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Neoclassical Inflation: No theory there

by
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Abstract

The theoretical generalization that the price level is determined by the quantity of money is commonly employed as a teaching device, in abstract modeling, and as a guide to policy. It represents a profound misunderstanding of inflation. In specific, the famous parable, more money then more inflation, is logically wrong.

Far from the strength of neoclassical economics, its theory of inflation encapsulates and epitomizes its most fatal analytical errors and contradictions. Prominent among these errors and contradictions are the failure to provide a convincing explanation for the existence of money, and the closely related inability to provide a definition of money that makes its supply analytically determinate. These basic problems require the creation of an imaginary economy, the analysis of which results in arbitrary conclusions that cannot be generalized beyond neoclassical Cloud-Cuckoo Land.

Introduction

It is commonly thought that whatever its other failings, the strength of neoclassical economics lies in its monetary theory, especially its theory of inflation. This is the view of inflation that both guides policy and rules the media. Even many progressive economists concede that while Keynes revolutionized the analysis of less-than-full employment, the neoclassicals can claim inflation as their territory. I was taught this concession in the late 1960s at a prominent center of Keynesianism, the University of Michigan (Ann Arbor), academic base of Gardner Ackley and Warren Smith.

It is wrong. In specific, the famous parable, more money, more inflation, is logically wrong. Far from the strength of neoclassical economics, its theory of inflation encapsulates and epitomizes its most fatal analytical errors and contradictions. Prominent among these errors and contradictions are the failure to provide a convincing explanation for the existence of money, and the closely related inability to provide a definition of money that makes its supply analytically determinate (Weeks 2011a). These basic problems require the creation of an imaginary economy, the analysis of which results in arbitrary conclusions that cannot be generalized beyond that neoclassical Cloud-Cuckoo Land.

I begin by defining the process we call inflation and identifying its principle characteristics. I then inspect the neoclassical treatment of the analytical outcome it identifies by the same word. The two, inflation as we observe it, and inflation as the neoclassicals define it, prove quite different, rather like the relationship between horses and unicorns.

The core of my critique lies in the assumptions that allow the neoclassicals to move from inflation as we know it to inflation as they define it. It proves a one-way movement, with no possibility of making a return journey. Key to traveling this *cul de sac* is the "natural rate of unemployment". I show that neoclassical inflation is not merely an extension of the Quantity Equation, it *is* the quantity equation, a tautology poising as theory. I conclude with a return to the real world to consider why actual inflation might be a problem for public policy to address.

Identifying Inflation

In his Preface to *The General Theory*, Keynes refers to the "outstanding fault" of the theory in his previous book, *Treatise on Money*, "that I failed to deal thoroughly with the effects of *changes* in the level of output" (Keynes 1936, vi-vii, italics in original). This statement explains why his book was "general" and the theorizing done by those he called the "classicals" was not. When he treats inflation he delivers on his promise to analyze changes in the level of output:

> When a further increase in the quantity of effective demand produces no further increase in output and entirely spends itself on an increase in [prices] fully proportional to the increase in effective demand, we have reached a condition which might be appropriately designated as one of true inflation. Up to this point the effect of monetary expansion is entirely a question of degree, and there is no previous point at which we can draw a definite line and declare that conditions of inflation have set in. Every previous increase in the quantity of money is likely…to spend itself partly in increasing [prices] and partly in increasing output. (Keynes 1936, 303)[1]

The nuances in this passage and the clear reference to concrete outcomes can be contrasted with the neoclassical view of inflation, encapsulated in a much-quoted phrase of Milton Friedman, that "inflation is always and everywhere a monetary phenomenon".[2] For its banality the statement is perhaps exceeded by "there is no such thing as a free lunch", a quotation much used by Friedman though he did not coin the phrase.

This view of inflation is so dear to the hearts of neoclassicals that the "always-and-everywhere" quotation appears with alarming regularity despite its vacuousness. The enthusiasm it excites arises from its ideological message that price instability is caused by

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[1] Where I have inserted "prices" Keynes uses the term "cost-unit". This does not affect his meaning and is more familiar for twenty-first century readers. The words "fully proportional" could suggest that Keynes had not completely abandoned the concept of the neutrality of money at full employment. An alternative explanation is that he did not mean the words as a rigorous analytical statement.

