

# Low Inflation and its Implications

## Summary:

Despite all indications that we experienced a continually tightening labor market in the decade after the Global Financial Crisis, US inflation, as measured by the core Consumer Price Index (which reflects purchases of consumer goods and services but excludes food and energy), has largely languished around 2% per year. Other indicators, including the Personal Consumption Expenditures index that is used by the Federal Reserve (“the Fed”), suggest that US inflation was actually lower than the Consumer Price Index measure indicates. This article takes an in-depth look at the underlying drivers of low inflation in the US.

Low inflation can be partially explained by corporate behavior. In seeking to maximize profits and minimize risk, companies employ concepts such as diminishing marginal returns to labor to justify cost reductions that minimize investments in their employees. The result of this has been an increase in outsourcing and offshoring and investments in automation that, over time, have reduced the pace of compensation growth to almost nothing. At the same time, companies have devalued the humanity of their customers in ways that don’t show up in the official inflation measures – extracting rents from customers at greater rates in an attempt to drive revenue growth.

It is important to understand that corporate behavior is a reflection of human behavior – without implicit approval from society in the form of demand for cheaper goods and strong cash-on-cash return on investment, it is unlikely that corporations would seek to take advantage of their employees and customers in this way. For this reason, changing corporate behavior must follow from changes in the way in which individuals seek to maximize our own ROI – we must be willing to bear the risk of accepting our uniqueness and the uniqueness of others, and collaborate with each other to generate non-diminishing returns to labor. In doing so, we will maximize long-term outcomes for ourselves and posterity.

## Why does inflation matter?

Inflation is defined as a general increase in the price level across an economy<sup>1</sup>. In order for inflation to occur, the prices of many goods and services must be increasing. Inflation reduces the amount of goods and services that can be purchased with a given

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<sup>1</sup> <https://www.frbsf.org/education/publications/doctor-econ/2002/october/inflation-factors-rise/>

amount of currency (known as the “purchasing power” of currency). Put another way, inflation reduces the value of a currency – without concurrent economic growth, inflation results in a reduction in the standard of living<sup>2</sup>.

Economists believe that moderate inflation is a natural byproduct of growth. Unchecked inflation rates that are too low or too high indicate impending economic trouble. Low inflation, for example, indicates that demand for goods and services is weak – and weak demand generally results in low economic growth, high unemployment and pressure on wages. Low inflation can also lead to reduced interest rates, which tends to dampen the availability of lending<sup>3</sup>, creating a negative feedback cycle that further hinders growth. High inflation on the other hand, deters saving by incentivizing more consumption today, when dollars are worth more. High inflation also reduces capital investment by leading to higher future interest rates and reduced returns on investment<sup>4</sup> – which can lead to a rapid deceleration in economic growth.

Economists also believe that inflation has an important impact on borrowers by eroding the value of debt. Most debt is issued in non-inflation-linked current dollars (nominal dollars, as explained below), meaning that over time, interest and principal payments that are made on debt will be worth less (they will have less purchasing power). Inflation can further erode the value of consumer debt when it is accompanied by rising wages – since consumer debt payments do not rise with inflation and wages, consumers will be able to more easily pay down their debt<sup>5</sup> when their wages are growing.

Deeper investigation into inflation can also provide significant value, because headline inflation is an easily observable symptom of various economic phenomena. Breaking down the causes of inflation can also tell us where broader price increases are happening in the economy, which can indicate areas of the economy where supply might be constrained. Additionally, understanding the level of inflation can help drive a deeper understanding of multiple economic phenomena, including compensation, productivity, and growth.

### **What are inflation and deflation? How is inflation generated?**

As mentioned above, inflation is defined as a general increase in the price level across an economy. The opposite of inflation is deflation – which is a general decrease in the price level across an economy. Deflation is very uncommon in developed economies outside of

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<sup>2</sup> <https://www.thebalance.com/what-is-inflation-how-it-s-measured-and-managed-3306170>

<sup>3</sup> <https://www.weforum.org/agenda/2019/06/inflation-is-healthy-for-the-economy-but-too-much-can-trigger-a-recession-7d37501704>

<sup>4</sup> <https://www.forbes.com/sites/jeffreydorfman/2016/08/19/inflation-is-still-bad-for-the-economy/#3505ac584340>

<sup>5</sup> <https://www.investopedia.com/ask/answers/111414/does-inflation-favor-lenders-or-borrowers.asp>

major economic downturns; since the US abandoned the gold standard in 1948, it has only experienced deflation twice – once during the financial crisis in 2009 and once in 2015 – when the Consumer Price Index (“CPI”) measured extremely minor deflation at -0.1%<sup>6</sup>.

There are two main economic theories explaining how inflation is generated: Monetarist theory and Keynesian theory.

Monetarist theory focuses on the role of money supply as the primary driver of growth and inflation. Monetarists believe that inflation is a phenomenon that can only be produced when the growth rate of the supply of money (as created by the central bank in an economy) outstrips the growth rate of productive capacity<sup>7</sup>.

