

# [The expectations augmented phillips curve - essay](https://assignbuster.com/the-expectations-augmented-phillips-curve-essay/)

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History has developed into two aspects, before and after the era of 1975, with a broad unanimity about the development of pre-1975, which is well apprehend (understood). Bifurcation starts in 1975, when the Philips curve break down into two fork (branches) of the road with having a little interaction between two branches or forks. As we look towards the major contribution of the paper, by the source of “ bifurcation” (divide it into branches) in order to examine the contributions of the forks that occur post 1975. The pre history of the Philips curve before 1975 is straightforward and clear in its manner. Philips initially discover the history of existing negative relationship between inflation and unemployment named as Philips curve, that was afterward popularized by Samuelson and Solow, and then followed by the period when the policy maker were supposing to feat the trade-off between them in order to reduce the unemployment on the cost of increasing inflation. For that development of Friedman, Phelps and lucas conquered the policy feat trade-off in favor of long run monetary impartiality. When Sargent explained the failure of their tests of impartiality, made refusal on the implemented econometric version of Philips curve in the 1960s wound, and finally they were condemned to the destroyed twist of the negative correlation between the unemployment and inflation in the era of 1960s converted to the positive in 1970s by the lucas and Sargent. The impartial architect and the adversary of Keynesian trade-off emerged victory with having major caveats of that concerned model were unconvincing as well as their price surprises all were conducting many mistakes without any supporting evidences. Literature of Philips curve split in two dimensions after 1975 (the era of evolution of PC), when everyone failed to recognize the contribution of others. The other section reviews the consistent, energetic and dynamic aggregate demand and supply framework that come into front in late 1970s in theoretical contribution and in textbooks of macro economics. This approach is determined, because the inflation rate is dominated by the perseverant in form of different long lags as compared to past inflation rate. In the main stream approach the major important difference is that the post inflation rate is unlimited to form the expectations, but also involves the perseverant effect due to the wage and price the contracts of fixed-duration, also the lags of unripe material and final goods prices.

Due to the demand and supply shocks inflation dislodged from its past sluggish values. This approach of econometric implementations sometime called “ triangle” because it showing the three cornered supply, demand and inertia. As the results of supply shocks, the approach describes the inflation and unemployment peaks in the era of 1970s and early 1980s, that provides the proportional analysis of “ valley” of low unemployment and inflation in late 1990s. It may emphasize that unemployment and inflation can either be negatively and positively correlated and also depending on the supply shocks and responses.

During the era of early and mid 1960, the three phases of Philips curve developed e following results. Firstly, the Philips curve provide the policy maker with a menu of different options. Secondly, the policy advisors of the Kennedy and Johnson government, that led by Walter Heller having support from Robert Solow and James Tobin, they made discussion that the previous Republican government (administration) had chosen a point too far south east along with the Philips curve trade-off, that time considered precious because of getting the country move again from south east to north-west. President Kennedy got some sort of recommendations from Heller’s group relevant to the major cuts in federal income taxes and these were implemented by the Johnson government in two phases of 1964 and 1965 after the death of president. Samuelson and Solow had calculated the unemployment rate in the late 1963 that was 5. 5% and compatible along zero inflation, so it was suitable to implement the expansionary fiscal policy of Kennedy-Johnson that accelerate the inflation even without loosening the floodlight fiscal trend due to the war of Vietnam. We refer to examine the period of 1960 to 1971by taking the quarterly data of US inflation and unemployment and then return to the same picture of evolution of Philips curve debate started in the post 1971 about the inflation and unemployment.

