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THE (CONFLICT-AUGMENTED) PHILLIPS CURVE IS ALIVE AND WELL ♦

Ricardo Summa* and Julia Braga⁺

Abstract: Blanchard recently stated that the old Phillips curve - a relation between the level of inflation and the level of the unemployment rate - is alive and well. In this paper we will argue that there are two routes to this old Phillips curve. We will compare and contrast them. The mainstream route assumes demand-pull inflation and full incorporation of inflation expectations into money wage increases, leading to an accelerationist behavior of inflation. Followers of this approach propose amendments to avoid this accelerationist relation between demand shocks and inflation without discarding the two crucial assumptions, based on introducing imperfections and anchored expectations. After a critical evaluation of these amendments in the accelerationist curve, we will argue in favor of an alternative route to the old Phillips curve that rejects any neoclassical assumptions. This alternative approach assumes that there is no labour scarcity and that inflation depends on conflicting claims over income. Therefore, expectations are not necessarily always fully passed on to nominal wages. Our general conflict-augmented Phillips curve is different from the conflicting-claims Heterodox NAIRU models as it is compatible both with the old Phillips curve but also with accelerating inflation, depending on the bargaining power of the workers.

Keywords: Phillips curve, distributive conflict, natural rate of unemployment

JEL codes: B51, E31, E13.

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1. Introduction

Almost sixty years after the seminal work of Phillips (1958), Olivier Blanchard stated that the (old) Phillips curve is alive and well, as empirical works find evidence of a relation between the *level* of inflation and the *level* of unemployment, for many advanced economies (Blanchard, Cerutti and Summers (2015)), including the US (Blanchard (2016)). This is a striking assertion made by a prominent mainstream macroeconomist. Since Friedman (1968), the old Phillips curve was replaced by the accelerationist Phillips curve, in which the gap between the actual unemployment rate and the natural rate of unemployment affects the *change* and not the level of inflation.¹ The view that the ‘accelerationist curse’ is over is also somehow accepted by Gordon (2018) and Solow (2018).

The theoretical route taken by the mainstream from the accelerationist Phillips curve back to the previous old Phillips curve does not discard the theoretical central assumptions of the former: (i) that wage inflation is demand-pull, a result of a situation of scarcity in the labour market and (ii) that expected inflation has to be fully incorporated into nominal wage increases, as workers are not assumed to have money illusion. Instead, it consists of amending the accelerationist Phillips curve by introducing imperfections in the functioning of the neoclassical labor market. According to this amended old Phillips curve version, the accelerationist view is the general case, but the old Phillips relation can occur due to specificities.

On the other hand, there is another route to arrive at the old Phillips curve. Following Serrano (2019), we shall call this alternative the “conflict-augmented” Phillips curve. This view interprets nominal wage increases in the original Phillips work as cost-push inflation in terms of conflicting-claims over distribution (Rothschild 1971, Desai 1975, Palley 2018). Wages may start rising because of the increased bargaining power of workers when unemployment rates are reduced long before full employment. In this alternative view, labour is usually not scarce, and the bargaining position of workers often does not allow for expected inflation to be fully incorporated into nominal wages. The “conflict-augmented” Phillips curve is both compatible with the old Phillips relation between unemployment and inflation but also with accelerating inflation, depending on the relative strength of the workers’ bargaining power.

This paper aims to compare and contrast these two routes back to the old Phillips curve and to argue that the conflict augmented alternative has the advantage of not being constrained by the two crucial neoclassical assumptions which lead to the accelerationist behavior.² We also make a further distinction between the conflicting-claims Heterodox

¹ The term ‘accelerationist Phillips curve’ is commonly used in the literature (Williams (2006), Blanchard (2016), Ball and Mazumber (2018)) to refer to rising (or decreasing) rate of inflation as a consequence of shocks.

² To focus on the relation between unemployment and inflation, we will consider the usual effects of monetary and fiscal policy on aggregate demand as materialized in the actual unemployment rate, without entering in details about the discussion of reaction function and the mechanisms of transmission from monetary and fiscal policies to output and employment, that would be beyond the limited scope of this paper.

NAIRU models and the more general conflict-augmented Phillips curve. The former drops the first assumption of labor scarcity but keeps the second assumption of fully incorporated inflation expectations. Thus, it also presents an accelerationist behavior. By contrast, in the conflict-augmented Phillips curve, the relation between inflation and unemployment is compatible both with the old Phillips curve and also with accelerating inflation, depending on the relative strength of the workers' bargaining power.

After this introduction, we briefly present the accelerationist Phillips curve, its key assumptions, and the theoretical attempts to amend this model (Section 2). Then (in Section 3), we look at the alternative conflict-augmented old Phillips curve. We address (Section 4) the empirical literature about the flattening of the accelerationist curve and present evidence of the change in the relative strength of the workers' bargaining power in advanced countries since the 1960s and its correlation with inflation. Final remarks are made in section 5.

2. The accelerationist Phillips curve and some amendments

2.1 The accelerationist Phillips curve and its assumptions

In general terms, the mainstream position views inflation π depending on inflation expectations π^e and a gap denoting demand pressures, here defined by a gap between the unemployment rate U and the natural rate of unemployment, U^* . Inflation expectations are passed fully through to inflation, and the parameter α in Equation (1) is equal to 1. The parameter β is the sensitivity of inflation to the unemployment gap:

$$(1) \pi = \alpha\pi^e - \beta(U - U^*), \quad \alpha = 1$$

If expectations are backward-looking, and if we suppose the simplest case where there is only one lag (Equation 2), substituting (2) into (1) we get the accelerationist Phillips curve (Equation 3):

$$(2) \pi^e = \pi_{-1}$$

$$(3) \pi = \pi_{-1} - \beta(U - U^*)$$

Friedman (1968) arrives at this result by assuming expectations are adaptive. Gordon (2011) shows Equation (2) can be interpreted not only by adaptive expectations but also by inertia (due to sticky prices, lengthy contracts, and also input-output supply chains), which is also compatible with rational expectations. Equation 3 represents a simplified version of the accelerationist Phillips curve (Taylor 2000, Ball 2009).

The accelerationist Phillips curve version, as defined in Blanchard, Cerutti and Summers (2015), is the one in which the deviation between unemployment and the natural rate of unemployment affects the *change* in inflation. As a consequence, one single

temporary demand shock changes the level of inflation permanently, and a permanent demand shock leads to hyper-(de)inflation. The only possible situation where inflation is stable occurs if the economy lies in the natural rate of unemployment.³

This accelerationist Phillips curve, however, is a direct result of two assumptions that were progressively incorporated in the mainstream Phillips curve: (i) that wage inflation is a result of a situation of scarcity in the labour market (Lipsey 1960), and (ii) expected inflation is fully incorporated into nominal wage increases (Friedman 1968). Both assumptions are directly derived by interpreting inflation from the operation of a competitive neoclassical labor market. A detailed record of the history of the economic thought of the Phillips curve can be found in Humphrey (1985), Furher et al. (2009), Gordon (2011), and Hoover (2015). For our purposes, we will only focus on these two crucial assumptions.

The first assumption – changes in nominal wages as a measure of scarcity in the labour market - was first proposed by Lipsey (1960). He interpreted Phillips' (1958) empirical findings within a neoclassical framework, in which wage inflation is seen as a consequence of a disequilibrium position between labour demand and supply, where the situation of full employment is only compatible with zero wage rate inflation.⁴ The old Phillips curve of the 1960s, which Blanchard (2016) is referring to, is the one alluded to above which is then incorporated into the neoclassical synthesis framework after the contributions of Lipsey (1960) and Samuelson & Solow (1960) by specifying it in terms of price inflation.⁵

The second assumption is introduced by Friedman (1968) where it is correctly pointed out that within the neoclassical framework if wage inflation is a result of disequilibrium in the labour market, the correct variable which governs labour demand and supply decisions is not the nominal wage but the *real wage*. In this way, expected real wages must be taken into account. From this assumption, Friedman deduces that the whole of expected inflation is incorporated into nominal wage increases and is thus passed through to current inflation - which in Equation (1) means that α is equal to one. Moreover, labour scarcity will happen at U^* , which was called by Friedman the natural

³ Demand shocks are the leading cause of inflation in the accelerationist curve because a significant part of the economists that use the accelerationist Phillips curve consider that supply shocks are random with mean zero (white noise). Gordon (2011) prefers to include explicitly supply shocks in his 'triangle' Phillips curve (which is an accelerationist curve with lags and explicit supply shocks). For him, supply shocks are a result of changes in relative prices, but they must be neutral to the level of inflation since "in the long-run inflation is 'always and everywhere an excess nominal GNP phenomenon' (Gordon 1990, p.4).

