

Price Stability versus Full Employment: The Phillips Curve Dilemma Reconsidered

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15. Mai 2016



Kumulative Dissertation zur Erlangung
des akademischen Grades Dr. oec.

Eingereicht an der Fakultät
Wirtschafts- und Sozialwissenschaften
der Universität Hohenheim
am 4. Dezember 2015

Institut für Volkswirtschaftslehre (520H)

Datum der mündlichen Promotionsleistung (Kolloquium): 23. März 2016

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To Amrei

Acknowledgements

Although each paper included in this thesis features a separate acknowledgements section, many people and organisations helped me in different ways during the whole research process. I would like to take the opportunity and express my gratitude to all those who contributed to this thesis.

First and foremost my wife supported me throughout all the years for which I am deeply grateful.

The supervisor of my thesis, Harald Hagemann, provided excellent advice and guidance in any stage of this dissertation. He also put me in contact with Robert Solow, who commented on the Samuelson-Solow paper included in this thesis. Harald Hagemann also introduced me to David Laidler, who always had most valuable remarks and who shared many contemporary experiences with me which cannot be found anywhere else. David Laidler also put me in contact with Richard Lipsey, Edward Nelson and Grant Reuber. Edward Nelson commented on the paper on Friedman's view about the "cruel dilemma". His comments very much improved this paper. Grant Reuber kindly invited me to visit him during my stay in Toronto and to discuss my paper on his Phillips curve contributions with him. The discussion was followed up by exchanging letters and emails. This paper also profited enormously from comments by Ronald Bodkin and William Scarth. Within this "Canadian connection", particularly Richard Lipsey stands out. In effect, there is not one paper which did not profit from the extensive conversations we had during my stay in Vancouver and from the many email exchanges throughout the years. Indeed, Richard Lipsey might be regarded as the hidden third supervisor of this thesis and I am deeply grateful for his help and comments regarding nearly any paper of mine.

Hans-Michael Trautwein kindly took over the job of the second supervisor from Heinz-Peter Spahn. This switch became necessary for administrative reasons and I am very grateful that both potential supervisors made a smooth transition possible. Furthermore, they provided a most helpful exchange of ideas throughout the years either at conferences and seminars or during personal conversations.

Since a full list of those who contributed to this dissertation in one way or another would require a paper on its own, I would like to restrict myself to expressing my gratitude towards those who contributed a lot to my scientific and also personal progress: Kevin Hoover extended my knowledge about macroeconomics in general and about writing papers in particular in many discussions. Jean-Sébastien Lenfant encouraged me to submit my essays to journals while also providing very helpful advice on how to write good papers and to promote my ideas. The same is true for José Luís Cardoso, Steven Medema, and Perry Mehrling. Richard Arena, Muriel Dal Pont Legrand, Heinz Kurz and Hagen Krämer always had important things to say, be it at conferences or during personal conversations. Manfred Neumann provided very helpful comments on a paper on the German translation of Friedman's Presidential Address. Sylvie Rivot invited me to present my research in Strasbourg for which I am grateful. James

Forder commented on my paper about Friedman and the “cruel dilemma”. Not only these comments but also his contributions to the Phillips curve debate proved to be enormously helpful for my own research. John Black sent me most valuable comments on the paper about the goal of economic growth within the Phillips curve discussion. Robert Lucas and David B. Gordon shared important personal knowledge and background information regarding the “cruel dilemma” with me, for which I am very grateful.

Throughout the years my colleagues provided very helpful discussions (and digressions!) as well as support when it was needed the most. I would like to thank Daniel Aichinger, Julian Christ, Christine Clement, Constanze Dobler, Patricia Hofmann, Felix Geiger, Vadim Kufenko, Arash Molavi Vasséi, Ralf Rukwid, Oliver Sauter, Lukas Scheffknecht, Benjamin Schmidt, Sandra Specht, Christian Philipp Schröder, and Oliver Zwiessler for sharing all those years with me. This dissertation and my published as well as unpublished articles profited enormously from the support of my colleague Niels Geiger, who went above and beyond the call of duty in any possible respect. Furthermore, our long and fruitful discussions helped me enormously to sort out many issues and to straighten my ideas.

Many organisations provided very helpful support throughout the years. The Ph.D. scholarship by the Evangelisches Studienwerk Villigst made it possible to focus on the thesis and to attend international conferences. Rudi Häussler, through his Förderpreis, enabled me to discuss my research with Grant Reuber and Richard Lipsey in Canada. The European Society for the History of Economic Thought, the History of Economics Society, and the Keynes-Gesellschaft all provided the possibility to present my research on an international stage and in front of a diverse audience.

Last but not least, the publishers and copyright holders of the journal articles and of the diagrams included in this thesis kindly granted permission to include this copyright-protected material in my essays as well as in this thesis free of charge (see the Chapter “Copyright and Permissions” at the end of this thesis) for which I am very grateful.

Even though so many people and organisations contributed to this project, I alone, of course, am solely responsible for all views expressed and for all remaining errors in this thesis.

Stuttgart, May 2016

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Science is possible only because at any one time there is a body of conventions or views or ideas that are taken for granted and on which scientists build. If each individual writer were to go back and question all the premises that underlie what he is doing, nobody would ever get anywhere.

Milton Friedman (1975: 17f.)

Preface

This dissertation focuses on selected issues of the Phillips curve debate. Thus, it is part of “one of the great public works enterprises of all time” since Phillips’ article “has provided more employment than any project since the construction of the Erie Canal” (Solow 1979: 36). Indeed, the accumulated literature on the Phillips curve is enormous (JSTOR’s *Data for Research* database lists over 6700 entries related to the term “Phillips curve”), which not only shows that this topic kept (and still keeps) economists—including myself—busy, but which also reinforces Paul Samuelson’s view (in Burns and Samuelson 1967: 54) that the Phillips curve “is one of the most important concepts of our times” (a point of view very recently shared by Snower 2015: 110).

Hence, even though so much has been written on this topic by much more sophisticated economists than myself, the important role of the Phillips curve in nearly any macroeconomic model and the ongoing debates, be it about theoretical or policy-related issues, prove that the Phillips curve is still a worthwhile topic for research. This is not only true for “modern” approaches, but also with respect to the history of economic thought as recent research by Forder (2014) on the Phillips curve “myth” shows.

At the beginning of this dissertation it was not my intention to focus in particular on the history of economic thought regarding the Phillips curve discussion. Rather, the New Keynesian model and related approaches caught my attention at first. However, since I prefer to have a founded knowledge about the things I am writing on, I considered it mandatory to have a look at the original Phillips curve article. What I read in this and in related papers, however, was not what I had expected. Indeed, most of it seemed to stand in contrast to my basic textbook knowledge, which proclaimed the naive long-run Phillips curve trade-off since the late 1950s and the salvation from this myopic view at the end of the 1960s and the beginning of the 1970s.

Thus, I felt that a detailed analysis of this discussion seemed necessary before any modern approach could be discussed. Acquiring this knowledge, for different and most of the time personal reasons, took much longer than expected, so that this dissertation focuses particularly on the developments in the 1960s and not, as intended at the very beginning of my research, on recent approaches. In this respect, Friedman’s introductory statement—which by the way is part of Friedman’s discussion of Phillips’ view about his curve—that “nobody would ever get anywhere” if indeed everyone “were to go back and question all the premises that underlie what he is doing” is quite correct. On the other hand, the results of my research show that an advancement of knowledge is also possible by challenging the “body of conventions or views or ideas that are taken for granted”. Indeed, a thorough discussion of different lines of thought is not just of theoretical, but particularly of practical interest since—as Solow (1978: 203) remarked about the conference at which Lucas and Sargent (1978) presented their devastating criticism of the Phillips curve—even though “the battles that are fought [...] appear to be fought with antique pop guns, the bullets are real and they may soon be fired at you by the Federal Reserve.”

General Outline

The general structure of this dissertation, of which the main part consists of three already published articles, is as follows: After some organisational remarks and notes in this Preface, an introduction to the included journal articles on the Phillips curve will follow in Chapter 1. The respective articles are reproduced in the Chapters 2, 3, and 4. A discussion of these articles and of important results of other essays of mine not included in this dissertation will take place in Chapter 5. Finally, Chapter 6 concludes.

Article Overview

The following three articles and their contents are reproduced in this Ph.D. thesis with kind permissions from the respective copyright holders, that is, with permission from each journal's publisher as well as with permissions from the copyright holders of included third-party material (for example, diagrams). For more information regarding these permissions see the Chapter "Copyright and Permissions". All three essays were published in peer-reviewed journals:

A.W. Phillips and His Curve: Stabilisation Policies, Inflation Expectations and the "Menu of Choice" This article was published in 2012 in *The European Journal of the History of Economic Thought* 19(6), 976–1003. It is reproduced in Chapter 2.

Samuelson and Solow on the Phillips Curve and the "Menu of Choice": A Retrospective This paper was published in 2013 in *Economia* 3(3), 359–389. It is reproduced in Chapter 3.

Growth as an Objective of Economic Policy in the Early 1960s: The Role of Aggregate Demand This essay was published in 2014 in *Cahiers d'économie politique / Papers in Political Economy* 2(67), 175–206. It is reproduced in Chapter 4.

The following papers are not yet published but were also written during my research on the Phillips curve. Since these papers are not included in this Ph.D. thesis, a short summary will be provided for each essay. However, because these papers extend and strengthen the arguments presented in the three already published articles, the results of these yet unpublished essays will also be part of the discussion in Chapter 5.¹

¹More information regarding these papers is available upon request. Please write to schwarzer.econ@gmail.com.

The Cost of Inflation vs. the Cost of Unemployment: A Review of the Pioneering Contribution of Grant L. Reuber This essay was presented at the 2012 History of Economics Society Annual Conference at Brock University, St. Catharines, Ontario, Canada. It will be cited as Schwarzer (2015a).

This paper analyses the contributions by Reuber (1962, 1964), which focus on contemporary monetary policy issues in Canada. The 1962 study can be regarded as the first calculation of an optimal point on the Phillips curve by taking into account the gains of reduced unemployment and the economic costs of higher inflation. It is shown that Reuber's proposal to accept some inflation in order to reduce the rate of unemployment was based on the assumption of prevailing involuntary unemployment. Making use of the Phillips curve trade-off was endorsed, even though Reuber was well aware of the theoretical importance of inflation expectations and of the possibility of endogenous changes regarding the behaviour of economic subjects. However, empirical evidence seemed to show very convincingly that the trade-off had remained stable under different conditions of aggregate demand pressure in the past. Furthermore, due to endogenous increases in productivity, removing involuntary unemployment did not go hand in hand with a lower level of real wages, but instead was accompanied by an increase in the real wage. Therefore, particularly wage earners profited from making use of the trade-off by removing involuntary unemployment at the cost of a higher rate of inflation. Hence, even though Reuber's essay seems to be an inflationist proposal at first sight and thus fits very well into the usual textbook trade-off story, it is argued in this paper that Reuber's study was actually quite sophisticated, that it took into account many elements of later developments such as the role of inflation expectations or to a certain extent even the Lucas critique, and that the underlying assumptions (particularly involuntary unemployment) were very different from later trade-off models since Friedman's Presidential Address (Friedman 1968).

The Non-Inflationary Rate of Unemployment (NIRU): The Revival of the Long-Run Trade-Off and of Active Stabilisation Policies in the 1970s This paper was presented at the 2012 PROCOPE-Symposium "Business Cycles and Growth" at the University of Hohenheim and at the 2013 Séminaire Cournot of the Bureau d'Economie Théorique et Appliquée (BETA) in Strasbourg. It will be cited in this thesis as Schwarzer (2015b).

This essay discusses the concept of the "Non-Inflationary Rate of Unemployment" (NIRU) of Modigliani and Papademos (1975, 1976, 1978), which emerged out of the contemporary issue of stagflation due to oil price shocks and which is to be regarded as a forerunner of the better known "Non-Accelerating Inflation Rate of Unemployment" (NAIRU). The NIRU concept criticised the (monetarist) policy implications of Friedman's "natural rate of unemployment", which not only denied a trade-off between inflation and unemployment in the long run, but also opposed the idea of fine-tuning and that of active economic policy. The NIRU framework in contrast emphasised the important role of active stabilisation policies to minimise the loss of society in the case of supply side shocks. However, whereas the long-run Phillips curve is vertical at the "natural rate of unemployment", the NIRU framework essentially incorporates a negatively sloped long-run Phillips curve at least for unemployment rates higher than the NIRU. Thus, two important elements of the discussion in the 1960s, that is, active demand

management and a long-run trade-off between inflation and unemployment, were revived in the NIRU framework.

Phelps 1967 vs. Phelps 1968: The Phillips-Curve Discussion at its Turning Point This paper was presented at the 2015 Ph.D. Seminar of the Keynes-Gesellschaft in Graz at the Karl-Franzens-Universität, at the 2015 Annual Conference of the European Society for the History of Economic Thought at Roma Tre University, and at the 18th Summer School on History of Economic Thought, Economic Philosophy and Economic History at the University of Hohenheim. It will be cited in this thesis as Schwarzer (2015c).

Two important contributions of Phelps at the end of the 1960s are compared with each other in this paper. It is shown that Phelps' 1967 article is very different to the 1968a one with respect to the causality underlying the Phillips curve and the policymaker's motive to make use of the trade-off: While the 1967 contribution essentially interprets the Phillips curve as an equilibrium relation in the sense that both workers and firms remain on their labour-supply and labour-demand curves all the time, even though this equilibrium is unstable due to fully adjusting inflation expectations, the 1968 paper interprets the Phillips curve in the same way as Phillips (1958b) and Lipsey (1960) did, that is, as a disequilibrium relation, so that at least one party on the labour market is off their supply or demand curves. The motive to exploit the temporary trade-off in the 1967 paper is based on the assumption of involuntary unemployment in some sectors of the economy due to separated labour markets and an unequal distribution of demand among them. This approach thus incorporates elements of the original Phillips curve discussion, particularly to be found in Schultze (1959) and Lipsey (1960). In the 1968 contribution, unemployment is modelled as search unemployment. Nonetheless, due to the possibility of downwardly sticky wages, involuntary unemployment can also be prevalent even though the economy is in macroequilibrium. Because of Phelps' focus on involuntary unemployment in both contributions, his account of the Phillips curve trade-off is much closer to the "dilemma view" of the early 1960s than to Friedman's approach. For this reason and due to Phelps' preference for active economic policy, it is argued in this paper that Phelps' contributions to the Phillips curve discussion are, contrary to those of Friedman, not a critique of the trade-off, but a refinement thereof. This is also apparent since Phelps emphasised the possibility of an endogenous "natural rate of unemployment", for example, due to hysteresis.

Price Stability vs. Full Employment: Friedman and the "Cruel Dilemma" This essay was presented at the 2014 Ph.D. Seminar of the Keynes-Gesellschaft in Darmstadt and at the 2014 Summer School on History of Economic Thought, Economic Philosophy and Economic History at the University of Zaragoza. It will be cited in this dissertation as Schwarzer (2015d).

This essay extends the argument already sketched in the paper on Samuelson and Solow (see Section 3.4) that Friedman argued within a different framework of the inflationary process. The paper thus reviews the cost-push demand-pull inflation debate and highlights the role of the Phillips curve as a quantitative assessment of the inflationary process. The Phillips curve for most economists seemed to show that the policy goals of full employment and price stability are conflicting policy objectives, so that the choice between the two objectives necessarily

resembled a “cruel dilemma”. Particularly strong unions seemed to be responsible for this conflict by demanding wage increases higher than productivity growth as soon as employment came anywhere near to the full employment level. In contrast to this dilemma view, especially Friedman argued that unions cannot be responsible for inflation, since the rate of inflation is ultimately determined by monetary policy. Therefore, it is argued in the paper, there is no inherent conflict between price stability and full employment in Friedman’s account of the Phillips curve. The only mechanism for trading off inflation for unemployment hence can be due to surprise inflation. However, his characterisation of the “natural rate of unemployment” indeed includes cost-push forces such as the aggressiveness of unions, so that Friedman essentially defined away the beforehand lively debated incompatibility between both policy goals. Friedman’s arguments thus were met with much scepticism and criticism, since his view was perceived as falling back into a framework of the inflationary process based on an L-shaped supply curve. It is then shown that Friedman’s critique of the Phillips curve trade-off essentially rested on two elements: on assuming a different inflationary process *and* on emphasising the role of inflation expectations. However, his Presidential Address and his Nobel Lecture focus only on the latter, but not on the former. In this sense, it is argued in this essay, Friedman silently abandoned the dilemma view and thus reinterpreted the negatively sloped Phillips curve as a relation which will only show up due to surprise inflation. The issue of an unavoidable inflationary bias at full employment thus disappeared and the original trade-off between inflation and *underemployment* became to be subsequently understood as a relation to push the economy beyond full employment by surprise inflation. Thus, the Phillips curve trade-off after Friedman’s critique has not much in common with the previous dilemma interpretation any more.