Third aspect was the rate of unemployment fall below 5. 5% in 1964 and remained below 4% in between 1966 to 1970. The ups and down in inflation remained compatible in econometric model with having the natural unemployment rate (consistent with steady inflation rather than the zero inflation) in the range of 5. 5% – 6. 0%. Another aspect of that period was the invention of mainframe (the super electronic computer). For the first time, the computer made it practical to estimate the large scale econometric models contained in (Formm and Tauban 1968). These model consisted of two equations. The main explanatory variable in that equation of incorporated Philips curve was the unemployment rate, sometimes the rate of change of unemployment rate, some variables measure the expected inflation of sets of lags and on tax rates. In the equation of price level to the wage level the estimated change of wage was typically translated into the inflation rate and adjusted for the productive tendency, the so called unit labor cost tendency. Demand was intensively measured and responds by the price-labor cost ratio. The price-labour cost ratio or ‘ mark-up’ was allowed to respond to a measure of demand, this particular situation related to the productive market not to the unemployment rate, such as the ratio similar to the unfilled shipment orders. The inflation rate depend on the rate of change of unemployment in the reduce form of this approach where it measure the demand as well as different lags of inflation. With dealing the challenge of Friedman-Phelps natural rate hypothesis, a problem encountered showing the conflict in the data taken in the late 1960s.

Although, the pertaining competition, the feature was devoted among the different departments of economics working at the University of Chicago, dealings happening in between Milton Friedman and Franco Modigliani. A debate occurred between them in 965 by their co-authors over the issue that only monetary policy mattered or only fiscal policy mattered and debated seemed fantastic when the results were based on IS-LM model showed that both the fiscal and monetary policy mattered in estimation of PC by excluding some extreme cases. The presidential address of Friedman (1968) comprised of two sections that had a main point which was closely correlated.

First, it signified the faster inflation due to showing the inefficiency in control of nominal interest rate by the central bank and it adds fuel toward the inflation fire in the economy. Second, it showed the importance of Philips curve debate and derived conclusion by said that the policy makers had no ability to select any other unemployment rate rather than the natural rate of unemployment and excluded from the macroeconomic structure of the product and the labor market. Another more desirable and suitable interpretation about the natural rate of unemployment was given that showed the compatibility with accurate inflation rate which comprised the slow and steady inflation rate. Analysis which was not neutral based on the policy trade off had ignored the expectations that used for adjustment purposes. By consider an economy proceeding at the natural rate of unemployment and also based on the 1% inflation rate was precisely prevented.

By pushing the unemployment rate below the natural unemployment rate can tend the economy towards the north east of the short run Philips curve and the consequences appeared in form of increasing the actual inflation rate. But if the agents noticed that the inflation rate become higher as compared to the initial anticipated inflation rate of 1%, the inflation expectations become higher and it shift the short run Philips curve higher. And the process will continue unless and until the rate of unemployment reached at the natural rate of unemployment. So, the Friedman’s timing to address becomes weird and impeccable. According to the verbal predictions of the model given by Friedman, The fiscal expansion of Kennedy-Johnson that included both the spending on Vietnam War and tax cuts that also accompanied by the monetary accommodations had not only push the rate of unemployment down to 3. 5% from 5. 5% but in each year in between 1963 to 1969 the rate of inflation become swift. The large scale econometricians who had estimated the unemployment rate of 4% and also forecasted the inflation rate become perplex that how the acceleration of inflation had been exceeded from year to year. Defamers of Friedman attacked on the verbal model given by him and used to motivate the natural rate, when the econometricians become well aware of their failures regarding to forecast the acceleration of inflation in late 1960s and in later the model become “ fooling model”. According to the employers expectations related to price level a thought given by Friedman that are always accurate but the employees remained dissatisfied of the expected prices that does not respond to the actual price level. When the business expand, the prices raises more than the ratio of wages, so the need is to provide the incentives to the employees in order to bridge up the gap of lower real wages, as they remained fail to fulfilled their expectations to adjust the prices.

Friedman’s verbally assumed model become implausible, as the workers had complete access of the Consumer price index and were well known about the actual prices prevailing in the market. There could no business cycle in the world of Friedman. The credit of co-discovering the natural hypothesis was given to Phelps (1967, 1968). In juxtaposition, the Friedman distinction was in between dumb workers and smart firms, but in Phelps’s world everyone is dumb considered equally fooled. The general price level rises in the rest of economy as both the workers and the firm seems the price rises in the industry and the consequence was to increase the production level. So the Phelps developed a model in which employees treated separate from the information of the economy. The workers quit regularly from one firm to another firm in order to get the high wages and the unemployment become frictional. But the workers does not quit as the same firms offered them the high wages. Without their knowledge the unemployment rate became low, and at the same time all the firms raised the wages by the same proportion of the money. The macroeconomic data registered a decline in the unemployment as the employees became fooled of declining the frictional unemployment rate. Hence there prevail a correlation in between the rate of unemployment and wage rate, but due to this situation the expectations are incorrect. The criticism directed to the Friedman verbal fooling model as well as applied to Phelps model, whether the firms or employees became fooled or both of them treated in the same direction. But the workers and the employees got information of consumer price index on monthly basis and buy different goods and services smoothly. So the consequences appeared by said that, if the country’s GDP is very high and the unemployment rate become low then the aggregate prices goes up, so the workers and firm can learn many more from the past expectations and can use their experience In the proper way.