⁴ There is some controversy on the interpretation of the Phillips seminal paper (1958) within mainstream economists. Some authors, such as Tobin (1972), believe that Phillips presents only empirical evidence on the relationship between wage inflation and the unemployment rate, without a theory, while others, like Gordon (2011) and Solow (Solow, Taylor and Mankiw 2009), disagree and say that you can find a theoretical basis on Phillips' work. Solow also believed that Phillips has the idea of wage change as a situation of disequilibrium in the neoclassical labour market.

⁵ The passage from wage inflation to price inflation can be made by abstracting from changes in labour productivity and the mark-ups. Samuelson and Solow (1960) were aware that this systematic relation between unemployment and inflation was valid in the short run, but the action of policymakers could shift the Phillips curve. For a detailed discussion on Samuelson and Solow, see Hoover (2015).

rate of unemployment, and when positive (negative) demand shocks occur, the unemployment rate deviates from the natural rate of unemployment at the cost of accelerating (or decelerating) inflation. (Humphrey 1985, Dixon 1995, Tobin 1995).⁶⁷

The accelerationist Phillips curve as a result of these two assumptions can be quite unstable since a permanent demand shock can lead to a situation of hyper(de)inflation. The theoretical exercises found to avoid instability within the inflation rate generated by this accelerationist model, in simple terms, are related to the introduction of imperfections in the functioning of the neoclassical labor market. We will discuss these implications in the next sub-sections of the mainstream alternatives to avoid accelerating inflation behavior.

2.2 The Time-Varying NAIRU and weak Hysteresis

One alternative to mitigate inflationary effects of demand shocks is done through introducing hysteresis effects in the natural rate of unemployment (or in the NAIRU), that is, by allowing it to change endogenously over time.

For Gordon (1989), hysteresis occurs (in the simplest case) when the Time-Varying NAIRU (TV-NAIRU) is a function of the lagged current unemployment rate (U_{t-1}) (Gordon 1997, Ball and Mankiw 2002)⁸. Equation (4) depicting the NAIRU exemplifies the idea of hysteresis for Gordon (1989):

⁶ Some economists prefer to use the non-accelerating inflation rate of unemployment (NAIRU) instead of the natural rate of unemployment. In the definition of the natural rate Friedman (1968) said that is was compatible with imperfections in the neoclassical goods and labour markets. Nevertheless, the developments of the new classical macroeconomics made the natural rate more associated with the competitive labour market (Tobin 1995). New Keynesians developed models with imperfections in the goods and labour market, and they are more associated with the concept of the NAIRU (Ball and Mankiw, 2002). However, for Blanchard (2018), the concept of the natural rate is compatible with imperfections.

⁷In the mainstream view, institutions and imperfections matter and are incorporated in the neoclassical labour market (Solow 1990). Nevertheless, they change only the real variables, like the equilibrium levels of unemployment and real wages, with no consequences to nominal wage and price changes. This equilibrium level of unemployment in the imperfect labour (and goods) market will be higher than the competitive one. The difference between the two is called Involuntary or Structural Unemployment by the New Keynesians. Notice that in this situation there is no scarcity in the labour market. However, there is scarcity in the goods market since the potential output will be associated with the equilibrium level of unemployment in the imperfect labour market – or the NAIRU. The cause of Involuntary Unemployment in the New Keynesian view is much different from the old Keynesian view, which was due to the lack of effective demand.

⁸ There are different interpretations by mainstream economists for the causes of the presence of hysteresis (see Ball and Mankiw 2002). The most common one says that a temporary rise in unemployment can decrease the 'human capital' by workers that went out of labour market. There is a decrease in the marginal product of labour, leading to a permanent rise in the unemployment rate. This interpretation is based on the new-Keynesian model of structural unemployment with real wage rigidity (Mankiw 1995). In this model, potential output is given by the stock of capital, whose growth depends on potential savings, so it is not determined by the same factors of current output that is demand driven. In this interpretation, the level of employment, in the long run, is determined by supply-side forces, as the capital stock, human capital, the productivity of labour and the level of rigid real wages. There is also a more applied literature on unemployment scarring devoted to checking at the micro-level data the long-run effects of an individual's unemployment now on the future risk of being unemployed (and also on his future earnings after re-

$$(4) U^* = \eta U_{-1} + (1 - \eta) Z$$

In this model, hysteresis is partial (where $0 < \eta < 1$), and the TV-NAIRU varies in the short run. Changes in the current unemployment rate will also affect the NAIRU and reduce the size as well as the duration of unemployment gaps thereby generating less inflation. In the long run, Z , which is determined by microeconomic supply-side variables, is a slow attractor.

2.3 Total, short-run and long-run unemployment

Another type of labour market imperfection is one in which the short-run, and not the total unemployment gap, is relevant in determining the inflation rate. This point is justified theoretically by supposing the long-run unemployed are on the margins of the labour market and should not influence nominal wage changes (Gordon (2013), Krueger, Cramer and Cho (2014)).

In the neoclassical labour market framework, this change means that the relevant disequilibrium now comes from short-run factors instead of the aggregate unemployed. The result is that the long-run unemployed should not be considered in the labour supply function, which implies an introduction of more imperfections in the neoclassical labour market.

2.4 Worker's aspirations and productivity shocks

Another theoretical attempt to avoid (de)accelerating inflation is to introduce supply shocks - mainly productivity shocks – in the Phillips curve. Ball and Moffit (2001) present a simple model to theoretically justify why real wages may not follow labour productivity in the short run. Wage aspiration represents the real wage that workers find fair. The model supposes that wage aspiration influences nominal wages and is a function of past real wages. The assumption is that workers are accustomed to a certain level of purchasing power and slowly adjust real wage aspirations upward to their productivity gains. Consequently, if productivity changes, this gain will not be incorporated into the current wage for a period of time. Ball and Moffit (2001) and Ball & Mankiw (2002) developed this model to take into account the case in which an increase in productivity did help to avoid accelerating inflation in the context of an unemployment rate lower than the NAIRU of the 1990s. Gordon (2013) uses the decrease in productivity to explain a missing deflationary period of the 2000s. Long run distributive neutrality (a constant wage share) is imposed in these models, and thus after some time, workers realize productivity has grown and fully incorporate it in their real wages.⁹

engagement), see Arulampalam et al. 2001. See Blanchard (2018) for a survey on the persistent effects of unemployment on both the employability of workers and the size of the labour force.

⁹ Note that Ball and Moffit (2001) use assumptions, such as fairness considerations affecting the bargained wage, which are incompatible with a competitive neoclassical labour market and the use of terms such as

2.5 Nominal wage rigidity

There is also the assumption of downward nominal wage rigidity, that is, positive unemployment gaps do not generate continuously decelerating inflation because the level of nominal wages does not fall (Bernanke and Carey 1996, Daly and Hobijn 2014, Carlin and Soskice, 2018). As noticed by Krugman (2018), the nominal wage rigidity assumption is just an ex-post explanation and not a modification of the theory that would allow policymakers to foresee the phenomenon. It is also important to stress that this assumption is not symmetric since it can avoid decelerating inflation in the case where unemployment is higher than the natural rate (or the NAIRU), but not the case of accelerating inflation¹⁰.

