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MIND THE GAPS: THE CONFLICT AUGMENTED PHILLIPS CURVE AND THE SRAFFIAN SUPERMULTIPLIER

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Abstract

The paper discusses the theoretical basis of the impact of an increase in effective demand on the price level, rate of inflation and the acceleration of inflation, the distinction between demand and cost inflation and the associated tradeoffs (or lack of them) between output and inflation in the longer run. And we propose an alternative framework, making use of a simple version of the sraffian supermultiplier model in which core inflation is the result of a cost push, driven by incompatible claims over distribution. These claims depend on the relative bargaining power of firms and workers, which is affected by the unemployment rate, generating a conflict augmented (old) Phillips curve. In sharp contrast to the New Consensus macroeconomics and its single NAIRU, we find a permanent tradeoff between the rate of inflation and the rates of growth of output and productive capacity, and thus also between inflation and structural unemployment.

[1] Paper presented at the Eastern Economic Association meeting, New York, March 1,2019. This version has benefitted from recent discussions with my colleagues Fabio Freitas and Ricardo Summa and comments by Mark Setterfield (as well as from correspondence with Tony Aspromourgos many years ago). Remaining errors and omissions are my own.

1 Introduction

We are concerned with clarifying, at a very high level of abstraction, two basic (but very important) questions about the impact of an increase in effective demand on prices. The first is, does this rise in demand increase the price level, causes a positive rate of inflation or does it accelerate permanently the rate of inflation? Our second question is should this impact of the increase in demand be seen as an instance of demand (pull) inflation or cost (push) inflation?

After Friedman and Phelps up to the current the New Consensus model, most people think that usually a single aggregate demand shock that generates a positive output gap leads to a permanent acceleration of inflation, that is to a step increase in the rate of inflation. This, as it is well known, is associated with the idea of a single NAIRU (nonaccelerating inflation rate of unemployment) and implies the inexistence of a stable tradeoff between inflation and unemployment in the long run. Empirically, for the more advanced capitalist economies, especially after the 2008 world financial crisis, this view is getting harder and harder to sustain, as widespread high rates of unemployment have coexisted with very low but stable and still positive rates of inflation.

In this paper we propose an alternative framework for answering our two questions, making use of a simple version of the sraffian supermultiplier model in which core inflation is the result of a cost push, driven by incompatible claims over distribution. These claims depend on the relative bargaining power of firms and workers, which can be affected by unemployment, generating a conflict augmented (old) Phillips curve. In sharp contrast to the New Consensus macroeconomics and its single NAIRU, we find a permanent tradeoff between inflation and the *rates of growth* of output *and* productive capacity, and thus also between inflation and the unemployment rate. Section 2 discusses the prevailing accelerationist view. Section 3 briefly shows how the result changes if (following Palley(2018)) we drop the traditional assumption of full incorporation of expected inflation, making a demand shock have an effect on the level of the rate of inflation, instead of in its acceleration. Section 4 adds to this the sraffian supermultiplier demand led growth model to discuss output hysteresis and we get that the permanent effect of a single demand shock will, by itself, only have the effect of raising the price level. Having thus completed the discussion of demand-pull inflation, section 5 then

introduces exogenous cost-push conflicting claims to our alternative story. Section 6 then adds a relation between the employment rate and wage inflation, to get to our conflict augment Phillips curve, where a higher growth of both demand and potential output will usually have the effect of raising the level of inflation, thus generating a conflict augmented "old" Phillips curve for the longer run. Section 7 contains brief final remarks.

2 The "New Consensus" Accelerationist View

2.1 Three fundamental assumptions

The "New Consensus" model (see Blinder (1997), Romer (2000), Taylor (2000))[2] which supposedly guides modern monetary policies (and in particular "inflation targeting", see Taylor, 1999), tells us that inflation can be explained starting from a Phillips curve of the general form of what Gordon (2018) likes to call the "triangle model":

$$(1) \qquad p = ap - 1 + b\left(\frac{Y}{Y^*} - 1\right) + c$$

where p is current inflation, p_{-1} lagged inflation , here representing expected inflation, by assuming (for the sake of maximum simplicity) the most naïve form of adaptive expectations, *u* is the actual degree of capacity utilization, expressed as the ratio of actual output *Y* and normal capacity output *Y** , b measures the effect of the output gap (Y/Y*-1) on inflation and *c* accounts for supply shocks.[3]

The "New Consensus" model[4] is based on three general (and quite strong) assumptions, namely:

Supply shocks are random and zero on average over a longer period. Thus, *c* is zero, on average, over time.

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[2] In this paper we are interested only in the aggregate inflation dynamics of the more pragmatic "New Consensus" model and not at all concerned with the "New Neoclassical Synthesis" variants of this model explicitly incorporating neoclassical "New Classical" microfoundations such as those discussed in Clarida , Galí, & Gertler (1999).

[3] Note that normal capacity output Y* may be substantially the maximum capacity output on account of margins of planned spare capacity. For the sake of simplicity we are ignoring the possible lag structures of the equation. In a more complex framework these coefficients should accordingly be interpreted as *the sum* of all current and lagged coefficients on that variable.

[4] As it is well known, the (closed economy version) of this model also includes an "IS curve" and an interest rate rule but these features will not be discussed in this paper, which is concerned only with the Phillips curve. Some criticism of the IS curve and the concept of natural rate of interest using a Sraffian supermultiplier framework can be found in Aspromourgos (2007) and in Serrano, Summa & Garrido Moreira (2019).

Potential or capacity output is determined by supply forces, these forces being such that: ii.a) there is enough factor substitution to so that potential output means both normal (or desired) degree of utilization of the capital stock and the full employment of labor or, to be more general, an equilibrium between labor supply and labor demand if real wages are flexible in the long run ; and ii.b) the levels of potential output are thus determined independently from the path of actual short run levels of output, and the latter are usually seem as determined by aggregate demand due to assorted nominal rigidities.

Another very important characteristic of this model is that the coefficient on expected inflation (lagged inflation in this simple "backward looking" version of the model) is equal to 1 which means that whole of expected inflation is passed on to current inflation.[5]

2.2 Demand shocks and the acceleration of inflation

These three assumptions tell us that the long run inflation dynamics should be described by an accelerationist Phillips curve:

(1a) $p=p_{-1} + b(Y/Y^*-1)$

In this view, the dynamics of inflation has a number of quite peculiar characteristics. Because of assumption iii) of full incorporation of expected inflation gives us full inflation persistence, in this framework any temporary shock that lasts only for a single

[5] We use here a "backward looking" expectations augmented Phillips curve because empirically new Keynesian models with expected "forward looking" rational expectations inflation seem to have performed very badly and are seen as not useful for realistic policy analysis (see Fuhrer (1997) and Gordon (2013)). We often see in practice hybrid versions where current inflation depends both on actual lagged and another forward looking component. Assumption iii in this context means that the sum of the coefficients of past inflation and the forward looking component must add up to one. However, even in these hybrid models, in general, forward looking component is not (and cannot be) exogenous in a longer run. Expectations must be at some point be revised according to experience and thus this brings us back to the traditional accelerationist curve.

period (whether it is a demand or supply shock) has the effect of increasing permanently the rate of inflation.

