creates productivity. There was some heteroscedasticity, but the variables pass a Breusch-Pagan test. The hypotheses for all are:

The Inflation/Unemployment, Saving, Female, Investing, Trade, and Part-time variables should create flexibility, reducing risk and volatility, in the next two tables.

Ho: B = 0 H1: B < 0: The beta figure standardizes coefficients for comparing.

For Gini, Housing, Productivity, these create greater risk, and should be volatile.

Ho: B = 0 H1: B > 0: The beta figure standardizes coefficients for comparing.

Table-2. Volatility and consumption.

Variable: Volatility [abs.(growth-ave.)] No. of Obs: 90 F > p= 0.0864 R2= 0.1633

Independent Variables	Coefficient	t value	p value	beta
Inf_over_unemployed	0.2359	1.82	0.072*	0.2983
Saving Rate	0.1008	0.76	0.439	0.3143
Female Workforce	-.0644	-0.83	0.407	-0.1842
Capital Inv.	-0.0439	-0.33	0.740	-0.1220
Trade over GDP	-0.2108	-2.13	0.036 *	-0.3209
GINI	5.4364	0.516	0.516	0.1592
Housing	-0.0000176	-1.88	0.063*	-0.2969
Part-time Work	0.1464	1.11	0.269	0.2838
Productivity	0.0679	0.58	0.567	0.0625
Constant	5.3830	1.03	0.304	N/A

Note: *= Significant at 90% or greater.

Consumption in the housing market, in particular, creates massive aggregate volatility. Keynes would have called this a “shock.” As the housing market improves, it reduces volatility, significant at the 90% level. Trade per GDP is negative, which is an unusual result. One explanation for this is that as countries grow larger, they solidify their institutional supply chains, and GDP in the denominator increases, which is stabilizing and allows for greater risk taking. The changing inflation-over-unemployment relationship (the Phillips Curve) is also significant as destabilizing. Energy, not included previously, is insignificant and interferes with the inflation variable.

Table-3. Volatility and the Phillips Curve.

Variable: Volatility [abs.(growth-ave.)] No. of Obs: 90 F > p = 0.0901 R2= 0.1929

Independent Variables	Coefficient	t value	p value	beta
Saving Rate	0.0606	0.46	0.646	0.1889
Female Workforce	-0.1363	-1.74	0.085	-0.3897
Capital Inv.	0.1435	1.15	0.252	0.3988
Trade over GDP	-0.2023	-2.03	0.046*	-0.3079
GINI	18.5216	2.36	0.021*	0.5399
Housing	-0.0000192	-2.06	0.043*	-0.3238
Part-time Work	0.1958	1.48	0.142	0.3796
Productivity	0.0440	0.34	0.737	0.0405
Energy	-0.0175	-0.67	0.504	-0.0873
PC Shift	1.4109	1.69	0.096*	0.3679
PC Slope	1.8422	2.07	0.041*	0.4459
Constant	-1.7441	-0.33	0.742	N/A

Note: *= Significant at 90% or greater.

Phillips Curve shifts, and new slopes, affect volatility, more-so the slope (>beta).

For Saving, Female, Trade, GINI, Housing, Part-time, Productivity: these variables, if risen, should result in greater unemployment, causing a shift inwards, rarer than shifts outwards.

$$H_0: B = 0 \quad H_a: B < 0.$$

For Saving, Investing, Gini: these variables, when increased, lessen the money multiplier, discussed in Theory I, and as workers need tools to work. The GINI inequality index should also cause a shift outward, since the wealthy tend to save more.

$$H_0: B = 0 \quad H_a: B > 0$$

Table-4. Phillips Curve shift regression.