The following notable working paper is still subject to change, but nevertheless marks an important milestone on the way to this dissertation:

Optimising Agents and Deliberation Costs: The Case of Inflation Expectations This paper was written in joint collaboration with my colleague Niels Geiger and was presented at the 2011 Graz Schumpeter Summer School at the Graz Schumpeter Centre.

It is argued in this essay that modern macroeconomic models building upon Calvo pricing could be improved by taking into account that processing information comes at a cost: the cost of thinking, or, more abstract, the costs of the whole decision process (deliberation costs). Hence, instead of imposing an external restriction onto economic agents which cannot be changed no matter how high the costs of such a restriction (for example, an unchanged Calvo “lottery” even though there is hyperinflation), it is argued that taking deliberation costs into account allows for a more realistic restriction in the sense that agents can decide by themselves and based on their own optimality considerations when to update or make use of new information. By focusing on inflation expectations, the approach is in principle close to the ideas of learning (Evans and Honkapohja 2001), rational inattention (Sims 1998, 2003, 2006; Reis 2006a, b), sticky information (Mankiw and Reis 2002), or near-rational wage and price setting (Akerlof and Yellen 1985; Akerlof et al. 1996, 2000). For example, in the case of a credible

inflation target of the central bank, adaptive inflation expectations or even static expectations (expecting the central bank's inflation target) can be considered to be optimal on a cost-benefit approach.

Supplementary Notes

In order to make the appearance of this dissertation and of the included articles as uniform as possible without completely changing the original style of each article, the following modifications have been made:

- Abstracts and acknowledgements have been made uniform in appearance throughout all articles.
- Headings and captions were adjusted, missing headings (for example, "Introduction" in Chapter 3) were added.
- The numbering of sections and figures now includes the chapter number, however, with the same subsequent numbering of each section and figure as in the original article.
- Information with respect to the permission to reproduce copyright-protected material has been updated.
- Footnotes have the same numbering as in the original articles. Where necessary, the footnote counter has been adjusted accordingly (for example, in Chapter 4).
- Some minor typographical errors as well as some minor errors with respect to typesetting (for example, missing italics in the references) have been corrected.

No other changes have been made to the articles, particularly no changes have been made with respect to the content of the already published articles included in this thesis.

Because some time has passed since these articles were published and as each article necessarily reflects the scientific progress at that point in time, my knowledge and views about some details have changed (and new results by other researchers have become available). Since I regard such an evolution of ideas as the natural way of how a Ph.D. thesis develops, these details will not be debated separately but will be part of the discussion in Chapter 5. However, serious content-related errors and inaccuracies which came to my mind after the articles had been published are outlined in the following Section "Errata".

Errata

The following errors or inaccuracies have been found after the publication of the articles:

- In Chapter 2 on page 39 in Footnote 2 the term "potential output" is used, which is appropriate given Phillips' assumption of the target of a stable price level. However, Phillips did not use this term as the reference value in order to calculate the "error in

production”. Rather, it is “[t]he difference between the actual production and desired production at any time [which] will be called the error in production” (Phillips 1954: 293). Since “desired production”, as is discussed in this chapter, can be but need not be that level of production at which prices are stable, the term “potential output” is too narrow to describe Phillips’ definition of the “error in production”.

- In Chapter 2 on page 50 Samuelson and Solow (1960) are presented as having introduced the term “Phillips curve”. This is not correct, since it was most likely Routh (1959: 304) who made use of this term for the first time.
- In Chapter 4 on page 95 it is stated that “the real rate of interest might be lowered if the nominal rate does not adjust fully to the higher rate of inflation, so that the marginal efficiency of capital rises and therefore induces further investment”. This statement is not fully correct, since there is no change of the marginal efficiency of capital as such if the real rate of interest changes. Rather, the lower real rate of interest at a given marginal efficiency of capital will induce additional investment as long as investment as such is interest-rate elastic. Hence, it is a movement on a given investment schedule being negatively dependent on the real rate of interest, but no shift of such a curve. This error was probably introduced while rearranging some formulations, since in the next sentence expressions such as “optimistic atmosphere” and “general spirit of optimism” are mentioned, which indeed point at a higher expected rate of return on investment for a given real rate of interest.
- In Chapter 4 on page 100 the term “aggregate supply curve” is used although actually a relation close to the Phillips curve is discussed. This is due to the fact that Black (1959: 147) made use of the term “aggregate supply curve or function” since he “is unable to think of any other name which suggests its actual function adequately” even though Black (1959: 147) was fully aware that there is an important difference between an aggregate supply curve and the concept which became known as the Phillips curve (on the difference see Subsection 1.3.2 and Section 2.6). Black (1959: 147) thus correctly noted that an aggregate supply curve shows “the quantity of the supply of goods which will be forthcoming at any given price, or alternatively the price which will be needed to induce producers to supply any given quantity”, while the curve used in his analysis is closer to a Phillips curve since it “indicates rather the behaviour of prices over time which will result from any given level of employment.”
- The caption of Figure 4.1 in Chapter 4 on page 101 should rather be “The Trade-Off Between Price Stability, Employment, and Growth” than “The Trade-Off Between Inflation, Employment, and Growth” in order to better represent the different goals of economic policy.
- In Chapter 4 on page 99 and on page 103 it is stated that the rate of growth in the neoclassical growth model in the long run solely depends on population growth and technical progress. This emphasis on the neoclassical model should not imply that this implication is not to be found within “Keynesian” growth models.

A Note on the Term “Keynesian”

Throughout this dissertation the term “Keynesian” will catch the reader’s eye and might raise the question why this term was used even though there might be no clear connection to John Maynard Keynes himself, or even worse, a possible misinterpretation of Keynes’ contributions. The reason to use this term is quite straightforward: Many contemporary opinions and concepts discussed in this dissertation, particularly also the non-vertical long-run Phillips curve, were labelled “Keynesian”—or even ascribed to Keynes himself—by proponents as well as by opponents of respective ideas (see, for example, Tobin 1967: 103f. and Friedman 1975: 16f., who both refer to the role of “Keynesian” money illusion for the negative slope of the long-run Phillips curve).

Since I do recognise that such labelling is problematic, the term thus is usually used within quotation marks. Indeed, also in the 1960s and 1970s this term was perceived by some economists as being very questionable. Smithies (1961: 546, n. 8), for example, stated that “I wish I could save words and simply say the analysis [...] is ‘Keynesian.’ Unfortunately that term has acquired so many political overtones that its scientific usefulness has been seriously impaired.” Nevertheless, even though the term is and was blurred, it was an essential term at times of the Phillips curve discussion. Indeed, Lucas and Sargent (1978) used the label “Keynesian”—“a flag a lot of people salute” (Lucas in Snowden and Vane 1999b: 155)—explicitly to address the issues related to the idea of a stable non-vertical long-run Phillips curve.

Of course, making use of an alternative term to describe and summarise this general line of thought, for example, “economists of the Neoclassical Synthesis”, might have been better suited on some occasions, in the same sense as the term “New Neoclassical Synthesis” (Goodfriend and King 1997; Goodfriend 2004) might be preferred to the term “New Keynesian Economics” for current mainstream models featuring a “New Keynesian Phillips Curve” (Roberts 1995: 979).² However, the term “Keynesian” would have still been present in the contemporary contributions and thus in quotes included in this thesis, so that this disclaimer would have been necessary anyway. Furthermore, the term “Keynesian” most of the time probably serves better in order to draw a line between the two rivalling lines of thought which are discussed in this dissertation, that is, the long-run Phillips curve trade-off proponents and their “monetarist” opponents, particularly Milton Friedman. Moreover, important economists of this Phillips curve debate such as Paul Samuelson and Robert Solow are also labelled as “Keynesians” in other

²As is well known, the term “Keynesian” in New Keynesian economics is used since nominal rigidities are assumed, which is close to the preliminary assumption of a fixed nominal wage in Chapter 2 of Keynes’ *General Theory*, even though this assumption is replaced by flexible wages in Chapter 19. See, for example, Woodford (2003: 218) for making reference to Keynes’ emphasis on sticky wages. However, as Meccheri (2007: 713ff.) points out, the assumption of flexible wages and prices would restore full employment at the same “natural rate of unemployment” in standard New Keynesian models (see critically Trautwein and Zouache 2009), while Keynes argued that even flexible wages do not guarantee that the economy will achieve full employment by its own devices (see Spahn 2009: 182; see also Boianovsky and Trautwein 2003: 428 for reference to the influence of Wicksell’s “cumulative process” on Keynes; see furthermore Patinkin 1948 and Leijonhufvud 1968: 49ff.). Phillips (1958a: 385f.) saw his approach to macro-dynamics within this “Keynesian” tradition of inherently unstable market economies—indeed, Leijonhufvud (1968: 396f.) noted that “I feel that this was the direction in which Keynes’ work pointed.”

more recent contributions on the history of economic thought (see, for example, Young et al. 2004: 114), so that it seems to be a problematic, albeit common, term.

Furthermore and in general, this dissertation does neither aim at disentangling “Keynesian” concepts from Keynes’ contributions, nor does it aim at a discussion of whether or not proponents or critics of the long-run Phillips curve trade-off rightly or wrongly and implicitly or explicitly also accused Keynes himself of endorsing such a trade-off view or other doubtful “Keynesian” concepts. Such an approach is part of the discussion in Rivot (2013: 10ff.), which turned out to be very difficult, if not problematic (see Colander 2014: 520), due to the fact that Keynes and critics of the long-run Phillips curve such as Friedman lived and wrote at different times and thus faced different economic circumstances. Of course, this difficulty in itself is no reason to dodge the issue, and indeed, where appropriate, some critical remarks are included in this dissertation and in the research articles. But a deeper investigation of this controversial subject would not have been possible within the narrow word count limit and within the specific research questions of each article. Hence, in order to take full account of such issues, nothing less than a completely different dissertation would have been appropriate. However, since I do not claim to be an expert on Keynes, I follow Samuelson (1958: 340) who emphasises that “[p]art of learning a subject is learning when to reserve judgment.” Hence, I will only point at some important details with respect to the Phillips curve discussion and particularly what most likely should not be ascribed to Keynes, but without the claim of being complete or taking full account of the issue:

Keynes’ view of the inflationary process was lively debated by contemporary economists (see, for example, Boianovsky 2005) and it hence would not have been possible to fully review this discussion. Furthermore, many economists already discussed Keynes’ view of the inflationary process (see, for example, Leeson 1999), also in comparison with Friedman’s view (see, for example, Davidson 1972: 867ff.), or with respect to Keynes’ preferences regarding inflation and unemployment (see, for example, O’Connell 2016). In a nutshell, many contributions emphasise that “Keynes was not an inflationist” (Skidelsky 2009: xviii). Harcourt (2000: 305f.) hence points out that the common Phillips curve trade-off has nothing to do with Keynes’ work in general, even though, as already noted, the Phillips curve, Keynesianism, and Keynes are often regarded to be connected (see, for example, Friedman 1997: 3f.). In the same vein, Solow (1976: 5) remarked about the Phillips curve that “there is little that is specifically Keynesian about it, either historically or analytically.” According to Harcourt (2000: 305f.), Keynes’ view of the relationship between wages, inflation, and unemployment was far more complex and depended on the specific economic circumstances.

In the *General Theory* Keynes (1936: 10) assumed that an increase in output will be accompanied by a fall in real wages, since prices rise stronger than money wages due to increasing marginal costs (see also Spahn 2000: 15, n. 22). This rise in employment at a falling real wage is in line with Keynes’ (1936: 14f.) argument that workers care not only about the real wage, but also about their relative wages (see also Tobin 1972b: 3 and Meccheri 2007: 705).³ On the other hand, Keynes (1939: 44) conceded that a rise in output may also go hand in hand with a rise in

³As Keynes (1939: 40) pointed out, he himself was also accused of “deceiving, so to speak, the working classes into accepting a lower real wage”. For a discussion of Keynes and the role of money illusion see Trevithick (1975). See also Section 5.5.

real wages if, among other reasons, the economy is facing severe excess capacity, so that a rise in output will not raise marginal costs but rather diminish them at least over a certain range (see also the diagram in McCombie 1985: 244 and the discussion in Hagemann 1988: 200ff.). Thus, the relation between employment, prices, nominal and real wages is subject to change depending on the specific circumstances in the economy. At least, there is no L-shaped supply curve assumed in Keynes' writings (see Rivot 2013: 25), even though such a kinked supply curve is usually regarded as being part of "Keynesian" analysis (see, for example, Lipsey 1963: 415f.).

Furthermore, it is clear that Keynes did not advocate to make use of inflation in order to increase the level of employment beyond full employment (see Rivot 2013: 75f.). Spahn (2016) thus remarked that Friedman's statement that aiming at an employment rate higher than the "natural rate" will only lead to inflation is not in contrast to Keynes, since "[t]he 'discovery' that money growth beyond the point of full employment will necessarily lead to inflation without increasing output can already be read in the *General Theory* (Keynes 1936: 303). There is hardly any deviation from Friedman's acceleration principle, although one has to concede that a systematic treatment of inflation expectation[s] is missing in Keynes (but note that trend inflation is a post-WWII phenomenon)." Also Hicks (1950: 124) remarked that "[h]as not Keynes taught us that when an uncontrolled economy reaches a position of full employment, without the expansionary forces being exhausted, it will break into a boundless inflation of wages and prices, unless the inflation is counteracted by monetary restriction?" In the same vein, but after the monetarist counter-revolution, Modigliani (1986: 29) stated that "the non-existence of a 'long-run trade-off' between inflation and unemployment [...] can be seen as a rehabilitation of Keynes' notion of a unique upper bound to sustainable employment or, from a different perspective, of the traditional view that in the longest run the stock of money – or its time derivative of any order – must be 'neutral'. This view, which was briefly lost in the burst of enthusiasm over the Phillips Curve, is at present broadly accepted by macroeconomists of most persuasions, at least as implying an upper bound to employment in the Keynesian sense."

As has been sketched in this section, the term "Keynesian" as well as the concept of the Phillips curve are not necessarily related to Keynes and his writings. Nevertheless, since this term was used in the contemporary debate, it will also be used in the following discussion subject to the disclaimer above.

1 General Introduction

1.1 The Phillips Curve and the History of Economic Thought

The history of the Phillips curve reflects nothing less than the history of macroeconomics particularly since the end of the 1950s: Due to the fact that the Phillips curve debate features important economic elements such as wages, prices, unemployment, output, unions, business cycles, expectations, monetary and fiscal policies, and so on, the whole discussion is deeply embedded in any macroeconomic discourse. Because of this vast amount of research comprising various lines of thought, Rothschild (1971: 245) remarked that “it would require a very specialised knowledge indeed (and lots of space) to give a full account of all the ramifications into which the debate has run.” In this respect, a complete discussion of the history of the Phillips curve or connected elements would have required to go far back in time and to extend the analysis to nearly any economist alive or dead (see Humphrey 1985 on some early forerunners of the Phillips curve).