This belief finds its foundation in the Quantity Theory of Money, which proposes that the exchange value for money is determined like any good, by supply and demand. The most common formulation of the Quantity Theory of Money states that, for any economy, the money supply multiplied by the velocity of money (the rate at which money changes hands) is equal to nominal expenditures (calculated as the volume of goods and services consumed multiplied by the nominal price of those goods and services). The Quantity Theory formula can be seen below:

$$MV = PT$$

Where:

M is the money supply,

V is the velocity of money,

P is the nominal price level,

T is the volume of transactions of goods and services consumed

This formula is an accounting identity – meaning the dollars on both sides of the equation must be equivalent for the economy to work – and therefore must be true<sup>8</sup>. Monetarist theory is predicated on the assumption that velocity is stable over time, which means that inflation (increases in P in the formula above) must be positively related to an increase in the money supply (increases in M in the formula above). The implication of this analysis is that the central bank in an economy holds enormous

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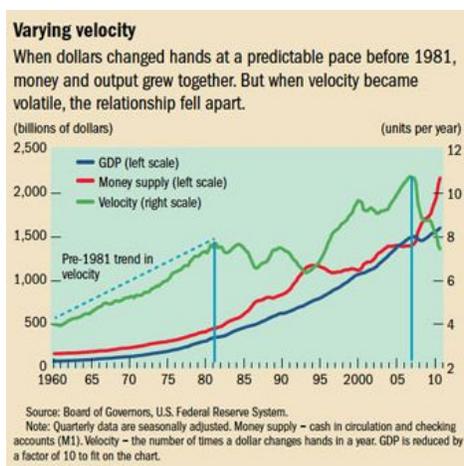
<sup>6</sup> <http://www.thefiscaltimes.com/2015/02/26/America-Deflation-So-What>

<sup>7</sup> [https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic\\_review/1975/pdf/er610602.pdf](https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic_review/1975/pdf/er610602.pdf)

<sup>8</sup> <https://www.imf.org/external/pubs/ft/fandd/2014/03/basics.htm>

power – by determining the supply of money in the economy, a central bank is able to explicitly manage the amount of inflation that an economy experiences.

Prior to the 1980s, velocity increased at a steady rate, enabling Monetarists to make the assumption that velocity is stable over time. However, since the 1980s, a number of changes to the banking system have increased the volatility of velocity, as seen in the chart below<sup>9</sup>:



Economists believe that the increased volatility in the velocity of money is due to a number of financial innovations introduced in the 1980s and 1990s, including the introduction of interest-bearing checking accounts, money market mutual funds and other assets to which cash could be allocated. As the link between money supply, growth and inflation weakened, economists began to call the validity of Monetarist Theory into question.

Further evidence of the weakness of Monetarist Theory can be found in the post-financial-crisis era. Between 2008 and 2014, the Fed created over \$3.5 trillion of new dollars in the form of reserves and injected them into the economy by purchasing mortgage backed securities and US Treasuries from the banking system. Monetarist Theory predicts that this action would generate a large amount of inflation; but this prediction is inconsistent with the reality over that time period of ~2% inflation. Despite the fact that QE successfully recapitalized the banking system, interest rates remain too low to incentivize banks to increase lending activity – which would lead to the increase in inflation that Monetarist Theory predicts.

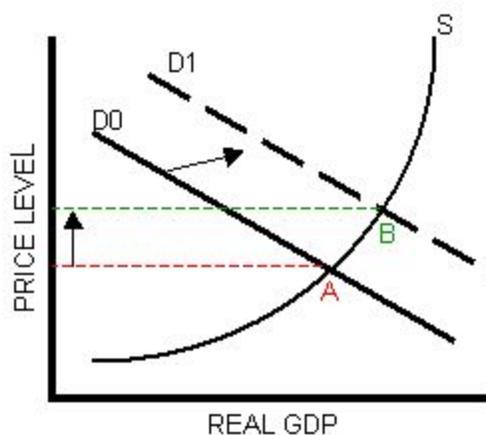
<sup>9</sup> <https://www.imf.org/external/pubs/ft/fandd/2014/03/basics.htm>

The weakening of Monetarist Theory has caused it to fall out of favor with policymakers<sup>10</sup>, and money supply has become a much less useful indicator than it was prior to the 1980s. Despite the limitations of this theory, some of its predictions remain relevant today – most importantly that economic growth and inflation will be limited without increases in the money supply, and therefore controlling the money supply is a critically important function of any central bank<sup>11</sup>.

The Keynesian approach to inflation allows for a deeper analysis of the relationship between inflation and compensation, productivity and growth. Keynesian economists believe that inflation generally results in one of two ways: demand-pull inflation and cost-push inflation<sup>12</sup>.

Demand-pull inflation occurs when demand for an economy's goods and services exceeds what the economy is capable of producing<sup>13</sup>. Demand-pull inflation is most commonly experienced as a by-product of economic growth. In a growing economy, lending typically increases and consumer spending naturally increases faster than the economy is capable of bringing new productive capacity online. As a result, demand temporarily outstrips supply, causing prices to rise.

Demand-pull inflation is illustrated graphically below:



In the graph, increased consumer spending is represented by a shift in the demand curve from D0 to D1. Since productive capacity does not increase, the supply curve does not shift, and the equilibrium point moves up from A to B. At equilibrium point B,

<sup>10</sup> <https://www.weforum.org/agenda/2015/09/has-the-fed-abandoned-monetarist-theory/>

<sup>11</sup> <https://www.imf.org/external/pubs/ft/fandd/2014/03/basics.htm>

<sup>12</sup> <https://inflationdata.com/articles/2012/07/21/what-is-demand-pull-inflation/>

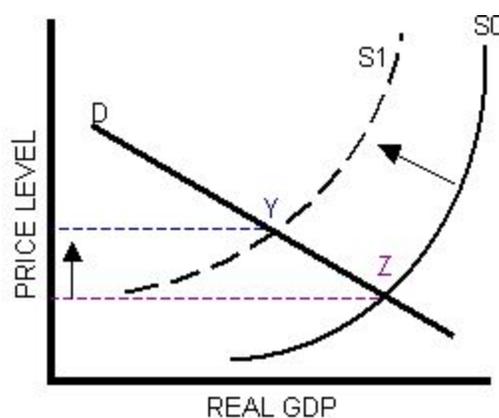
<sup>13</sup> <https://www.frbsf.org/education/publications/doctor-econ/2002/october/inflation-factors-rise/>

products are sold at a higher price than they are at equilibrium point A, resulting in inflation and, ultimately, higher output.