## The Origins of the Phillips Curve

Alban Philips was the first name of Philips curve which is afterward known as Philips curve, when an econometric survey was conducted in United Kingdom in the era of 1861 to 1957 in order to examine the behavior of money wage and unemployment. To justify this behavior Philips did not had any macroeconomic model, then by took help from theoretical thought he made a statistical model. Philips argued that “ when few are unemployed and the demand for labor is very high we should expect from employers to bid the wage rates up rapidly (Philips, 1958, p: 283). So according to him, the wages can be increased with having a low unemployment rate. And the other aspect was, there prevail a “ highly non linear” relationship, as the workers will not accept the low wages when there prevail a high unemployment rate in the economy, so the wages fall slowly. Two other factors are also state by Philips named as the rate of change in the retail prices and the business cycle (Philips 1958, p: 283). To find the evidences, that the negative relationship exists in the wage rate and unemployment, Philips enquire into three period separately from 1861 to 1913, 1913 to 1948 and 1948 to 1957 respectively (Philips, 1958, p: 299). No worth was given to this because in 1926, Irving Fisher has already been found this relationship (Fisher 1973). While after in 1960, this work was named as Philips curve1, when Samuelson and Solow repeated the work of Philips in United States (Samuelson and Solow, 1960). In 1960 this article “ the Philips curve” became very much important and central for any of the macroeconomic discussion, thinking and policy.

## 2. 2 Expectations-Augmented Phillips Curve

The Phillips curve broke down in its original form after the 1960s. And the expected augmented Philips curve was the new form of Philips curve. First to find out why the original relationship broke down, the analysis of original framework of Philips curve is important. As we facing a high inflation rate now a days. We became used to of this situation, as the prices become high day by day, the wages increases and we face inflation. In the statistical terms the price follows a random tendency. In the last year USA faced negative inflation, Austria faced it in 1955 and for the last time in 1953 when the inflation was negative (Blanchard, 2006). Inflation was sometimes negative and followed by a white noise before the World War 1, when the gold standard was still inefficient (Mankin and Reis, 2002). So the Philips curve discovered negative relation and the analysis was done for the white noise inflation period. In that period when the household expected no inflation or zero inflation in the economy, the wage-price spiral as discussed in the Philips’s article, as follows:

* As the low unemployment directs the firms to increase the wages
* The increased wages leads to higher prices
* And the higher prices will direct the workers to demand higher wages

So the low unemployment leads inflation in the above framework. In 1970s this form of model broke down in USA due to its failure to incorporate the economic behavior of the human being in the right and correct way. In 1970s there were two important things that provided a clear proof of this fact. First, this model was called the “ Philips schedule” but later on this model and the whole article switched up to “ Philips curve”. On the other hand the world was already faced two oil shocks and inflation considered as the permanent phenomenon, people has been expecting inflation in order to bid up their wages (Blanchard, 2006). To make it able an analysis about influences conducted to include the price shocks and expectations in the model. There are three components of Philips curve are as follow:

## Demand Pull inflation:

If the inflation is below its structural rate of 3% the inflation is called demand pull inflation that tend to increase due to the aggregate demand.

## Cost-pushh inflation:

This inflation refers to the supply shocks. Low supply directs the firm to increase the prices, so this causes higher inflation.

## Expectations:

People expect more about inflation and when the prices rise they bid up the wages. So, it can be said as there exists the negative relationship in between cyclical unemployment and unanticipated money wage.