Therefore, it was necessary to restrict my own research to some key aspects: The explicit focus in this thesis will be on the original Phillips curve and on those subsequent contributions considered to be path-breaking on an international level (such as Friedman’s Presidential Address). Hence, the discussion most of the time focuses on the debate in the 1960s in the UK and in the USA. Thus, as with Keynes, only casual remarks to possible forerunners or to comparable debates outside of the UK and the USA are made in the papers included in this thesis, even though I am fully aware that similar concepts had been developed and similar issues had been debated before or at the same time in other countries. For example, Reuber’s 1962 analysis of the Canadian Phillips curve will play an important role in Section 5.3. A noteworthy debate regarding the compatibility of full employment and price stability also took place particularly since the mid-1940s in Sweden and is partly covered in the edited volume by Turvey (1952).¹ In this sense, originality of the literature and concepts reviewed in this thesis is not claimed at all. However, even though the focus is on the discussion in the UK and in the USA, the amount of literature which had to be reviewed was not only enormous, but also diverse and offered many different interpretations of the Phillips curve.

Since each new interpretation and explanation regarding this relationship either was a refinement or criticism of previous ideas, knowledge about the development of the underlying assumptions of each Phillips curve concept is crucial for understanding the different lines of thought. For example, are markets assumed to be non-clearing in the short run as in the orig-

¹See, for example, also the contributions by Eagly (1964) or Jacobsson and Lindbeck (1969), who concluded that price stability and full employment (unemployment below 2 per cent) are conflicting policy objectives in Sweden. See furthermore Lindbeck (1968: 18ff.) for an overview about the Swedish experience and related contemporary theoretical discourses.

inal interpretation by Phillips (1958b) and Lipsey (1960), so that there is a place for active stabilisation policies, or are all markets assumed to be in equilibrium in general, only to be disturbed by policy shocks as in New Classical models such as the one in Lucas (1975)? Reflecting on these different assumptions and putting the whole model in its historical as well as theoretical context hence is crucial to appreciate the explanation each theory offers and to avoid misunderstandings. For example, Meltzer's (2012: 31) rather recent statement that "Keynesians introduced a Phillips curve relating departures from full employment to inflation. Their work in the 1960s implied that policymakers could choose to raise the inflation rate to increase employment" is flawed in many respects. As will be shown, especially the idea that "Keynesians" tried to push the economy beyond full employment by means of creating (unexpected) inflation must be strongly refuted by the available evidence. If at all, "Keynesians" tried to remove involuntary unemployment by accepting some modest inflation as the natural outcome of an economy at full employment. Particularly this inflationary bias at full employment gave rise to the "cruel dilemma" and thus to a long-run trade-off between price stability and full employment. The emphasis of a trade-off between (unexpected) inflation and overemployment, as stated by Meltzer above, thus is not a "Keynesian" concept. Rather, as will be shown, it is the trade-off concept underlying Friedman's line of thought which also became incorporated into the New Classical framework. Hence, even though both lines of thought feature a trade-off between two economic variables, one related to the rate of inflation and the other one related to economic activity, each trade-off concept is embedded within a specific economic framework which also leads to different normative statements. Despite these differences, which will be elaborated more deeply in this thesis to show that there are many interpretations of the Phillips curve trade-off, the term "trade-off" will be used throughout this thesis independently of the underlying theory or line of thought: The term will be used for describing the possibility for economic policy to temporarily move on a given Phillips curve (short-run trade-off) or to even pin down the economy to a specific combination of inflation and unemployment (long-run trade-off). Meltzer's quote, however, strikingly shows how easily this notion of a trade-off can be misinterpreted if this concept is discussed out of context.

Particularly Phillips' original contributions, but also those that followed shortly thereafter, are prone to being misinterpreted, since they mark the beginning of a new way of analysing and discussing the inflationary process. Even though the relationship between unemployment and inflation or, more general, economic activity and its relation to the price level, had been studied many times before, Phillips' estimation of a stable relation for nearly 100 years between unemployment and wage rate changes "was the discovery of order where before there seemed to be only chaos" (Lipsey 1962: 108). Lipsey's (1960) shortly following econometric confirmation and theoretical underpinning of the curve spurred further research in this direction. However, by being pioneering contributions, the whole line of argument is often not fully developed, the focus not always perfectly clear, and the importance of each result not fully understood. Without doubt, these caveats do not only apply to Phillips and his followers, but also to other pioneers such as Friedman, who presented an internally inconsistent explanation of the Phillips curve trade-off in his Presidential Address in 1967 (see Laidler 2012: 20ff.), but which nonetheless (and for good reasons)² was included in the top 20 articles ever published in the *American*

²Indeed, the "stagflation" (a term created by Iain Macleod in 1965, the spokesman on economic issues for the

Economic Review (see Arrow et al. 2011: 4f.).

Focusing on a detailed analysis of such pioneering contributions thus can help to disentangle the often heated debate between different lines of thought. Pioneering work within the history of economic thought regarding the Phillips curve has especially been conducted by Leeson (1994a, b, c, 1995a, b, 1996a, b, 1997a, b, c, d, 1998a, b, 1999). But being most of the time a pioneer himself, some arguments and interpretations might be amended by a more detailed analysis as is argued in some parts of this thesis (see Section 2.6). Other researchers in the last years, most notably Forder (2010a, b, 2014), also focused on the history of the Phillips curve. This recent research provides a balanced account of the trade-off interpretation of the Phillips curve. However, whereas Forder often takes a broad perspective, my own research examined selected contributions to the Phillips curve in more detail and put them into context. Furthermore, Forder's and my assessment regarding the trade-off interpretation of the Phillips curve differ with respect to some important details (see Section 3.4 and Chapter 6).

Three main research questions can be found throughout all of my papers, also in those essays not included in this dissertation:

1. Was the Phillips curve really interpreted as offering a long-run trade-off or a “menu of choice” between inflation and unemployment? If so, was the Phillips curve also perceived as a stable relationship offering a trade-off in the long run based on the idea of permanent money illusion? Do reasons other than permanent money illusion make a stable trade-off plausible?
2. If the Phillips curve was interpreted as a long-run trade-off between inflation and unemployment, why did it seem to be necessary to make use of it? If so, which policy combinations were proposed, why were they proposed and were they truly inflationary? What underlying factors were regarded as being responsible for the perceived inherent incompatibility of full employment and price stability?
3. What elements and results of the Phillips curve discussion until the 1970s can be regarded as being important and noteworthy even today?

As will be shown in the three articles included in this thesis, as well as in the other papers of mine, providing a clear and straightforward answer to these questions is not as easy as it seems at first sight. Even though sometimes seemingly unambiguous terms and vocabulary

United Kingdom's Conservative Party; see Nelson and Nikolov 2004: 293) of the 1970s seemed to confirm particularly Friedman's prediction of an accelerating inflation and the breakdown of the stable Phillips curve and thus rendered his criticism attractive not only from a pure theoretical, but also from an empirical point of view (see Lucas 1973b: 382, Lucas 1981: 560, Friedman in Taylor 2001: 124, and Taylor in Solow et al. 2009: 75). Mayer (1999: 117) thus concluded that the “Great Inflation” of the 1970s was also caused by the idea of a long-run trade-off between inflation and unemployment: “There are several villains, and the biggest one turns out to be then prevailing views of economists, and not malicious political interference with the central bank, or cartel-imposed supply shocks. We have met the enemy and he is (or rather was) us.” On the other hand, oil price shocks and the following productivity slowdown contributed considerably to the bad economic performance (see Blinder 1982: 275ff. and Solow 1992: 162ff.), so that Solow (1992: 171) concluded that “[t]he policies that led to avoidable overheating and excess liquidity in the 1960s were guilty of manslaughter but not first-degree murder.”

such as “menu of choice” were used in contemporary contributions, a deeper analysis indeed shows that particularly these expressions have to be interpreted carefully. This is especially true with respect to the development of the Phillips curve. Since the Phillips curve today is already framed by and embedded within the typical distinction between a short-run and long-run relation, that is, within Friedman’s framework, the meaning of such terms also changed since they had been used for the first time. By taking the historical circumstances into account and by putting each contribution into the general theoretical context, it becomes possible to disentangle the different meanings and interpretations of each term over time and to take full account of each important detail within the respective contribution.

In order to provide a general overview of the essays included in this thesis and to show how they are connected with each other, a short summary of the three articles in the next subsection will highlight the main scopes and results of each paper.

1.2 Three Times the Phillips Curve

The first of the three articles included in this dissertation (Chapter 2) focuses on the role of the Phillips curve within Phillips’ research programme. Phillips’ research interest and approach to economic theory clearly were influenced by his career as an electrical engineer, the best example being the “Phillips Machine” (Phillips 1950). Phillips was sceptical regarding the usually applied static analysis of economic systems as, on the one hand, movements of prices and the interest rate cannot be observed in such static models and as, on the other hand, the dynamic process itself will not ensure that an equilibrium will actually be reached. Phillips thus became interested in the upcoming concept of automatic stabilisers which were regarded as a viable alternative to pure discretionary policy. However, knowledge about their implications for the dynamics in the economy was rare. Phillips thus focused on the analysis of the dynamics of economic systems in continuous time. Especially the question which automatic stabilisation policy or which combination thereof may serve best in reducing economic fluctuations constituted the core of his research programme—a question which Phillips analysed with methods which originated in the engineering literature, where optimal stabilisation rules emerged “from conventional linear-quadratic optimisation problems” (Turnovsky 2011: 68).

The Phillips curve, as is argued in Chapter 2, thus was part of this research programme on stabilisation policies, since it provided an empirical estimate of the speed of price adjustments if the economy is in disequilibrium. Since flexible prices themselves may contribute to the overall stability—but in certain circumstances also to the instability—of the system, such a guess about price dynamics provided helpful information about the inherent stability of a market economy. In the same sense, also price and inflation expectations were discussed by Phillips as an important stabilising or destabilising force. Inflation expectations, however, by being implemented on the demand side of the economy, were discussed in a different way than by Friedman (1966a; 1968) and Phelps (1967).

However, as is shown in this article on Phillips, also the trade-off view is indeed prevalent in his writings, even though it is argued that the trade-off has to be interpreted in the historical context. Particularly cost-push forces (such as strong unions) as a cause of inflation, in combination with the fixed exchange rate system of the time, created enormous problems for

economic policy. In this sense, the Phillips curve also for Phillips served as a trade-off relationship and there is no clear indication that it was not regarded as a long-run one. However, in the contemporary context, economic policies were discussed and implemented in order to assure full employment and price stability at the same time and there is no notion of making use of surprise inflation to steer the economy towards an unsustainable level of over-full employment—to the contrary: Since a perceived conflict between full employment and price stability in the UK existed, Phillips proposed to endure a higher unemployment rate in order to fight inflation while also emphasising the need to shift the curve to the left by structural adjustments on the supply side.

This trade-off interpretation of the Phillips curve and the importance of the historical context are discussed in more detail in the article on Samuelson and Solow (1960) in Chapter 3. The cost-push demand-pull debate about the causes of inflation without apparent aggregate excess demand at the end of the 1950s is emphasised as the reason why the Phillips curve as a quantitative answer to the (in-)compatibility of full employment and price stability was endorsed by Samuelson and Solow. In this respect, “[t]he Phillips curve was one way of making sense of that episode” (Solow 1976: 4). Furthermore, Samuelson and Solow were very sceptical about the stability of the relation, for example, due to adjusting inflation expectations and hysteresis. Thus, Phelps’ (1995: 17) statement that “the Keynes–Phillips orthodoxy was sailing on smooth waters, the object of much congratulation, rather like the liner *Titanic* prior to its collision with the fateful iceberg” is plainly wrong. Due to the specific interpretation of the Phillips curve in light of the cost-push demand-pull debate, Chapter 3 also shows that Friedman’s attack on the curve rested on two different arguments. On the one hand, on the importance of inflation expectations, which, however, was actually well-known and acknowledged by many contemporary economists. On the other hand, on the denial of any long-run effect of cost-push forces on the rate of inflation. Thus, in Friedman’s view, a structural conflict between price stability and full employment does not exist, since “[i]nflation is always and everywhere a monetary phenomenon” (Friedman 1963: 39 and 1966b: 18). Ongoing inflation thus cannot be due to cost-push forces, but can only emerge due to demand-pull factors, that is, an inadequate monetary expansion. The Phillips curve trade-off therefore is decoupled from its original interpretation and incorporated into an essentially conflict-free economy. Whereas inflation in the “Keynesian” view was regarded as an inevitable outcome of a full-employment economy, surprise inflation is the driving force of the short-run trade-off between inflation and unemployment in Friedman’s framework. The paper thus argues that Friedman’s attack on the trade-off was not only based on the emphasis of inflation expectations, but more fundamentally attacked the whole assumed underlying economic structure, since in his view full employment and price stability are not conflicting policy objectives as it was perceived by Samuelson and Solow (1960) and other contemporary economists.

Chapter 4 discusses the importance of this perceived conflict between full employment and price stability in the broader historical but also economical context. It is shown that there was a lively debate about the relation of the third major policy objective—a high rate of economic growth—to the other two policy objectives of full employment and price stability. A high rate of growth was regarded to be of utmost importance in the USA due to the perceived military threat of the Soviet Union. Hence, the choice of an optimal combination between all three objectives was not just regarded as an important but difficult issue of economic policy, it also

was perceived—as drastic as it may sound—as a matter of survival.³

The paper discusses three different lines of thought. On the one hand, the “Keynesian” approach which emphasised the importance of high demand pressure to foster investment and therefore the rate of growth. On the other hand, proponents of the “Paishian” view argued that some slack in the economy could be beneficial to keep up economic incentives to improve productivity and to implement cost-saving ways of production. This view was more prominent in the UK than in the USA, due to ongoing issues with respect to the balance-of-payments which limited the possibilities of economic policy to opt for a high demand-pressure economy. Economists of the third, “sceptical”, view argued that empirical evidence indicated that the rate of growth was rather independent from the rate of inflation and the overall rate of capacity utilisation, which was also in line with their theoretical reasoning.

This article thus shows that the conflict between full employment and price stability was augmented by a third dimension.⁴ Lipsey (1963: 521) hence remarked that if the rate of growth actually depends on the level of unemployment “then a much more complex choice confronts us in deciding our relative preferences between growth, stable prices and employment.” The paper thus discusses the compatibility of “the holy trinity that has become standard: full employment, economic growth, and stable prices” (Friedman 1982: 100), which was also analysed within a Phillips curve framework as is shown at the end of the article.

In sum, all three papers have in common that they demonstrate that the interpretation of the Phillips curve in the 1960s was very different from subsequent interpretations after Friedman and Phelps. The policy objectives of full employment and stable prices were perceived to stand in conflict with one another due to an inflationary bias of the economy at full employment, whereas particularly Friedman argued that full employment, that is, the “natural rate of unemployment”, is compatible with any rate of inflation, deflation, or price stability.

However, since the three articles included in this Ph.D. thesis do not provide a deeper analysis of the writings of probably the most important contributor to the Phillips curve discussion in the 1960s, Richard Lipsey, a review of his writings is appropriate and necessary for clarifying important concepts and terms to be used within the papers and the discussion. Furthermore, in contrast to Phillips, who abstained from the Phillips curve debate nearly completely shortly after his seminal paper had been published, Lipsey has relentlessly participated in the whole Phillips curve debate up to today. Thus, an analysis of Lipsey’s contributions provides important insights into how the interpretation of the Phillips curve evolved over time. Furthermore, such an analysis will help to clarify the terms used in this thesis and will shed light on different Phillips curve concepts.⁵

³However, some contemporary authors were sceptical that a faster rate of growth than that of the Soviet Union was a necessary or even sufficient condition to assure the nation’s security. On the one hand, Viner (1963: 24) remarked that not output as such but the structure of production (consumption versus military goods) might be more important. On the other hand, Tobin (1964: 6) conceded that a high level of output does not necessarily also imply military strength since “[n]uclear technology has made this connection looser than ever.”

⁴Another source of a possible conflict for economic policy was, of course, posed by the fixed exchange rate regime of Bretton Woods. This conflict is particularly pronounced in Phillips’ writings (see Section 2.6) and also in Reuber’s (1962; 1964) analysis of feasible Canadian economic policy choices (Canada as a small open economy built the basis for the Mundell-Fleming model; see Mundell 1961a, b, 1962, 1963 and Fleming 1962).