On the other hand, any permanent shock will eventually lead to hyperinflation. For instance, if the government tries to keep output above the potential level permanently through expansionary fiscal and/or monetary policies, as in the famous Friedman (1977) Nobel lecture story, this will create a permanent demand shock and the inflation rate will accelerate all the time.[6]

Given the assumption of full incorporation of expected inflation (a=1) inflation will also accelerate if there is supply shock. Thus, after a change in the relative price of oil, the real exchange rate, or some other exogenous price, tax or public utility rate, *c* will become greater than zero and the rate of inflation will increase until the shock is over and *c* goes back to zero. Even then inflation will stabilize at a permanently higher level.

This result is not important in the long run only because supply shocks are conveniently and arbitrarily assumed to be zero on average (assumption i). This strong assumption guarantees that "cost-push" inflation does not really matter in the long run since any bad supply shock will end up being evenly compensated by a good supply shock in the future. It is quite curious that such symmetry of compensating shocks is definitely *not* assumed for demand shocks.

Since positive and negative supply shocks compensate each other and full incorporation of expected inflation is assumed, the path of inflation in the long run will reflect the history of all previous demand shocks. That is why, in this view, the "core" or trend rate of inflation is ultimately "demand pull" inflation and should be dealt with the control of aggregate demand. In this case there is a permanent NAICU (Non Accelerating rate of Capacity Utilization) and inflation will accelerate whenever the economy expands beyond it.

[6] The same story was told later (with the same macro hypothesis) from a totally different "neo-marxian" point of view by Rowthorn (1977) and from another eclectic (partially "Kaleckian") point of view by Carlin, & Soskice (1990). For a Sraffian critique of the latter see Stirati (2001).

2.3 Implications for Inflation Targeting

If there is a single positive demand shock (demand and actual output exceed potential output) and policy makers want to bring inflation back to its former level (say, the "inflation target") the model tells us that the authorities must generate a demand shock of the opposite sign causing a positive output gap to appear and help decelerate inflation back to its former level.

According to this model, in the case of negative supply shocks there are two alternatives. The first is that policy makers accommodate the shock and allow inflation to accelerate for a while, "knowing" that not only a positive *c* will die out on its own but also lead in the future to a negative *c* of the same magnitude. This is the reasoning behind people who want "inflation targets" to be set over long periods of calendar time and/or to be set only for the "core" or persistent element of the rate of inflation (which, if you believe in this model, reflects only demand pressures).

Another option would be to not accommodate the presumably temporary bad supply shock and tighten monetary (and/or fiscal) policy in order to generate an anti inflationary demand shock at the same time. This alternative would also prevent the temporary acceleration of headline (or full) inflation which some people claim is good for "credibility" but it would certainly imply costs in terms of output volatility. More seriously, over any period of time short enough for the compensating benign supply shocks not to have happened yet, we would have, if authorities did not accommodate, permanent output (and employment) losses once the output gap over that period would be positive on average, instead of zero.

Most of the debates concerning inflation targeting have been around these policy choices. But the main lesson of the model, given its accelerationist character, is that any inflationary shock, whether on the supply or demand side, that becomes permanent will accelerate inflation without limit. This means that there is no permanent trade-off between inflation and output gap and that monetary authorities should be vigilant because hyperinflation is always there lurking just around the corner (Taylor,1999).

3 Partial incorporation of expected inflation and the permanent tradeoff between output gap and inflation

Given that in reality one does not observe hyperinflation (nor a situation in which inflation rates go on falling and turn to deflation) very frequently, we may wonder if the model above is a bit too drastic and perhaps not very realistic for the vast majority of inflationary experiences.

Luckily, one can easily get rid of these drastic results by simply dropping the strong assumption iii) of full incorporation of expected inflation. Indeed, traditionally, i.e., before Firedman and Phelps, it was widely thought that excess demand caused "demand-pull" rate of inflation and not an acceleration of inflation. In the same fashion, most people thought that supply shocks (or distributive conflict) caused "cost-push" inflation, instead of an acceleration of inflation. It is true that in reality there is always some incorporation of expected inflation and inertia for a number of reasons, including formal or informal contract indexation schemes but there is absolutely no reason to assume that for the economy as a whole the whole of full indexation to past or expected inflation. As Palley (2018) puts it (taking the lead from Rowthorn (1977)) the crucial distinction is that between the formation of expectations and the power to incorporate them into wage contracts and prices. Assumption iii above implies that all agents have the power to incorporate all of the inflation they expect, in this simple model equal to lagged inflation, into wage and/or price increases.

But if, realistically, we drop assumption iii and admit that in the aggregate incorporation is only partial (a<1 even if by just a little, say a=0,9) the results change substantially. Even in a model that sticks to assumptions i) and ii) above (average c=0, Y* independent of actual Y) we would revert to something like the old original Phillips curve where inflation would tend to:

$$p= \frac{\mathbf{b}\,(\frac{\mathbf{Y}}{\mathbf{Y^*}}-\mathbf{1})}{(\mathbf{1}-\mathbf{a})}$$

and there would be a permanent tradeoff between inflation and the output gap. And a permanently positive output gap will cause permanent inflation rather than a permanent acceleration of inflation.

Note also that with partial incorporation of expected inflation, the acceleration of inflation is explained not by the level but only by the change in the size of the output gap:

$$p - p_{-1} = \frac{\boldsymbol{b}\left[\ \frac{\mathbf{Y}}{\mathbf{Y^*}} - \left(\frac{\boldsymbol{Y_{-1}}}{\boldsymbol{Y^*_{-1}}}\right)\ \right]}{(\mathbf{1}-\boldsymbol{a})}$$

and a temporary contractionary (or expansionary) demand shock will have the effect of lowering (or raising) the level of the rate of inflation but not for much longer than it lasts. With no output gap and hence no excess aggregate demand, the rate of inflation converges back to zero (assuming no supply shocks on average). Note there is no need to suppose that there is hysteresis in potential output in order to get this result. Partial incorporation of expected inflation is enough.

With partial incorporation of expected inflation (retaining the assumptions of exogenous potential output and compensation of supply shocks), we conclude that inflation is the result of excess demand and the acceleration of inflation would be a function of the increase in excess demand, just like in the pre-Friedman "demand pull" tradition (on this see Setterfield (2004a)).