2.6 Anchored expectations

A distinct approach to the backward-looking Phillips Curve discussed in equation (3) is forward-looking inflation expectations, which result in the New Keynesian Phillips Curve with quite different behavioural inflationary dynamics. In general, it is assumed that agents have perfect foresight, inflation expectations are forward-looking, and depend on expectations about inflation in the future. Equation (5) introduces this idea:

$$(5) \pi^e = E\pi_{+1}$$

Substituting (5) into (1) we arrive at the reduced form of the New Keynesian Phillips curve:

$$(6) \pi = E\pi_{+1} - \beta(U - U^*)$$

Anticipated demand shocks will deviate the rate of inflation from its expected value. If Equation (6) is solved recursively, inflation will be equal to the sum of all expected unemployment gaps in the future. This is a problematic result since, according to the model, inflation would tend to fall in booms and increase in recessions, since those gaps are perfectly anticipated (Carlin and Soskice 2014, Mankiw 2000). See also Gordon (2011, 2013) for more criticisms about the New Keynesian Phillips curve.¹¹ Blanchard

wage aspiration directly derived from the conflict inflation literature (Rowthorn 1977). However, the model of Ball and Moffit includes the restriction that, in the long run, the wage share is constant, the rate of growth of the real wage is equal to the rate of growth of labour productivity, and so the wage aspiration becomes constant over time. In opposite to this set of arbitrary assumptions, in the models of distributive conflict inflation, distribution of income can change permanently, and aspirations have permanent effects on the rate of inflation.

¹⁰ However, this kind of model is compatible with long-lasting deflation if demand shocks are permanent and productivity growth is positive, as nominal wage growth is equal to zero.

¹¹ The standard microfoundation for this version of the Phillips curve is the Calvo Model, a staggered price model in which only a random fraction of firms can adjust their price in each period. The firms who can adjust prices will do that based on their present rational expectations about future prices and the deviations

(2009) used to be more sympathetic to this version of the Phillips Curve, but recently has changed his mind about the nature of these forward-looking expectations: they should be anchored and represented by a constant term (equal, for example, to the target rate announced by the Central Bank).

The premise of anchored expectations is where ‘expectations may have become so well anchored that inflation may be well characterized by random deviations around a constant’ (Fuhrer 2010, p. 469) which dates back from Williams (2006), Mishkin (2007) and Fuhrer (2010). We translate Blanchard (2016)’s ideas using our notation. Inflationary expectations are fully passed through to inflation, and demand shocks are generated by deviations of the unemployment rate from the natural rate (equation 1). However, now expectations are in part exogenous with a constant (a) and in part dependent upon lagged inflation (equation 7):

$$(7) \pi^e = \varphi\pi_{-1} + (1 - \varphi)a$$

Substituting (7) into (1), and assuming that inflation is static $\pi = \pi_{-1}$, inflation will converge to:

$$(8) \pi = a - \frac{\beta}{(1-\varphi)}(U - U^*) , 0 < \varphi < 1$$

Equation 8 shows a considerable change in the reduced form of the Phillips curve with significant consequences to the accelerationist principle. According to Blanchard, the ‘accelerationist curse’ may have come to an end, since, “with anchored expectations, a period of high unemployment implies a low level of inflation but not an ever-falling level” (Ball and Mazumder 2018, p.115).

However, Blanchard warns that the central bank must be aware of the dangers of exploiting this trade-off since ‘prolonged deviations of inflation from target may de-anchor expectations’ (Blanchard 2016, p. 33). In our scheme, this is equivalent to a tendency of φ to increase when a macroeconomic policy stimulates the economy. If φ converges to one, the Phillips curve became accelerationist again (see equation 7).

The aforementioned proposal is flexible enough to make the model compatible with both stable and accelerationist inflation, by supposing that expectations can quickly change and became backward-looking again if the government tries to explore the output-inflation trade-off. In this version, the accelerationist Phillips curve is alive but maybe “hibernating” (Hooper et al., 2019). According to Blanchard, central banks should keep

from the optimum level. In general, this new Keynesian version of the Phillips curve takes into account a mark-up gap (the difference between current and optimal markup) as a source of demand pressures. The optimum level of the markup is defined by a constant demand elasticity faced by each firm operating on imperfectly competitive markets (Goodfriend 2004). Nevertheless, the optimal markup is associated with a unique level of employment (and unemployment). In this way, here we present the New Keynesian Phillips curve with the unemployment gap as a proxy of the mark-up gap in order to compare it with the tradition of the Phillips curves. However, it is important to notice that the labour market in this kind of model is always in equilibrium since when aggregate demand fluctuations occur, they shift labour demand schedule while workers are always in their labour supply schedule (Stirati 2015).

the natural rate assumption as a baseline but keep an open mind and put some weight on the alternatives (Blanchard 2018, p. 100). However, it is not explicit why and when exactly the parameter φ will change.

Recently, Gordon (2018) and Solow (2018) seem to agree with Blanchard regarding anchored expectations and its implications on the accelerationist behavior. However, they are quite skeptical about using this scheme in the long run. Even in the medium run, anchored expectations are a significant departure from the assumption of rational expectations. The premise that agents do not adjust their expectations in the medium run, even if they know that the economy will not stay at the natural rate of unemployment during this period, cannot be reconciled with rational expectations.

3. The conflict augmented Phillips curve

3.1 Persistent unemployment and conflict inflation

The alternative route back to the old Phillips curve begins by rejecting the neoclassical principle of factor substitution and the associated idea of a tendency towards full employment of labor for any available quantity of capital. This idea, whose theoretical foundations have been found since the Sraffian critique of capital theory, is the basis for the first crucial assumption of the neoclassical view of the price of labour being the measure of the relative scarcity of this factor of production (represented by the natural rate of unemployment). Once we reject this view and assume that capital and labor are complementary and the availability of labor is usually higher than that of capital, the situation of labour scarcity should happen only in exceptional circumstances in capitalist economies (Kalecki (1950)). In this way, long-run unemployment (or the presence of an ‘industrial reserve army’) is a normal phenomenon (Rowthorn 1977, Garegnani 1990, Carlin and Soskice 1990, Pollin, 1998, Stockhammer, 2008, Levrero, 2013)¹².

With persistent unemployment, the traditional neoclassical idea of flexible real wages also ceases to be logical, since a situation of chronic excess labour supply would lead to real wages falling to zero (Garegnani 1990, Levrero, 2011). Wage determination thus must be explained by other means than a measure of relative scarcity of labour. The classical surplus approach has a long tradition in providing an alternative explanation of the functioning of the labour market and wage determination. In this view, the level and evolution of nominal and real wages are necessarily determined by political, institutional and social factors that can affect workers' bargaining power in influencing their money

¹²This is why we do not include as part of the conflict augmented Phillips curve tradition the literature that assumes that capital and labour are substitutes and some real wage rigidity prevents aggregate supply to fully employ both factors, causing persistent unemployment. For an example of a model with persistent unemployment in the presence of factor substitutability, see Rose (1966). The author does introduce wage bargaining, however, it is a real rigidity that affects only the level of employment and not directly inflation, which is supposed to be determined only by an excess of aggregate demand and not by conflict or cost-push inflation. But the assumption of substitutability between production factors as a response to their relative prices has been shown by Sraffa and his followers to be theoretically flawed in the course of the well known Cambridge capital controversies (Petri 2004).

and real wages (Stirati 1994). This means that wage inflation can happen much before the situation of full employment and must be a result of conflicting claims over income distribution (Okishio 1959, Kalecki 1971, Lavoie 2014).

Lerner (1951) distinguished 'High Full Employment' – a situation with actual labour scarcity – and 'Low Full Employment' - a position where workers' bargaining power is strong and can create a price-wage spiral even if the current level of output is below the 'High Full Employment' level. Wages may start increasing because of the increased bargaining power of workers when unemployment rates are reduced long before full employment is reached. In the 'Low Full Employment' scenario, cost-push or conflict inflation is understood as a consequence of 'workers "excessive" demands' (or claims) relative to productivity growth, rather than the usual view of an 'excess demand for labour' that would generate demand-pull inflation beyond the 'High Full Employment'¹³ level. The above was the reason why Lerner favored income policies to deal with the cost-push inflation that starts from 'Low Full Employment.'