No doubt, many economists agreed upon that the classical quantity theory of money is inconsistence with the stable long run Philips curve that shows the trade-off between the inflation and unemployment. In the quantity theory of money, money stock changes can only affect the nominal variables and the price while the impact became nil in real variables. By Juxtaposition, Philips curve explained that the money growth rate can raise the level of output and increase employment. Now the question arises how could the economists frequently cleave two opposite views? According to the great eighteenth century economists of Scott land and the philosopher, the question centralized to the disputation over the contributions of David Hume (1711-1776). For example, Thomas Mayer argued that, the David assuredly rejected the trade-off between the inflation and unemployment because it is incompatible with quantity theory of money.

According to the Mayer, as the quantity theory of money is central for the David Hume likewise the Philips curve trade-off is also central to the David’s economics because if this trade-off exists in the economy, it also affect the quantity theory of money as well and the consequences are in form of prices that do not increases in quantity theory of money. Similarly, Frenkel quotes David’s creed in the neutrality of quantity theory as (the money stock can only affect the nominal variables) as an proof of David’s rejection of the Philips curve. Frenkel says, there is an evidence that David Hume did not trust in the long run Philips curve Trade-off, the overpowering inclination of Hume’s and the important feature of monetary theory had been the assertion objective of the money neutrality which states, the monetary policy perform no longer pressure on the real variables. Mayer and Frenkel, no doubt, admitted that during the transitional period, money wages can affect the inflation, output and unemployment. But if there is no long run Philips curve trade-off, it can only affect the temporary real effects that can vanish while after.

According to the Charles Nelson controversy, who claims that the David Hume is in need to show trust in the long run Philips curve trade-off as it is unique in its functions. Nelson says, the money stock in quantity theory can raise the output, wages, prices and employment permanently. Therefore, David Hume was believed in the long run Philips curve. The purpose of this discussion is to show and remove the controversy to the content of Mayer and Frenkle and the Hume did believe in the quantity theory of money and the long run Philips curve trade-off as well. The purpose of this study is to correct the both phenomenon which are partially mistaken and contrary to Mayer and Frenkle, and David Hume should trust in stable long run Philips curve with contrary to the suggestions given by Nelson, that Hume was not alone to accept this stable Philips curve but Henry Thornton was also joined with him (1760 to 1815), perhaps the primary fiscal theorist of the nineteenth century at British traditional school; and eventually, that neither Hume nor Thornton compete that the real possessions of a steady, unrelenting rate of money growth were controlled to a concise execution period but idea of those possessions could persist for an imprecise phase. More precisely, the article shows that both Thornton and Hume notorious among levels and rates of conversion of the money hoard, that they held the preceding work to be unbiased and the later partial with deference to definite fiscal variables, and that this variation resolve their conviction in both the long run Philips curve and the quantity theory of money. Moreover the article shows that, even if both Thornton and Hume thought in the continuation of a steady long-run Phillips curve, they varied concerning the attraction of utilizing that association for policy purposes, Hume errand and Thornton disparate such a policy.

The vision of Hume and Thornton are imperative not just as they show that at least two foremost classical quantity theorists accepted the Philips curve, but as well as they demonstrate how divergent policy prescription can obtain from the similar fundamental theoretical framework. According to Hume, the long run trade-off, though, the same is not accurate of a stable sequence of such fiscal increase. He deliberate such increase would, if preserve over a permanent sequence of intermediary modification period, apply stable real effects. That is, he emphasized the actual consequence of a unrelenting fiscal extension, thus timely Adam Smith’s aside that “ Mr. Hume’s analysis is remarkably inventive. He look, though, to have left a modest into the concept that community luxury consists in wealth.” (9; p. 197 quoted in 7; p. 136) absolutely bigheaded that prospect of future inflation would always remain nil and then would never go into price and wage demands, Hume asserted that a repeatedly increasing money stock would ever more protest in front of prices and wage, always annoying their 1 Hume’s oversight of inflationary prospect could be clarified on at least three basis.