[2] The cliché is usually attributed to his Wincott Memorial Lecture in London, 16 September 1970.

governments. This is made explicit by Fischer and Easterly, long-time bureaucrats at the IMF and World Bank, respectively:

> Milton Friedman's famous statement that inflation is always and everywhere a monetary phenomenon is correct…Rapid money growth is conceivable without an underlying fiscal imbalance, but it is unlikely. Thus, rapid inflation is almost always a fiscal phenomenon.
>
> (Fischer and Easterly 1990, 138-139)

The Fischer and Easterly endorsement touches another neoclassical ideological base, fiscal deficits. They thereby neatly combine two alleged policy sins, fiscal deficits and "printing money" into one.

Not withstanding this endorsement, considerable elaboration is required to convert Friedman's ideological cliché into a substantive analytical statement, and even more to link it to fiscal policy. If Friedman's statement means, "in a one commodity system in which money itself has no value and its supply is determined by the monetary authorities, at full employment increases in the price of the commodity result from increases in the supply of money so defined and controlled", then it is correct but trivial. If it is intended to mean, "the price increases we observe are the result of the authorities increasing the reserves of the banking system (monetary base)", it is may be true or false, depending on economic conditions and framework of interpretation. If it is intended to mean, as it certainly was, that "inflation results from governments printing money", it is wrong.

To understand why it is wrong and more generally the limitations of the neoclassical theory of inflation, it is first necessary to clarity the phenomenon that it seeks to explain. The following discussion refers to what I shall vaguely identify as "moderate" inflation. What is often called "hyper-inflation" is a separate phenomenon with its own causes and dynamics.

Frequent changes in the prices of commodities and services are a characteristic of a market economy. Price fluctuations are the mechanism by which capitalists allocate and re-allocate resources across sectors of an economy. The term "deflation" describes a fall in prices, and "inflation" a rise, though giving clear and rigorous meaning to these terms is not simple. In all economies people buy and sell many different commodities

and services, and it is unlikely that all of these would simultaneously experience price increases or price declines.

Therefore, in practice the terms inflation and deflation always refer to a composite measurement of prices, a price index. A statement of the type, "inflation is an increase in the general level of prices," must always refer to specific aggregate measures of the prices of commodities and services. Even when referring to a specific measure, such as a consumer price index, this definition of inflation has ambiguities.

All price indices employ a weighting mechanism, and the consumer price index in most countries uses the quantities of the household with average (mean) income. Consumption patterns change substantially over the income distribution, with housing and food carrying heavier weights towards the lower end. The more unequal the distribution of income, the greater will be the number of households below the average. For example, in 2005 in the United States average income for people fifteen years and older was $35,500. The income level exactly halfway up the rank ordering of people was $24,300, more than $1000 less. The obvious implication is that a price index based on the behavior of the average household would be more representative of the expenditure patterns of the rich than the poor. This distribution effect creates inherent imprecision of measurement. Substantial inflation for one class of income earners may be trivial for another (see Muellbauer 1974a and 1974b).

A second ambiguity arises because different types of commodities and services have their prices determined in substantially different ways. The clearest example is for commodities and services that enter global markets ("tradables") and those that do not ("non-tradables"). Perhaps the most important of the former is petroleum, which is relatively homogeneous in quality and whose price is strongly influenced by the market power of producers. When the price of petroleum rises, this contributes to a rise in aggregate price indices, directly at the retail level (the price of gasoline) and indirectly through the prices of all commodities using it as a production input. Governments and central banks can do very little to prevent this component of inflationary pressure, which is also the case to varying degrees for all globally traded commodities and services.

Third, both traded and non-traded commodities and services include ones with prices constrained in the short run by contracts. These include housing and

accommodation, as well as wage and salary levels. The importance and duration these contractual constraints varies by country. They are a further limitation on the ability of governments and central banks to influence price levels over a short time period.