Demand-pull inflation can also be caused by (1) increased consumer expectations of future inflation, which pulls forward consumption from future periods; (2) fiscal policy, which most often takes the form of increased government spending and/or tax cuts and; (3) technological innovation, which enables increased consumption of existing products and services or creates new consumable products and services<sup>14</sup>.

Cost-push inflation occurs when the cost of production rises, forcing suppliers to increase prices. Since most markets are highly competitive, cost-push inflation is relatively uncommon and can only occur when production input costs rise for all producers (otherwise, producers that try to raise prices will push buyers towards lower-priced alternatives)<sup>15 16</sup>. A common type of cost-push inflation is related to input price increases. For example, if we examine the market for steel widgets, an increase in the price of steel will be felt more or less evenly across all producers, resulting in an increase in the input cost of producing widgets. As a result of the increased cost of production, suppliers of widgets will reduce their supply – if demand is largely unchanged, the result will be that some of the increased cost of steel will be passed through to consumers of widgets.

Cost-push inflation is illustrated graphically below:



In the graph, increased input costs result in a reduction in supply across all suppliers, which is represented by a shift in the supply curve from  $S_0$  to  $S_1$ . Assuming that demand

<sup>14</sup> <https://www.thebalance.com/what-is-demand-pull-inflation-3306100>

<sup>15</sup> <https://www.investopedia.com/terms/c/costpushinflation.asp>

<sup>16</sup> <https://www.investopedia.com/ask/answers/111314/what-causes-inflation-and-does-anyone-gain-it.asp>

remains unchanged, the equilibrium point will move from Z to Y, resulting in higher prices and lower real GDP.

Cost-push inflation can also be caused by (1) Government regulation and taxation, which can cause an exogenous increase to the cost of production and; (2) wage growth, which is a form of input price increase<sup>17</sup>. Through the rest of this article, we will return to focus on exploring the links between wage growth and inflation.

### **What do the terms “nominal” and “real” mean?**

In economics, the terms nominal and real are used to refer primarily to prices and interest rates.

When referring to prices, nominal means current dollar – at any given point in time, the nominal price of a good is on the price tag that you can see at the store. Real prices are adjusted for inflation and indexed to a given period in time. For example, the real price of a good can be measured between 2010 and 2020 using a base year of 2010 – this means that the impact of inflation between 2010 and 2020 will be removed so that fluctuations in the price of the good can be examined as though the price of the dollar were constant at 2010 levels<sup>18</sup>. Real prices are often calculated by dividing the nominal price of a good in each consecutive year after 2010 by the percentage increase in the CPI. Due to the compounding impact of inflation, the calculation must be performed in consecutive order for each year between 2010 and 2020 in order to continue to measure the real price of the good in terms of 2010 dollars.

This exercise enables economists to see how much of a good’s price increase (or decrease) between 2010 and 2020 can be attributed to factors other than inflation. Economists believe real price increases are mainly driven by improvements in the quality of products, while real price decreases are mainly driven by improvements in input productivity that leads to reduced production cost.

Nominal interest rates are the interest rates quoted to borrowers by lenders. Lenders are only able to set nominal rates (not real rates), and the Fed influences short-term nominal interest rates by setting the Federal Funds Rate. A real interest rate is an interest rate that has been adjusted to remove the effects of inflation<sup>19</sup>. Real interest rates are important for lenders and borrowers to understand because inflation

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<sup>17</sup> <https://www.thebalance.com/what-is-cost-push-inflation-3306096>

<sup>18</sup> <https://www.stlouisfed.org/publications/inside-the-vault/fall-2007/nominal-vs-real-oil-prices?print=true>

<sup>19</sup> <https://www.investopedia.com/ask/answers/032515/what-difference-between-real-and-nominal-interest-rates.asp>

structurally reduces the purchasing power of interest payments. Real interest rates are therefore calculated by subtracting the rate of inflation from the nominal interest rate.

A country's gross domestic product ("GDP") can also be measured using nominal and real methodologies. In this context, nominal GDP is the current-year value of all goods and services that an economy produces in a given period (generally measured in fiscal quarters or years). Real GDP is the total value of all goods and services that an economy produces in a given period, calculated using the prices of a selected base year. Real GDP therefore measures changes in output, as opposed to nominal GDP, which measures changes in both output and prices<sup>20</sup>. Growth in real GDP can only be driven by an economy producing a greater quantity of goods and services – and is generally illustrative of a healthy economy expanding its productive capacity.

Note that in most cases, nominal metrics are easily observable in the economy by checking the price of a good at the store or requesting an interest rate quote from a bank. Real metrics cannot be observed in the economy as they must be calculated. The value of real metrics lies in their ability to measure returns or changes in price that are not attributable to inflation.

### **How are inflation and deflation measured?**

The rate of inflation is measured as the percentage change in prices over a period – the inflation rate most commonly cited in the US is the year-over-year change in prices.