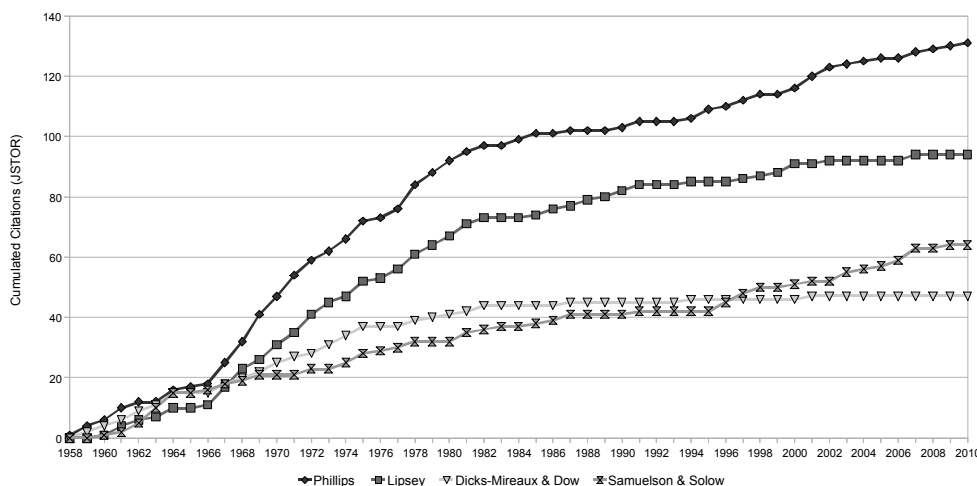
⁵The following discussion in Section 1.3 and some parts in Section 5.4 are based on an essay which was presented at the 2013 History of Economics Society’s Annual Conference at the University of British Columbia,

1.3 From an Adjustment Relation to a Trade-Off Interpretation: The Role of Richard Lipsey

Lipsey's 1960 article was one major reason why Phillips' paper, and not other contributions, such as Dicks-Mireaux and Dow (1959) or Klein and Ball (1959), "caught the profession's eye" since "Phillips's article was extended in a brilliant piece by Richard Lipsey" (Santomero and Seater 1978: 500). Hence, Lipsey's (1962: 106) original assertion that he only "played some small part" in this discussion is a clear understatement: A closer look at the citation count in journals available on JSTOR indeed reveals that Lipsey's 1960 contribution was cited considerably more often than comparable articles such as Dicks-Mireaux and Dow (1959) or even Samuelson and Solow (1960) (see Figure 1.1). Since the mid-1960s, the cumulated amount of Lipsey's citations was at least around 60 per cent of those of Phillips (1958b) and even reached some 80 per cent in the early 1990s (see Figure 1.2).⁶

Figure 1.1: Cumulated Citations of Phillips (1958b), Lipsey (1960), Dicks-Mireaux and Dow (1959), and Samuelson and Solow (1960), 1958–2010, JSTOR.

Own illustration. Source: <http://dfr.jstor.org>. See Footnote 6 for further details.



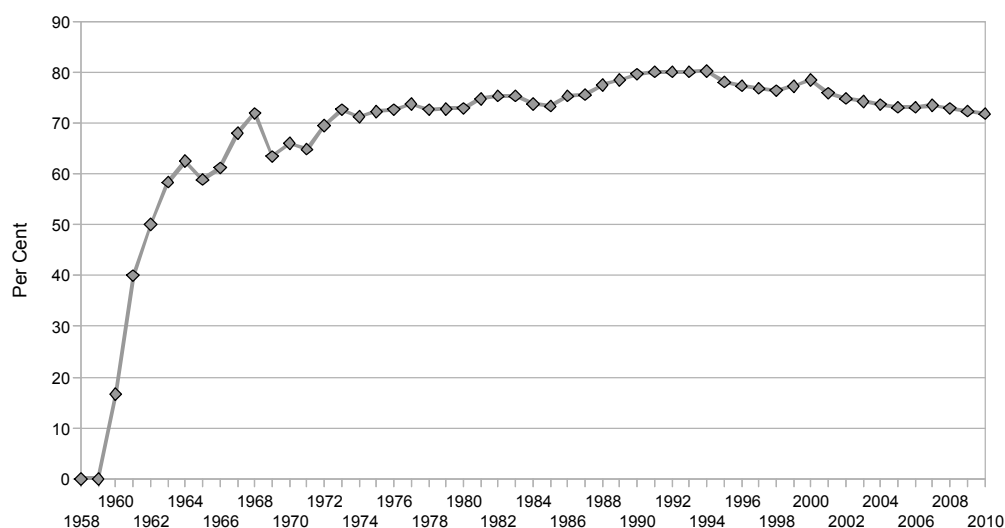
Besides Lipsey's important role with respect to the theoretical underpinning of the Phillips curve, Lipsey's empirical assessment of the curve was a major step towards establishing the

Vancouver. It was discussed at length with Richard Lipsey at the conference and the following days.

⁶Search pattern for both figures: Phillips (1958b): "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom" AND Phillips AND 1861 AND 1957 AND 1958. Lipsey (1960): "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom" AND "A Further Analysis" AND Lipsey. Dicks-Mireaux and Dow (1959): "The Determinants of Wage Inflation" AND "United Kingdom" AND Dicks-Mireaux AND Dow. Samuelson and Solow (1960): "Analytical Aspects of Anti-Inflation Policy" AND Samuelson AND Solow. Search only in references. Unfortunately, the author had no access to the *Social Science Citation Index* before 1975 so that JSTOR's *Data for Research* database was used as a second-best solution. JSTOR, however, covers many distinguished journals, for example, *The American Economic Review*, *Econometrica*, and *Economica*, so that not all journals but at least the most important ones are included in this database. This database search was conducted on 17 April 2013. A similar search in June 2015 generated unreliable results for unknown reasons.

Figure 1.2: Relative Cumulated Citations of Lipsey (1960) in Per Cent of Phillips' (1958b) Cumulated Citations, 1958–2010, JSTOR.

Own illustration. Source: <http://dfr.jstor.org>. See Footnote 6 for further details.



Phillips curve in the economics profession as Phillips estimated his curve not by standard methods, but by making various simplifications. Hence, before analysing Lipsey's theoretical contributions to the Phillips curve discussion, a short review of Lipsey's empirical assessment of Phillips' estimations will be given in Subsection 1.3.1. This review of Phillips' and Lipsey's ways of estimating the curve will provide a more thorough analysis of the empirical Phillips curve compared to Section 2.3 and 2.4. Furthermore, recent research suggests that also Samuelson and Solow (1960) made use of Phillips' technique instead of just drawing a "freehand fit" (Bodkin 1966: 31) as is supposed in Section 3.3.⁷

The 1960 paper was written while Lipsey still was in regular contact with Phillips (see Lipsey 2000a: 238). Lipsey (1960: 1, n. 1) also gave credit to Phillips in the acknowledgements section pointing out that he is "particularly indebted to Professor Phillips for his constant aid and encouragement" (see also Lipsey 2000a: 236). Hence, an analysis of Lipsey's 1960 contribution to the theoretical underpinning of the curve in Subsection 1.3.2 will offer deeper insights not only into Lipsey's interpretation of the curve, but also indirectly into Phillips' own view about the curve (which is discussed more deeply in Chapter 2). Furthermore, Friedman's derivation and interpretation of the Phillips curve will be reviewed and compared with Phillips' and Lipsey's views.

Subsection 1.3.3 will then focus on the important distinction between the Phillips curve of a single market in one sector of the economy and the Phillips curve in the aggregate. The relation between inflation and unemployment on the macro level, as will be shown, crucially depends on the distribution of demand and therefore of unemployment over all sectors in the

⁷See on this issue the debate between Hall and Hart (2012, 2015) (who argue that Samuelson and Solow must have drawn their Phillips curve by hand since standard econometric regressions do not show such a relation) and Hoover (2015a, b) (who argues that Samuelson and Solow applied Phillips' estimation technique with which the Samuelson-Solow curve can be derived).

economy. This approach of treating the macro Phillips curve as an aggregation phenomenon has important policy implications as will be more deeply discussed in Chapter 5.

Not only Lipsey's first contribution to the Phillips curve debate, but also an essay following some years later marked a milestone in the discussion, since it was Lipsey himself who contributed to the reinterpretation of the Phillips curve from being a short-run adjustment function to becoming a long-run trade-off relation. While Lipsey (1978: 58ff. and 1981b: 547) emphasised that the curve had been interpreted by Lipsey (1960) as a disequilibrium relation in line with Phillips' view, that is, as showing the speed of adjustment if there is excess demand or supply in the economy, Lipsey (1978: 56f. and 1981b: 557, n. 16) also admitted that, at least for one time, he had used the curve as if it provided a long-run trade-off between inflation and unemployment. Hence, Lipsey (2000a: 240, n. 8) noted that "[i]n Lipsey (1964) [Lipsey (1965)] I drew a stable Phillips Curve and used policymakers' indifference curves to establish the optimal combination of unemployment and inflation." This contribution is cited besides Okun (1965) in the well-known paper by Phelps (1967: 255, n. 1) as offering such a long-run trade-off view. Also subsequent writers after Phelps (1967) cited Lipsey (1965) as a prominent example of the long-run trade-off assumption (see, for example, Johnson 1983: 191, n. 4). Laidler (2010: 122f.) hence pointed out that Lipsey (1965) was one of "the real culprits". In this sense, Lipsey (2000a: 237, n. 6) remarked that "[f]or myself, by the time I wrote the Phillips piece I strongly advocated putting up with significant amounts of inflation as the price of keeping unemployment low". This trade-off view will be discussed in Subsection 1.3.4 and, together with an investigation of different editions of Lipsey's textbook (Section 5.4), will play an important role in the concluding discussion in Chapter 5.

Subsection 1.3.5 will provide a short summary, highlighting the different possible interpretations of the curve which will be discussed in the other chapters of this thesis.

1.3.1 Lipsey's Econometric Account of the Phillips Curve

Phillips (1958b: 290) estimated⁸ his curve by an equation of the form

$$y + a = bx^c$$

or, as a log-linearised function,

$$\log(y + a) = \log b + c \log x$$

with y as the rate of change of wage rates, x as the unemployment rate in per cent, and a , b , and c as constants. However, logarithms of negative values cannot be calculated, while a direct estimation of the original function without using logarithms seemed to be technically unfeasible (see Footnote 9 for further details). As a workaround, Phillips (1958b: 290) calculated averages of y and x for specific intervals of the rate of unemployment for the years 1861–1913 (with the upper bound included in each interval).⁹ These intervals have equal weights (see

⁸See on Phillips' estimation technique Desai (1975: 3ff.) and Wulwick (1989: 176ff. and 1996: 397ff.).

⁹Phillips (1958b: 290) pointed out that this averaging eliminates the effect of the change in the rate of unemployment on wages as rising and falling unemployment rates are included in each interval, "so that each cross gives an approximation to the rate of change of wages which would be associated with the indicated level

Lipsey 1960: 5, n. 3; see critically Santomero and Seater 1978: 501) and are represented by the dotted vertical lines in Figure 1.3. The corresponding averages are illustrated as crosses in the same figure. Phillips (1958b: 290) estimated the constants b and c by least squares for these average values of y and x up to an unemployment rate of 5 per cent. According to Phillips (1958b: 290), the constant a was adjusted by trial and error so that the curve also fit the two remaining averages for unemployment rates higher than 5 per cent as good as possible.¹⁰

The Phillips curve thus was found by Phillips (1958b: 290) to be best described by the equation

$$y + 0.900 = 9.638x^{-1.394}$$

or in logarithms by the equation

$$\log(y + 0.900) = 0.984 - 1.394 \log x$$

of unemployment if unemployment were held constant at that level.” Amongst other assumptions, methods, and data used by Phillips, this one was particularly criticised by Routh (1959: 315). Lipsey (1960) defended Phillips’ results against most of Routh’s criticism particularly regarding the data used. Lipsey (1960: 5), for example, paid attention to the differences between the wage series for the years 1881–1885 provided by Brown and Hopkins (1950) and by Bowley (1937) to meet the criticism of Routh (1959: 313) that Phillips (1958b: 291) had arbitrarily chosen the data sources in his discussion of the curve to arrive at the desired relationship between the two variables. Wulwick (1989: 180ff.) furthermore supposed that Phillips had arbitrarily chosen the intervals to arrive at the hyperbolic curve, so that the form of the curve was in line with his theoretical reflections (see Section 2.2). In general, Phillips’ technique of estimating and drawing such a hyperbolic curve was criticised by contemporary economists such as Knowles and Winsten (1959: 114ff.), but also in a later and influential contribution by Santomero and Seater (1978: 500f.). Hence, Wulwick (1989: 174) concluded that it was indeed “a crude curve-fitting technique” while also noting that this technique had been quite common at the time. Lipsey (2000a: 239) recalled that Phillips most likely had chosen this kind of technique due to technical restrictions:

I asked Phillips many times why he had not used more conventional statistical methods for his original article. He had two answers. Early on, he said that, since the curve had a logarithmic form and since there are no logs of negative numbers, he was forced to use unconventional methods of first averaging the data into a few points and then fitting a curve to those points by eye. [...]

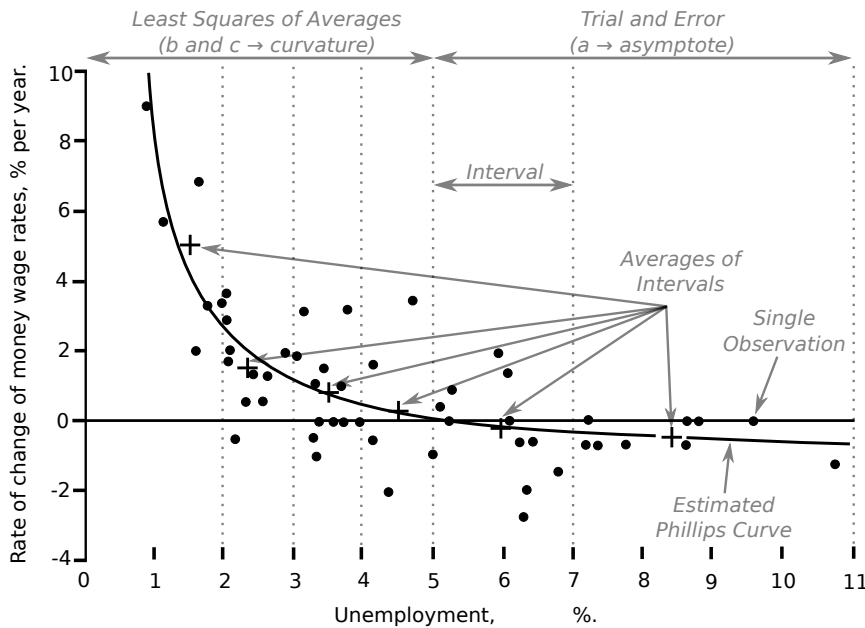
Phillips’ second response, which he used more often after my work was completed, was that he saw no half-way house between really crude eyeballing of data and what he regarded as a fully satisfactory econometric treatment, which would take him well beyond the conventional statistical methods which I had been taught.

Also Gilbert (1976: 53) took the point of view that Phillips’ way of estimating the curve had more to do with technical limitations at the time than with deeper economical meaning as Desai (1975: 2) supposed. In the same vein, Wulwick (1996: 403) pointed out that in the 1950s “[n]o computing programs existed that could use the least-squares criterion to search for the unknown parameters of an equation” which Phillips regarded as the correct one. Wulwick (1996: 395), however, also remarked that Phillips indeed had access to and also had previously made use of the computer at the National Physical Laboratory at Teddington. Thus, Wulwick found it remarkable that Phillips decided to estimate his curve by using an electrically run Marchant mechanical desk calculator even though he was short on time since he “had to go off on sabbatical leave to Melbourne” (Phillips in Blyth 1978: xvi). See also Wulwick (1996: 396, n. 6).

¹⁰Gilbert (1976: 56), however, took the point of view that “Phillips in fact first estimated a graphically and then estimated b and c by least squares” (see also Lipsey 1960: 5, n. 2).