Variable: PC Shift	No. of Obs.: 90	F > p = 0.01	R ² = 0.2104		
Independent Variables	Coefficient	t value	p value	beta	
Saving Rate	-0.0206	-0.63	0.528	-0.2468	
Female Workforce	-0.0219	-1.20	0.235	-0.2405	
Capital Inv.	0.0138	0.46	0.647	0.1468	
Trade	-0.0362	-1.45	0.150	-0.2111	
GINI	1.2275	0.72	0.477	0.1428	
Housing	-4.25e-06	-1.85	0.069*	-0.2750	
Part-time Work	0.0322	0.98	0.330	0.2391	
Productivity	-0.0358	-1.21	0.231	-0.1265	
Constant	1.6127	1.29	0.200	N/A	

Note: *= Significant at 90%.

The Phillips Curve shifts primarily due to the housing market; the negative sign means the shift is inward with an improved mortgage market. Energy is excluded for serial correlation: the Phillips Curve includes an inflation component.

For Saving, Female, Trade, Gini, Part-time: they will lessen price/wages-to jobs.

$$H_0: B = 0 \quad H_1: B < 0$$

For Capital, GINI, Housing, Productivity: these will reduce price/wages related to jobs.

$$H_0: B = 0 \quad H_1: B > 0$$

Table-5. Phillips Curve slope regression.

Variable: PC Slope	No. of Obs: 90	F > p = 0.025	R ² = 0.1883		
Independent Variables	Coefficient	t value	p value	beta	
Saving Rate	0.0459	1.50	0.138	0.5915	
Female Workforce	0.0196	1.14	0.258	0.2318	
Capital Inv.	-0.0457	-1.62	0.110*	-0.5242	
Trade	0.0218	0.93	0.355	0.1370	
GINI	-2.3811	-1.42	0.161	-0.2867	
Housing	2.30e-06	1.06	0.292	0.1601	
Part-time Work	-0.0257	-0.83	0.292	-0.02061	
Productivity	0.0138	0.49	0.407	0.0525	
Constant	0.7632	0.65	0.517	0	

Note: *= 90% significance, given the 1% room for human error, explained below.

Slope changes were codified first, the lesser in curvilinear magnitude when compared to shifts. Judging slope changes is difficult, which is not quite the same as the relationship between inflation and unemployment, so this analysis has significant room for human error, including the rare event, with “sticky” expectations, the curve may shift and pivot simultaneously. Two or more, same direction shifts would indicate expectations. Energy affected

other variables, as the Phillips Curve has an inflation component. Only capital investment is significant, though saving comes close. Low investment signals low profits, hence lower wages. Flattened slopes were coded with a dummy variable, so an increase in saving should flatten the slope, since it would lead to less spending and inflation, and the reverse for capital investing, which, with a negative sign, steepens the curve. Capital investment in 2014 was low at 19.9% of U.S. GDP, versus 24.8% in 1978, causing a flattening (Gross Capital, 2017). Nearly significant is saving, the reverse of consuming, which fell from 9.5% in 1978 to 3.4% in 2014 (Saving Rate, 2017b).

To determine the best balanced growth (inflation/unemployment), see the table below. This table was used to create the “line of balanced growth,” using the fact that inflation over growth is volatile, but that liquidity traps bring slow growth, a finding by Solow that equivalent wage and employment growth is stabilizing See Figure 11, App.).

For Saving, Female, Trade, Gini, Part-time: they will lessen price/wages-to jobs.

$$H_0: B = 0 \qquad H_1: B < 0$$

For Investing, Housing, Productivity, Energy: these will increase price/wages- to jobs.

$$H_0: B = 0 \qquad H_1: B > 0$$

Table-6. Inflation chart of consumption and investment.

Inflation/Unemployment	No. of Obs: 90	F > p= 0.0000	R2= 0.6630	
Independent Variables	Coefficient	t value	p value	beta
Saving Rate	0.1008	0.97	0.335	0.2486
Female Workforce	-0.1294	-2.08	0.040*	-0.2926
Capital Inv.	0.3537	3.59	0.001*	0.7772
Trade	-0.0259	-0.33	0.745	-0.0312
GINI	24.9552	3.96	0.000*	0.5752
Housing	-0.0000161	-2.19	0.032*	-0.2141
Part-time Work	0.0989	0.94	0.352	0.2281
Productivity	0.0659	0.65	0.519	0.1516
Energy	0.0714	3.53	0.001*	0.2825
Constant	-10.7113	-2.67	0.009*	N/A

Note: *= Significant at 90% or greater.