This discussion produces the obvious conclusion that governments and central banks do not in practice have the power to influence "the price level", because there is none. To varying degrees they can influence components of the aggregate price indices. It should also be obvious that these components are those with prices overwhelmingly determined in domestic markets that are relatively competitive. To take an example, in a country with a small and open economy, success in constraining the rise of aggregate price indices will be through non-traded commodities. Because the most important non-traded item is labor, the probable effect of successfully constraining inflation in an open economy is the compression of real wages. For this reason if no other, capital tends to be more enthusiastic about anti-inflation measures than labor.

In addition to distributional effects and the differences in the behavior of prices there is a third practical consideration affecting the theory, measurement and interpretation of changes in composite measures of prices, qualitative changes in commodities. The term inflation refers to the behavior of prices in chronological time. In every economy as time passes qualitative improvement occurs for commodities and services. Price indices can be up-dated to include new products, but accommodating quality change is much more difficult.

In 1996 an expert commission established by the US Congress, the Boskin Commission, estimated that the commonly used aggregate indices *overestimated* actual price changes in the United States by from one-half to slightly over one percentage point per annum (see summary in Oulton 1998; and noted in Stiglitz and Walsh 2006, 124-25). This estimate indicates that when a composite price index shows a rate of change of zero, it should be interpreted as indicating deflation. To be specific, it means that the average rate of inflation in the United States during the 1990s and 2000s was not significantly different from zero.

The income distribution effects of price changes, the sensitivity of different prices to policy measures, and qualitative changes in commodities and services are not minor nuances. They are the essence of the inflation process and highly relevant for policy.

Inflation is a process in which uneven increases in prices across commodities and services undergoing qualitative change have different consequences on households and businesses depending on their expenditure patterns.

Inflation is *not* "a general rise in the price level" that "reduces the purchasing power of money", as it is frequently defined. It is this analytically simplistic and empirically inappropriate definition of inflation that neoclassical economics enthusiastically adopts. This definition ignores all the important aspects of price changes that should be the focus of policy. Milton Friedman could write that inflation is a purely monetary phenomenon because the statement referred to a one commodity economy with no technical change, eliminating the possibility of differential price movements, as well as excluding income distribution effects and quality change. When it has thus trivialized inflation, neoclassical theory still is unable to generate a coherent theory, as the rest of this paper shows.

The Neoclassical Inflation Hypothesis Decoded

The formal theoretical statement of the neoclassical inflation hypothesis takes its simplest form in the famous Quantity Equation. The Equation states algebraically what would seem an obvious relationship between prices and money in circulation. On closer inspection the Equation degenerates into an identity and triviality.

The definitional nature of the Equation can be demonstrated by beginning with an obvious tautology, that the sum of all commodity transactions equals the sum of all means by which those transaction were realized. It is necessary to use the vauge words "were realized" rather than ones implying payment, because a person can engage in an exchange by contacting a debt and promising to pay later. If I identify commodities by the subscript i and each transaction by the subscript j, by definition we obtain what I call the "transactions equation".

$$\Sigma[(P_iQ_i)_j] \equiv \Sigma\mu_j$$

P_i = price of commodity i

Q_i = quantity of commodity i

P_iQ_i = transaction j

μ_j = the means of realizing transaction j

The equation merely states the obvious, that the sum of all transactions equals the sum of all means by which the transactions were carried out. Empirical measures of inflation use the left hand side of the equation, defined over various categories of commodities and services at various stages of production and distribution, to obtain consumer, wholesale, producer and other composite price measures. The right side of the equation contains a great variety of means of purchase, cash, personal checks, credit card debits, and many others.

To convert this definition into a behavior relationship, neoclassical economics simplifies the transaction equation beyond recognition (see summary in Table 1). Moving from left to right, the neoclassical macro model assumes one commodity, which I note as y. This reduces many prices times their quantities, $\Sigma[(P_iQ_i)_j]$, to one price times one quantity, py. Note that many complications of the real world are eliminated by the one commodity case: distribution effects (no weighting or "index number" issues), quality change (a homogenous commodity cannot change its quality), and all tradable effects. Tradable effects are excluded even in a so-called open model, such as the Mundell-Fleming, because the production function generates homogenous value added, not commodities.