4 Hysteresis and the sraffian supermultiplier

4.1 Full hysteresis in output

Considerable empirical evidence has been accumulating in favor of strong or full hysteresis on output ever since Nelson & Plosser (1982) (see Blanchard (2018)). This means that the longer run trend of output is not only partially determined by whatever drives short run output (presumably aggregate demand) but rather that potential output is actually *fully* determined by the trend of whatever drives actual output.

As it is well known, this result of strong hysteresis in the output (GDP) series has been taken to provide evidence in favor of the "real business cycles" strand of new classical macroeconomics in which the common elements driving both the trend and the cycle are factor supplies and their productivity. But early New Keynesians in the 1980s (before the DSGE) correctly pointed out that the idea of a short run cycle is supply rather than demand driven (and that the economy is in a full neoclassical intertemporal general equilibrium path even in the short run) is very unrealistic.

Moreover, if the trade cycle was driven by changes in aggregate supply instead of demand we should observe in practice that booms would imply negative output gaps and low inflation, while recessions should be associated with positive output gaps and high inflation (a inverted Phillips curve) , exactly the opposite of usually happens in reality.[7]

However, at the same time these early New Keynesians have had great difficulty in dealing with the mounting evidence of strong hysteresis in output, since this evidence is incompatible with their view that the cycle is driven by demand but the trend is driven by altogether different (supply) forces. Therefore is only natural that they have for a long

[7] A very long time ago this has been pointed out by Hicks(1950) when he explained why his trade cycle was driven by demand.

time been trying to question the quality of these empirical findings (Campbell & Mankiw (1987)).[8]

Nevertheless, in spite of the ongoing controversy, our general impression is that the more recent evidence and tests (Blanchard (2018)) mostly confirm Nelson & Plosser (1982) original findings of strong hysteresis in output that we take as a stylized fact that theories have to explain.

But neither the New Classicals nor the New Keynesians seem to have seriously considered another possibility: that indeed the trend and the cycle are driven by the same forces, but that both of them are determined by the evolution of effective demand. This would allow us to make sense of the stylized fact of strong or full hysteresis on output and, as we shall see, does not seem to require much more than to take seriously the idea that the business sector´s capacity generating investment is induced by the old and sensible "capital stock adjustment principle" or flexible accelerator (Matthews, 1960).

4.2 The gap that tends to close itself: the sraffian supermultiplier

Let us then turn to discuss the possibility of dropping assumption ii) above, concerning the independence of potential output from actual output and effective demand. How could potential output be affected in the long run by aggregate demand?

In the Sraffian or classical surplus approach that we follow here (Garegnani (2007)), where distribution and in particular real wages are given by social conflict and customs, capitalist economies are considered as not constrained by labor scarcity even in the very long run. And capital and labor are largely complementary (not substitutes) and normal

[8] See the attempt by Delong (2005) to argue that the growth of the U.S. economy has been around a given exogenous trend by extending the sample to the whole period from the 1880s to the 1980s. Delong argues that the great depression demand driven slump was just a cyclical matter around a given supply determined by an exogenous trend since it was entirely matched by a compensating Second World War demand driven boom leaving exogenous the trend rate. He mentions that he might have to resort to some "Old Keynesian" view where Keynesian demand management could have important trend effects for the post WW2 period.

potential or capacity output is determined by size and efficiency of the existing stock of capital equipment. Additionally, the levels of both sectoral and aggregate outputs in the long run are determined by the trend of effective demand, defined as the demand of those who can pay normal prices of production which are enough to, given technical conditions and a particular distributive configuration, induce firms to supply them regularly. Within this general approach some authors use the sraffian supermultiplier (Serrano (1995), Serrano, Freitas & Bhering(2019)) as a simple model of the process of demand led growth

The idea is that in the long run there is both a marginal propensity to consume and a propensity to invest and the sum of both, the marginal propensity to spend is assumed, in a demand-led context, to be lower than one. Thus the reciprocal of the marginal propensity not to spend gives the size of the supermultiplier, and the autonomous expenditures do not create productive capacity for the private sector are what is being "supermultiplied". In this view the trend growth of these "unproductive" autonomous expenditures is the key to sustained growth of effective demand, output and capacity output.

Formally, taking *Z* as the amount of autonomous expenditures that do not create capacity, *w* as the marginal propensity to consume and *h* as the marginal propensity to invest we have that the level of output is given by :

$$Y = Z/ (1- w-h) \tag{4}$$

In this view, gross investment is basically induced via a flexible accelerator or supermultiplier process by the need to gradually adjust the size and growth of productive capacity (with given planned margins of spare capacity to deal with fluctuations emphasized by Ciccone (1986) to the gradual growth of the trend of effective demand over time.

Therefore, if the actual level of output happens to be initially different from the level of normal capacity output, the marginal propensity to invest *h* (gross investment share) will tend to change over time, gradually increasing when the output gap is positive and

decreasing when the gap is negative.[9] This will make normal capacity output adjust to the trend of demand over time, the output gap will be tending to zero and the gross investment share will tend to that level (h*) which is required to sustain the growth of demand and capacity output at the rate *z* that the autonomous expenditures is growing[10]. Thus capacity output will tend to:

$$(5) \qquad Y^*=Y=\frac{z}{(1-w-h^*)}$$

The supermultiplier shows that, once the growth rate of autonomous demand *z* is not too high and that the flexible accelerator adjustment of the investment share is not too intense, the growth of normal capacity output tends to follow the long run trend of the growth of actual output and aggregate demand.[11] The trend and the cycle indeed have a common nature as the empirical literature shows but this common nature reflects that both are explained by demand (not supply) factors. Therefore, the Sraffian supermultiplier model seems to be entirely compatible with the evidence of full hysteresis in the output time series.

The supermultiplier allows us to understand that, if there is this type of full hysteresis in output, positive or negative output gaps are mostly self correcting, even without policy intervention. This is because any more persistent under (or over) utilization of productive capacity will tend to stimulate a decrease (or increase) in the pace of productive (i.e., capacity generating) gross investment as firms are continuously trying to adjust the size of their productive capacities to the size of the trend of effective demand.

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[9] There are many ways to formalize this adjustment process. Perhaps the simplest is just to make the investment share to adapt slowly the expected trend rate of grow of demand to the past actual rate of growth of output. Thus if we call *v* the normal capital-output ratio, *d* the drop-out rate and *x* a small partial adjustment parameter we can write: $h = (1-x)h_{-1}+xv(g_{-1}+d)$. See Serrano, Freitas & Bhering(2019)

[10] To be precise, we have: $h^*= v.(z+d)$.

[11] A sufficient (but not strictly necessary) condition for the dynamic stability of the Sraffian supermultiplier is that x is sufficiently low as to guarantee that the marginal propensity to spend remains below one both structurally and during the cyclical adjustment of capacity to demand, a condition which is assumed here to hold. For a detailed discussion (and appendices with formal proofs) see Serrano, Freitas and Bhering (2019).