Figure 1.3: Estimation of the Phillips Curve.

Unemployment and the rate of change of money wage rates, United Kingdom, 1861–1913. Source: Phillips (1958b: 285). Redrawn and modified (grey lines and text). See Chapter “Copyright and Permissions” for further information.



Phillips (in Blyth 1978: xvi) noted with respect to Lipsey’s approach to his estimated curve that he “was appalled at the scientific approach, and tried to refute it, Popperwise”. As Lipsey (1960: 3) aimed at estimating the curve “by standard statistical methods if at all possible”,¹¹ he had to set up a new equation. Thus, Lipsey (1960: 4) used the following function

$$\dot{W} = a + bU^{-1} + cU^{-2}$$

with \dot{W} as the percentage rate of change of money wage rates, U as the unemployment rate, and a , b , and c as constants.

This function can be estimated by standard statistical techniques without making use of Phillips’ workaround. Lipsey (1960: 4) found that by choosing the parameters accordingly, his equation could in principle be adjusted in such a way that it draws a hyperbola very close to that of Phillips’ original curve, so that “choosing between the two curves [Phillips’ and Lipsey’s] does not necessitate choosing between different hypotheses about the nature of the

¹¹Wulwick (1996) tried to replicate the results of Phillips (1958b) and Lipsey (1960): While being able to reproduce Phillips’ results, Wulwick (1996: 393) noted that “Lipsey’s results are in certain important respects not reproducible.” Whereas the period 1861–1913 is reproducible, the estimates of the period 1914–1957 are not (see Wulwick 1996: 418). This, as pointed out by Wulwick (1996: 410), also happened to other economists trying to reproduce Lipsey’s results, even though there had been no published paper beforehand of such failed attempts; but see Leeson (1994c) and Wulwick (1994) for a further discussion. Unfortunately, as Lipsey (1997b: 2) recalled, the data sheets on which the regressions based got lost during Lipsey’s move from England to Canada in 1970.

relation between \dot{W} and U .¹² Lipsey at this stage of his paper thus accepted the proposed non-linear shape of the Phillips curve as a working hypothesis (see Lipsey 1960: 4, n. 1). Furthermore, Lipsey (1960: 5ff.) also found some evidence in favour of Phillips' observation that the rate of change of unemployment \dot{U} plays an important role for the determination of wage rate changes. This will be discussed in Subsection 1.3.3.

In sum, Lipsey confirmed Phillips' hypothesis regarding the relation between unemployment and wage rate changes as he (1960: 11f.) concluded that "[t]here is a significant relation between the rate of change of money wage rates on the one hand and the level of unemployment and its rate of change on the other. Over 80 per cent. of the variance in money wage rates over the period 1862–1913 can be associated with these two variables, U and \dot{U} ." Lipsey's approach thus proved that the curve did not show up merely as an artefact of Phillips' special estimation technique so that "Lipsey's claim to have replicated the Phillips curve by means of a standard technique convinced many economists to accept the Phillips curve as an empirical entity" (Wulwick 1996: 410). Thus, "[i]t was Lipsey's replication that clinched the institutionalization of the Phillips curve" (Wulwick 1996: 419). Also Lipsey (2000a: 236) himself noted:

I suspect that my more orthodox statistical treatment of the curve did quite a bit to still some of the many early criticisms, helping the curve to gain acceptance within the profession.

Most important, Lipsey (1960: 8ff.) conducted an empirical investigation of Phillips' hypothesis regarding cost of living effects on wage rates (see Section 2.3). For Phillips (1958b: 283f.), cost of living adjustments will only have an influence on wage rates if the rise of the cost of living—which is assumed to be exogenously driven by strongly rising import prices—is high enough to cause a reduction of the real wage. That means that any rise in the cost of living is assumed to have no effect on wage rates as long as the cost of living is rising weaker or exactly as strong as nominal wage rates. Lipsey (1960: 9), however, rejected Phillips' hypothesis, which in his view rested on "intuitively implausible" (Lipsey 1960: 8) behavioural assumptions, by the data.

Instead, Lipsey (1960: 9ff.) proposed and tested the different hypothesis that the percentage change in the cost of living index, denoted by the variable \dot{P} , directly affects the percentage rate of change of money wage rates \dot{W} . The corresponding Phillips curve equation thus became

$$\dot{W} = a + bU^{-1} + cU^{-2} + d\dot{U} + e\dot{P}$$

For the time span from 1862 to 1913 this coefficient e of the change of the cost of living is only around 0.21 (when added to the explanatory variables consisting of the unemployment rate U and its rate of change \dot{U} as in the above equation). Thus, Lipsey's estimation suggested that there is no one-one relation between wage rate changes and the cost of living.¹³ This value changes to 0.37 if the change of the rate of unemployment is dropped (the change in the rate of

¹²Since Lipsey estimated the curve for different data sets and periods and thus produced many slightly different results, which in sum confirmed Phillips' estimation, no such estimation results will be presented in order to keep the focus on important details such as the coefficient of the cost of living in the next paragraphs.

¹³For Desai (1995: 349), Lipsey thus started the trade-off debate since the coefficient of the cost of living was significantly less than unity. In this respect, Lipsey (2000b: 71, n. 18) noted that "[w]hat I did not do was to estimate and use the *expected* inflation rate." Lipsey (2000b: 71) also recalled: "I found no evidence of a statistically significant effect of this sort, and hence abandoned the price level as an explanatory variable, not

unemployment and in the cost of living might be regarded as substitutes due to their possible high correlation). Even if cost of living effects are treated as the only explanatory variable of wage changes there is still no one-one relation between wage changes and price changes since the coefficient of \dot{P} becomes 0.55. This result, however, might be related to the relative stability of the price level for the time under consideration, so that there was no need for wage setters to take continually rising prices into account (see also Lipsey 2000a: 236f. and Section 2.3). On the other hand, Phelps (1967: 256, n. 1) remarked concerning Lipsey's regression that the current rate of inflation might be a poor proxy for the expected one and therefore a major cause for the weak influence of the change in the cost of living on wage changes. Lipsey (1960: 12) hence concluded that "[t]here seems to be some evidence in favour of a simple (but rather weak) relation between changes in the cost of living and changes in money wage rates."

However, for the years from 1923 to 1939 and from 1948 to 1957, Lipsey's (1960: 26) estimation of the coefficient of the cost of living was 0.69, which led him to the conclusion that there had been a tendency towards a one-one relation between wage and price changes (see also Lipsey 1963: 438, n. 4). Lipsey (1960: 29f.) also pointed out that these cost of living effects might explain rising wages since 1934 despite high levels of unemployment. Lipsey (1960: 31), however, warned that "[a] satisfactory theoretical explanation (together with independent tests) would be needed of the high correlation between \dot{W} and \dot{P} . Until more is known about the causal links between \dot{W} and \dot{P} it is very dangerous to argue as if either of these variables were independent of the other."¹⁴

1.3.2 The Theoretical Underpinning of the Phillips Curve

Lipsey, in the second part of his paper, focused on building a model in order to analyse the Phillips relationship not only on empirical grounds, but also from a theoretical point of view as "Phillips had given very little indication of the sort of model of market behaviour which would produce his postulated relations" (Lipsey 1960: 2). Indeed, as is pointed out in Section 2.3, the theoretical underpinning by Phillips was not very detailed, even though Phillips had discussed a comparable relationship on theoretical grounds some years earlier (see Section 2.2).

This part of Lipsey's paper was strongly influenced by George C. Archibald who "was the analytical alter ego to the LSE group" (De Marchi 1988: 151) and whose "persistent criticisms

because Phillips and I thought it intrinsically uninteresting, but because we could not find evidence of its affecting the wage bargain. If we had had it to do again with a more satisfactory expectations hypothesis, we might have found the evidence we looked for and did not find". In the same vein Lipsey (2000a: 236) remarked: "I also tried to give the curve a micro-theoretical explanation but was hampered by not having a good model of expectations. As a result, I related money wages to the price level by a catch-up rather than an expectations variable. Since the catch-up variable did not perform well, I dropped it and was left with a simple, stable Phillips Curve." Lipsey (1997b: 2) also explicitly pointed at the problem of money illusion: "We were not unaware of the charge that the model contained money illusion but, lacking any articulated theory of forward-looking expectations, we sought to catch the effects of changes in the price level with a catch-up variable based on past changes in the price level. It did not, however, show much influence."

¹⁴Due to this possible interdependence between prices and wages, Bowen and Berry (1963: 170) were critical of Lipsey's regressions.

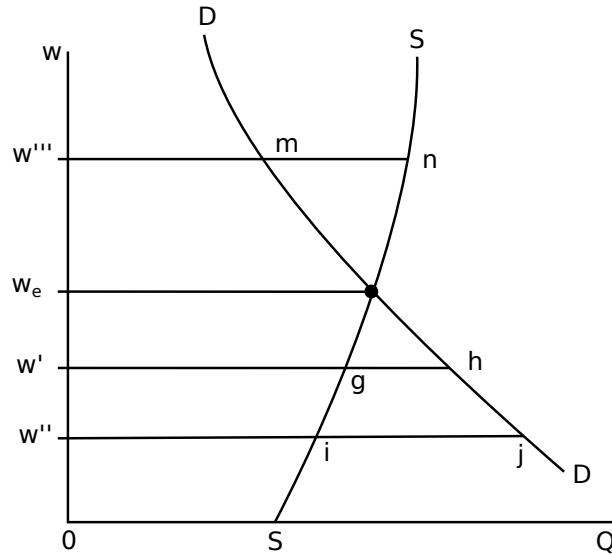
of measurement without adequate theory” (Lipsey 1960: 12, n. 1) urged Lipsey to also focus on the theoretical underpinning of the curve.¹⁵

Lipsey (1960: 13) started building up his model from the simple dynamics on a single market, that is, prices will rise in the case of excess demand and will fall if there is excess supply. This, in essence, is the whole theoretical basis on which also Phillips (1958b: 283) built upon in his own investigation. The wage-change unemployment dynamics of such a single market, however, are not necessarily representative for the wage-change unemployment relation in the aggregate, that is, for the economy as a whole. This issue will be discussed in Subsection 1.3.3. In order to keep the analysis tractable and to stay in line with Lipsey’s approach, the dynamics on a single market will be analysed first:

Such a single labour market is depicted in Figure 1.4. In the case of excess demand, that is ij , wages should rise, but should fall when there is excess supply such as mn . The speed of wage adjustment is assumed to depend on the overall amount of excess demand and excess supply.

Figure 1.4: Demand and Supply on the Labour Market.

Source: Lipsey (1960: 14). Redrawn. See Chapter “Copyright and Permissions” for further information.



Lipsey (1960: 13) chose to model the relation between the percentage rate of change of money wage rates \dot{w} and relative excess demand $\frac{d-s}{s}$ (with d for demand and s for supply) as a linear one (with α indicating the strength of the relation):¹⁶

$$\dot{w} = \alpha \left(\frac{d - s}{s} \cdot 100 \right)$$

¹⁵Even though Lipsey (1960: 12, n. 1) pointed out that Archibald “should in fact be regarded as joint author of part (1) of this section”, Archibald (1969: 125ff.) later attributed the model only to Lipsey. Also Wulwick (1987: 844, n. 19) noted that “Professor Archibald requested that he [did] not appear as co-author of the model (in a letter to this author [Wulwick] dated 26 February 1986).”

¹⁶Phillips (1958b: 283), however, pointed at the non-linearity of such an adjustment relation due to downwardly rigid nominal wages. As will be shown, in Lipsey’s model a non-linear Phillips curve in the case of excess demand is derived, while the relation becomes linear in the case of excess supply.

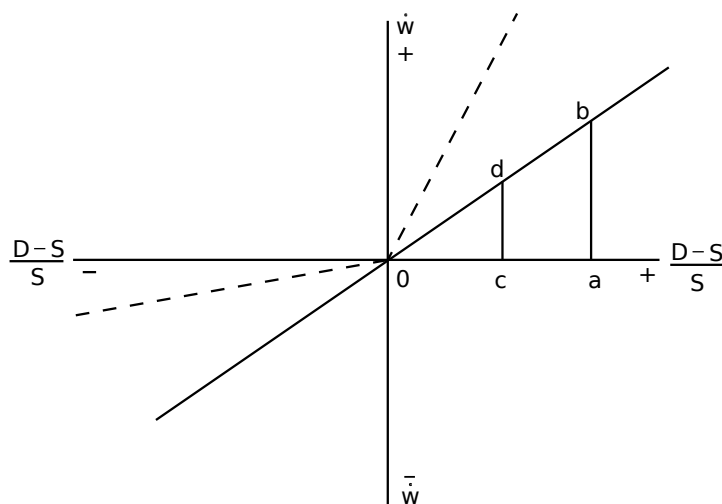
This relation is illustrated in Figure 1.5.¹⁷ Relative excess demand of $0c$, which corresponds to $\frac{gh}{w'g}$ in Figure 1.4, causes a rise in the wage rate of cd . Higher excess demand such as $0a$ ($\frac{ij}{W''i}$ in Figure 1.4) is related to wage rate changes of ab .

It is evident in this part of Lipsey's analysis that the adjustment mechanism was treated by Lipsey (1960: 13, my italics) as a relation for describing disequilibrium phenomena as wage changes are "related to the excess demand, and specifically, the greater is the proportionate *disequilibrium*, the more rapidly will wages be changing."

Lipsey's model thus incorporates some kind of wage or price stickiness, since with full price and wage flexibility, that is, an instantaneous adjustment of prices or wages, no disequilibrium in the sense of excess demand or excess supply can occur. Ackley (1978: 447) therefore critically remarked about the notion that the speed of adjustment depends on the amount of excess demand and supply that "[r]eflection will show that this is not *demonstrated* in Lipsey's model, it is merely *assumed*. The assumed underlying wage-adjustment function *already embodies that idea*; but no explanation is given for such a relationship."

Figure 1.5: The Basic Adjustment Relation Between Excess Demand and Wage Rate Changes.

Source: Lipsey (1960: 14). Redrawn. See Chapter "Copyright and Permissions" for further information.



Lipsey (1960: 13) pointed at the advantage of depicting the adjustment relation as in Figure 1.5: The adjustment curve in this figure is independent of whether the demand or the supply curve or even both curves shift. Thus, "it is necessary only that there be an unchanging *adjustment mechanism* in the market, i.e., that a given excess demand should cause a given rate of change of price *whatever the reason for the excess demand*". Inflation as the result of excess demand for labour thus might be explained by a shift of the labour-demand but also of the

¹⁷Since Lipsey (1960: 12) made a distinction between the dynamics on one single market and the whole economy, it is relative excess demand which is under his consideration with respect to the analysis and comparison of different single markets. Lower-case letters are used for single markets while capital letters refer to the whole economy. The figures, however, despite having capital letters, also apply to a single market. This is because the figures are unaltered reproductions of Lipsey's originals.

labour-supply curve, which rendered this adjustment function—and therefore also the thereby derived Phillips curve—equally attractive for demand-pull and cost-push theories of inflation (see Laidler 1971: 78, n. 6). This was also noted by Lipsey (1960: 17) as “the observation of the postulated relation is quite consistent with changes in wages caused by union-induced shifts in the labour supply curve.”

Unions, however, may change the beforehand symmetrical reaction of wage changes to excess demand and supply into an asymmetrical one. This is illustrated by the dashed lines in Figure 1.5. Unions may influence the dynamics in the labour market in such a way that wages react more slowly to excess supply but faster in situations of excess demand (see Lipsey 1960: 17).¹⁸

The problem Phillips and Lipsey were facing with respect to estimating the adjustment function was that data for excess demand or supply of labour is usually not available or observable at all (see Phillips 1959: 2 and Lipsey 1960: 14, n. 1). Thus, the rate of unemployment was used as an approximate measure of the excess demand for labour. Lipsey (1960: 13f.) pointed at this issue:

Now if excess demand for labour were directly observable there would be no need to go any further. Unfortunately, this is not the case [...] and it is necessary to relate excess demand to something that is directly observable, in this case the percentage of the labour force unemployed.