3.2 The Heterodox NAIRU

Rochon and Rossi (2018) argue that the conflicting-claims approach to inflation is still compatible with the existence of a single NAIRU. There are some conflict inflation models that maintain the notion of a level of the unemployment rate that guarantees inflation does not accelerate because, at that point, the claims over distribution are consistent. We will call this level the Heterodox NAIRU.

In this Heterodox NAIRU view, the economy presents persistent unemployment (some authors refer explicitly to the concept of 'industrial reserve army'), but there is a level of unemployment which turns the real wage desired by workers and the real mark-up of firms (that is, the real wage firms desire to pay) consistent (Rowthorn 1977, Carlin and Soskice 1990, Stockhammer 2008, Lavoie 2014). Workers desired real wages depend on the unemployment rate (as a measure of their bargaining power). The real wage firms are willing to pay in some specific models depends on the unemployment rate (Lavoie 2014) but do not depend on this variable in others (Carlin and Soskice, 1990)¹⁴.

In these models, if the unemployment rate is different from the heterodox NAIRU, this will lead to (decelerating) accelerating inflation. In all the models, although not supposing labor scarcity, it is the maintenance of the second assumption discussed in section 2 – full incorporation of inflationary expectations into wages - which will cause this result. Consequently, conflict inflation must be a temporary phenomenon, that is, it

¹³ Some years later, after the development of the Phillips curve, Lerner (1967) regrets to have denominated this situation as 'Low Full Employment' and believes that the range from Low to High Full Employment could be re-interpreted as something similar to an old Phillips curve, implying he sees that there is a range in the Phillips curve where labour is not scarce, and inflation is a cost-push and not a demand-pull phenomenon.

¹⁴ Carlin and Soskice (1990) assume that real mark-up is given, and ultimately firms will determine the real wage, and workers can only shift the heterodox NAIRU. With this scheme, shifts in the desired real mark-up can also shift the heterodox NAIRU.

must be accommodated; otherwise a permanent conflict will lead to a hyper-(deflation) inflation.

It is crucial noting that the Heterodox NAIRU is not an attractor in these models, as noticed by Stockhammer (2008). In this way, stabilization must be made by the management of Macroeconomic Policies. In Isaac (1991), the stabilization of the model to the heterodox NAIRU (called by him as the steady-state Unemployment rate) is guaranteed by the Monetary Authority through managing aggregate demand to keep the unemployment rate equal to the heterodox NAIRU.¹⁵ Stirati (2001) proposes, from a Sraffian perspective, a model with fully passed-through expected inflation to nominal wages. Inconsistent claims over income distribution would lead to accelerating inflation, but the Central Bank can stabilize the model by reconciling the distributive claims by the fall in the real rate of interest and thus also of the profit share.¹⁶

In sum, within Heterodox NAIRU models, it is the full incorporation of expected inflation on nominal wages, which will lead to the accelerationist behavior of inflation, from a conflict-claims perspective. However, while in the neoclassical tradition, this assumption is derived by the necessary relation between real wages and unemployment, and in the heterodox tradition, we can drop this assumption and still be consistent within the conflict inflation framework.

3.3 Expectation formation versus incorporation

Rowthorn (1977) starts his analysis by differentiating expectations and anticipations of inflation. While the first is only a state of mind, the second refers to the capacity to act upon the expectations. So, he calls to attention that the critical question is not the ability of workers in forecasting future inflation, or how expectations are formed, but the extent of the actual power of workers to incorporate expected inflation in their negotiated wage contracts. Although, as we saw in the last section, Rowthorn did not explore this remarkably interesting insight and presupposed that workers can fully anticipate their expectations and incorporate them in their nominal wages.

Rosenberg and Weisskopf, with a similar argument, reach an important distinction between workers' aspirations and their ability to act upon their aspirations. The latter is understood as the effectiveness of workers in boosting money wages to meet their aspirations which will depend upon their strength as well as the ability and desire of capitalists to resist their demands (Rosenberg and Weisskopf 1981, p.44). Flaschel and Kruger (1984) call this the 'aspiration factor'. The parameter which measures the degree

¹⁵ Isaac (1991) proposes some extensions of his model, and one possibility introduced in the model is exogenously fixed inflation expectations - remarkably similar to Blanchard (2016) – which helps to stabilize his accelerationist model. In Isaac (2009), these exogenous expectations will be equal to the expected inflation target. Another interesting extension of the model is made in Isaac (1993) by proposing a hysteresis effect on the Heterodox NAIRU; hence the level of the heterodox NAIRU will thus be influenced by the macroeconomic policy.

¹⁶ As we discussed in footnote 13, a shift in the real mark-up as a consequence of a change in nominal interest rate managed by monetary authority will shift the heterodox NAIRU (assuming a relationship between the interest rate and the profit rate). See Aidar (2011).

of incorporation of wage aspirations into wages is supposed to depend positively on the rate of capital accumulation.¹⁷

Inspired by these insights, we will suppose that a nominal wage change will be the result of workers' aspiration, which is composed of expected inflation plus the desired increase in the real wage (c) and the capacity of workers' in incorporating this wage aspiration into their nominal wages (Palley 2012, 2018), measured by the parameter α .

$$(9) w = \alpha(\pi^e + c)$$

Palley (2012) assumes that inflation expectations are incorporated only partially, but believes that this occurs due to labour scarcity in some segmented disaggregated markets. Setterfield and Leblond (2003) and Palley (2018), however, relate the parameter depicting the incorporation of expectations into wages to the degree of capital-labour conflict. The same point is made in Serrano (2019) and Lavoie (2014). We will assume that workers do not fully incorporate their aspirations into their wages ($\alpha < 1$).¹⁸ Inflation is equal to nominal wage increases minus productivity growth (y) $\pi = w - y$ (abstracting from changes in the nominal mark-up). If inflation expectations are fulfilled, $\pi^e = \pi$ (Palley, 2009) and supposing that the productivity change is zero, inflation will converge to:

$$(10) \pi = \left[\frac{\alpha}{1-\alpha} \right] c$$

Now conflict will be permanent and will explain the level of inflation. The higher the parameter c (the bargained increase in wages over expected inflation) and the degree of incorporation of inflation expectations, α , the higher will be inflation.

3.4. Bargaining power, unemployment and the old Phillips curve

First, relaxing the assumption of zero productivity growth (y), inflation will converge to¹⁹:

$$(11) \pi = \left[\frac{1}{1-\alpha} \right] (\alpha c - y)$$

¹⁷ Flaschel and Kruger (1984) assume that the parameter that measures the degree of incorporation will be equal to one only when the actual rate of capital accumulation is equal to the normal rate (defined as the growth of labour force plus productivity).

¹⁸ Akerlof et al. (2000) obtain the same result, but by supposing that agents have near rational expectations, so this leads to the underestimation of expectations of inflation. We think that the assumption that workers are systematically fooled is much weaker than the idea that workers can forecast inflation very well. Nevertheless, maybe they do not have the power to incorporate it fully into their wages.

¹⁹ Equation 11 can be obtained first by substituting equation (9) $w = \alpha(\pi^e + c)$ in $\pi = w - y$, both discussed in sub-section 3.3. We get in $\pi = \alpha(\pi^e + c) - y$. Second, including the assumption that inflation expectations are fulfilled $\pi^e = \pi$, also discussed in sub-section 3.3 we get $\pi = \alpha(\pi + c) - y$. If $\alpha < 1$, also discussed in sub-section 3.3, we arrive in equation 11 after some algebra.

This equation is coherent to Lerner's concept of low full employment, where cost-push inflation is understood as a consequence of 'workers "excessive" demands' (or claims) relative to productivity growth.

Additionally, we can better formulate the desired increase in real wage, c , assuming that it depends on the level of the unemployment rate, as well as on other political, institutional and social aspects such as minimum wage policy, the power of trade unions, labour protection legislation, etc. that influence workers' bargaining power (Stirati 1994, 2001, Levrero, 2011).

$$(12) \quad c = c_0 - \psi U$$

Here it is important to notice that both parameters c_0 and ψ depend upon the degree of bargaining power of workers in setting their wages and so can vary according to institutional, social and political changes. Isaac (1991) called a parameter similar to c_0 as 'autonomous claims'.