In this context of hysteresis, explained by effective demand and induced investment, even if we go back to the very strong assumption (iii) of full persistence, "demand-pull" inflation would only accelerate the rate of inflation temporarily. At least to the extent that capacity can adjust over time to demand, a single demand shock would be self correcting and it could not bring the economy to hyperinflation. After capacity adjustments to the permanently higher levels of demand, the positive output gap would close itself and inflation would stop increasing and stabilize at the new, permanently higher level. The same reasoning would hold in the case of a negative output gap that, if persistent, would lead to a lower pace of capital accumulation in order to adjust the economy to the desired normal degree of capacity utilization.

4.3 Hysteresis, full incorporation of expected inflation and a temporary NAICU

In equation *1a* above, the normal or planned degree of capacity utilization has been normalized as being equal to one by our definition of Y^* as normal instead of maximum feasible capacity output. A degree of capacity utilization greater than one should accelerate inflation and hence in this context the value of the unique and exogenous NAICU (Corrado & Mattey (1997)), the Non Accelerating Inflation degree of Capacity Utilization, should be equal to one. However, with the supermultiplier process and the full hysteresis in output, even under full inflation inertia there isn't really a permanent NAICU, because the acceleration of inflation caused by a degree of capacity utilization remaining persistently greater than one will not last too long as induced investment would make capacity output would gradually increase to close the output gap.

Therefore, if there is strong hysteresis in the levels of output (and employment) here we would certainly not have demand-pull hyper-inflation. The acceleration of inflation would not tend to be permanent[12].

[12] Unless the government was really irrational and on purpose kept, through expansionary macro policies, demand growth always one step ahead of capacity growth, which could be done only if the rate of growth of autonomous demand remains permanently very high making the marginal propensity to spend structurally greater than one , getting the economy to a supply constrained regime (but see footnote 12)

4.4 Full hysteresis on output and partial incorporation of expected inflation

Note, however, that even granted this connection between actual and potential output, we still get the result that a temporary, indeed self correcting, excess demand shock would permanently increase inflation. But this happens only because we dropped assumption ii) of no hysteresis on output but went back to assumption iii) of full incorporation of expected inflation and persistence. If we take the much more reasonable assumption of partial persistence, when we combine it with full hysteresis on output, and interpret the latter according to the sraffian supermultiplier, we see that these excess demand situations (by their very nature temporary in this context) will not accelerate inflation permanently. With partial inflation persistence demand pressures will tend to lead to higher inflation rates temporarily. Over time as capacity catches up with the higher levels of demand, demand inflation will stop. And with less than full incorporation of expected inflation and inflation persistence, the memory of this episode will fade away completely over time.

In fact, as we have seen in section 2 (equation 2), with partial persistence the permanent level of the rate of inflation is a function of the size of the output gap. In the supermultiplier model, even a permanent increase in the growth of autonomous demand causes only a temporary positive output gap. This means that,within the bounds of a demand led growth regime, demand-pull inflation is inherently a transient phenomenon. The only permanent effect of the demand shock will turn out to be a permanently higher price level (but zero permanent rate of inflation)

Indeed, in terms of equation 3 above, with the supermultiplier, a permanently higher rate of growth of demand will only cause inflation to accelerate while the output gap is increasing. As soon as the gap stops increasing, even if it is still positive, as capacity slowly catches up with (and then temporarily overtakes) the faster growth of demand, inflation will stop accelerating and will begin to fall all the way towards as the output gap starts falling. In other words, with full hysteresis in output levels modelled using the sraffian supermultiplier and partial incorporation of expectation and inflation persistence, “demand-pull” inflation is just a temporary phenomenon that will raise the general price

level once and for all and therefore does not determine a positive rate of "core" or persistent inflation.[13]

[13] Note that assuming the values of the parameters to be in the demand-led regime (i.e., respecting the conditions mentioned in note 10 above) before and after the changes examined. It is true that if parameters are such that the aggregate marginal propensity to spend (implausibly in our view) becomes chronically above one we would be in a capacity constrained demand-pull core inflation regime. Note however that if this were the case in reality there should be no evidence of strong hysteresis in output as capacity output should be independent from actual output (unless as mentioned in the text one is prepared to think along with the "real business cycles" literature where even the short run cycles are determined by supply rather than demand forces).

5 Incompatible Distributive Claims and "cost push" core inflation

5.1 The Aspiration Gap

We began this paper complaining that the accelerationist model produced too much inflation but now we run the risk to have too little inflation, since core inflation would tend to zero over time in an economy with output hysteresis ($Y^* \rightarrow Y$) and partial inflation persistence ($a<1$). This is because we have not yet relaxed the strong assumption (i) of zero average supply shocks ($c=0$). Although the misleading name of "supply shocks" evokes temporary phenomena such as bad or good harvests, c in fact represents all autonomous cost-push pressure, the "aspiration gap", i.e., all the conflicting claims over the distribution of a particular level of output between profits and wages. A permanently positive c usually means that workers keep desiring and bargaining for an autonomous increase in their current money wages greater than the rate of growth of productivity. Note that it is immaterial at this point why they do this. This may be just to recover some "fairer" level of real wages or of the wage share obtained sometime in the past, but that has been eroded by previous changes in other relative prices or distributive variables (oil prices, exchange rates, indirect taxes, public utility rates, profit mark-ups etc.), which is known as "real wage resistance". Perhaps workers are more actively pushing for a shift in distribution in their favor or even if they just expect higher inflation in the future and want to protect themselves from it. In any case, c will be positive whenever there are basic conflicting claims over distribution (an "aspiration gap" or "real wage resistance") of that particular level of output and this distributive inconsistency will reflect as a "cost push" increase in the normal supply prices, even if the output gap is zero (or positive, for that matter).[14]

[14] The importance of changes in distributive "aspirations" for inflation has been admitted in the empirical literature about the U.S. economy by Ball & Moffit (2001) and even R. Gordon (Dew-Becker & Gordon (2005)) although these authors still insist that one day these "shocks" will be reversed. It can be found also without these restrictions in Pollin (2002) and Setterfield (2004b).

The size of these conflicting claims can and does of course change a lot over time, but there is absolutely no reason to think the aspiration gap is a temporary and self correcting phenomenon, which is implied by assumption (i) above.