Inflation and deflation are primarily measured by the Bureau of Labor Statistics ("BLS") and the Bureau of Economic Analysis ("BEA"), which release estimates of the Consumer Price Index ("CPI") and the Personal Consumption Expenditures ("PCE"), respectively, each month. The BLS surveys 23,000 businesses and compiles the prices of 80,000 consumer goods and services every month to create the CPI. The products included in the CPI represent the purchases of an average American family of 4, and are updated once every two years<sup>21</sup> to account for changes in purchasing patterns, technological improvements and quality improvements that may raise or lower prices across the index (these adjustments known as hedonic adjustments, and are very complex)<sup>22</sup>. The CPI is used in many financial contracts, including inflation-indexed Treasury debt<sup>23</sup>, Social

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<sup>20</sup> <https://courses.lumenlearning.com/boundless-economics/chapter/comparing-real-and-nominal-gdp/>

<sup>21</sup> Business Statistics of the United States 2018: Patterns of Economic Change (Susan Ockert); Pages 282-283

<sup>22</sup> <http://www.coppolacomment.com/2019/03/inflation-is-always-and-everywhere.html?m=1>

<sup>23</sup> <https://www.newyorkfed.org/research/economists/medialibrary/media/research/epr/04v10n1/0405sack.pdf>

Security payment adjustments, and some employment agreements that include cost-of-living adjustments<sup>24</sup>.

The Fed historically used the CPI to track inflation and deflation, but began using the PCE in 2012 (at the same time that it established its 2% inflation goal) as it proved to be more flexible and comprehensive than the CPI<sup>25</sup>. The BEA estimates PCE using quarterly US GDP and monthly US retail sales reports<sup>26</sup>. Since PCE derives from actual sales and GDP reports, it represents a broader and more accurate set of goods and services than the CPI. As an example, PCE covers health care services that are self-pay and paid for by Medicare and Medicaid, whereas CPI only counts self-pay medical services in its calculation<sup>27</sup>.

Inflation can also be measured by the GDP deflator, which takes the ratio of nominal GDP to real GDP for a given base year<sup>28</sup>. The GDP deflator is also considered to be a broad measure of inflation because it accounts for expenditures by businesses, consumers and the government, as opposed to the CPI, which only measures a narrow set of consumer expenditures<sup>29</sup>. Many economists favor the GDP deflator for this reason – theoretically, measuring changes in the difference between real and nominal GDP should capture shifting consumer preferences and the introduction of new goods better than either the CPI or the PCE.

While none of these measures is perfect, they allow economists and other market-observers to track the inflation trend. In tracking inflation, most market observers focus on what is known as “core” inflation, which excludes food and energy prices as those categories tend to be extremely volatile and can skew the overall measure significantly.

### **How are inflation, employment and compensation related? How has that relationship changed over time, and does it explain why inflation is so low?**

The relationship between inflation and employment is laid out in the economic theory known as the Phillips Curve. The Keynesian interpretation of the Phillips Curve posits that when an economy grows, unemployment typically declines, resulting in an increase in compensation that profit-maximizing producers must pass on in the form of higher

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<sup>24</sup> <https://www.investopedia.com/ask/answers/112814/how-does-cost-living-adjustment-cola-affect-my-salary.asp>

<sup>25</sup> <https://www.stlouisfed.org/publications/regional-economist/july-2013/cpi-vs-pce-inflation--choosing-a-standard-measure>

<sup>26</sup> <https://www.thebalance.com/pce-inflation-how-it-s-calculated-why-the-fed-prefers-it-4004939>

<sup>27</sup> <https://www.businessinsider.com/medical-inflation-weighs-on-pce-not-cpi-2014-1?IR=T>

<sup>28</sup> <https://courses.lumenlearning.com/boundless-economics/chapter/comparing-real-and-nominal-gdp/>

<sup>29</sup> <https://www.investopedia.com/terms/g/gdppricedeflator.asp>

prices<sup>30</sup>, if they are unable to offset the increase in costs with improving productivity. Therefore, economists believe, growth and lower unemployment directly result in higher inflation. Similarly, when employment falls, increased slack in the labor market results in less pressure to increase compensation, resulting in a lower rate of inflation. The Phillips curve rarely predicts deflation as a result of high unemployment because over time, wages are downwardly rigid (meaning nominal pay cuts are rare)<sup>31</sup> even if unemployment is increasing.

The Phillips curve forms a cornerstone of US monetary policy – central bankers and economists at the Fed use updated and modified versions of the model (which still predict a negative general relationship between unemployment and inflation, but now incorporate consumers' future inflation expectations and other factors that help explain the relative flatness of the curve) to inform monetary policy decisions such as the level at which to set the short-term interest rate<sup>32</sup>. Indeed, up until 2018, Federal Reserve Chairmen including Jerome Powell and Janet Yellen have explicitly defended the Phillips curve in public speeches as still having merit in informing monetary policy decisions<sup>33 34</sup>.

However there is significant evidence that the relationship between unemployment and inflation laid out in the Phillips curve no longer exists in the US. The chart below shows that the negative relationship between inflation and unemployment that existed prior to the mid-1980s began to weaken between 1985 and 1994, and completely disappeared between 1995 and 2013<sup>35</sup>.

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<sup>30</sup> <https://www.stlouisfed.org/open-vault/2020/january/what-is-phillips-curve-why-flattened>

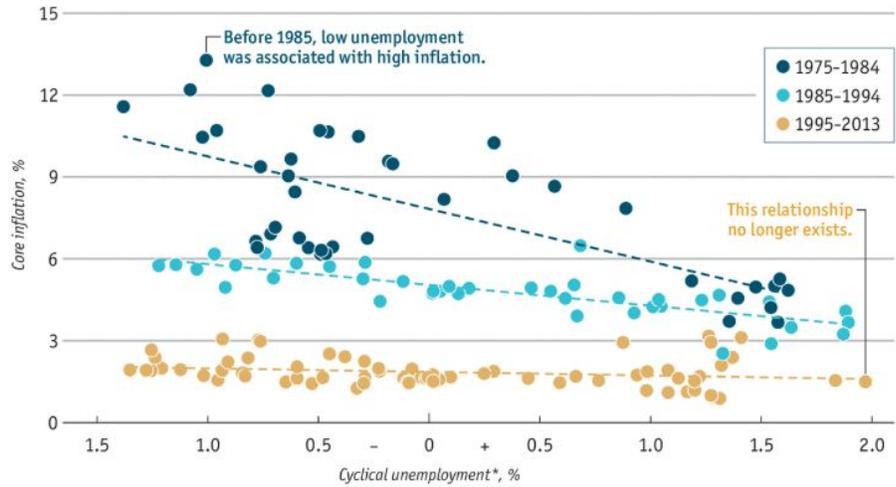
<sup>31</sup> <https://www.frbsf.org/economic-research/files/wp2013-08.pdf>