One commodity also eliminates the principle function of price changes in a market economy, to guide the reallocation of resources, including labor. It is ironic, if not absurd, that an analytical framework that claims to focus on "price signals" eliminates them when it seeks ot explain inflation. Underlying this irony is the failure of the neoclassical school to consider aggregation in a serious manner.

The right side of the equation is similarly transformed. All the means of purchase are reduced into one, "money". If all the transactions take place simultaneously as in a Walrasian market day, the equation collapses into py = M. However, there is no need to assume that all transaction are simultaneous, because with only one commodity this is automatically the case. To give the simplistic simplification the appearance of real world relevance, I allow the fiction that there is more than one time period. Multi-periods result in the famous "velocity of money" (v), and the Equation becomes py = vM.

The neoclassical inflation hypothesis can now be rigorously stated. In a model with one commodity and a homogenous means of purchase, changes in price result from changes in the amount of money. Even if one accepts a homogeneous means of purchase ("money"), the hypothesis remains unconfirmed in logic. A change in price could result from a change in quantity or velocity as well as the amount of money. The converse also holds, that a change in money could result in a change in velocity or the quantity of output.

The simple one commodity, one means of payment model is rendered even simpler by a constant velocity of money. Making this assumption leaves only two algebraic possibilities. Changes in money result in changes in quantity or changes in price (or a combination). The neoclassicals could leave the analysis with this limited degree of flexibility. To do so would allow the inference that what happens to price when money changes is theoretically indeterminate. This would imply that the principle purpose of monetary policy need not be to fight inflation, which by the last decades of the twentieth century was the keystone of neoclassical macroeconomic policy. Assigning overwhelming priority to fighting inflation would be inconsistent with an empirically indeterminate outcome.

The analytical outcomes can be reduced to one, inflation, by the assumption/belief that market economies adjust automatically to their maximum potential output (full employment). If it were the case that 1) an economy had only one commodity, 2) all purchases of that product were with one instrument ("money"), 3) the rate of turnover of that instrument were constant, and 4) the product was at its maximum quantity, then increases in the purchasing instrument would logically result in increases in the price of the commodity (though not necessarily equally proportionate increases).

This amazing trivialization of aggregate price changes is then offered as the true interpretation of what we observe. This astounding proposal might be inspired by Oscar Wilde's famous anti-mimesis formulation, "life imitates art", though the neoclassical one commodity model is unlikely to qualify as the latter. The inflation-money conclusion is trivial. To be non-trivial, the theory must 1) explain the meaning of full potential or full employment; 2) show why many forms of purchase can be represented by one; and 3) justify a constant velocity of the means of purchase. Clarifying these points makes the

money-inflation hypothesis valid for one commodity. The task of generalization to a multi-commodity system would remain. This task need not be confronted, because the hypothesis flounders on defining full employment.

Table 1: The Neoclassical Trivialization of Inflation

1	$I_{pt} \equiv \Sigma[(P_{it}Q_{io})] / \Sigma[(P_{io}Q_{io})]$	Price index, a definition: the composite price level (I_p) in period t measured by using quantities in period zero (Laspeyres method)
2	$\Sigma[(P_iQ_i)_j] \equiv \Sigma\mu_j$	Convert numerator and/or denominator into a definition, the "transactions equation"
3	$\Sigma[(P_iQ_i)_j] = vM$	Assume only one means of purchase, M, the amount is set by the "monetary authorities", and is used v number of times each period, a constant, implying a behavioral equation
4	$py = vM$	Assume the economy has only one product, y, whose price is p; both p and y can change, but py is a constant because vM is constant
5	$p = vM/y$	Assume the output of y is at its maximum value, which implies than only p and M can change. It follows that inflation ($\Delta p/p$) is the result of the "authorities" increasing the money supply. Therefore, " inflation is always and everywhere a monetary phenomenon" (M Friedman 1970).
6	Let $p' = \Delta p/p$, etc. $p' = v' + M' - y'$ $v' = y' = 0$ $p' = M'$ QED	Inflation is the first central difference of equation 5. *Quod erat demonstrandum*, indeed.