Persistently lower trend rates of unemployment strengthen the bargaining power of the labour force, especially under favorable political and institutional circumstances (Kalecki 1943, 1971, Garegnani 1990). This can be captured in Equation (12) as the effect of the level of unemployment on the desired increase in real wage, c , agreeing with Pollin (1998), who believes that the size of the 'reserve army of labour', and thus a persistent and structural level of unemployment, is crucial to put downward pressure on wages through the bargaining power effect. The relation between the level of unemployment and wage change can occur even if the economy is still quite far away from a situation of labour scarcity.

Substituting (12) into (11), for a given level of productivity, the resulting inflation rate in this conflict augmented Phillips curve will be:

$$(13) \quad \pi = \left[\frac{1}{1-\alpha} \right] (\alpha c_0 - y) - \left[\frac{\alpha}{1-\alpha} \right] \psi U$$

This equation in general terms is similar to the reduced form proposed by Blanchard (2016), that is to say, a relation between inflation, a constant term and the unemployment rate – however, with a significantly different explanation and implication.²⁰ In this 'conflict augmented Old Phillips curve,' nothing guarantees that expected inflation can always be fully incorporated. The other difference is that the level of structural unemployment (and not disequilibrium away from full employment) can influence inflation due to workers' bargaining position.

Also, this Phillips curve is compatible with episodes of accelerating inflation, when conflict is so strong that workers fully incorporate their expected inflation over nominal wages. In this case, the parameter α is equal to 1, and there will be a level of

²⁰ In fact, in Blanchard (2016), productivity growth is not explicit in the reduced form, and also demand shock is due to the unemployment gap (the difference between the unemployment rate and a natural rate of unemployment).

unemployment capable of stabilizing inflation – a heterodox NAIRU as we discussed in section 3.2.²¹

It is important noticing that the unemployment rate that affects the bargaining position of workers in claiming for higher nominal wages should be related to the actual ‘degree of utilization of the available labour force’. This considers the flexibility of the labour if there are job opportunities, the number of hours, and the participation rate can change accordingly. Fontanari, Palumbo and Salvatori (2019) propose a few ways of evaluating the utilization of the labour force, such as an index that incorporates marginally attached workers and part-time workers and also by an index of hours worked divided by the prime working-age population²²

Finally, the conflict augmented Phillips curve is much more similar to the old Phillips curve based on Phillips’s seminal work and not the one incorporated in the neoclassical synthesis. This possible interpretation of the original Phillips curve based on bargaining power is proposed by Rothschild (1971) and developed by Desai (1975, 1984, 1995), who believe Phillips (1958) points to a long-run relation between nominal wage changes and the unemployment rate. This view seems to be much closer to the conflict view than that based on disequilibrium in the neoclassical labour market (Palumbo (2010), Stirati and Meloni (2018)).

4. Two possible interpretations for the empirical evidence

The accelerationist view of the Phillips curve has survived many well recognized empirical difficulties posed by long-lasting unemployment gaps occurring without (decelerating) accelerating inflation. The first was the recession of the European economy in the 1980s, when high and lasting unemployment rates did not lead to continuous deflation (Blanchard and Summers 1986). The second were the low levels of unemployment (below the presumed NAIRU at the time) with a controlled and stable inflation rate in the US economy during the 1990s (Ball and Mankiw 2002). The third is

²¹The heterodox NAIRU can be derived as follow. Inflation is equal to nominal wage change minus productivity growth, $\pi = w - y$. Nominal wage change is determined according to equation (9) $w = \alpha(\pi^e + c)$ and equation (12) $= c_0 - \psi U$. Assuming, to simplify, that: $\alpha=1$; productivity growth is equal to zero $y = 0$; and expectations are fulfilled $\pi^e = \pi$, then inflation will be stable only when $U = \frac{c_0}{\psi}$.

²² Other indicators reflecting the situation of the labour market can also influence wage change if it affects the bargaining power of workers. First, Phillips (1958) himself believed that the change in the unemployment rate was important to explain wage growth. This view is shared by Alogoskoufis and Smith (1991), Pollin (2003) and Gordon (2011). Another possibility is to think that not only the level and change in unemployment could influence wage inflation, but also the time for which the unemployment rate remains at high or low levels. Thus, in periods where the unemployment rate is kept in low (high) levels for a long period, an increase (decrease) in the bargaining power of workers can arise through the ‘discipline effect’ (Kalecki, 1943). Finally, some authors think that the relation between unemployment and wage inflation is not so systematic, and maybe there can be a threshold of unemployment rate in which wage inflation did not change (Tobin 1995). This view is compatible with the conflict augmented Phillips curve since the causality from unemployment to bargaining power, and thus to wage increases are not necessarily systematic in this tradition. It is important to recall that Phillips (1958) proposed a non-linear Phillips curve, relating extremely low unemployment with strong nominal wage pressure, but a much flatter curve for high unemployment.

the ‘missing deflation’ in the US after the 2008 crisis, as high and long-lasting unemployment have coexisted with low but stable, instead of decreasing, inflation (Ball and Mazumder 2011).

There is also strong evidence in the empirical literature that the accelerationist Phillips curve has flattened since the 1980s (Mishkin 2007, Ball and Mazumder 2011, Blanchard, 2016, Murphy, 2018, Stock and Watson 2019). As can be seen in Figure 1, for the US economy, the estimated accelerationist Phillips curve is much more pronounced in the period 1960-1983 than it is in recent years (1984-1999 and 2000-2019).

From the standpoint of the mainstream, the flattening of the curve reflects a weak response of wage and price changes due to disequilibrium position in the labour market. According to Blanchard, ‘the most convincing [explanation] is that as the level of inflation has decreased, wages and prices are changed less often, leading to a smaller response of inflation to labour market conditions. Blanchard (2016, p. 32)’. Nevertheless, this explanation involves circular reasoning: low levels of inflation lead to weak responses of disequilibrium in the labour market, but the level of inflation itself should be explained by the history of the imbalances on the labor market.

Figure 1 shows the relation between the change in inflation and unemployment for the US economy, following the suggestion of Stock and Watson (2019) to divide it into three different periods (1960-1983, 1984-1999, 2000-2019).²³

From Figures 1 and 2, we can see that the accelerationist Phillips curve is quite horizontal since the mid-80s²⁴. This result corroborates the evidence that the ‘accelerationist curse’ appears to be over. However, as we saw in section 2, the mainstream macroeconomists do not discard the accelerationist Phillips curve framework to explain inflation dynamics, but amended it in order to fit these empirical findings into the model.

One way to keep accelerationist Phillips Curve alive empirically is to consider that the natural rate of unemployment (or the NAIRU) varies slowly over time. The concept of time-varying NAIRU (Gordon 1997) can be seen as a smooth trend of the current unemployment rate and is economically interpreted as a weak hysteresis on labour market, as we saw in section 2.2.²⁵

²³ Inflation is measured by variation of the ‘consumer price index except food and energy’, unemployment rate is ‘harmonized unemployment rate’, both from OCDE statistical website.

²⁴ We also ran Bai-Perron break test, which showed that the level coefficient changed in 1973 for the US economy, after the first oil crises, while the slope of the curve changed in 1984. It is possible to observe the same pattern of change to Canadian economy while Japanese economy experience the flattening earlier, in 1976, as estimated by Bai-Perron procedure. The Bai-Perron test for the breaks was not performed for European countries because of the lack of data availability for the earlier decades in the OCDE statistical website. Unit root tests reject the null hypothesis of unit root so that Bai-Perron tests are valid. The method is to test breaks in all recursively determined partitions. Standard error and covariance matrix are estimated by Ney West procedure. The breaks are determined in $t+1$: in the first quarter of 1974 and the first quarter of 1985.