<sup>32</sup> <https://www.stlouisfed.org/from-the-president/speeches-and-presentations/2019/three-themes-for-monetary-policy-in-2019>

<sup>33</sup> <https://www.federalreserve.gov/newsevents/speech/yellen20170926a.htm>

<sup>34</sup> <https://www.federalreserve.gov/newsevents/speech/powell20181002a.htm>

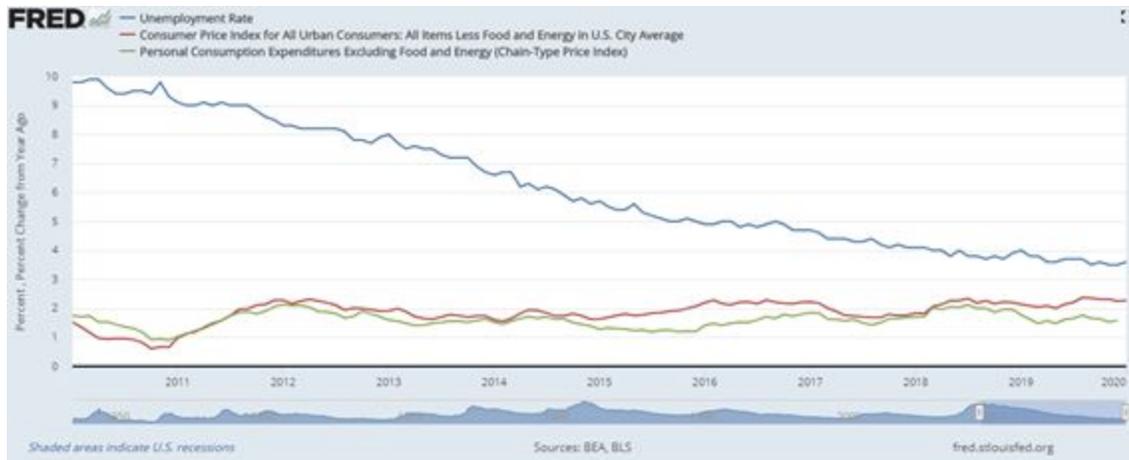
<sup>35</sup> <https://www.economist.com/graphic-detail/2017/11/01/the-phillips-curve-may-be-broken-for-good>



Sources: OECD; IMF  
Economist.com

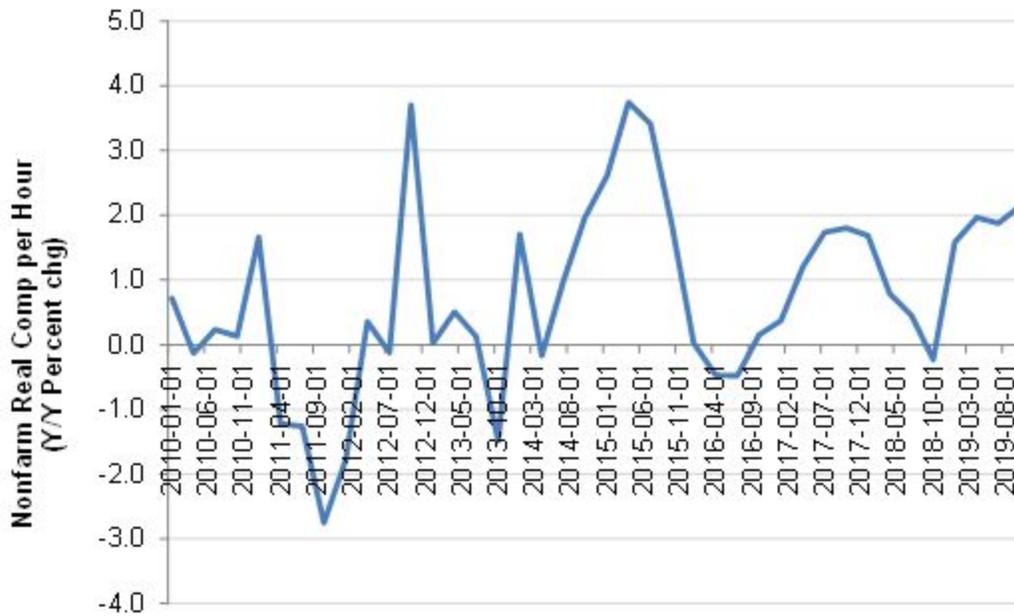
\*Actual unemployment minus the "natural" rate of unemployment

The US's recovery from the financial crisis illustrates this breakdown particularly well – since the end of the 2009 recession, the unemployment rate has fallen steadily from around 10% to around 3.5%, while core CPI inflation and core PCE inflation over that time period have largely remained below 2.5%, as shown in the chart below:



One potential reason for this phenomenon could be that, despite the significant decline in unemployment, there has been a marked lack of growth in real compensation between 2009 and 2019, as illustrated in the chart below<sup>36</sup>:

<sup>36</sup> <https://fred.stlouisfed.org/series/COMPRNFB>



Over the last 10 years (2009-2019), average real worker compensation has grown at an annual rate of approximately 0.75%, a significant slowdown from the 10-year annualized growth rate seen before the financial crisis (1997-2007), which was over 2%. Nominal compensation trends show a similar slowdown – compensation growth in the 10 years prior to the financial crisis grew at ~4.5%, while post-financial crisis compensation growth has slowed to ~2.5%<sup>37</sup>.