First, he was unfolding a world clanging inflation rate relatively low (1-3 % per year on average) through recent principles, perchance insufficient to achieve the least observation entrance requisite for the creation of inflation prospect. Second, specified a clanging fiscal standard, one could disagree on prosperity basis that the anticipated long term inflation rate is nil. The basis, certainly, is that if the reserve of fiscal metal were primarily growing at an inflationary velocity so as to lift the metal price of goods as well as labor. The consequential drop in the purchasing power of metal mutual with the increasing labor cost of drawing out it would persuade mine owners to restrain clanging production to non inflationary stage. Furthermore, the inflationary over production of gold would, through lower its worth comparative to further goods, provide the later supplementary gainful to fabricate than gold, thus repeatedly scrutinize the over production of gold. Emphasize this price stabilize production effect would be a move in the demand for gold from monetary to non monetary uses as gold’s value as money declines. Third, the discovery of gold and silver mines in the New World could be observed as random, casual events having an expected value of approximately zero. For these reasons, Hume’s understandable that either the monetary change is relatively positive or negative. That real wage rate is “ as harmful to industry, when silver and gold are retreating, as it is beneficial when these metals are rising.” particularly, in the devaluation case of pessimistic money growth, “ The laborer has not at the same employment from the producer and merchant although he pays the same price for all things in the marketplace. The farmer cannot organize of his corn and livestock; while he has to pay the similar rent to his landowner. The poverty as well as beggary, and sluggishness, which must follow are simply anticipated.” [3; p. 40]

Here is Hume’s strain on the actual consequence and inconsequentiality correspondingly, of rates of change vs. unlimited quantity of money. This stress is also obvious in the subsequent way, in which he terminates that it is of no substance of result, with considering to the household pleasure of a state, whether money is in lesser or in larger quantity. The good and efficient policy of the magistrate based only on its maintenance. If likely, still rising as by those resources, he maintains lively strength of tat manufacturing unit in the state, and enlarge the reserve of labor, in which consists all actual authority and riches. About this course, Blaug observes that Hume’s “ demand for a frequent inflow of valuable metals quantity to a demand for a unremitting sequence of intermediary phases” through which inflationary money growth constantly and everlastingly motivate trade. [1; p. 20] Here is Hume’s observance to the long run Philips curve. Here also is his settlement of that perception with his quantity theory. There is no argument between the two theories, his deliberation, since the one refers to rates of modify and the other to substitute levels of the money stock.

Phillips’s inference In the 1950s, Alban William Hoosegow Phillips tried to determine the neoclassical anomaly [68-73]. Phillips, who had degree in electrical engineering (1938) and sociology with economics (LSE, B. A., 1949) [10], was viewing how to erect a water flow model as a similarity of the neoclassical income expenditure model. The final replica frequently was symbolized in arithmetical terms, but some economic students had complexity with mathematics. Both these two models (hydraulic and income expenditure model could be explained by the way of discrepancy calculus. The hydraulic machine, though, was evident and understandable to students. The machine, explained in Phillips’s Ph. D. thesis, provoked his selection as assistant lecturer at the LSE in 1950. In explanation of the machine, Phillips alert on modifying following a disorder of equilibrium, which be conventional to Hick’s modern trade cycle theory. In addition, Phillips used engineering systems expressions to the blocked loop systems, fabrication faults, positive and negative feedback, adjustment factor, habitual parameter are organized.

The economics of all this come up to from the neoclassical IS-LM model. Phillips precise the equations of the income expenditure relation or savings investment characteristics with investment depends on the interest rate and the accelerator, record modification, and liquidity preference. The labor supply based on the money wage rate, the usual Keynesian formulation. Later than, the Marshallian neoclassicist A. C. Pigou assault the fix-wage conference [74]. According to Pigou, there was a distinguished compassion in money wages-even if monopolist unit made this slow and only partly followed by a fall in real wages- because the drop in nominal values could have a actual balance effect on savings, which would direct to a increase in investment. Also, neoclassical Keynesians renowned that a decrease in nominal values, when liquidity preferences were not considerably flexible, would cause a decrease in the money rate of interest (the LM curve shifting right) and a rise in investment [43, 200]. Moreover, there exists exclusive equilibrium in the economy having full employment. In 1954, Phillips, possibly owing to his inter penalizing exercise provoke to smash from the conference of the neoclassical fusion. He depicts “ a association among the level of production and the rate of change of factor prices.