²⁵ TV-NAIRU can be estimated as a stochastic filter like the Hodrick-Prescott filter, as in Ball e Mankiw (2002) or a frequency filter as in Staiger, Stock e Watson (1996). A criticism to the idea of estimating the NAIRU with statistical filters, which in the end is a kind of moving average of the actual unemployment rate data, can be found in Palumbo (2013, 2015).

Figure 1 Accelerationist Phillips Curve for US economy – Source: *OECD.Stat data*

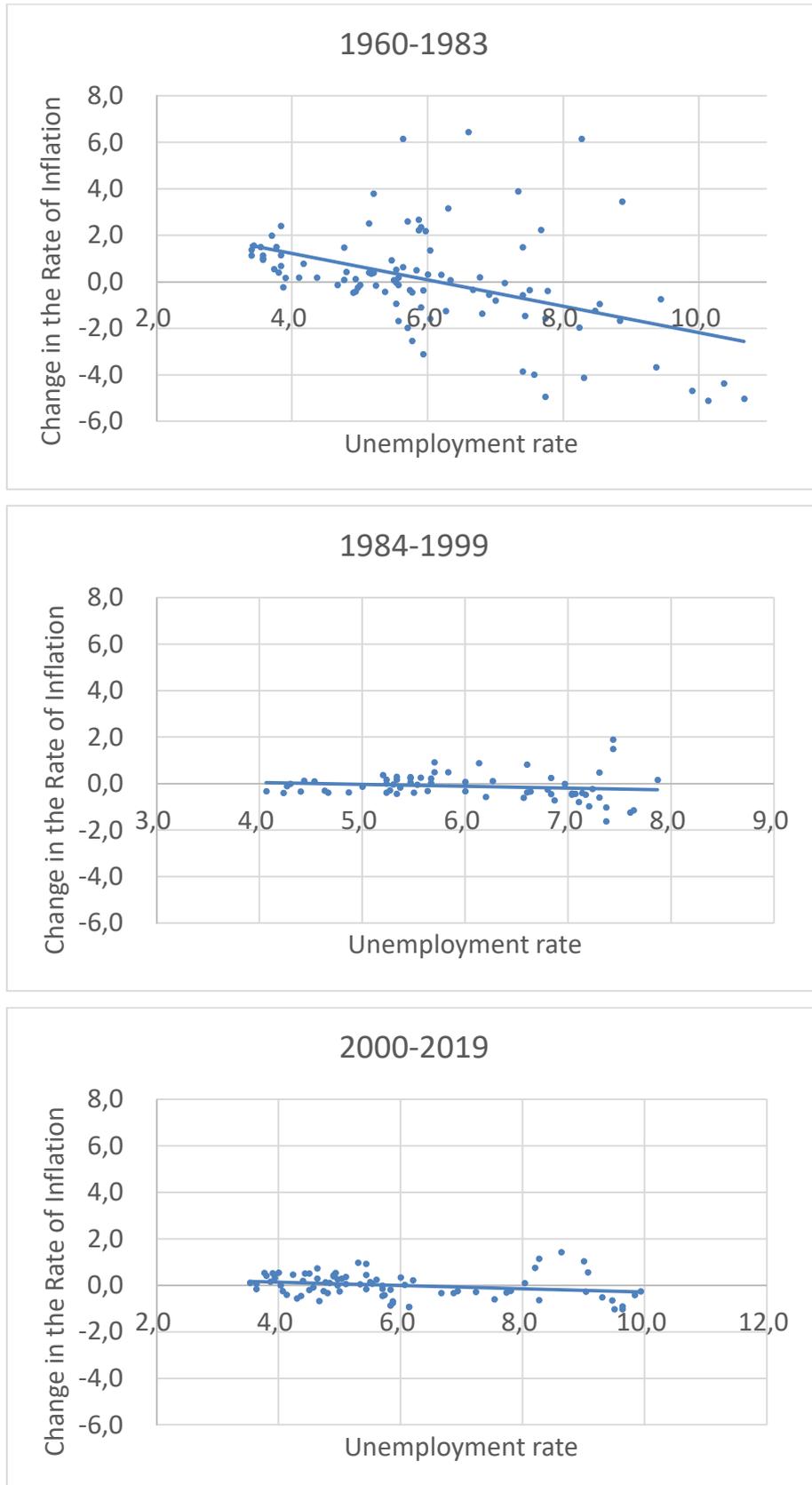
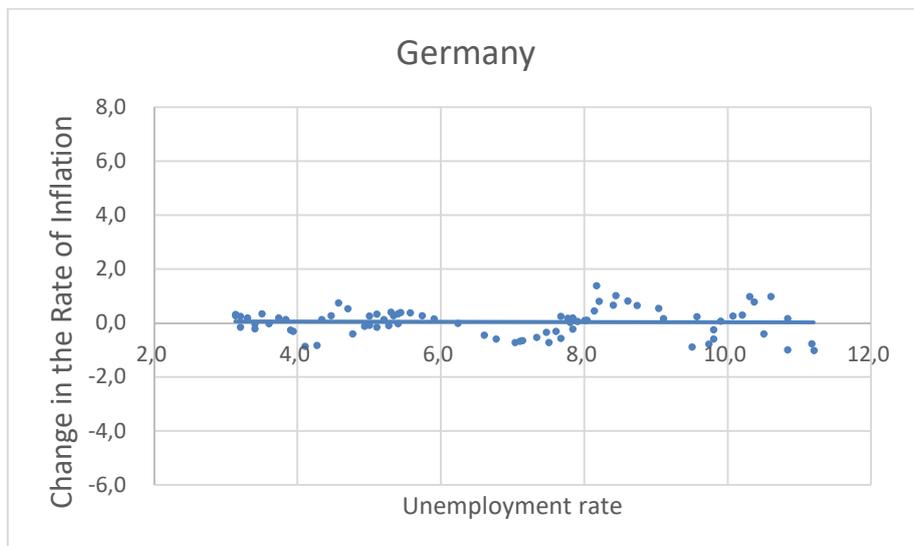
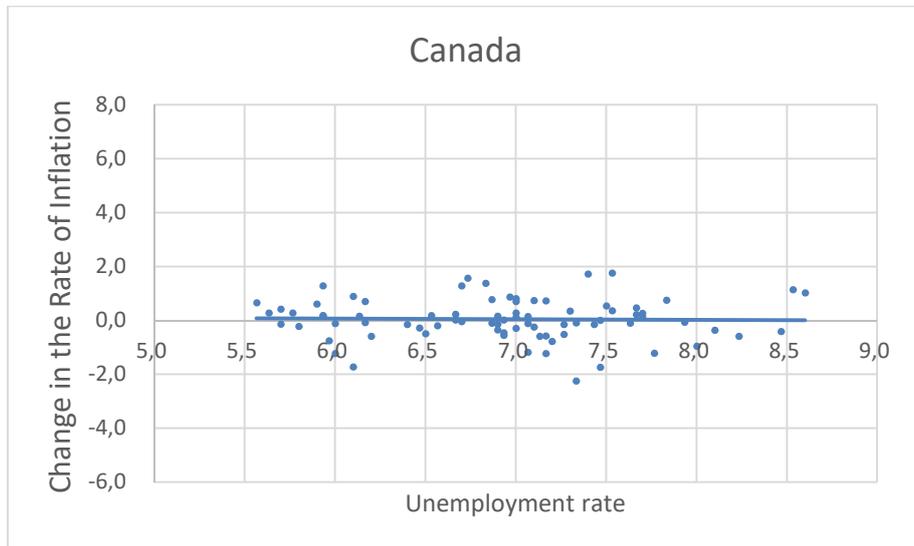
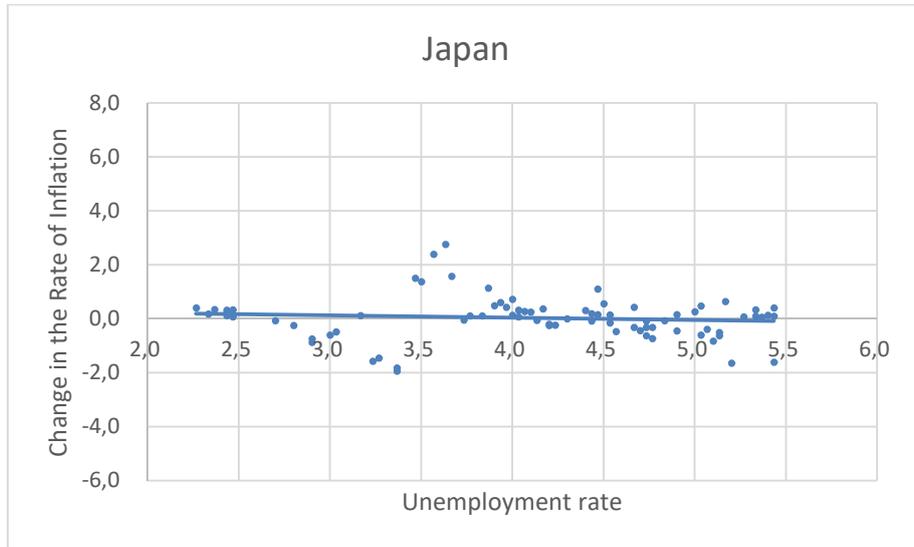
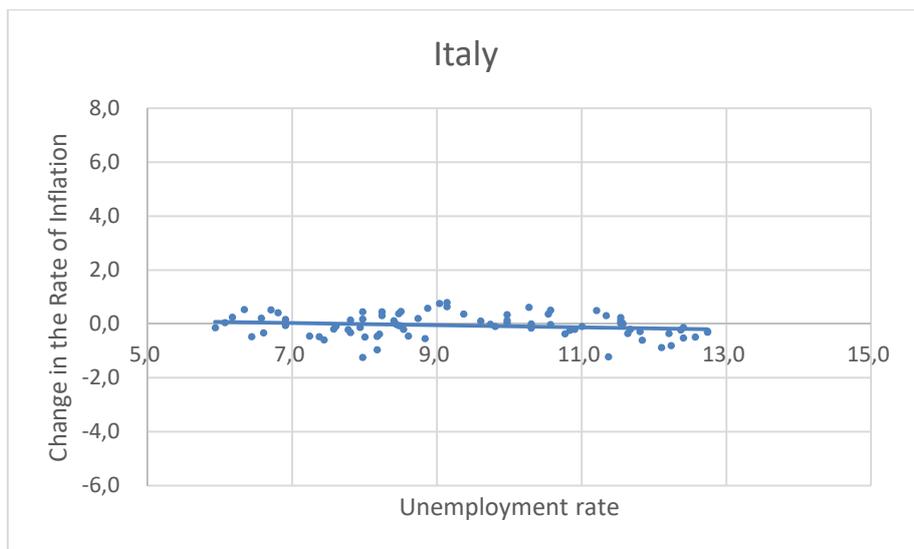
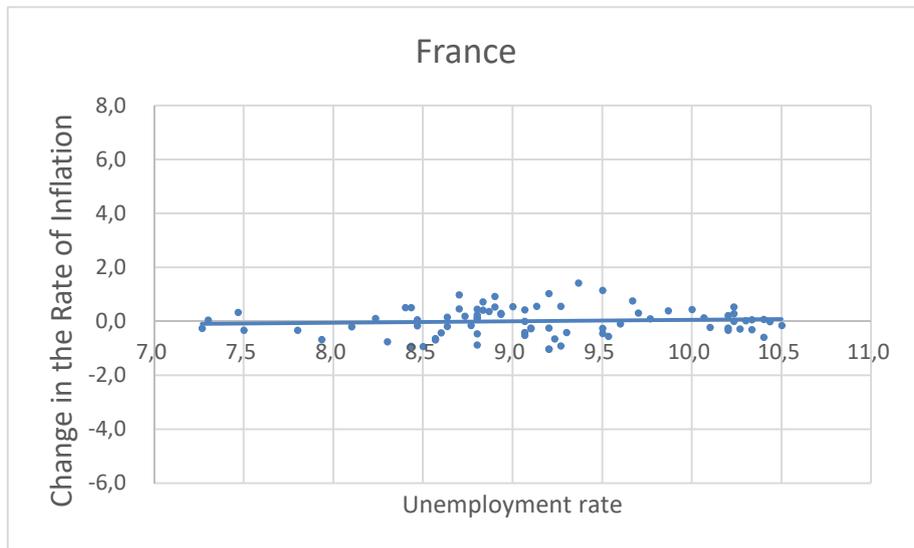
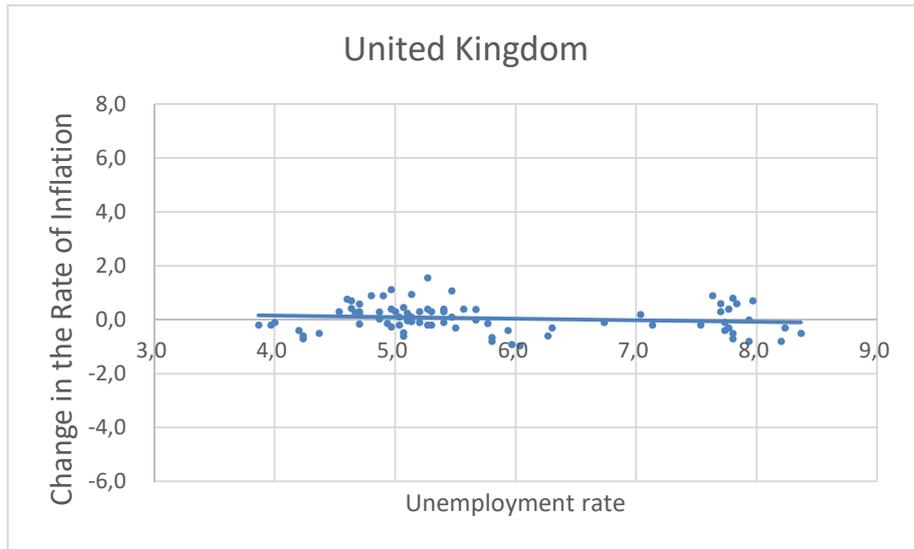