Capital investment steepens the inflation-over-unemployment relationship which can also shift the curve outward, most likely because it results in greater risk taking that leads to higher inflation and interest rates; this is consistent with other parts of the study. In 2020, with low investment, the relationship is becoming less steep, which would contribute to greater unemployment, which, through Okun’s rule of thumb that unemployment lessens growth, also increases volatility. The GINI inequality variable was unusual. Income inequality is increasing inflation, implying the middle class is morphing into lower classes that spend more, relatively. But, there is a difference between core and non-core inflation; core inflation eliminates food and energy prices. The data from the St. Louis Federal Reserve included both. Finally, female workers make the economy more elastic, since they give employers greater flexibility in production, and since employers can lower wages. Women earn only approximately 79 cents to every dollar men earn in the United States, and even less abroad. Productivity was insignificant again, perhaps because it only has short-run effects. Although volatility was included here, a GDP growth regression was also run, but since many factors go into growth, the model was not significant, and not included. Adding the dependency ratio variable was insignificant in all regressions, via serial correlation, making other variables counter-intuitive, as well as raising the heteroscedasticity number, and the F values, so, it was not included.

13. COMBINED MODEL

The policies of the Federal Reserve to keep interest rates low but assure firms it would only be temporary, the decisions of businesses not to invest due to a liquidity trap over finicky consumption, and the changing structure of

the U.S. workforce and economy all contributed to a 2010's Phillip Curve that shifted sideways, instead up and down as via traditional theory. An additional reason may be that employers, unable to gage longer-run wage changes, rely on productivity data in the on-demand economy see [Figure 8](#), App.. Finally, as Appendix [Figure 8](#) shows, more investment over the "Great Recession," and even today (2020) is going towards capital (equipment) rather than towards new hiring or for wages. Growth is most balanced, and lost volatile when inflation and unemployment change in similar increments, which comes from [Table 6](#)'s regressions, and the conceptuality shown in [Figure 11](#) in the Appendix.

14. POLICIES FOR CONSUMPTION AND LIQUIDITY:

What could remedy the inconsistent, finicky consumerism and global illiquidity of today? Political leaders must make the traditional Phillips Curve choice, recognized as far back as Solow, but which is now more complex ([Solow, 1956](#)). While classical economists like Adam Smith were laissez faire, and favored non-government interference in the economy, Keynes, though only briefly in [Keynes \(1936\)](#) urged for risk-taking fiscal stimulus, such as the Depression era construction projects. President Herbert Hoover, and even Franklin D. Roosevelt initially, were for balancing the budget at all costs. Keynes argued this was foolish. Fiscal policy and even deficit spending, at a multiplier (velocity) rate of 2.5 at his time, were necessary, he said, because prices and wages could be "sticky" and slow to adjust to the market. This section will address how taxes and other laws can be used to remedy the volatility.

American companies today have a record total of \$2 trillion dollars in cash on their balance sheets, which, if it were a country, would be the tenth largest in the world ([Feroohar, 2016](#)). Apple keeps nearly $\frac{1}{4}$ of its market capitalization (the value of its equity, which is about \$700 billion) entirely in cash, which allows it to quickly buy start-ups firms when synergy opportunities arise. However, this also lessens investment. Global companies are outsourcing their money to do research and development (R&D) in less expensive countries. General Electric, for example, conducts more than $\frac{1}{4}$ of its healthcare research in India (The Economist "The rise of" 2016b, 6, 7). And, U.S. firms are now spending \$1 trillion dollars per year, or 95% of their earnings, on buying back their own stock, known as "treasury stock," which increases the stock price, rather than invest it. For instance, Microsoft bought \$20 billion of treasury stock in 2006 to repair a stock market fall when they had announced a new R&D plan, which did not impress investors ([Feroohar, 2016](#)). Taiwanese-American economist Richard Koo called the "Great Recession" a "balance sheet recession." Firms use profits to pay off debts, and to offer high CEO salaries, rather than invest or pay higher wages ([Feroohar, 2016](#)).