A permanently positive *c* means that some attempt to change distribution is occurring. This is much more plausible under partial incorporation of expected inflation. If we had full incorporation of expected inflation, a permanently positive *c* would mean that there always is some group that is trying to make their nominal rates of remuneration grow by more than the past rate of inflation. In the more realistic case in which there is only partial incorporation of expected inflation this is not necessary. If $a<1$, a positive *c* only implies that some group wants positive nominal increases in their remuneration. And the opposite orthodox assumption of zero average supply shocks in the long run would (under partial inflation persistence) imply that over time for every inflationary supply shock there would always be a sufficiently compensating autonomous reduction in nominal remuneration and prices. And this symmetric downward wage and/or price nominal flexibility is hardly urealistic.

5.2 An alternative cost push benchmark for core inflation

If we assume the existence of some persistent degree of real wage resistance (or distributive conflict) and partial inflation persistence we get that, as capacity adjusts to demand via induced investment and the output gap closes itself, core inflation tends to:

(6) $$p = \frac{c}{1-a}$$

The equation shows that trend or core inflation is a "cost push" phenomenon that depends on the size of the aspiration gap and the degree of inflation persistence (Serrano (1986,

2010)). In this view demand shocks usually have only temporary effects on the level of inflation.[15]

On the other hand, a permanent increase in the aspiration gap would lead to a permanently higher level of core inflation. Here it is important to note that different types of "supply shocks" may have very different impacts on inflation dynamics. For instance, imagine that there is an exogenous increase of the domestic price of imported oil and the bargaining power of workers is so low that they do not react to the initial increase in inflation (caused by this shock) by increasing their aspiration gap. This means that *c* will be positive only temporarily and also that the ensuing permanent fall in the wage share will generate a negative demand shock as the fall in the wage share reduces the marginal propensity to consume of the economy *w*. In this case the impact of the supply shock on inflation will be not only temporary but also weakened by the effect of the opposite and also temporary negative output gap on inflation caused by the permanent fall in the wage share. Of course the gap will close itself and gradually investment and capital accumulation slows down to adjust capacity to the lower levels of aggregate demand that come from the smaller size of the multiplier.

Things would be different if we assume the supply shock was a "wage explosion" caused say by increased trade union militancy. In this case the increase in the aspiration gap will permanently increase core inflation. At the same time the probable increase in the wage share that would ensue would increase the marginal propensity to consume *w* and generate a positive demand shock and output gap which would add to the rate of inflation. This positive gap will however be temporary and inflation will settle over time at its new high cost-push core level as the investment and capacity output growth catches up with the increased effective demand generated by the new and permanently higher multiplier. It is

[15] Arguing from a Kaleckian perspective Kriesler & Lavoie (2004) go further and argue that for a wide range of different degrees of capacity utilization demand has no effect whatsoever on inflation. Only very high rates of actual capacity utilization would increase prices and very low ones would decrease them.

interesting to note how this brief analysis of the reaction of the economy to a supply shock is very different from that based on the New Consensus model discussed above.[16]

[16] Although we have argued that the degree by which inflation expectations are incorporated on inflation is usually far below one, it is true that the level of inflation itself may affect this degree of incorporation and thus increase the degree of price indexation and inflation persistence. There is a simple reason for that which is the fact that payment and financial contracts are never perfectly synchronized. This means that the fluctuation of the real value of these contracts is a direct function of the rate of inflation. Therefore. when inflation begins to reach higher levels the difference between peak real value and average real value of contracts begins to increase bringing up all sorts of difficulties, even if there is no particular conflict in what regards the average real value. As the inflation rate goes up, first gradually, then at an increasing pace, the duration of contracts begins to shrink, for a given aspiration gap. In our terms, is tantamount to an increase in the degree by which inflation expectations are incorporated in price increases, as it increases our a coefficient. This process can lead to hyperinflation, in the limit when a approaches 1 for a positive level of c in equation 6 above. For a discussion of issues connected to very high cost push inflation following the approach taken here see Serrano(2010)

6 The gap that never closes: Money wage dynamics and unemployment

6.1 Nominal wages and nominal profit margins under historical cost pricing

We will assume that the economy produces a single good by means of itself (used as circulating capital) and labor. We assume also that prices are formed initially by adding a nominal profit margin to historical costs. This is in contrast to most Post Keynesian models of inflation that assume that prices are set with a real profit margin being added to replacement costs. The problems with the latter procedure are that, as the (real) markup is added to costs of the same period with no lags, the profit share is exogenously given and is never eroded by increases is costs, no matter how much those costs have risen . Moreover, if pricing is done directly on a replacement cost basis the total effect of any supply shock (such as a rise in prices of imported oil) would be felt immediately, as firms would at once fix money prices that would reflect the new equilibrium of relative prices (with the same real profit margins). Both results are not very realistic, as often increases in money wages are not fully and immediately neutralized by a sufficient increase in nominal markups. And also increases in input prices are normally passed on to product prices only quite gradually. [17]

We start by provisionally assuming that money wages grow at an exogenous rate w.

In this context inflation is given by the lagged rate of growth of labor and input cost increases (the rise in historical costs) plus the current rate of change of nominal profit margins (k) :

(7) $p=\alpha w_{-1} + (1- \alpha)p_{-1} +k$

[17] Okishio(1977), Serrano(1993), Serrano(2010).

Note that the historical cost pricing assumption already gives us a component of partial inertia or persistence in inflation that is independent of expectations (that in a more complex setting would encompass the whole input-output matrix).

A once and for all increase in the nominal profit margin may be due either to a conflicting claims desire to have a bigger profit margin , that we denote by k^0 , or from a possible demand pull pressure on product prices:

(8) $k=k^0 +k^1(Y/Y^k)$

Thus, given the level of effective demand and degree of capacity utilization Inflation will then tend to :

(9) $p=w_{-1} + \frac{k^0+k^1(\frac{Y}{Y^k})}{\alpha}$

As we are assuming that in the longer run capacity adjusts to demand through a supermultplier mechanism, the output gap will close itself endogenously (as Y^k tends to Y) and the core or trend of inflation will depend only on the cost push and inertia elements:

(6) $p=w_{-1} + (k^0 /(\alpha))$

And inflation will tend to follow the increase in wage costs (with a lag) when the nominal profit margins remain constant ($k^0=0$). In this situation the wage and profit shares do not change. But any acceleration of wage inflation w will, if the nominal markup remains constant, or at least does not increase as much as the increase in w, increase the real wage and lower the share of profits.