Low inflation can be partially explained by the slow pace of compensation growth. Without compensation growth, many businesses don't see significant cost inflation that they need to pass through via higher prices (labor costs remain low) and consumers can't demand more (because wages aren't rising fast enough), which would also stimulate price increases.

### How is inflation linked to productivity and growth?

As seen in the previous section, inflation and compensation can be linked through the Phillips Curve – this section will extend this analysis to explore productivity and growth.

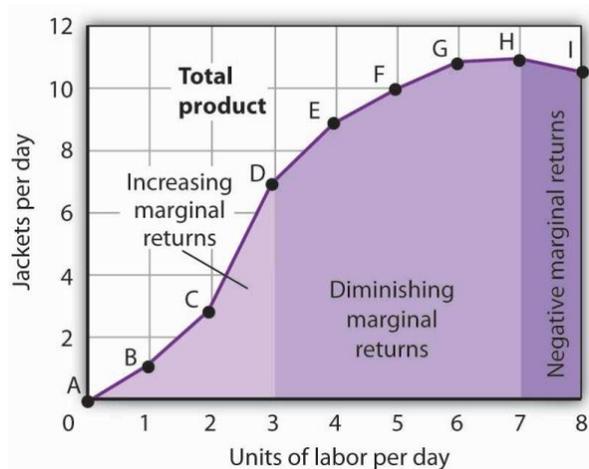
In the long-run, economic growth is primarily driven by 3 main factors: (1) increases in capital stock; (2) increases in labor inputs such as workforce or hours worked; and (3) technological progress, which improves the productivity of capital, labor or both.

<sup>37</sup> <https://fred.stlouisfed.org/series/COMPNFH#0>

Economic theory believes, and economic studies have shown, that a country's ability to grow through increases in capital stock and labor inputs are limited because of the law of diminishing marginal returns<sup>38</sup>.

In simple terms, the law of diminishing marginal returns states that labor or capital can be added to a production process (whether for a good or a service) in order to increase output up to a point, after which adding incremental units of labor and/or capital will result in smaller and smaller amounts of incremental output.

A common example for the concept of diminishing marginal returns uses a factory that has limited floor space. Assuming that the factory produces jackets, as the factory adds workers, jacket production will increase non-linearly until the point where the factory floor becomes crowded. At this point, the addition of incremental workers will still result in increased production, but because of the crowding, the incremental workers will be less productive and generate less incremental output than workers that were added before the factory was crowded. As more workers are added, eventually the factory floor will get so crowded that jacket production will actually begin to decline as the productivity of existing workers will be pulled down by the incremental nonproductive workers. These concepts are demonstrated in the chart below:



According to many economists, diminishing marginal productivity of labor and capital leaves technology as the primary and most important driver of economic growth. Technological improvements enable companies and individuals to produce goods and

<sup>38</sup> <https://www.stlouisfed.org/on-the-economy/2015/june/what-drives-long-run-economic-growth>

services more efficiently, driving an increase in production (growth) and potentially a reduction in costs (which would in turn, result in increased production or growth)<sup>39</sup>.

From this line of reasoning, it would follow logically that over the last 20 years, as digital technologies capable of helping humans build products even more efficiently took hold, we would expect productivity growth to accelerate. Yet, paradoxically, annualized worker productivity growth in the US (as measured by growth in real product per hour worked) has slowed from the long-run average as digital technologies have boomed over the last 20 years<sup>40 41</sup>. This slowdown has been even more pronounced since the financial crisis, despite continued progress in the development of technology<sup>42 43</sup>.

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<https://www.sciencedirect.com/science/article/pii/S1877042815036538/pdf?md5=de3b3eec5d99a8f188d900a9a4ad324e&pid=1-s2.0-S1877042815036538-main.pdf>

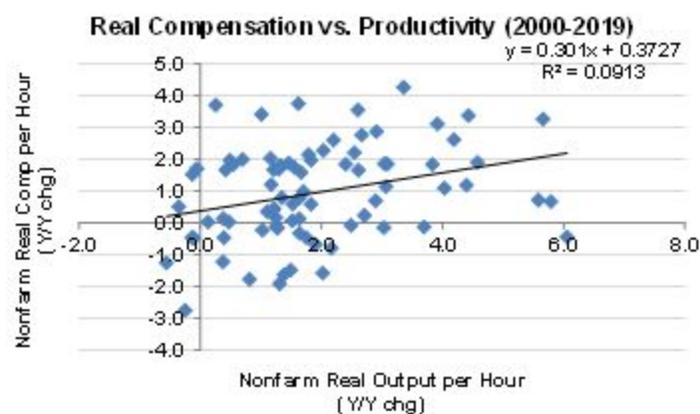
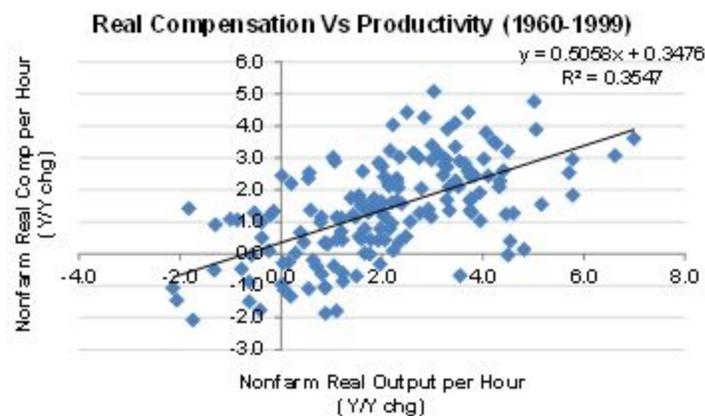
<sup>40</sup> US annualized productivity growth (using real output per hour) between 1958-1998 was approximately 2.0% vs. annualized productivity growth between 1998 and 2019 was approximately 1.9%