The best way to solve liquidity traps might be large investment tax credits, similarly implemented by U.S. President William J. Clinton in the 1990s. The tax credits helped prevent a liquidity trap by stimulating investment, which went towards the use of technology, and ushered in the New Economy. Therefore, it would seem that, just as dividends have been taxed twice, on both the company and individual side, policy-makers should also consider a temporary cash tax on a firm's balance sheet during illiquid periods of falling investment. Although it would mean taxing cash in the form of income as well on the income statement, unless taxing the latter were temporarily reduced, a cash tax would encourage firms to spend money, on: more risky investments, paying higher wages, or paying off debt, since they would seek to use the cash rather than have it taxed. This could go to creating greater, and more stable, growth. Economist James Tobin suggested taxing Wall Street transactions. This would lead to investment outflows, which occurred to Scandinavian countries in the 1990s. A cash tax would encourage investment, and, if firms did not spend the cash, the state would still receive revenues for policy options. This idea

is original, never before perceived, and would could also help improve income inequality by freeing cash from wealthy firms that could multiply down to lower classes.

Assume that a company has \$100 dollars in cash. If the cash is taxed at 10%, then the “cash tax” burden is \$10 dollars. The company could instead spend that \$10, and be cash taxed \$9 dollars (\$90 cash x 10% cash tax = 9), and save \$1 in cash tax. Then, for the company to come out ahead under a cash tax, the \$10 spent would have to earn a return to make up for the \$9 future’s return, and it does so by making investments at a risky time, which are thereby encouraged by the policy. So, the company would spend the money if the return of the cash flow and the tax saving is greater than the future expected return. Therefore, to stimulate spending, the government could set the cash tax rate just less than the going rate of return, which could be at the 1 year Treasury Bond yield. This would keep the program one that is short-term focused which is easier for planning. Assume the return is around 1%. The benefit to the firm would be the: (cash spent + saving x 1 yr. bond rate), or $(\$10 \times [1+g]) = \$10.10 > \$9$ x future growth rate using a 10% cash tax rate and 1% growth rate. A 1% return, which, if a 35% corporate tax rate is taken out, would be a gain of 0.6565, which is greater than the 0.6% tax here proposed.

The company comes out about better than if it had done nothing under the cash tax regime, but, by investing the money in such bonds, or R&D projects earning a similar rate, society benefits. There would more funds earning returns and for loaning money, rather than just sitting on a balance sheet waiting to be spent. And, some interest is tax deductible. Tax *credits* for investing are a more preferable policy, but would add to government deficits; the choice between the two, if not using both, would depend on a nation’s finances. This would enable risk, spurring an illiquid economy. And, if, in 2018, \$2 trillion dollars sit on America’s balance sheets, then the tax revenue, given a 0.6% yearly tax, would yield \$13 billion dollars. Also, the government could tax capital (particularly Artificial Intelligence) to create worker-AI parity, and use the revenue for taxpayer relief.