6.3 The relation between money wages and the rate of unemployment

Let us now drop the assumption of an exogenous wage inflation and look how money wages change. The nominal wage increases desired by workers are a function of expected inflation p^e and desired real wage increases which may be affected by a number of things including the unemployment rate, which is more convenient to represent here (with the opposite sign) by the employment rate Y/Y^n, the ratio between actual output and what level output would have to reach to obtain the full employment of labor (given by the size of the labor force N times its product per worker B). To check that this ratio is really the employment rate note that the employment rate is equal to L/N and that current output can be decomposed tautologically as output per worker times the actual level of employment. We then have:

$$(8) \quad \frac{Y}{Y^n} = \frac{L.B}{N.B} = \frac{L}{N}$$

We assume that workers as whole do not suffer from any money illusion but at the same time do not always (and nowadays not very often) have the power to obtain their desired nominal wage increases. So we distinguish explicitly between the formation of inflation expectations and the power of incorporating such expectations fully in all labor contracts. Assuming that on average only x percent of what workers desire is actually obtained as money wage increases we get:

$$(11) \quad w = x(\ p^e\ + w^0 + \ w^1(\frac{Y}{Y^n}))$$

Where w^0 includes other determinants of desired money wage increases connected with higher real wage aspiration. Using this nominal wage increase function and equations (3) and (4) that inflation will be given by:

$$(12)\ p = \alpha\left(x\left(\ p^e_{-1}\ + w^0_{-1} + \ w^1\left(\frac{Y_{-1}}{Y^n_{-1}}\right)\right) + \ (1 - \ \alpha)p_{-1}\ \right) + (\ k^0 + \ k^1(\ \frac{Y_{-1}}{Y^k_{-1}}))$$

If inflation expectations of workers are adaptive and naive ($p^e = p_{-1}$), this will tend to:

$$(13)\ p = \frac{(w^1\left(\frac{Y_{-1}}{Y^n_{-1}}\right) + k^1\left(\frac{Y_{-1}}{Y^k_{-1}}\right)) + (k^0 + \alpha x w^0_{-1}\ \ )}{(\ \alpha x + 1 - \alpha)}$$

Note that a necessary condition for this Phillips curve to be accelerationist for a given level of potential output (and labor supply), it would be necessary that workers always have the power to get the full desired nominal wage increase (x=1).

Otherwise, inflation will have the same structure as an old Phillips Curve. The only difference being that now we include have two distinct output gaps, one for labor and another for capital and , as we have done in section 4 above, assuming that growth is demand led through the supermultiplier, capacity adjusts to demand and thus inflation in a longer run would tend to:

(14) $p = \frac{w^1\left(\frac{Y_{-1}}{Y^n_{-1}}\right) + c}{(1-a)}$, where $a=(\alpha x + 1 - \alpha)$, $c=(k^0 + \alpha x w^0_{-1})$

Note that in (15) the trend rate of labor unemployment is equal to the structural unemployment in the old sense of the difference between the level of output at normal capacity utilization of the capital stock (capacity output) output and the full employment of labor levels of output. The interesting result is that the rate of strucutural unemployment is determined through the supermultiplier by the evolution of effective demand (close to what was argued by Garegnani (1962[2015]).

6.4 The natural rate of growth is endogenous

But in order to know if this conflict augmented Old Phillips curve is minimally stable we must show that the labor unemployment rate can remain stable in a context in which demand output and capacity output at all growing at the rate that autonomous demand grows through the operation of the sraffian supermultiplier g=z. In other words, we must show, as it is empirically reasonable, in spite of the existence of persistent *levels* of open unemployment, that the so called natural rate of growth (growth of labor force n plus labor productivity q) is endogenous and tends to follow g=z. This can be done in various forms. We start assuming provisionally that the rate of growth of productivity q is exogenously given. We will suppose that rate of unemployment increases there is a

tendency for the growth of the labor force to slowdown and vice versa, as the size of the labor force tend to follow employment opportunities (Garegnani (1990)). But this adjustment can be quite slow and gradual (ρ <1 being the partial adjustment parameter). And we must also consider other factors that affect the growth of the labor supply independently of the increase in employment opportunities. The latter include institutional and other social changes such as , for instance, improvement in the provisions of the welfare state that allow people to remain looking for jobs in the formal sector (which would increase the labor supply independently of its effects on demand), or demographic and social factors such as increases in labor force participation of particular groups of workers such as women (which also increase the supply of labor). we must assume that there is also an exogenous component rate of growth of the labor force. This exogenous component of the growth of the labor force n^0 can be permanent or temporary. As examples of a more permanent exogenous rate of growth could the tendency towards migration away from poor or conflict countries or regions towards more prosperous and safer onesρ. On the other hand, things like a change in the participation rate of workers of particular age groups can increase or decrease the rate of growth of the labor force for a while but by their very nature are unlike to change it permanently. Taking all these things into account we our growth of labor force equation can be written as the sum of the endogenous and exogenous growth of the labor force as:

$$(15)\ n= n^0+ \rho\ (g_{-1}-q_{-1}- n^0_{-1}) +(1- \rho\ )(n_{-1}-n^0_{-1})$$

The equation above shows that the size of the labor force will tend to grow at the same rate as the rate of growth of employment opportunities. Note that, because of the lag in the adjustment, whenever the rate of growth of employment (growth of output minus productivity growth) increases permanently the level of the unemployment rate will fall permanently too. And whenever the rate of growth of employment decreases persistently the unemployment rate will decrease persistently too. Moreover, any *change* in the

growth rate of the exogenous component of the growth of the labor force will also have a permanent level effect on the rate of unemployment.[18]

We can complete our model by dropping the assumption that the rate of productivity growth q is exogenous. We can make it endogenous by combining the trend Kaldor-Verdoorn type of effect and the procyclical Okun effect , the latter here operating through the rate of change of the degree of capacity utilization.[19] Therefore, the rate of growth of productivity will depend on an exogenous component q^0 , a cyclical component and a trend component showing how through embodied technical change, learning by doing, and increasing returns , capital accumulation increases productivity growth:

(16) $q=q^0+q^1(g- g^k) + q^2(g^k)$

Combining this with our labor force growth equation and noting that in the sraffian supermultiplier que growth of the capital stock g^k follows the growth of demand, the degree of utilization tends to normal, and the trend of demand growth follows the growth of autonomous demand z , we finally get:

[18] Equation (15) and (16) is in part similar to the formulation presented by both Palley (2019) and Fazzari et al (2018). They key difference is that they relate (negatively) the endogenous rate of growth of the labor force to the *level* of the unemployment rate. By doing this they arrive at a definite equilibrium rate of unemployment for each rate of growth of demand (given the other parameters), and to minimum rate of unemployment. In our formulation, we arrive at the same adjustment of the growth of the labor force to the growth of employment opportunities without the assumption that the economy will always tend to the same equilibrium rate of unemployment for a given set of variables and parameters ($g-q$, ρ, n^0), independently of its initial condition. By making the adjustment of the labor force a negative function of the *rate of change* of unemployment , we make the level towards which the unemployment rate will tend to always depend on its initial level, contrary to these other formulations that determine and equilibrium unemployment rate that is independent of initial conditions. The difference between these formulations is not so big but we do think that our version is simpler and perhaps more general. Nah and Lavoie(2018) using a simpler story also arrive at same final equation (17).