Symbols: P is the price of a commodity or service, Q is the quantity, i specifies the item (i = 1, 2…n), j is the transaction P_iQ_i (amount spend on item i), μ_j is the means by which P_iQ_i was purchased (cash, check, credit card, etc), M is a homogenous means of purchase ("money"); and v is the "velocity of money" (constant).

Neoclassical Full Employment

In the neoclassical framework inflation is by analytical necessity a full employment phenomenon. At less than full employment increases in the quantity of money need not generate inflation. It is rather inconvenient that experience that inflation occurs at different levels of unemployment even within the same country over a relatively short period of time, which would seem to contradict the neoclassical money-inflation story (see Figure 1). This experience indicates a fundamental characteristic of market economies, that full capacity has various meanings and empirical manifestations. Neoclassical analysis has resolved this real world ambiguity by defining full employment with reference to inflation itself: inflation is a full employment phenomenon; therefore, when inflation occurs an economy is at full employment.

This unenlightening syllogism gains a semblance of substance through introduction of the "natural rate of unemployment". The relationship between unemployment and money wage changes, and by extension unemployment and prices, can be investigated empirically in a straight forward manner. This was probably done first by Irving Fisher in the 1920s (Fisher 1926), though the empirical relationship is known as the Phillips Curve, after an article by A. W. H. Phillips in 1958 (Phillips 1958). Phillips' hypothesis was a simple one: a low rate of unemployment is associated with excess demand for labor; an excess demand for labor will generate upward pressure on money wages; and rising money wages will provoke businesses to raise prices.

The Phillips hypothesis is shown in Figure 2, with the rate of change of the price level measured on the vertical axis (p) and unemployment on the horizontal axis (u). With regard to causality, Phillips hypothesized that tight labor markets were the cause of inflation by generating higher money wages that would lead to higher prices. In the neoclassical rendition causality is reversed. The hypothesis of Phillips was strictly *empirical*, and he came under sharp criticism for allegedly not supplying an adequate theoretical explanation of the relationship. By treating Figure 1 as an empirical relationship, one can say that there is by definition an excess demand for commodities to the left of unemployment rate u^* (prices rise), and an excess supply to the right of that rate (prices fall).

The problem with this apparently obvious approach is that positive or negative excess demand for commodities does not in itself imply what conditions prevail in the labor market. Wage increases may not be the cause of price increases. Both may result from the operation of some third variable not represented on the two-dimensional diagram, such as a temporary shortage of a non-labor input. The presumption that wage increases are the only possible cause of price increases requires specific assumptions.

The argument is sometimes made that price inflation can be reduced to wage inflation because "labor costs represent a fairly stable proportion of total costs" (Parkin, 1984, 300). This is an *ad hoc* argument with no obvious theoretical basis. Strictly speaking, the link from wage increases to price increases is valid only in a one commodity model with no non-labor inputs. This conclusion cannot be generalized to a multi-commodity system without additional assumptions or analytical linkages. As one frequently finds, Keynes was not so naïve or analytically narrow to take this labor cost approach to inflation.

> …[I]n general, the demand for some services and commodities will reach a level beyond which their supply is, for the time being, perfectly inelastic, whilst in other directions there is still a substantial surplus of resources without employment. Thus as output increases, a series of "bottle-necks" will be successively reached, where the supply of particular commodities ceases to be elastic and their prices have to rise…
>
> (Keynes 1936, 300).

Neoclassicals swept aside arguments over causality and the commonsense of "bottle-necks" by the practice of treating wages and the output prices as the only relevant variables. This reduction is the logical extension of the microeconomics of the firm, in which there are no non-labor inputs. Having converted the complex multi-product world into the neoclassical special one-commodity case, we can consider Figure 3, the Phillips hypothesis re-interpreted by Friedman. The unemployment rate is measured on the horizontal axis (u), and the inflation rate on the vertical ($p = \Delta P/P$). The analysis begins by postulating a unique and stable rate of unemployment for which the rate of change of inflation is zero. For this unemployment rate any given inflation rate has no tendency to increase or decrease. Friedman named this "the natural rate". Let this "natural" rate be u^*

or point A in Figure 3. Through u* passes line SFC1, a short-run Friedman curve. This curve has the characteristic that economic agents anticipate a zero rate of inflation.