In addition, tax credits for investment and hiring the long-term unemployed could remove these vices from the developing economy. In the United Kingdom, Prime Minister Theresa May followed ideas in the United States dating to the 1960s, and recently placed union representatives on corporate boards, but it was quickly rejected by some as being “silly” (The Economist Group, 2017). And, in the 2016 U.S. presidential election, candidate Hillary Clinton proposed tax credits for companies that share earnings with employees. More similar, innovative ideas might be: dividends paid to employees, not just stockholders; allowing employees, under law, to vote for the board members who support the highest wages; or, in the long-term, creating a “Legion of Merit” of wealthy families or individuals who donate funds to the state, which could go for the wage-depressed middle-class through Keynesian-style stimulus projects. This idea was even proposed during the time of American President Franklin D. Roosevelt, but, writes Myers (1939) was opposed by populist movements and by third parties in the 1930s.

Furthermore, a new idea, proposed by Barry (2015) which has come to be known as “pump theory,” suggests that when savings rate of the public are high, the government could tax savings, and pump it into the economy through spending, yet cut taxes for spending when saving is low. Typically, consumption and government stimulus increase GDP the most, because they multiply, not savings. Disposable income would be taxed before being saved, or savings tapped into themselves, so that the revenue could be used for Keynesian projects, too risky for companies, to stimulate the economy. The government acts like a tire pump, allowing pressure (savings) to accumulate, taxing disposable income, and then pumping the air (savings) into the tire (the economy). Interest rates would adjust to the level of saving, such that they will be low when savings are high, due to outward supply, and high when savings are low, from inward supply. This policy would smooth saving versus spending, but would be highly political. The negative effect would be on long-term savings, but states could allow savings to

accumulate until tax-rate (% spent) $[\sum (1+i)^y]/\text{time value} > \text{tax-rate} \times \text{sum}$, unless individuals consume their savings given lower taxes. The policy would be to use several pumps at a time.

15. DISCUSSION AND CONCLUSIONS

Theories about finicky consumerism, particularly in 2020, over high-tech goods, Keynesian illiquid investment, the Phillips Curve tradeoff, and volatility are all related, contributing to the “Great Recession’s” topsy-turvy growth and swings in employment. Some blamed weather, as the Federal Reserve did from 2013-2014, for the stuttered growth after the 2007-2009 collapse. In fact supply chains were effected, and weather can indeed affect certain retail industries, but these are eased by structural changes such as online sales. While housing starts and permits fell 3% in 2014 (Bloesch & Gourio, 2015) statistically significant, this is not enough to blame weather nationally. Instead, the 2013-2014 volatility, for example, was mainly from finicky consumption over iterations of high-tech goods, leading to excess inventory.

Long-term, the risk to liquidity traps is low growth, it is indicated by the Phillips Curve, and it stems from numerous structural changes to the developed economy, most notably: the variable of women entering the workforce, finicky consumerism over high tech products, as well as low investment. These factors impacted the volatility of the “Great Recession” and the stagnation in its aftermath. The results were not conclusive statistically regarding productivity. Investment affects the Phillips Curve slope most, but, surprisingly, the housing market had the largest impact on volatility, most likely for the 2008 crash itself. Chair Yellen herself said in June, 2017 “that the so-called Phillips curve appears to be quite flat. That means that inflation doesn’t respond ... to movements in unemployment,” and, “research by economists ... will help inform our future decisions on this” (Federalreserve.gov, 2017).

One can observed that the “Great Recession,” and its topsy-turvy, up-and-down stagnation aftermath, had both demand and supply side impetuses, due to finicky consumerism for the former, and investment on the latter. This is why it was so “great,” and the aftermath so stagnated, so different from the 1970s; the risks exist today. These main factors have caused Phillips Curve changes, with high GDP and employment volatility, and low inflation and wages.