Phillips (1959: 2), however, noted that the unemployment rate might not be a good proxy for excess demand in the case of low unemployment, since then “there may be considerable excess demand for labour, and quite large changes in the excess demand for labour will be associated with only small changes of the percentage unemployed.”¹⁹

The assumed relation between excess demand and the rate of unemployment in Lipsey’s model is depicted in Figure 1.6. At point *a*, there is zero excess demand. This corresponds to the equilibrium wage rate $0w_e$ in Figure 1.4. As can be seen in Figure 1.6, the absence of excess demand or supply does not imply that there is zero unemployment, but that there is some positive amount of unemployment, that is, frictional unemployment: This amount of frictional unemployment for Lipsey (1960: 14) exists even if the labour market is in equilibrium as switching between jobs (that is, finding a new job) is assumed to take some time.

The negative relation between excess demand and the rate of unemployment comes about since positive excess demand is assumed to reduce the time necessary to find a job so that (frictional) unemployment falls.²⁰ The crucial assumption to arrive at a negative relation between excess demand and unemployment is that the amount of workers searching for a new

¹⁸Such a kinked reaction function was used by Lipsey and Parkin (1970: 117ff.) in their study on incomes policy— “[a] piece that [...] became quite influential, in spite of its flawed econometrics” (Lipsey 1997a: xxviii). For example, a wage policy might aim at flattening the slope of the reaction function if there is excess demand. Lipsey (1977), however, strongly opposed wage-price controls as a means to keep inflation under control (see Lipsey 1981a: 45f. for the historical background, that is, imposed wage-price controls in Canada in 1975).

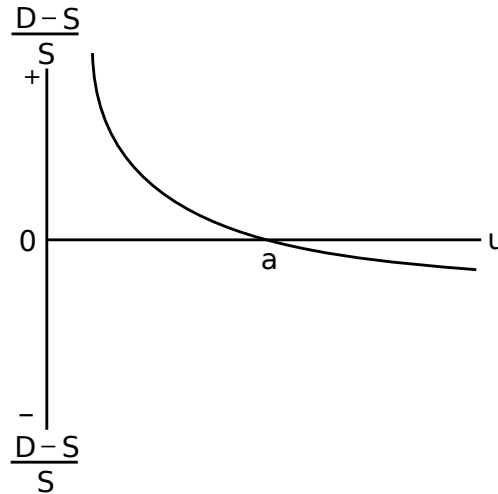
¹⁹Later studies indeed showed that the rate of unemployment is not a perfect measure for excess demand. For example, hidden unemployment (see Simler and Tella 1968) or hoarded labour should be taken into account (see Taylor 1970).

²⁰Also Rees (1957: 39f.) pointed at this mechanism of higher demand reducing frictional unemployment as “[v]ery low levels of unemployment can be reached by creating a vast demand for goods and services, which eliminates all unemployment except frictional and reduces the amount of frictional unemployment by shortening

job does not endogenously rise in response to the higher excess demand (see Lipsey 1960: 14f.). Lipsey's approach was criticised on these grounds by Corry and Laidler (1967: 194f.) as it might be equally reasonable that higher excess demand may induce more people to search for a new job.²¹

Figure 1.6: The Relation Between Unemployment and Excess Demand for Labour.

Source: Lipsey (1960: 14). Redrawn. See Chapter "Copyright and Permissions" for further information.



The mechanism underlying Lipsey's labour-market dynamics hence is a search theoretical approach, albeit a very basic one.²² Nevertheless, Lipsey was the first to provide a model to explain the specific negative and non-linear shape of the Phillips curve in the case of excess demand. Corry and Laidler (1967: 193) thus pointed out that "[i]n the literature on the Phillips curve we have been able to find only one place where any attempt is made to explain this aspect of the relationship".

The mathematical derivation can be found in a footnote (Lipsey 1960: 15, n. 1) but is reproduced here as the non-linearity of the Phillips curve is based on this non-linear connection between excess demand and unemployment:

Assume that a constant fraction α of employed persons E become unemployed in each period, so that the number of those employed becoming unemployed is αE . The number of

the time needed to find jobs." See also the statement by the Commission on Money and Credit (1961: 27). Lipsey's approach was extended by Hansen (1970) in order to take into account further frictions in the labour market.

²¹Thus, Corry and Laidler (1967: 189f.) remarked "that the particular form of the Phillips curve, which shows a continuously negative marginal rate of trade-off between the rate of change of wages and unemployment, is not derivable from basic theory without making some rather special and unverified assumptions" (see for a further discussion also Vanderkamp 1968 and Corry and Laidler 1968). However, only such a negative slope of the curve "would lead to the all important implication of the existence of a trade-off between the policy goals of high employment and price stability" (Corry and Laidler 1967: 195).

²²However, Batyra and De Vroey (2012) did not cite Lipsey (1960) as a pioneer of search unemployment. On the other hand, Ackley (1978: 447, n. 19) noted that Lipsey (1960) "to some extent, anticipates the Phelps' model [Phelps (1968a)]". Indeed, Phelps (1968a: 688) himself acknowledged that his search model is based on Lipsey (1960).

unemployed people is denoted by V . The number of unemployed getting back into employment depends, first, on the overall amount of unemployed, and, second, on the amount of free jobs available (vacancies). This number of free jobs available is defined by total jobs available (J)—which is equal to the overall demand for labour—less the number of people already employed, that is, $J - E$. Thus, it is assumed that the number of unemployed successfully getting back into employment (N) can be described by the following equation, while β is a constant:²³

$$N = \beta V (J - E)$$

A constant level of unemployment requires that the number of people becoming unemployed and getting back into employment is equal:

$$\alpha E = \beta V (J - E)$$

As the number of employed E is given by the difference between the overall labour force L less unemployed V , the equation above can be rewritten as:

$$\alpha (L - V) = \beta V (J - L + V)$$

Solving this equation for the amount of total jobs available (J) gives the equation:

$$J = \frac{\alpha L}{\beta V} - V + L - \frac{\alpha}{\beta}$$

Absolute excess demand is given by the number of total jobs available less the labour force, that is, $J - L$. Relative excess demand (X) is hence defined as $X = \frac{J-L}{L}$. Thus, J can be replaced by $LX + L$. After this substitution and by solving for X the equation above can be rewritten to show the functional relation between relative excess demand and unemployment:

$$X = \frac{\alpha}{\beta V} - \frac{V}{L} - \frac{\alpha}{\beta L}$$

Differentiating this function shows that this relation is indeed negative and non-linear since

$$\frac{\partial X}{\partial V} = -\frac{\alpha}{\beta V^2} - \frac{1}{L} < 0$$

and since

$$\frac{\partial^2 X}{\partial V^2} = \frac{\alpha}{\beta V^3} > 0$$

Thus, the higher the excess demand, the lower the number of unemployed. But as excess demand increases, the amount of unemployed falls at a decreasing rate.

To arrive at the relation between excess demand and the rate of unemployment u , one final replacement is necessary. As $u = \frac{V}{L}$, the relation between relative excess demand and unemployment can be rewritten as:

²³As Lipsey (1974: 64) pointed out, β must be “sufficiently small for the number of persons finding work to be less than the number looking.”

$$X = \frac{\alpha}{\beta Lu} - u - \frac{\alpha}{\beta L}$$

Since u cannot be negative it converges towards its smallest level possible (zero or a small positive amount) asymptotically if excess demand becomes infinite. This means that even if there is high excess demand there will always be some amount of frictional unemployment as switching between jobs is ongoing.

However, the relation to the right of a in Figure 1.6 is assumed to be linear as any additional excess supply will just be added as deficient-demand unemployment to the zero-excess-demand amount of frictional unemployment.²⁴

Holmes and Smyth (1970: 314) criticised that it is not possible to derive such a definite relation between unemployment and excess demand, as it is not *a priori* clear if the final quantity traded lies on the demand or on the supply curve or somewhere in-between so that “a relation between the rate of change of money wages and the rate of unemployment cannot be derived from this model and the Lipsey type of theoretical justification for the Phillips curve phenomena is not valid.”

Lipsey (1974) replied to this criticism and explained his theory in more detail. Most important, Lipsey (1974: 64) added the assumption, which, if at all, only implicitly showed up in Lipsey (1960), “that out of equilibrium the quantity of transactions is determined by the lesser of q^d , q^s ”, that is, quantity demanded and supplied. With this assumption, a unique relation between unemployment and wage rate changes can be derived.

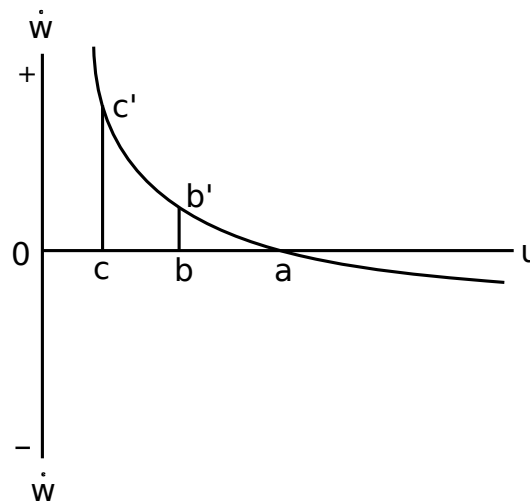
The theoretical Phillips curve (see Figure 1.7), then emerges out of a combination of Figure 1.5 (the wage-change/excess-demand relation) and Figure 1.6 (the excess-demand/unemployment relation). Note that due to the assumed linearity of the wage-change/excess-demand relation and of the excess-demand/unemployment relation for unemployment rates higher than a , the theoretical Phillips curve in Figure 1.7 thus becomes linear to the right of a as well, even though the curves in Lipsey’s diagrams (Figure 1.6 and 1.7) are not drawn linear to the right of a as would follow from his approach.²⁵

²⁴De Vroey (2010: 250ff.) criticised Lipsey’s approach for incorporating these two different forms of unemployment within the same model.

²⁵Lipsey (1960: 15) explicitly remarked that the relation in Figure 1.6 to the right of a is linear. A correct diagram can be found in Kaliski (1964: 3), who received comments by Lipsey. However, at least the non-linearity to the right of a in Figure 1.7 can be explained by an aggregation phenomenon if Figure 1.7 is understood as representing the aggregate macro relation as is more deeply elaborated in Subsection 1.3.3. Thus, Lipsey’s approach differs from that of Phillips (1954, 1958b) who assumed a non-linear Phillips curve also in the case of excess supply. This is explained by an asymmetric wage-change reaction, so that downwardly rigid nominal wages in the case of high unemployment are the reason for a non-linear relation if there is excess supply (see Section 2.2 and 2.3). Lipsey (1978: 60, n. 11), however, remarked that not altering the adjustment relation (Figure 1.5) by including downwardly sticky wages to arrive at a non-linear relation also in the case of excess supply caused “some unnecessary complications”. It is remarkable that Lipsey did not opt for the rather easy solution of downwardly rigid wages, particularly since even some critical contemporaries admitted that such an assumption is not *a priori* unreasonable (see Corry and Laidler 1967: 192). Leeson (1997a: 96) noted with respect to this inconsistency of the theoretical relationship with the data that “during its period of policy influence, the theoretical derivation of the Phillips curve contained a dormant but elementary error.” Lipsey (1981b: 558, n. 17), however, responded to a similar criticism by Cornwall (1981: 167) who stated that “Lipsey’s analysis of most labour markets is incorrect”:

Figure 1.7: The Phillips Curve as a Disequilibrium Relation

Source: Lipsey (1960: 14). Redrawn. See Chapter “Copyright and Permissions” for further information.



Point a is interpreted as an equilibrium rate, that is, there is no excess demand or supply, since a is the point at which “disequilibrium [...] is completely eliminated” (Lipsey 1960: 16). Such a disequilibrium can emerge since “[t]here is no Walrasian *t[â]tonnement* process, so that transactions can (and do) take place at *disequilibrium* wage rates” (Lipsey 1974: 63f.). A movement on the curve from a to b' and finally to c' thus indicates “that the demand and/or the supply curves have shifted over the period in such a way as to increase the disequilibrium in spite of the increase in wage rates” (Lipsey 1960: 16). Thus, such a sequence of wage-change/unemployment combinations indicates ongoing disequilibria as wages do not change fast and strong enough to compensate for shocks to the demand or supply curves. On the other hand, a sequence of c' to b' and finally to a indicates that equilibrium is being restored. One possibility is that the price mechanism works as supposed so that wage changes remove some excess demand in each period until equilibrium on the labour market is finally reached. Another possibility is that wage changes are fast enough to overcompensate any shift of the demand or the supply curve on the labour market. In sum, any movement away from a indicates that shifts of the demand and supply curve are more than offsetting the equilibrating forces of wage changes. On the other hand, any movement towards a shows that wage changes are strong and fast enough to overcompensate any disturbing shifts of the demand and the supply

I plead guilty to ignoring in that paper the asymmetry problem in order to concentrate on the link between the aggregate wage-Phillips curve and micro labour markets. Indeed, by linking the Phillips curve to competitive but non-instantaneously clearing labour markets I was outside of the neo-Keynesian tradition, and Cornwall is quite right to take issue with me on this point. Note, however, that neither Phillips nor myself, nor anyone else whom I know of in the early Phillips-curve tradition, ever drew an empirical Phillips curve which did not display the asymmetry that wages could rise fast in the face of excess demand and would fall only slowly in the face of excess supply. Phillips, for example, calculated the asymptotic rate of decrease in U.K. money wages as unemployment went to 100 per cent as 1 per cent per annum!

curve or that shifts of these curves help to restore equilibrium.

From the point of view of a trade-off interpretation of the curve, it is interesting to note that Lipsey (1960: 16) remarked that ongoing excess demand (point b') is only possible if “rightward shifts in demand and/or leftward shifts in supply were sufficient just to offset the equilibrating effects of changes in w , leaving excess demand constant.” Thus, Lipsey was fully aware that targeting any other point to the left of a would require ongoing excess demand and hence a disequilibrium in the economy engineered via deliberate and fast enough shifts of either the supply or the demand curve in such a way that market forces (the wage reaction) are unable to restore equilibrium in time.

If at all, such a trade-off does not emerge due to money illusion, but, as has been shown, is based on an endogenous adjustment of the speed of labour turnover.²⁶ Hence, it is frictional unemployment which is modelled as being endogenous to demand pressure. Of course, one drawback of such an approach emerges if the main reason for voluntary search unemployment is to find the employer offering the highest wage (subject to search costs) as then money illusion once again enters the stage: Slowly adjusting inflation expectations in combination with higher nominal wage offers due to excess demand may induce shorter search periods as perceived real wage offers are extraordinarily high—until the individual recognises the higher rate of inflation and adjusts once again (see for an overview Santomero and Seater 1978: 518f.).²⁷ Lipsey (1960: 14), however, explicitly made no assumption at all about the causes of search unemployment as “workers change jobs for any reason whatever”, so that the criticism just raised is, despite being reasonable as such, not applicable to the theoretical explanation brought forward by Lipsey (1960).

After having described Phillips’ and Lipsey’s *disequilibrium* approach to the Phillips curve, it is worth focusing on Friedman’s *equilibrium* approach to explain movements on the curve. Unfortunately, Friedman’s own explanation is not straightforward and completely worked out in his probably most famous contribution to the Phillips curve (Friedman 1968).²⁸ Hence, the following discussion builds mostly upon Friedman (1975, 1976). Friedman’s (1977b: 456) statement that “[o]nly surprises matter” is the essence for the existence of and movements on a short-run Phillips curve. This idea is depicted in Figure 1.8. In Friedman’s (1976: 221ff.) view, it is the anticipated real wage and not the nominal wage which is crucial for the amount of labour demanded and supplied. The equilibrium nominal wage thus must grow at the anticipated rate of inflation (abstracting from productivity growth). As these anticipations of changes in the rate of inflation (and hence of expected price levels in the future) adjust only slowly, an (unexpected) rise of the nominal wage will be first interpreted by workers as a rise of the real wage. Thus, such a rise in the nominal wage will cause a movement on the curve at first (from the initial equilibrium unemployment rate E_0 to E_F). This movement is the outcome of the effect that the rate of change of nominal wages becomes higher than the anticipated rate of change of prices—the difference between these two is shown on the ordinate.²⁹ However, contrary

²⁶Lipsey, in a correspondence with the author dated 27 July 2011, pointed out that it remains unclear whether or not Phillips himself accepted this underlying theoretical explanation resting on the speed of labour turnover.