<sup>41</sup> <https://www.brookings.edu/blog/up-front/2020/02/25/technology-and-the-future-of-growth-challenges-of-change/>

<sup>42</sup> US annualized productivity growth (using real output per hour) between 2009 and 2019 was approximately 1.1%

<sup>43</sup> <https://www.stlouisfed.org/on-the-economy/2015/november/relationship-between-wage-growth-inflation>

The slowdown in productivity growth since the late 1990s is theoretically linked to the slowdown in compensation growth – in a perfect world, productivity and compensation should grow at approximately the same rate. However, over the last 20 years, compensation growth has actually slowed more than productivity growth, and the relationship between the two has weakened significantly from the long-term trend, as illustrated in the charts below<sup>44</sup>:



Underlying this trend has been a reduction in the share of income generated by businesses that goes to labor – a 2017 BLS study showed that the share of income going to labor has declined across 77% of US industries since 1987<sup>45</sup>. Much of this can be explained by the rise of globalization, in which production is outsourced to workers in other countries, and automation, in which labor is replaced by capital.

<sup>44</sup> <https://fred.stlouisfed.org>; datasets: OPHNFB\_PC1, COMPRNFB\_PC1

<sup>45</sup> <https://www.bls.gov/opub/btn/volume-6/pdf/understanding-the-labor-productivity-and-compensation-gap.pdf>

A reduction in labor's share of income naturally follows from the conclusion that labor output is restricted by diminishing marginal returns – this logic rests on the assumption that every unit of labor is equal in its ability to contribute to a production process. Much of the investment in innovation and technological progress we have seen builds on this concept – resulting in the creation of products and processes like globalization and automation (both software and hardware).

Furthermore, as new technologies favor capital and higher-level skills, and as education's ability to equip displaced workers with necessary skills lags, displaced labor can fall out of the workforce, shrinking the overall labor pool and leading to increased income inequality and mounting anxiety about job security – all of which contribute to low rates of inflation while also fueling populist movements that have taken hold across the world.

There is reason to question the fundamental assumption that every unit of labor is equal. Recent research focuses on “people” rather than on firms, and provides evidence that companies that focus on building employee knowledge and specialization can experience non-diminishing marginal returns to labor<sup>46</sup>. The implication of this research is that when individuals develop specialized skill sets, the addition of incremental units of specialized labor to the appropriate production processes can generate non-diminishing returns to labor. Furthermore, companies can continue to generate improving returns on labor by investing in on-the-job training and other kinds of investment in their human capital. Put in simpler terms, companies can experience nonlinear positive growth by hiring individuals who have developed specialized skill sets that reflect their unique interests and desires into relevant positions and supporting their further development.

### **So why is inflation so low?**

Inflation is a complex phenomenon with multiple potential drivers – this article has investigated one of those: low growth in compensation. Weakness in compensation, in turn, can be explained through the economic behavior of firms – which apply diminishing marginal product of labor to grow their profits and cash flow. In equalizing every hour of labor, firms underestimate the value provided by each individual's unique viewpoint and thought process, justifying profit growth through cost-reductions and efficiency improvements that focus only on the Profit-and-Loss statement.

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<sup>46</sup> <https://ec.europa.eu/jrc/sites/jrcsh/files/JRC98665.pdf>

The effects of these actions are clear: a significant decline in labor’s share of corporate income, and a marked lack of growth in compensation – which manifests in the economy through low inflation. Furthermore, within firms, denial of the value of uniqueness in units of labor contributes to a culture of decision making through the lens of “career risk” and “justifying one’s job”, which generates friction between workers and prevents them from collaborating and contributing their full potential.

Ultimately, this cycle feeds on itself – as profit-seeking firms’ revenue growth is hindered by a lack of growth in consumption, these firms seek to generate incremental ROI by cutting costs, depressing compensation and consumption growth. While this effect keeps the measured inflation rate low, the underlying inflation rate must be higher than the measured rate because firms are trying to maximize revenue without actually meeting community needs.

Firms’ efforts to maximize ROI via the application of diminishing marginal returns also manifests more subtly in the way that they interact with consumers. In the absence of real innovation or consumption growth, firms often seek to segment their product offerings and billing / payment processes, among other means, to fuel revenue growth. There are examples of this rent-seeking behavior (defined as efforts to seek payment from a system without creating any new value for it) throughout the economy. Apple, for example, has leveraged its ~50% market share in US smartphones into a monopoly in the market for iOS apps that allows it to charge developers a 30% fee for all in-app digital transactions, while at the same time forbidding any app from linking or suggesting that users visit a website to acquire any sort of digital good or subscription<sup>47</sup>.