It would seem that conceptually see Figure 9 again, App., in times of low inflation, firms make expectations in terms of short-term price/wage changes but *also* conceptually in terms of on-demand productivity, needed to meet finicky consumers, along a kinked supply curve. This differs from the contention since the 1970s that firms only “expect” changes in wages, and think long-term, but it needs further research. Also, in the analysis of the Federal Reserve, and hiring in the 2010s, proving at what point, or “elasticity” of the Phillips Curve relationship this occurs, will be left to the future. Statements by central banks to keep inflation low, and increases in transparency, have enabled low wages but expanded options to firms to spend on inventories, invest (riskily), at a time of finicky consumerism, pay off debt, buy their own stocks, or expand workers, particularly women and part-timers who earn less and are more flexible. And, it would seem that *shifts* to the Phillips Curve happen during times of large, unexpected supply or demand shocks, notably housing, creating greater volatility, while a flattening *slope* correlates with 90% certainty to a lack of investment. This relationship is still changing, and as it does, it inserts new risk, and a need for new policies. A staggered, “pump” tax, to help consumers balance risk through saving and spending, a “cash tax,” to compel firms to take riskier investments, and a capital/AI tax, with revenues for tax credits, might prove propitious to economies if used wisely.

In total, in the short-run, the hypotheses are *in part* confirmed, that over several decades, certain structural changes, notably female employment, income inequality, as well as finicky consumption over high-tech goods, low

investment, housing shocks, assurances by the Fed, risky globalization, and expectations of employment have led to varied outcomes, namely, the perilous liquidity trap of low wages and inflation, the “stop-start” growth, and the volatile employment after the “Great Recession,” the Phillips Curve tradeoff. In sum, this article has added to the literature by juxtaposing concepts in all facets of consumption in never before seen ways.

16. ACKNOWLEDGMENTS

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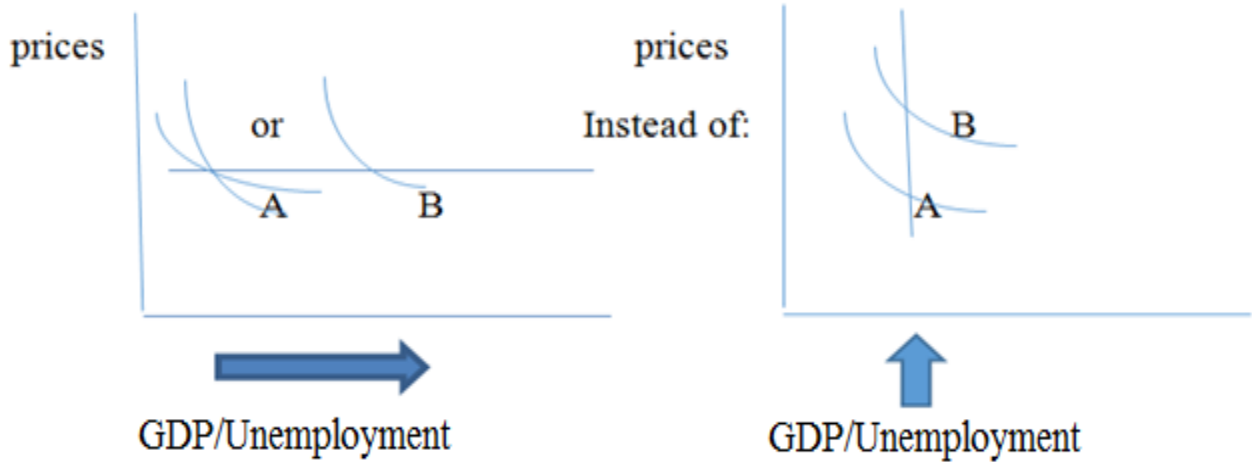


Figure-8. Alternate Phillips Curve: The curve is not vertical, but horizontal (Barry., 2018).

Source: This conceptual model is provided by the author.