Figure 2 Accelerationist Phillips Curve for Advanced economies (2000-2019)





Source: Authors based on OECD.Stat data.

The hysteresis in NAIRU is the mainstream explanation of the accelerationist Phillips curve puzzle in Europe in the 1980s. This hysteresis can make an empirically observed stable inflation compatible with a potentially unstable accelerationist Phillips curve model. Empirically speaking, the practical effect is to keep the NAIRU closer to the movements of the current unemployment rate, not letting the difference between them become too high, dampening in this way the effect of demand shocks.

Another strategy for keeping the accelerationist Phillips curve alive that ends up dampening the effect of demand shocks on inflation is to change the unemployment indicator to a short-run rate, as discussed in section 2.3 (e.g., Gordon, 2013). Ball and Mazunder (2018 p.116) show that the impact of demand shocks on the change in inflation are smaller if measured by a short run rather than the total unemployment rate. This change in the indicator is somewhat arbitrary since the Phillips curve in its long tradition has always been expressed in terms of the total unemployment rate. Moreover, even this effect is not consensual. Speigner (2014), for example, advocates that long-term unemployment has a significant negative influence on wage inflation.²⁶

Besides introducing a time-varying NAIRU, many authors opt to widen the variety and the impact of supply shocks other than the traditional “food and energy” in the model²⁷. Changes in the trend growth of labor productivity is added in a few articles improving the forecast performance of the model for the US (Gordon, 2013; Ball and Moffit, 2001 and Ball and Mankiw, 2002). In this case, there is always the assumption that the impact is restricted to the short (or medium) run and will eventually be reversed, keeping the assumption of the accelerationist model that long-run inflation is a demand phenomenon.²⁸ The increase in the rate of productivity growth associated with the ‘New Economy’ in the 1990s is also used a partial explanation of low inflation with low unemployment for the US economy. Implicit is the idea that nominal wage growth did not keep pace with the higher growth rate of productivity, and this helped to avoid the acceleration of inflation, as we discussed in section 2.4, despite the unemployment rate being below the NAIRU.²⁹

²⁶Speigner (2014) estimates a non-linear Phillips curve. Notice that for Pollin (2003) long-run unemployment - understood as something more related to structural unemployment and the size of ‘reserve army of labour’ – is more important to wage and price inflation than short-run changes in the unemployment rate.