Next, assume that workers individually or through their trade unions bargain for a money wage to clear the labor market. Finally, define the unemployment rate associated with a zero rate of change of inflation to be the unemployment rate consistent with clearing of the labor market. In other words, u* is the full employment rate of unemployment, though there is no analysis to support this. It is an assertion.

The discussion begins at point A, with the labor market in equilibrium and a zero rate of inflation is anticipated by all agents. Let there be an *ex machina* unanticipated increase in the price level. If money wages are constant, the real wage falls. The fall in the real wage induces firms to increase employment. This reduces the unemployment rate to u1, shifting left along SPC1. Dissatisfied with a lower real wage, workers demand a higher money wage to compensate themselves. The bargain for the new money wage will be such as to regain the "natural rate of unemployment", u*. A new short-run Friedman curve is established, SFC2, based on the expectation of a rate of inflation of p1. The adjustment process is from equilibrium at zero inflation (point A) to a disequilibrium with inflation (point B), to equilibrium with inflation (point C). The implication of the story is that any unemployment rate less than the "natural rate" will quickly result in a return to the "natural rate".

Now over three decades old, the purpose of the Friedman Curve was and is to undermine arguments for public policy intervention. It alleges that inflation results from the government expanding demand in a misguided attempt to reduce the rate of unemployment. By stimulating inflation and lowering the real wage, expansion of aggregate demand will lower the unemployment rate. The result is unsustainable, by implication "unnatural". Further, temporarily lower unemployment is purchased by inflation. To keep unemployment below its "natural" level an accelerating rate of inflation is required. Each rate of inflation calls forth an increase in the money wage to match it, so the SFC shifts continuously upwards.[3]

[3] "…[t]he long-run Phillips Curve is vertical, or, in substance, that in the long run money is neutral…" (Modigliani 1979, 119).

The Friedman hypothesis might appear a strong critique of expansionary fiscal and monetary policy. It asserts that at best these interventions only reduce unemployment momentarily at the cost of inflation. This reduction is "unnatural" because it is in conflict with the maximizing behavior of workers and employers, and contradicts efficient market outcomes.

Closer inspection reveals that the result is a trivial conclusion derived from an obfuscating re-statement of a the Quantity Equation. It is trivial because the analysis assumes what it claims to prove. If an economy is continuously and automatically regaining full employment equilibrium, it is obvious that expansionary public policies are not needed. There is absurdity in the triviality: policy intervention seeks to achieve full employment, and the Friedman hypothesis assumes that the economy is always there and with great self-importance concludes that intervention is useless.

The faux-analytical result is a special case because the "long-run Phillips curve" is vertical if and only if money is neutral. If money is not neutral, increasing the money supply at full employment causes a monetary expansion that will change the equilibrium rate of interest. This change can affect the supply curve of labor, shifting point u* even if the "natural rate" hypothesis were accepted as valid, as well as changing the distribution of demand between investment and consumption.

The Friedman-mutated Phillips Curve appeals to neoclassicals because it seems to resolve the problem that in theory inflation should only appear at full capacity, and in practice occurs at various levels of unemployment. By assuming economies are always in full employment general equilibrium, the resolution abandons any pretense to analyze the levels of output and employment. This is precisely the theoretical myopia that Keynes wrote *The General Theory* to expose.

The natural rate inflation tells us nothing more than when output cannot rise, increases in the money supply provoke proportional price rises. Even this trivial conclusion applies only in the Walrasian special case of continuous general equilibrium, because of the contradiction between Walras' Law and the Quantity Theory. Further, the assumption of a unique "natural rate of unemployment" is wrong, because in general money is not neutral (e.g., if there are public bonds).