New Keynesian Pull/Push Model

High-Tech/ Industrial Production Model

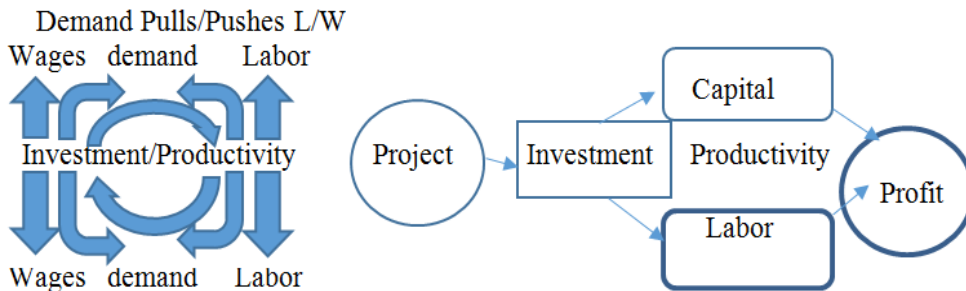


Figure-9. Investment Models: On the left, consumption in Keynesian style pulls or pushes investment, affecting labor or wages. On the right, investment is used for projects, with the resources flowing to either physical capital, or labor, based on which is more productive. With a lack of R&D spending, less money flows to workers. The profits, which are expected to be higher than the cost of financing, often are not, affecting future wages (Barry., 2018).

Source: This conceptual model is provided by the author.

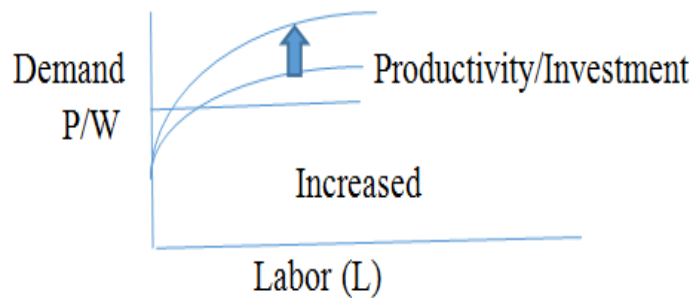


Figure-10. Demand and investment affect labor, and wages/prices (Barry., 2018).

Source: This conceptual model is provided by the author.

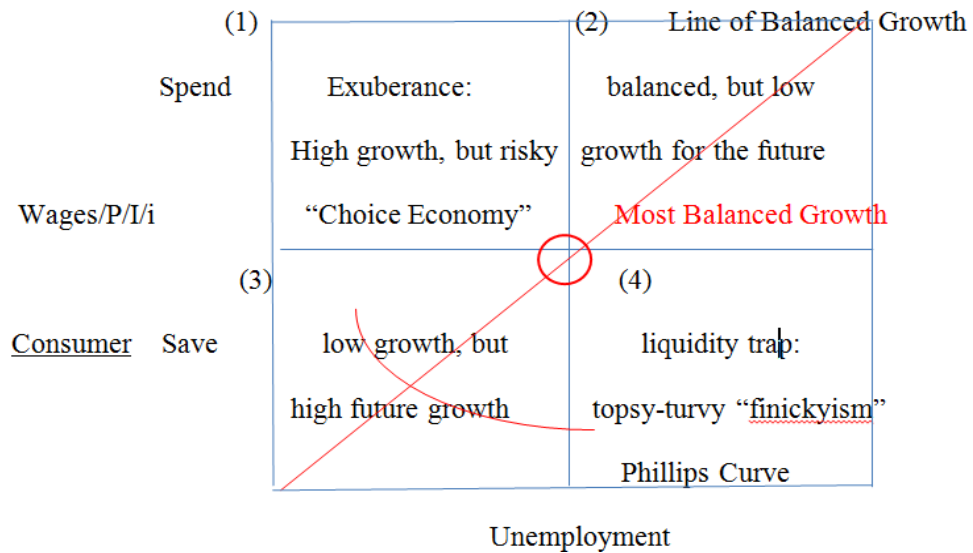


Figure-11. The Line of Balanced Growth (Barry., 2018): This corresponds with the Solow Model, that if capital does not diminish, but keeps pace with GDP through investment and technical progress, then consumption/wages and employment increase/decrease at the same time, meaning that growth stays constant with little or no volatility (Jones, 2002).
Source: This conceptual model is provided by the author.

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