²⁷ Positive supply shocks (meaning lower prices) were the cause of a low inflation associate with low unemployment in the US economy in the 1990s for Blinder and Yellen (2001). Gordon (1998) add new supply shocks in the accelerationist Phillips curve, such as the price of medical care and computers.

²⁸ Gordon (2013) introduces also a ‘productivity trend acceleration variable’ in his accelerationist Phillips curve. There is a permanent negative shock arising from this productivity index, avoiding a decreasing inflation since 2000. The same model (even with short-term unemployment and TV-NAIRU) estimated without this productivity shock shows a forecasted out-of-sample increasing deflation in Ball and Mazunder (2018).

²⁹ In Ball and Moffit, the value of the NAIRU is calculated also under the assumption of the steady state constant wage share. In this way, the movements of the difference between wage growth and productivity are treated as supply shocks, with temporary effects on inflation and do not change the NAIRU. Ball and Mankiw (2002) consider the idea that this temporary productivity shock not followed by aspirations in the short run can shift temporarily the NAIRU.

While some of the mainstream macroeconomists reinforce the idea of mitigating the effect of demand shocks and introducing supply shocks, others have preferred to include the possibility of a downward rigidity of the nominal wage level and anchored expectations³⁰. The anchored expectations hypothesis became the most common way to explain the missing deflation of the 2000s, implying that the Phillips curve has gone back to the old shape (Gordon (2018), Solow (2018), and Blanchard (2018)). Blanchard et al. (2015) and Blanchard (2016) test the anchored expectations hypothesis by estimating the magnitude of the parameter associated with an average lagged inflation, dynamically using a Kalman Filter procedure. They argue that the coefficient became close to zero in the 2000s because expectations became anchored to credible central bank targets for inflation, instead of being linked to past inflation. However, since the empirical exercise does not use expectations data, it is based merely on the detection of a lower weight of the past inflation being passed on to current inflation. This coefficient is explicitly estimated in Blanchard et al. (2015); for a great part of the countries, the estimated coefficients are smaller than one from 2000-14, which is in line with the old type Phillips curve.

The strategy of estimating the coefficient related to past inflation instead of imposing it as equal to one was disseminated in empirical studies on the Phillips curve in the 1960s and beginning of the 1970s. The coefficient was estimated as smaller than one (Perry 1970). This kind of procedure was abandoned at the beginning of the 70s (Gordon (2011, p.18-19) when the coefficient started being imposed to be equal to one in the estimated accelerationist Phillips reduced form equation.

There are empirical papers, more identified with the conflict augmented Phillips curve view, that also explicitly estimated this coefficient; see, for example, Pollin (2003), Setterfield (2005), Setterfield and Lovejoy (2006) and Braga (2006) for the US economy and Stirati and Meloni (2018) for OECD countries. According to this approach, there is no reason to impose that this coefficient is equal to one. An interesting finding occurs when variables that capture the bargaining power of workers are introduced as explanatory variables— for example, a bargaining index in Setterfield (2005) and Setterfield and Lovejoy (2006). The result is that the estimated coefficient decreases and becomes smaller than one.

According to equation 13 above, the bargaining power of the workers would change both the parameters α , c_0 and ψ . This would help to explain why the conflict-augmented Phillips behaved more similar to the accelerationist curve in the 60s and 70s but became flatter and more similar to the old type Phillips curve since the mid-1980s, as a result of the decline of the workers' bargaining power due to different political, social and institutional factors.³¹

³⁰ The empirical problem with the idea of nominal wage rigidity to explain US missing deflation is related to the difficulty in reconciling it with the fact of a stable and low but positive inflation in the US economy after the 2008 crisis. If nominal wage growth would be equal to zero due to nominal rigidity, a (stable) positive productivity growth would generate a (stable) deflation. And as noticed by Hall (2013), wage inflation was also positive in the US since the crisis.

³¹For an interpretation more identified with the conflict augmented Phillips curve about the wage explosion and the rising inflation due to strengthened workers' relative bargaining power and other cost-push

This relation between workers' bargaining power, institutions, and wage and price inflation, is also recognized by important policymakers and policy-oriented mainstream macroeconomists. Nelson (2005) shows that many of them used to believe that inflation in the 1970s was due to distributive conflicts and cost-push factors, such as the oil shock. In the US at the beginning of the 1980s, Volcker and Greenspan agree that the defeating of unions' power was very important to control trend inflation.³² The lower degree of worker bargaining power was recognized as being important to prevent (wage and price) inflation pressures with low unemployment rates in the 1990s by Yellen and Greenspan, the latter having classified workers as 'traumatized' (FOMC, 1996). Finally, even Phelps (2017), one of the fathers of the accelerationist curve, seems to have adopted the traumatized workers' argument to explain why inflation is not accelerating as a result of low unemployment in the US economy after 2017. And a similar explanation can be found in Summers (2017) about the effect of weak unions in explaining the recent low growth of nominal wage even with low unemployment rates.

5. Final remarks

In this paper, we compared two routes back to the old Phillips curve, as the empirical evidence points to the end of the "accelerationist curse". The first is the neoclassical route. We argued that this route is quite tortuous since its assumptions concerning the behavior of the labour market yields and unstable Phillips curve where the empirics are difficult to fit within the model. Amendments are needed to stabilize as well as to make it compatible with the relation between the level of inflation and the rate of unemployment like the old Phillips curve. The other route is represented by a conflict-augmented Phillips curve, which has the advantage of not being constrained by either of the two crucial neoclassical assumptions on labor scarcity and full incorporation of inflation expectations to wage increases. We saw that the problem of the second assumption is that it leads to the accelerationist behavior. Empirically, the procedures of the amendments are, while maintaining the two crucial premises: 1) to introduce some temporary supply shocks (such as productivity shocks); 2) to mitigate the inflationary effects of demand shocks in the short run by adding partial hysteresis effects in the NAIRU or other procedures to reduce the size and duration of unemployment gaps. These procedures produce an empirically observed stable inflation rate compatible with a potentially unstable accelerationist model in a long run. Another more recent way to fit the stable data in a potentially unstable equation is imposing inflationary expectations that are either exogenous or constant for some time.

pressures see Cavalieri, Garegnani and Lucii (2008) and Kaldor (1976). See also Glyn 2006 for the historical facts of this change in behavior of the variables which can affect the bargaining power of workers such as the rate of unionization, minimum wage and income policies, immigration, labour market deregulation All of these variables contributed to increase bargaining power of workers in the 60s and 70s and were reverted after the 80s.

³² For Volcker (Glyn 2006) and Greenspan (FOMC 1996), defeating the air traffic controllers' strike had very important anti-inflation consequences by suppressing the power of unions.

Our conflict-augmented Phillips curve can be differentiated from other conflict-claims models that adopt the concept of a heterodox NAIRU, since those drop only the first assumption, while ours eliminates both. In our view, labour is not usually scarce, and the bargaining position of workers does not often allow for expected inflation to be fully incorporated into nominal wages.

We argue that the conflict-augmented Phillips curve can better explain the findings of the empirical literature, as it is compatible with both the old Phillips curve and the accelerationist view, depending upon the relative strength of the bargaining power of workers. This model incorporates the idea of ‘autonomous claims’, that can be addressed to political, institutional, and social aspects such as minimum wage policy, the power of trade unions and labour protection legislation in addition to its influence on changes in the nominal wage.

In the framework of the conflict-augmented Phillips curve, the empirical findings of the literature of a structural break in the 1980s are due to the declining bargaining power of the “traumatized workers” in advanced economies since then. Although conflict over distribution has been more intense in some historical moments and institutional configurations while has been inflation relatively unstable (as in the late 1960s and the 1970s), the conflict-augmented Phillips curve has been alive and well all along since Phillips.

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