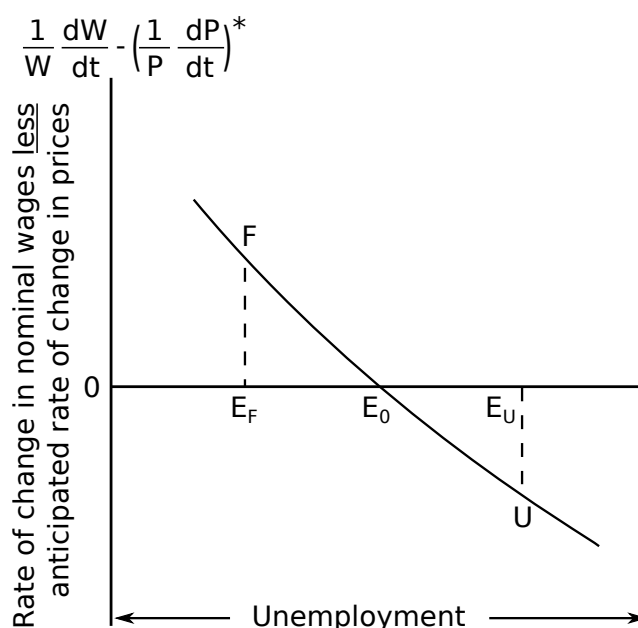
²⁷Such a model based on search unemployment and not fully adjusting inflation expectations, so that a long-run trade-off emerges, is developed in Holt (1969: 144ff.).

²⁸For a further discussion see De Vroey (2001: 128ff.) and Laidler (2012: 20ff.).

²⁹The mechanism described by Friedman rests on the assumption that there is a difference between expected and

Figure 1.8: Friedman's Derivation of the Short-Run Phillips Curve.

Source: Friedman (1975: 20). Redrawn. See Chapter "Copyright and Permissions" for further information.



to Lipsey, causality now runs from unanticipated price changes to unemployment (Friedman 1976: 222f.):

Suppose something, say, a monetary expansion, starts nominal aggregate demand growing, which in turn produces a rise in prices and wages at the rate of, say, 2 percent per year. Workers will initially interpret this as a rise in their real wage—because they still anticipate constant prices—and so will be willing to offer more labor (move up their supply curve), i.e., employment grows and unemployment falls.

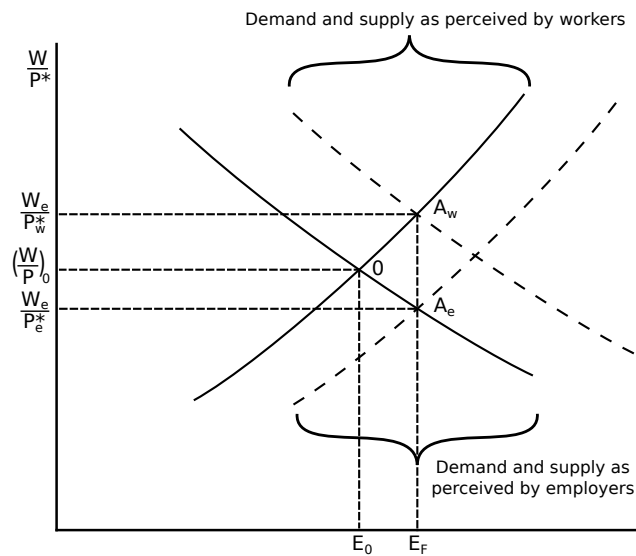
This rise in labour supply is fully absorbed by a rise in labour demand as employers “interpret a rise in the demand for and price of their product as a rise in its relative price and as implying a fall in the real wage rate they must pay measured in terms of their product” (Friedman 1976: 223). Hence, higher nominal wages imply higher real wages for employees as the general rise in the price level (or in the rate of inflation) is not recognised. On the other hand, for employers perceived real wages in terms of their product are falling. A rise of the rate of unemployment to E_U comes about *vice versa* by a decrease in the anticipated real wage. In both cases, the economy will move back to E_0 as soon as expectations about the rate of inflation adjust. Friedman (1976: 223) hence concluded that “[t]here is thus a *short-run* ‘trade-off’ between inflation and unemployment, but *no long-run* ‘trade-off.’”

realised rates of inflation, so that workers suffer from money illusion at first sight. However, such a short-run trade-off can also come about if wages are fixed for a longer time period while prices are (more) flexible. Due to this asymmetry regarding wage and price flexibility, such a trade-off based on surprise inflation can come about even if workers do not suffer from money illusion (see, for example, Frisch 1977: 1296).

Due to this misperception of changes in the rate of inflation, Friedman's supply and demand curves on the labour market (see Figure 1.9) thus shift implicitly (illustrated as the dashed lines) for the other party of the wage bargain. A demand expansion (starting from the employment level E_0 and the equilibrium real wage $(\frac{W}{P})_0$) induces workers to move up their labour supply curve because they interpret the rising nominal wage as a rise in the real wage since workers do not recognise that the general price level is rising (or rising faster than anticipated) at the same time. From their perspective, the demand curve of employers has shifted upwards as in their view employers are willing to pay higher real wages than before at every level of employment. Workers thus find themselves in A_w . They supply E_F units of labour at their perceived real wage $\frac{W_e}{P_w^*}$ (with W_e being the higher nominal wage offered by employers and P_w^* as the perceived, that is, too low and thus wrong price level). For employers, on the other hand, it seems as if the labour supply curve has shifted downwards. Workers seem to be willing to supply the same amount of labour at a lower perceived real wage of employers. Thus, employers move down their labour demand curve and settle at point A_e . Hence, they demand the same amount of labour E_F as supplied by workers but at a lower perceived real wage $\frac{W_e}{P_e^*}$. This is due to the fact that employers "count on being able to get a higher price" for their product (P_e^*), so that the real wage in terms of their product is falling despite paying higher nominal wages (W_e) (see Friedman 1976: 222ff.).

Figure 1.9: Labour Market Dynamics in Friedman's Model.

Source: Friedman (1976: 223). Redrawn. See Chapter "Copyright and Permissions" for further information.



Hence, the rise in employment comes about since the unexpectedly higher price level (or higher rate of inflation) is not yet incorporated into the wage bargaining process, so that real wages as perceived by workers and employers are different. This effect of an unexpected rise in the price level (or in the rate of inflation), however, will vanish as soon as expectations adjust.

For Friedman (1968: 8), there is thus only one level of unemployment which is compatible with fulfilled expectations: the "natural rate of unemployment". Reaching another level of unemployment will be possible only by accelerating inflation or deflation, so that (adaptive)

inflation expectations are never fulfilled. Causality thus runs from an unexpected change in the rate of inflation to a change in the rate of unemployment. From this it follows that the Phillips curve is reinterpreted as an aggregate supply curve since “fluctuations in output and employment in response to price level variations represent the voluntary choices of individuals operating in markets which are continually clearing” (Laidler 1981: 10; see also Lipsey 2010a: 371 and Lipsey 2010b: 377ff.).

Since workers and employers in effect stay on their supply respectively demand curve, Friedman’s model actually “features no unemployment” (Batyra and De Vroey 2012: 403; see also De Vroey 2001: 133), that is, no involuntary unemployment. Hence, there is always a temporary equilibrium on the labour market—even though it is unstable as it crucially depends on the misperception of the actually realised price level, since a change in the rate of inflation is not recognised.

In contrast, Lipsey’s explanation is about disequilibrium on the labour market with unemployment driving wages, so that the Phillips curve is a mechanism “to do the disequilibrium jobs” (Lipsey 1978: 70). Any change of the wage rate hence is a sign that there is some kind of disequilibrium on the labour market and at least one party is off their supply or demand curve. This distinction between Friedman’s equilibrium and the Phillips-Lipsey disequilibrium approach will be of importance throughout this thesis. The implications of this different approach for the trade-off between unemployment and inflation will be discussed more deeply in Section 2.6, 3.4, 5.5, and 5.6.

The misinterpretation of the original Phillips curve as an equilibrium relation was already prevalent shortly after Lipsey’s 1960 paper had been published. Lipsey and Steuer (1961: 19, n. 1) answered to the criticism of Downie (in Robinson et al. 1960: 280f.), who stated that Lipsey’s model regards “the level of wage rates for any period as an equilibrium rate” as “it can fruitfully be explained in terms of the intersection of supply and demand schedules” so that it focuses on “the magnitude one is trying to explain as the product of an equilibrium situation”. This view is essentially in line with Friedman’s model, but completely contrary to Lipsey’s (and Phillips’) approach.³⁰ Lipsey and Steuer (1961: 19, n. 1) thus emphasised:

Downie misses the whole point of the theoretical construct in any case. [...] The whole point of the Phillips-Lipsey model is that it is dynamic, not static. It relates the *rate of change* of wages to the *difference between* demand and supply.

An interesting view is provided by Corry and Laidler (1967: 190): They correctly remarked that causality regarding the Phillips curve runs from unemployment to wage changes. Further-

³⁰Lipsey (2000a: 238) pointed out that his theoretical underpinning was in line with Phillips’ view about the dynamics in an economic system:

My belief that I was reflecting Phillips’ own interpretation of his curve is based on the following considerations. First, I was in close contact with Phillips during the year that I was working on my article. If he had thought my interpretation was at variance with his, I would have known it. Indeed, when I tried to work with a market-clearing interpretation in which each point on the curve was generated by the intersection of relevant demand and supply curves, Phillips told me forcibly that he thought I was on the wrong track because his curve was a disequilibrium phenomenon.

Furthermore, Lipsey (1981b: 547) remarked that his disequilibrium view of the economy “was [...] taught to me by Bill Phillips when I was a junior staff member at the London School of Economics in the mid-1950s.”

more, they (1967: 191, my italics) also noted that “[s]ince the dependent variable in the Phillips relationship is a rate of change, its explanation must involve us in the *analysis of disequilibrium situations*: situations of excess demand or supply.” This is, as has been shown, fully in line with Lipsey’s and Phillips’ interpretation of the curve. On the other hand, however, Corry and Laidler (1967: 193) pointed out that rising or falling wages as a reaction to excess supply and demand as well as stable wages at some positive level of (frictional) unemployment “are hardly novel propositions, and the Phillips-curve analysis certainly does not derive its appeal from them.” What in their view is outstanding is that there is a “trade-off between the rate of increase of wages and the level of unemployment” for unemployment levels lower than the frictional level. Thus, in the same year (1967) as Friedman gave his Presidential Address to the American Economic Association (Friedman 1968), the curve is interpreted as a disequilibrium phenomenon and as offering “a trade-off between unemployment and inflation” (Corry and Laidler 1967: 197) at the same time—two interpretations which are not necessarily compatible with one another—at least without further assumptions.

One important element regarding such a trade-off based on disequilibrium dynamics is the idea that the slope and position of the Phillips curve in the aggregate depends on the state of demand within different micro markets. This approach will be very important for explaining the “Keynesian” notion of the trade-off between full employment and price stability in Chapter 5 and is thus discussed in the next subsection.

1.3.3 Micro versus Macro Relations

The relationship between the unemployment/wage-change mechanism on a single market and the average adjustment relation over all markets, that is, the Phillips curve, is discussed in Lipsey (1960: 17ff.).

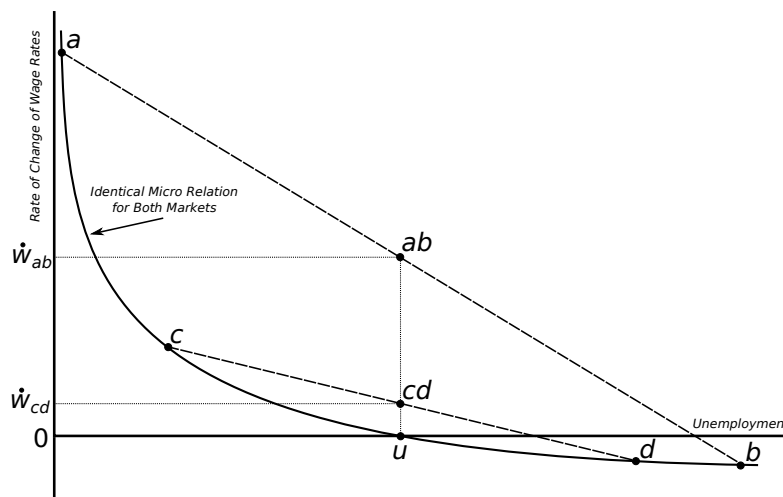
Even with identical adjustment relations across all micro markets the macro relation, which shows the aggregated behaviour over all micro markets, will have a different slope and location if unemployment is unequally distributed among the individual markets. This is owed to the fact that Lipsey’s Phillips curve is non-linear for unemployment rates lower than the equilibrium level. Thus, very low unemployment rates in some markets will cause a more than proportional rate of wage increases in these markets. On the other hand, high unemployment in other markets will only cause a proportional decline of wages as here the Phillips curve is linear. Hence, due to this special shape of the micro curves, an equal amount of unemployment on the macro level can point to different average rates of wage changes in the aggregate depending on the specific distribution of unemployment between the individual labour markets. This is sketched in Figure 1.10 which illustrates the issue within a two-sector economy:³¹ The same rate of unemployment u in the aggregate can be associated with different aggregate rates of change of wage rates \dot{w}_{ab} and \dot{w}_{cd} depending on the distribution of unemployment between the two micro markets. Assume that both micro markets have the same micro relation and have the same weight in the macro relation. However, if unemployment is spread very unequally across both markets, that is, one sector settles at point a and the other one at point b , then

³¹For illustrative purposes the micro relation to the right of u is drawn as being non-linear instead of linear. However, this does not alter the result in general as long as one market faces excess demand and thus falls into the non-linear part of the original relation proposed by Lipsey.

the average macro outcome will be at point ab . At this point, aggregate unemployment is at u while wages rise at \dot{w}_{ab} on average. If the variance of the spread of unemployment over both markets is lower, as is the case at the points c and d , then the same unemployment rate u can be in line with a less strong change in wage rates in the aggregate, that is, \dot{w}_{cd} .

Figure 1.10: The Relation Between the Micro and Macro Curve.

Source: Own illustration.



The whole macro relation therefore will have an upward bias compared to the micro relation and will have a non-linear shape over all possible rates of unemployment as soon as the unemployment rate in one particular micro market falls into the non-linear part of the individual relation (see Lipsey 1960: 19). Furthermore, due to “the upward displacement of the macro-observations, the observed macro-relation between \dot{W} and U will always tend to overstate the upward flexibility and to understate the downward flexibility of wage rates to be found in a typical individual market” (Lipsey 1960: 19). Hence, downwardly rigid wages in the aggregate relation do not necessarily reflect the extent of the rigidity of wages in each micro market.

The degree of inequality regarding the distribution of unemployment between all markets thus plays a crucial role for the actual shape and position of the Phillips curve on the aggregate level. A specific Phillips curve hence can only be used to predict wage changes *ceteris paribus*, that is, under the assumption that the inequality with respect to the sectoral distribution of demand stays the same over time (Lipsey 1960: 19):

If one wishes to predict the rate of change of money wage rates (\dot{W}), it is necessary to know not only the level of unemployment but also *its distribution between the various markets of the economy*.

In this respect, Lipsey (1960: 19) pointed out that economic policy may aim at decreasing the degree of inequality as this would shift the macro Phillips curve downwards. Most interestingly, also Phillips (1958b: 295) hinted at the hypothesis that the distribution of unemployment plays a role for the overall rate of inflation as he noted that “[t]he extremely uneven geographical distribution of unemployment may also have been a factor tending to increase the rapidity

of wage changes during the upswing of business activity between 1934 and 1937.” Moreover, Phillips (1962: 12) remarked that a “lack of mobility of labour and industry, resulting in uneven geographical and occupational distribution of unemployment” might be a reason why wages rise despite “significant unemployment”.