[19] This formulation is inspired by Jeon & Vernengo(2001). Fabio Freitas pointed out to me that since the Okun effect here relates the level of productivity with the level of the degree of capacity utilization, it would be appropriate to formalize the equation for the rate of growth of productivity as depending on the rate of change of capacity utilization.

(17) $n=(1-q^2)z-q^0$

Which shows that the natural rate of growth is endogenous both because of the endogenous part of productivity growth and the endogenous element of the trend of growth of the labor force.

6.3 Wage inflation and unemployment: demand pull or cost push?

For our purposes, demand pull inflation will be defined as a situation in which the level of Effective demand is substantially greater than normal potential output Y^k and prices begin to rise for this reason. Note that as by effective demand we mean the demand of those who are willing (and able) to pay the price of production (or normal supply price), in a such a situation the market price will be necessarily above the price of production. Accordingly, we define cost push inflation as increases in any component of the nominal price of production that occurs at any level of output below the level of potential output. In our view demand pressure on nominal profit margins when capacity utilization is sufficiently above the normal degree of capacity utilization can be definitely characterized as demand pull inflation. But what about the other gap? A faster growth of money wages may be caused by a reduction of the unemployment rate that has strengthened the bargaining power of workers by decreasing , but certainly not eliminating, the structural labor surplus (or "reserve army"). This increase in (wage) inflation is surely the result of demand pressure, but at the same time we consider it is an instance of cost-push inflation as wages are rising in a situation in which there is no sign of a real scarcity of labor (just a lower degree of abundance). It is not demand inflation (or "true inflation" as Keynes would put it) , as output and employment can still be easily increased. Lerner (1951) used to say that this type of inflation pressure came at "low" (as opposed to "high") full employment, since it was not really a full employment position but wages were rising. It would make no sense to stop the economy at this low level of activity in order to fight inflation and that is why he thought incomes policies were needed.

Ever since Philips´s seminal paper there has been lack of clarity concerning this point. Since Lipsey and Friedman the level of unemployment rate that led to wage inflation has been characterized as corresponding to the neoclassical equilibrium between labor supply and labor demand (full employment or the natural rate of unemployment). This means that demand expansion that led to an unemployment rate lower than that level clearly caused demand inflation , as labor was seen to be scarce at this rate. On the other hand, Samuelson and Solow(1960) (and Phillips himself) were rather ambiguous about this issue of the cost push or demand pull nature of the Phillips curve and of inflation in general , but at the same they claimed that there was a permanent tradeoff between unemployment and inflation that could be exploited by policymakers, implying that the economy could expand and this was obviously below full employment, so logically that wage inflation had to be cost push inflaton(in Solow (2018) we see that the ambiguity is still there, but he now seems to associate the Phillips curve as relating to a neoclassical labor market adjustment in disequilibrium around the full employment position).

7 An alternative set of assumptions and their implications

The upshot of our analysis above is that from our sraffian standpoint on inflation we prefer to replace assumptions i), ii.a), ii.b and iii), namely, zero average supply shocks, supply determined potential output and full incorporation of expected inflation by the following alternative general assumptions:

1. $c>0$, i.e. a distributive conflict exists;

2. potential output follows the trend of effective demand (Y^* adjusts to the trend of Y) as : a) potential output depends on the capital stock as capital and labor are complementary and labor is usually not scarce and; b) capital accumulation is governed by the trend of demand via the supermultiplier mechanism

3. and $a<1$: usually there is only partial indexing to past inflation which increases the level of the inflation rate associated with any level of the basic aspiration gap.

Although assumptions 1-2a-2b-3 are completely incompatible with orthodox economic theory they seem to find broad empirical support, not requiring the ad hoc amendments, both theoretical and in the empirical estimation procedures that have been widely used recently in order to make sense of the data on actual inflation dynamics.[20]

If we follow the set of assumptions we may now close by discussing what we think is the usual effect of a higher rate of growth of demand on inflation and the rate of unemployment. combining our sraffian supermultiplier with our conflict augmented Phillips curve. From the discussion above is easy to see that this once for all increase in the rate of growth of demand, will, as capacity adjusts to demand, increase the growth of the capital stock and potential ouput. Moreover it will also lead to a permanent reduction in the unemployment rate , that , will strenghten the barganining power of workers, cause

[20] For a critical analysis of these amendments from the standpoint followed here see Summa and Braga (2019) and Stirati (2018).

an increase in real wages (unless there is compensating increase in nominal profit margins) and lead to a permanently higher rate of inflation (but not the acceleration of inflation). This means that there is a longer run tradeoff between cost push inflation and the rate of unemployment and also the rate of growth of output and of the capital stock and productive capacity. Conversely a permanent reduction of the trend rate of growth of output and potential outpput as well, together with a permanently higher unemployment rate is likely to be the longer run cost of a policy of controlling inflation exclusively through a permanent reduction in growth rate of demand. These huge costs of this policy, are in sharp contrast with the cost of disinflation according to the accelerationist new consensus model, namely, a temporary increase in the unemployment and a equally reduction in the rate of growth of output, with no loss of potential output at all. As we believe our framework is equally simple, but way more realistic than the new consensus model, we do think that no matter how difficult technically and politically to devise and implement incomes policies in the current political and social climate, it is surely something worth a try.

References

Aspromourgos T. (2004a): '"The Functionless Investor": Keynes's euthanasia of the rentier revisited', in Aspromourgos T., Lodewijks J. (eds.): *History and Political Economy: essays in honour of P.D. Groenewegen*, Routledge, London.

Aspromourgos, T (2007) "Interest as an Artifact of Self-Validating Central Bank Beliefs**",** *Metroeconomica*

Ball, L. e Moffit, R. (2001) "Productivity growth and the Phillips curve", *NBER Working Papers,* n. 8421.

Blinder, A (1997) "Is there a core of practical macroeconomics that we should all believe?" *American Economic Review*.

Campbell, J & Mankiw G (1987). "Are Output Fluctuations Transitory?" *Quarterly Journal of Economics,* 102: 857-880.

Carlin, W. e Soskice, D. (1990) "*Macroeconomics and the Wage Bargain",* Oxford University Press.

Ciccone R. (1986) "Accumulation and capacity utilization: some critical considerations on Joan Robinson's theory of distribution', *Political Economy — Studies in the Surplus Approach*, 2, pp. 17–36.

Clarida, R., Galí, J. e Gertler, M. (1999) "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature,* Vol. XXXVII, December, pp. 1661-1707.

Corrado, C. e Mattey, J. (1997) "Capacity Utilization" Journal of Economic Perspectives, Winter.