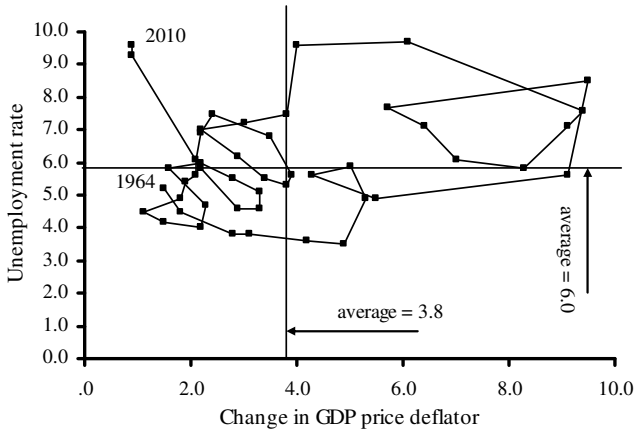
Finally, the concept of full employment and its familiar the "natural rate of employment" betray a systemic refusal to consider economies as they are. If meant as an actual number, "maximum output" and "full capacity" are purely ideal concepts. In reality many factors determine how much can be produced at any time. The labor force can vary because of changes in the level of employment itself, as well as changes in participation rates.[4] How much output can be obtained from the installed capacity at any moment is an empirical outcome that can only be known *ex post*.

Further, this empirically determined full capacity can be greater than, less than or equal to full employment of the labor force in the narrow numerical sense. For example, when labor is in short supply, private employers can introduce overtime and multiple shifts to increase production without hiring more employees. Analogously, local or economy-wide shortages of key non-labor inputs such as electricity generation may set a short term limit to output though labor of most skill categories is in excess supply.

There is nothing "natural" about unemployment or its level. Nor is there a "natural" level of output, not even a level determined by economic parameters alone. In a market economy the levels of output and employment are in part policy variables, determined by choices made by governments. The empirical estimation of the relationship between labor market pressure and inflation is important for an informed macroeconomic policy. Equally important is the estimation of the aggregate productive capacity of the economy. Both are key components in macroeconomic models to guide policy in central banks and the government agencies than manage fiscal policy. Defining these as natural phenomena produced by the automatic adjustment of an economy that is continuously at full employment is little more than ideology.

[4] The "discouraged worker" hypothesis maintains that when labor markets are in excess supply some people suspend the active search for employment because of the low probability of finding it. There is considerable empirical support for this hypothesis, which implies that the labor force participation rate and potential output vary with the level of aggregate demand (Flanagan 2008).

Figure 1: Annual rate of unemployment and the change
In the GDP price deflation, United States, 1964-2010



Source: United States Government Printing Office, *Economic Report of the President 2011*, tables B3 and B42

Figure 2: Inflation as a function of unemployment

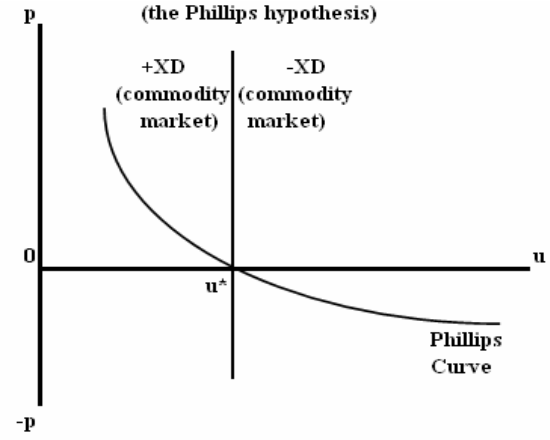
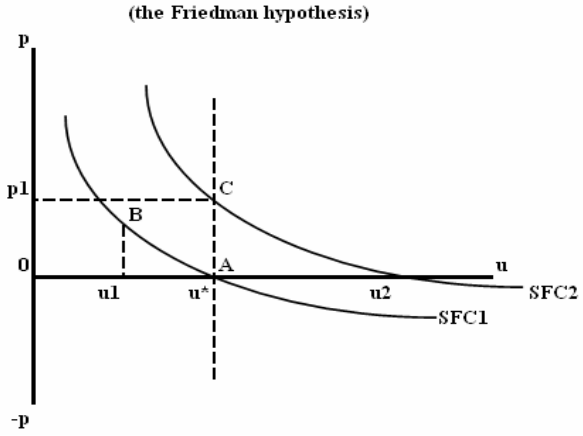


Figure 2: Unemployment as a function of inflation



The Theory that isn't there

As I and many others have demonstrated, neoclassical economics has no coherent explanation for the existence of money (Weeks 1989, chapter 4; 2011b, chapter 4). This failing leads to another: it has no theory of inflation. Neoclassical economics has no theory of inflation because it denies its existence, and a theory cannot be developed for a phenomenon whose existence the theory denies.