Rent seeking behavior is not contained to the technology sector – we see examples of rent seeking across many consumer-facing sectors. In healthcare, rent seeking behavior by Purdue Pharmaceuticals in the form of lobbying the FDA to expand the market for OxyContin and an aggressive marketing strategy that effectively bribed physicians for writing prescriptions contributed to the development of the opioid crisis in the US. In Industrials, Hertz and other car rental companies use a complex set of billing procedures and fee structures that overcharge customers and have a labyrinth of customer helplines that makes recovering money exceedingly difficult (the same is true for other consumer-facing industrial companies, such as Airlines). In Eyewear, EssilorLuxottica (which manufactures famous brands such as Ray-Ban) has a ~45% market share in prescription lenses and a ~25% market share in frames, and uses its massive market position to set prices and reduce competition<sup>48</sup>, supporting markups on

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<sup>47</sup> <https://stratechery.com/2018/antitrust-the-app-store-and-apple/>

<sup>48</sup> <https://www.latimes.com/business/lazarus/la-fi-lazarus-glasses-lenscrafters-luxottica-monopoly-20190305-story.html>

eyewear they produce of up to 1,000%<sup>49</sup>. In many housing markets, particularly in larger cities, landlords extract economic rents from tenants by offering housing units that barely meet habitability standards and responding slowly to maintenance requests while charging at-or-above market rental prices (note that the act of leasing out a housing unit is not considered rent-seeking, assuming that the landlord has invested in making the unit clean and habitable). Additionally, price increases are not always evident – in some cases, companies produce products that are inexpensive at first look, but are of very low quality. As a result, the customer inadvertently ends up spending more over time despite the initial savings (an example of this can be found in the Fast Fashion industry). These are just a few examples of areas in which rent seeking behavior by companies generates price increases for the customer that may not show up in official measures of inflation.

While corporate rent-seeking has clear negative effects on consumers and workers, it is important to highlight that consumers' and workers' actions reinforce this behavior. Consumer demand created Apple's monopoly and supports it to this day despite the fact that Apple wields its monopoly power so aggressively that almost no-one is willing to make on-the-record statements against the company<sup>50</sup>. Similarly, consumers empower rent seeking companies such as EssilorLuxottica with their demand for products including Ray-Bans and other luxury eyewear. Workers, fearing a reduction in their quality of life or an interruption of their income, continue to supply labor to companies whose values don't match their own.

All this behavior is justified by a core model employed by firms and people that seek to maximize ROI while minimizing risk - which also minimizes the ability of firms to innovate and provide real services to humanity. As a result of this behavior, consumers' and workers' purchasing power continues to diminish, hindering their ability to fuel economic growth.

## **Theoretical Framework for Understanding Low Inflation and its Implications**

The article on Quantitative Easing established a link between monetary policy (QE and low interest rates) and a lack of productive lending and investment in R&D and capital expenditures – we will expand on this through the lens of profit maximization to better understand the above discussion of inflation.

Below is a recap of the applicable theory from the QE article:

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<sup>49</sup> <https://www.latimes.com/business/lazarus/la-fi-lazarus-why-are-eyeglasses-so-expensive-20190122-story.html>

<sup>50</sup> <https://stratechery.com/2020/hey-v-apple-follow-up-shopify-and-walmart-three-follow-ups/>

*Since both short and long-term rates are artificially depressed by QE, banks don't have an incentive to make higher risk loans ("the juice isn't worth the squeeze")... Furthermore, given the reduced returns to risk-taking and innovation, established companies are also not incentivized to drive sales growth by investing in R&D or capital expenditures; instead companies have been cutting expenses – effectively sending larger and larger amounts of money to short-term profit at the expense of investments in medium and long-term growth. Indeed, large company profit margins have never been at higher levels than in the last 2 years.*

This lack of productive investment and innovation generates an environment in which corporate revenue growth is naturally low – and pressure to maximize profits and cash flow leads firms with low growth prospects to apply the theory of diminishing marginal returns to labor to maximize their profits in the most efficient way they know – by cutting costs and employing rent seeking as a tool to grow revenues. In doing so, they impair not only the productive capacity of the economy, but also the capacity of the consumer to participate effectively in the economy and generate real growth.

It is important to note that firms' pursuit of rent seeking strategies exacerbates the lack of innovation identified in the QE article. While these strategies, by definition, create no real value, they give the appearance of generating significant, low-cost (and lower risk) growth, which investors find very attractive – as a result, rent seeking opportunities attract incremental capital at the expense of investments that might fuel genuine innovation. Furthermore, this behavior constrains the ability of municipal and federal government to step in and invest to support the populace by limiting potential increases in short-and-long run tax revenue.

It is easy to look at the behavior of firms with anger, but it is important to remember that firm behavior is a reflection of human behavior - without real consumer demand for the products that firms produce, often at cheaper and cheaper prices, and without investors demanding a rapid cash-on-cash return on their investment, firm behavior would be completely different. Both of these human behaviors follow the same ROI maximization model that firms employ today.

Many individuals today are too willing to accept the tradeoff of a less-productive future in exchange for maximizing today's ROI, without realizing that their current comforts are likely temporary. In making this tradeoff, people avoid admitting that their unique responsibilities and desires for the future are valid. Invariably, following this path creates anxiety that they must externalize by controlling others and negating their

uniqueness as well. When many individuals follow this path over time, the result is the forced homogenization of large portions of the population – and from this forced homogenization spring concepts such as diminishing marginal returns to labor that we see applied at the corporate level today. In spite of this, our society has at numerous points in the past invested deeply in its own humanity, which has given us the significant jumps in growth and progress that have lifted the US to the strong global standing it holds today.

We now find ourselves at another point where we must invest deeply in our own humanity. In order to foster real economic growth, and ensure a better future for ourselves and our posterity, we must collectively work to undo this homogenization and admit that every individual has a set of desires, skills and perspective that are valid and valuable to society. When each individual is able to apply his or her specialized perspective and skills to solve shared societal problems or reach shared goals, the result will look like non-diminishing, or even increasing marginal returns to labor (this result is in-line with what recent economic research has begun to show). This approach will also facilitate increasing consumption of longer-duration goods – consumers will have more cash to invest, and companies will be incentivized to develop products that solve for actual needs – which should lessen the hidden inflationary pressures felt by many today.

Achieving this will require some short-term effort and sacrifice on the part of consumers and suppliers in today's economy – but the long-run economic benefit that results will likely prove worthwhile.

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