Delong B. (2005) "Existence of ´Unit Roots´", available *at* www.j-bradford-delong.net/

Dew-Becker I. & Gordon, R. (2005) “Where Did the Productivity Growth Go? Inflation Dynamics and the Distribution of Income”, *NBER Working Papers,* 11842,

Dutt & Ros, Amitava and Jaime Ros (2003), ‘Contractionary Effects of Stabilization and Long Run Growth’, *University of Notre Dame*, unpublished manuscript.

Eller, J. e Gordon, R. (2003) “Nesting the New Keynesian Phillips Curve within the Mainstream Model of U. S. Inflation Dynamics” draft of a paper to be presented at *CEPR Conference: T he Phillips Curve Revisited,* Berlin Hilton, Berlin, Germany, June 5-6, 2003.

Fazzari, S., Ferri, P. & Variato, A. (2018) Demand-Led Growth and Accommodating Supply, Washington University in St. Louis, september 2018.

Friedman, M (1977) "Inflation and Unemployment: Nobel lecture", 1977, *Journal of Political Economy*. Vol. 85, pp. 451-72.

Fuhrer, J. (1997), “The (Un)Importance of Forward-Looking Behavior in Price Specifications” *Journal of Money Credit, and Banking*, Vol. 29, No. 3 .

Garegnani (1962) GAREGNANI, P. ([1962]2015) “The Problem of Effective Demand in Italian Economic Development: On the Factors that Determine the Volume of Investment”, Review of Political Economy 27: 111-133.

Garegnani, P. 1990. ‘Sraffa: Classical versus Marginalist Analysis’ In Essays on Piero Sraffa, Unwin & Hyman, London.

Garegnani, P. (2007), “Prof. Foley and Classical policy analysis”, *Review of Political Economy*

Gordon, R. J. 2013. ‘The Phillips curve is alive and well: Inflation and the NAIRU during the slow recovery.’ NBER Working Paper number 19390. National Bureau of Economic Research.

Gordon, R. J. (2018) 'Friedman and Phelps on the Phillips curve viewed from a half century's perspective.' Review of Keynesian Economics 6 (4): 425-436.

Hicks, R, (1950) "A contribution to the theory of the trade cycle", Clarendon, Oxford

Hodrick, R. e Prescott, E. (1997). "Postwar U.S. Business Cycles: An Empirical Investigation," *Journal of Money, Credit and Banking*, Ohio State University Press, vol. 29(1), pages 1-16, February.

Jeon Vernengo Jeon, Y and M. Vernengo. 2008. 'Puzzles, Paradoxes, and Regularities: Cyclical and Structural Productivity in the United States (1950–2005).' Review of Radical Political Economics 40 (3): 237-243.

Kriesler, P. & Lavoie, M**.** "The New View On Monetary Policy: The New Consensus And Its Post-Keynesian Critique"**,** Universisty of Ottawa, mimeo

Lavoie, M. (2014), Post-Keynesian Economics: New Foundations, Cheltenham: Edward Elgar.

Lerner, A. 1951. The Economics of Employment. New York: McGraw Hill.

Matthews, R. (1960), "*The Trade Cycle*", J. Nisbet, 1960.

Nah, W. & Lavoie, M, (2018) **"**The role of autonomous demand growth in a neo-kaleckian conflicting-claims framework" FMM working paper No. 22 · May, 2018

Nelson, C. e Plosser, C. (1982) "Trends and Random Walks in Macro-economic Time Series: some evidence and implications", *Journal of Monetary Economics*, 10, 1399162

Okishio, N. 1977. Inflation as an Expression of Class Struggle. Kobe University Economic Review

Palley, T. 2018. 'Recovering Keynesian Phillips curve theory: hysteresis of ideas and the natural rate of unemployment.' Review of Keynesian Economics 6 (4): 473-492.

Palley, T. 2019 “The economics of the super-multiplier: A comprehensive treatment with labor markets”,

Pivetti, M. (2007), “Distribution, Inflation and Policy Analysis”, *Review of Political Economy*

Pollin, R. (2002), “Wage Bargaining and the US Phillips Curve: was Greenspan right about traumatized workers in the 90s?” mimeo, *Political Economy Research Institute*, University of Massachusetts Amherst.

Romer, D. (2000) "Keynesian and Macroeconomics without the LM curve", *NBER Working Paper*s, n. 7461, Jan.

Rowthorn, R. (1977), Conflict, Inflation and Money, *Cambridge Journal of Economics*, 1977, Volume 1, Issue 3**,** 215-39.

Samuelson, P. and R. Solow. 1960. Analytical aspects of anti-inflation policy. The American Economic Review 50 (2): 177-194.

Serrano, F. (1986), “Inflação inercial e dexindexação neutra” em *Inflação inercial, teorias sobre inflação e o Plano Cruzado.* Editora Paz e Terra.

Serrano, F. (1995) “Long Period Effective Demand and the Sraffian Supermultiplier”, *Contributions to Political Economy*, 1995, vol. 14, pages 67-90.

Serrano, F. 2010. O conflito distributivo e a inflação inercial. Revista de Economia Contemporânea, Rio de Janeiro, 14(2): 395-421, maio/agosto.

Serrano, F. , Freitas, F. & Bhering, G. (2019), The Trouble with Harrod: The fundamental instability of the warranted rate in the light of the Sraffian Supermultiplier *Metroeconomica*, May, 2019

Serrano, F. , Summa R., Garrido Moreira, V. (2019) “Stagnation and unnaturally low interest rates: a simple critique of the amended New Consensus and the Sraffian supermultiplier alternative”, Texto para Discussão 005 | 2019, IE-UFRJ

Summa, R. & Braga, J. “The (conflict augmented) Phillips curve is ‘alive and well’” Texto para Discussão 003 | 2019, IE-UFRJ

Setterfield, M. (2004a) Central banking, stability and macroeconomic outcomes: a comparison of new consensus and post-Keynesian monetary macroeconomics, in M. Lavoie and M. Seccareccia (eds), *Central Banking in the Modern World: Alternative Perspectives*, Edward Elgar, Cheltenham, pp. 35-56.

Setterfield, M. (2004b) “Worker Insecurity and U.S. Macroeconomic Performance During the 1990s”, Trinity College, Department of Economics.

Solow, R. 2018. ‘A theory is a sometime thing.’ Review of Keynesian Economics 6 (4): 421-424.

Stirati, A. (2001) "Inflation, unemployment and hysteresis: an alternative view", *Review of Political Economy*.

Stirati, A and W. Meloni. 2018. ‘A short story of the Phillips curve: from Phillips to Friedman… and back?’ Review of Keynesian Economics 6 (4): 493-516.

Taylor, J. (1999) “Monetary Policy Rules”. in Taylor, J. (Ed.), Chicago: University of Chicago Press, 1999.

Taylor, J. (2000) "Teaching Modern Macroeconomics at the Principles Level", *The American Economic Review*, 90, 90-94.