The merchandise price relatively than the money wage level emerges on the vertical axis since, given constant yield, there was a conversational relation among relative money wage and price changes. The economy was stable, defined by a steady price level. On the other hand there would be disequilibrium in the economy, if the firm slips up to produce the quantity relative to equilibrium demand. Changing price would receive effect, pretty like the Samuelson-Hansen linear model so as to, the rate of transformation of product prices (P) was relative to the difference of real production from the level of equilibrium. (The slighter the production error, the improved the linear equation would near to his nonlinear curve suggesting higher money wage stiffness in the unemployment range) [69, 308]. Afterward the price change moreover distorted the interest rate in the same or factual balances in the reverse course. To raise the speed of error correction, “ a monetary policy foundation on the morality of habitual modifiable systems would be sufficient” [69, 315]. The original Phillips curve, like a courageous inference that begin development of a theoretical model in arithmetic or the physical sciences, was inwards at by deductive conjecture stated in green, a theoretical terms [48]; what neoclassical lane between micro and macro-economic it assured to free. Prior to that could happen, though, the Phillips supposition required systematic testing and theoretical proof. Pragmatic scrutiny When Phillips draft the 1954 curve which showed that money wage rate modification in deflation and inflation was irregular; he was annoying to integrate an old, admired observation into a hypothetical configuration. Phillips furnished an example of this examination.

When labor demand is lofty and very fewer are unemployed, we should anticipate employer’s bid wage rate fairly swift. On the other aspect, it emerge that workers are unwilling to offer their services at lower than the existing rates when the labor demand is low high unemployment faced by economy, so that wages become low very slowly. Inevitable, Phillips’s study on a pragmatic model objectifying this trendy observation had its example [5]. The adjoining research was by Professor Arthur J. Brown [88]. Phillips and Brown mutually deliberate the history of wage transformation, using the same traditional data basis and pleasing the pre-World War I period as a foundation. Both researchers had the similar figures (that is the annual rate of adjust of money wage rates and unemployment percentages) confirmation on arithmetic flee diagrams casing the pre-World War I, interwar and post-World War II periods. They distinct the similar relationship between merchandise price and changes of money wage rates. Both supposed a contrary relationship between unemployment and inflation inside each pre-World War I cycle. However, unlike Phillips, Brown stressed that the accurate inflation-unemployment relation diverse obviously from cycle to cycle. Furthermore, Brown supposed that cost transforms distinct to the plane of aggregate demand were the foremost reason of inflation during the post-World War I and II periods.

Brown’s immense inflation thus advocated policies of reducing cost [13]. In distinction, Phillips accomplished that there had been a steady century long, contrary relation among the rate of change of money wage and unemployment, and affirmed that the price plane would be steady if unemployment were reserved. The same research by two researchers escorted to inconsistent conclusions a general experience in the narration of science in which each experimenter inferred the pragmatic data according to his own preceding, hypothetical perception. Moreover, the consequences had instant policy proposition. In the mid-1950s, there was a animated arguments among “ demand-pull” and “ cost-push” bloc regarding the grounds of inflation and the policies implemented against inflation. Brown, a cost-push Keynesian, and numerous classmates of Phillips responsive of his continuing research energetically contributed in this [47]. Phillips’s 1958 article really encouraged the demand-pull case. To sustain their deviating policies, Brown and Phillips keen to the “ similar” facts, annual wage rate transforms and unemployment percents. But such essentials as recent methodologists have strained, were not specified but created. Phillips really sincerely condemns the data, which were very insufficient for the foundation period as the key sources were the records of trade unification to which few employees belong. Moreover, union wage records were of regular, not valuable rates.

Furthermore, Phillips’s dealing of the data was mocked by economists at the Keynesian National Institute of Economics and Social Research (NIESR) [76]8 and Oxford Institute [45] because (1) Phillips exercise fixed weight wage and unemployment catalogs substituted of wage slanted indexes which permitted for transformation in numbers engaged by industry, (2) the unemployment and the wage sample did not comprise the same industries, and (3) the unemployment and wage sequence were not coordinated. By the era of 1960, statisticians had enhanced Phillips’s scatter diagram. However they stress that the premature data could not sustain a particular statistical relation between wage inflation and unemployment. But Brown had not yet seen a broad relation. And the question was who had Phillips? Phillips simplifies the scatter diagram by pertaining a re