The non-existence of inflation in neoclassical economics results because its macro-economy is a self-regulating system that continuously seeks full employment through barter exchange. In this system commodities have nominal prices that are a veil over barter exchange (money is neutral). It would be difficult to design a framework less appropriate for explaining the behavior of prices in a modern economy. When to this general equilibrium system is added the inability to specify money in a manner that can be generalized to real exchange, the task of explaining inflation is impossible.

In place of analyzing the real phenomenon, neoclassical theory offers an idealized surrogate consistent with the limitations of its framework, one commodity general equilibrium inflation, what might be called "*faux* inflation". Analogously to degenerate solutions in linear programming, "*faux* inflation" (one commodity general equilibrium inflation) is a degenerate solution. Even this degenerate case proves impossible to formulate without *ad hoc* interventions. The most important of these is defining the money supply as being under the control of a monetary authority. Even accepting this fiction is not sufficient to produce a logical analysis, because of the contradiction between the Quantity Theory and Walras' Law (Weeks 1989, 2011b).

The apparently simple statement, increases in the money supply generate equal proportional increases in prices, is the essence, the *sine qua non* of neoclassical inflation theory. The conditions under which this statement is logically true are so restrictive that by any rational judgment the statement is false. These are listed below along with the reason for each.

1. the economy produces one commodity so there are no differential price changes;

2. no technical change thus excluding quality change and new products;

3. all means of exchange can be reduced to one homogenous and valueless money;

4. the velocity of the homogenous means of exchange is constant, which excludes hoarding of money or the commodity;

5. the production of the commodity is at its maximum, thus preventing any output change in reaction to changes in the quantity of money; and

6. the economy is in continuous general equilibrium eliminating the conflict between the Quantity Equation and Walras' Law and making money neutral.

Perhaps the most striking characteristic of the neoclassical inflation parable is that it seems so simple, but proves so difficult to formulate with logical consistency. Even more than the real wage and employment parable, the money and inflation one seems so simple as to be obvious: more money in circulation makes prices go up. In both logic and practice this putatively simple parable is false, because neither of the principle concepts, money and inflation, can be consistently specified by the theory attempting to explain it.

Why is inflation a problem?

The obvious and not-so-obvious failings of the neoclassical theory of inflation do not imply that movements in prices are an unimportant macroeconomic policy issue. By treating inflation as a phenomenon in a system that automatically adjusts to achieve full employment, the neoclassical analysis dictates a clear and dysfunctional policy rule, that fighting inflation should take priority over all other goals. It is this practical policy conclusion that makes the money-inflation hypothesis so pernicious.

A rational public policy would first focus on management of the price level, not inflation. This means it would be concerned with the consequences of deflation as well as inflation. This management would follow several practical guidelines. First, at the aggregate level, price level policy should be consistent with other macroeconomic policy goals, namely employment and growth. If the over-riding goal of policy is employment, then the rate of change of the price level could be treated as a flexible constraint to achieving that outcome. Second, underlying the aggregate impact of price changes are distribution effects of several types, among households, across enterprises by size, and among sectors of the economy.

These considerations would indicate the appropriate policy instruments for implementing management of the price level. Among the available and effective instruments in an advanced economy are the various tools of the central bank, administrative price controls, rationing and in some countries use of commodity stocks. An example of the last is the Strategic Petroleum Reserve in the United States, which in May 2011 held about one month's supply. The choice of one or more of these would be determined by the forces generating inflation (or deflation) at a specific moment.

In neoclassical analysis all changes in an aggregate price index have the same cause, too much money in circulation. This approach, in which the central bank interest rate is a hammer and every inflation a nail, severely misrepresents the policy choices facing governments. Breaking out of the money-inflation parable is essential to rational policy-making.

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