The change in the distribution of unemployment between different labour markets throughout a business cycle was brought forward by Lipsey (1960: 21ff.) as an alternative explanation for the loops observed by Phillips: Lipsey (1960: 5ff.) investigated Phillips’ tentative idea that wage changes do not only depend on the level of unemployment, but also on the rate of change of unemployment which is the main explanation of the observed loops Phillips found surrounding the curve. “Loop” in this discussion means that wage rate changes were usually found to be higher than predicted by the Phillips relationship when unemployment was falling and lower than predicted when unemployment was rising, which implies an anticlockwise movement around the Phillips curve during a business cycle. Phillips (1958b: 291, n. 1; 292f.) explained these anticlockwise loops by an influence of the rate of change of unemployment, since employers would be bidding more strongly for labour when unemployment is falling than when it is rising (see Phillips 1958b: 283; see also Lipsey 1960: 20f.). The change in the direction of the loops from being anticlockwise to a clockwise loop from 1953 to 1957 (see Phillips 1958b: 297) was then explained by Phillips (1958b: 297) by referring to the argument that the unemployment rate might influence wage changes only with a certain time lag (which implies clockwise loops). This lag, Phillips (1958b: 292f.) argued, could be the result of increased collective bargaining or arbitration and conciliation procedures. Furthermore, Phillips (1958b: 292) also noted that the influence of the rate of change of unemployment had become less important over time as the loops seemed to narrow. However, Lipsey (1960: 7ff.) found no empirical evidence that the influence of the change of the rate of unemployment on wage changes had become less strong over time.

Due to this evidence against Phillips’ hypothesis and also for theoretical reasons, Lipsey (1960: 21ff.) was in favour of a different explanation for the loops. These loops, according to his alternative hypothesis, would be the outcome of systematic displacements of the macro relation due to a changing dispersion of unemployment across the sectors during a business cycle. Anticlockwise loops (as observed by Phillips for all but one period) in Lipsey’s (1960: 27) approach emerge if the upswing causes a rise in the unequal distribution of unemployment while a downswing affects all sectors equally and at the same time (this hypothesis was tested by Smyth 1979 and rejected). Hence, a change in the direction of the loops from anticlockwise to clockwise could be explained by the change from increasing inequality in the upswing and decreases thereof in the downswing (anticlockwise) to decreasing inequality in the upswing and increases in inequality in the downswing (clockwise).

Furthermore, following Lipsey (1978: 62, n. 14) a change in the direction of the loops³² might also be explained by the amplitude of cyclical fluctuations: If the amplitude of such fluctuations is high, then the sectoral distribution of unemployment plays an important role for

³²Knowles and Winsten (1959: 119), however, brought forth another explanation for the change of the direction of the loops as they stressed the effect of cost of living adjustments on wages as a possible source for clockwise loops—an idea already hinted at in Lipsey (1960: 11) and later also emphasised by Phelps (1972: 47). Indeed, in modern terms, fully adjusting inflation expectations over a business cycle would cause clockwise shifts of the short-run Phillips curve around the “natural rate of unemployment”.

anticlockwise loops, whereas Phillips' approach to explain clockwise loops (lagged unemployment) becomes more influential if the amplitude of such fluctuations is low, so that the overall moderation of cyclical fluctuations since the Second World War may explain the change in the direction of the loops from being anticlockwise to clockwise.

The effects of the distribution of unemployment between separated labour markets were picked up in Lipsey's later work, for example, Lipsey and Parkin (1970: 117ff.) and, as will be pointed out in Chapter 5, played an important role for explaining the perceived incompatibility between full employment and price stability.

Lipsey's disequilibrium model, however, seems to stand in contrast to his 1965 long-run trade-off contribution, which also played an important role in the Phillips curve debate, since Lipsey's paper was one of those contributions to which Phelps (1967: 255, n. 1) referred to in his well-known essay on the necessary distinction between the short-run and long-run Phillips curve trade-off (see Section 5.7).

1.3.4 The 1965 Contribution: The Phillips Curve as a Trade-Off Relation

Lipsey (1981b: 557, n. 16) recalled that he "followed the lead of Samuelson and Solow (1960) in treating the Phillips curve as if it provided a stable long-term menu of choice between inflation and unemployment." Furthermore, Lipsey (1997c: 353) admitted that "[t]he [1965] paper reads in a somewhat dated fashion because of its use of a negatively sloped, long-run Phillips curve."

Lipsey's 1965 contribution deals with the contemporary discussion about the sources of unemployment in the USA, that is, whether unemployment is demand-deficient or structural.³³ The first part of Lipsey's (1965: 210) paper discusses this issue on theoretical grounds as it "attempts to define various types of unemployment in a way which is operationally meaningful." Lipsey's approach is explicitly based on a trade-off between inflation and unemployment (Lipsey 1965: 210f.):

Consider the problem of reducing unemployment. Almost everyone would prefer less unemployment to more unemployment *ceteris paribus*. Problems arise, however, when the objective of reducing unemployment conflicts with other objectives such as maintaining a stable level of prices and a satisfactory balance of payments.

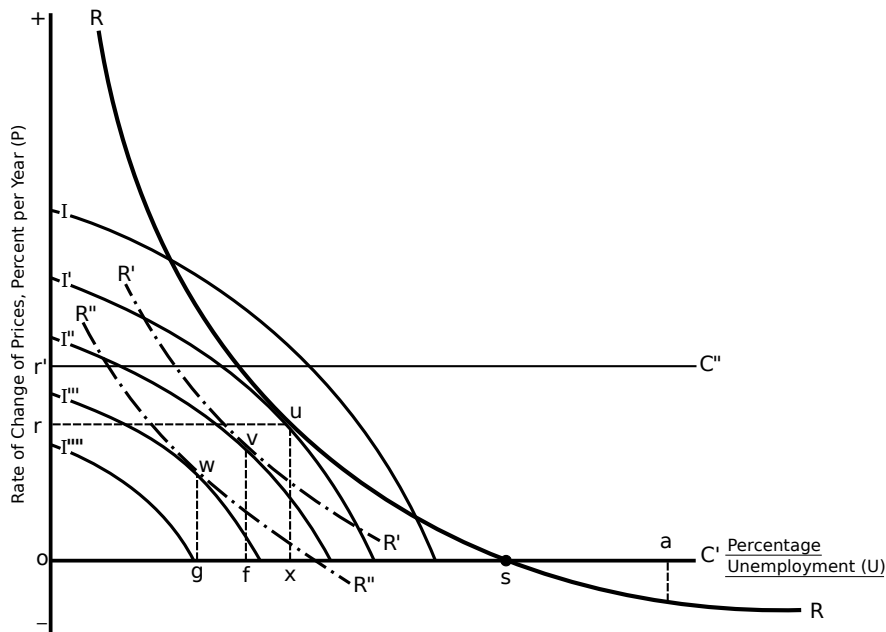
Figure 1.11 shows this policy dilemma as society (preferences represented by the indifference curves I, I', I'', I''', I'''') has to decide between different combinations of unemployment and inflation, while combinations closer to the origin of ordinates are preferred. All possible combinations which are attainable by using aggregate demand policies lie on the RR curve which is explicitly based on the Phillips curve (see Lipsey 1965: 212, n. 1).

For given preferences (for example, indifference curve I') between unemployment and inflation, the policymaker hence will choose point u with $0r$ being the "acceptable rate of inflation" which "is worth incurring in order to reduce unemployment" (Lipsey 1965: 213). The unemployment rate which will therefore be maintained (and is also attainable) by demand management

³³See, for example, also the study by the Commission on Money and Credit (1961: 27f.) and Neil (1964). Lipsey's 1965 approach also influenced a passage in the forth edition of Lipsey's textbook (Lipsey 1971: 693f.) which deals with the causes of and cures for structural and deficient-demand unemployment.

Figure 1.11: Structural vs. Deficient-Demand Unemployment.

Source: Lipsey (1965: 211). Redrawn. See Chapter "Copyright and Permissions" for further information.



is $0x$. Of course, absolute constraints on some variables are also possible (for example, as given by the horizontal lines $r'C''$ or $0C'$), which indicate that the policymaker is willing to only accept inflation up to $0r'$ and 0 respectively.

It may be possible to shift the RR curve by structural measures to the left (for example, by reducing inequalities of excess demand between separated labour markets or by reducing the time necessary for adjustments on the supply side; see Lipsey 1965: 213). RR might also shift endogenously in the sense that ongoing high demand may foster the reduction of unequally distributed excess demand for labour across separated labour markets (see Lipsey 1965: 213, n. 3). This argument is very much in line with Lipsey (1960: 19, n. 4).

However, the costs of such structural measures need to be taken into account, so that a cost-benefit analysis becomes necessary. Thus, shifting RR to $R'R'$ and therefore reducing the unemployment rate from $0x$ to $0f$, will be only beneficial if the increased additional output is higher than the costs involved in these structural measures. Of course, not all such supply side policies will have a positive net gain in strictly monetary terms. For example, shifting $R'R'$ to $R''R''$, so that an unemployment rate of $0g$ becomes attainable, might be possible by introducing “structural measures which would be desirable on social grounds in spite of showing a net monetary loss” (Lipsey 1965: 214).

By making use of this model it becomes possible to differentiate between different kinds of unemployment and to arrive at a definition of full employment: Consider the case in which current unemployment is $0a$. Given the RR curve and society's preferences (I') about inflation and unemployment, unemployment of the amount of ax can be interpreted as “deficient-demand unemployment in the sense that this much unemployment could be removed by raising aggregate demand without creating unacceptable conflicts with other goals of policy” (Lipsey

1965: 214), which points at a long-run Phillips curve trade-off. On the other hand, regarding the costs and benefits of shifting the Phillips curve, xg represents structural unemployment which can be removed by supply side policies which “pay for themselves” on a monetary base (shifting RR to $R'R'$) and/or which are desirable ($R'R'$ to $R''R''$) because of “nonpecuniary social benefits” (Lipsey 1965: 214). Hence, the remaining unemployment of $0g$ can be considered to be frictional unemployment as there are no (perceived) monetary or social net benefits so that “the persistence of this amount of unemployment is thus consistent with our notion of full employment and we may define $0g$ as full employment” (Lipsey 1965: 214).

Of course, defining the amount of unemployment at $0g$ as the full employment level is by far less objective than other definitions, for example, point s , since at this unemployment rate prices would be stable, indicating that there is no excess demand or supply on the labour market. However, Lipsey is fully aware of these “value judgements”³⁴ emphasising that “point s is objectively determined and independent of the decision takers’ preferences” (Lipsey 1965: 214f.), whereas, on the other hand, u “involves preferences as well as the objective RR curve” (Lipsey 1965: 215). Equally subjective is point v , which is determined by the objective $R'R'$ curve (as costs and gains of shifting RR to $R'R'$ can be objectively calculated) but is also determined by the subjective preference function I'' . Point w is completely subjective as full employment is now determined by the subjective $R''R''$ curve (as the social desirability of shifting the curve cannot be expressed objectively in monetary terms) and the preference function I''' .

As a consequence of this approach, no objective, but only a subjective, separation between deficient-demand, structural, and frictional unemployment (that is, full employment) is possible. In effect, “structural unemployment is that part of frictional unemployment which is not acceptable either because there would be a net money gain in removing it or because the social gains of removing it are judged to outweigh the *net* money cost of so doing” (Lipsey 1965: 215). This indicates that full employment, in an extreme interpretation, might also be zero unemployment as soon as policymakers decide that all remaining unemployment after an appropriate increase in aggregate demand should be cured by supply side policies. On the other hand, any amount of structural unemployment can be declared to be in line with frictional unemployment—and hence full employment—if only the policymaker is convinced that there are no monetary or non-monetary net gains of removing the remaining non-deficient-demand unemployment.

However, not only the definition of frictional unemployment and thus full employment becomes subject to policymakers’ preferences. Also the definition which amount of unemployment should be cured by demand policies is influenced by such subjective judgements as “by deficient-demand unemployment we mean unemployment which can be removed by raising aggregate demand without encountering *unacceptable* conflicts with other goals of policy” (Lipsey 1965: 215), that is, in particular, the rate of inflation.

Lipsey’s approach of focusing on both deficient-demand and structural unemployment hence had far-reaching policy implications as beforehand full employment was often considered to be reached as soon as there is no deficient-demand unemployment (that is, unemployment of $0x$ in Figure 1.11). For example, the Council of Economic Advisers (1962: 46) defined full em-

³⁴See also Ackley (1966: 176f.) on the issue of value judgements with respect to economic policy.

ployment to be reached as soon as a “further expansion of expenditure for goods and services, and for labor to produce them, would be met by only minor increases in employment and output, and by major increases in prices and wages.” Exactly this approach is criticised by Lipsey (1965: 215f.), since this definition neglects the possibility of shifting the Phillips curve by appropriate supply-side policies:

This makes all unemployment deficient-demand unemployment by definition in the sense that, whatever its causes, full employment can always be restored solely by increasing aggregate demand. Any structural change which shifts the *RR* curve to the right merely raises the level of *U* at which full employment is defined to occur. Clearly, there is nothing to be gained by this defining away of the problem, and it is thus necessary to define the goal of full employment which is similar, if not identical, to the one adopted here.

Lipsey thus argued that full employment should not be defined in a narrow sense by referring solely to the acceptable rate of inflation (that is, a movement on the Phillips curve until inflation becomes too high for comfort), but also to the costs and gains of shifting the Phillips curve to the left by structural policies.

In sum, on the one hand, Lipsey’s contribution provides a definition of different kinds of unemployment. On the other hand, however, it sheds light upon the issue of how the “menu of choice” interpretation of the Phillips curve opened Pandora’s box as any unemployment rate could be defined as deficient-demand unemployment if only the policymaker is inclined to accept the accompanying inflation. The relative amount of structural and deficient-demand unemployment hence ultimately depends on the preferences of the decision-maker (see Lipsey 1965: 216). This definition of different kinds of unemployment thus “is based on cures rather than on causes” (Lipsey 1965: 216).³⁵

Lipsey’s treatment of the problem of defining the unemployment rate consistent with full employment hence was based on a long-run Phillips curve trade-off in combination with a set of indifference curves. In effect, the definition of full employment became a subjective one. Tobin (1972b: 2) therefore correctly stated that “[t]his view [the Phillips curve] contained no concept of full employment. In its place came the tradeoff, along which society supposedly can choose the least undesirable feasible combination of the evils of unemployment and inflation”, so that a clear definition was replaced by “a zone of more and less full employment” (Tobin 1997: 4). This issue of the difficulty of defining full employment will play an important role in Section 5.1.

The overall policy proposal out of Lipsey’s analysis is straightforward: The first step would be to reduce unemployment by expansionary policies until inflation becomes unacceptable, so that deficient-demand unemployment is zero. After that, any remaining unemployment might be removed by structural measures (see Lipsey 1965: 217). Lipsey (1965: 217) hence concluded:

³⁵However, for Vanderkamp (1966: 221) there is one important advantage of this definition as testing this hypothesis becomes straightforward: “Lipsey defines structural unemployment with reference to the empirical trade-off relationship between unemployment and price changes. Although it would seem possible to devise an alternative definition which relies on information concerning individual labour markets, the definition advanced by Lipsey has the advantage of testability. That is, providing one can agree on the specification of the trade-off relation it is possible to say whether or not structural unemployment has increased in a particular period.”

Thus in a perfect world, in which policy makers acted rationally, we would behave *as if* we were deficient-demand theorists and increase aggregate demand until the limit set by acceptable price rises was reached; we would then all behave as structuralists and consider how the remaining unemployment could be removed.

Lipsey (1965: 217) furthermore seemed to be optimistic that such fine-tuning is indeed possible or, at least, that the dangers inherent in active demand management are negligible so that demand policies should always be tried:

The worst that could happen if we followed this policy is that we might overshoot the mark and experience rates of inflation one or two percentage points above the acceptable level for a short time until demand could be lowered to the desired level. Of course, there can be no finality about value judgments, but I should regard anyone who opposed this policy because of fear of inflation as having either an insufficiently thought-out position or a set of value judgments that were definitely perverse judged by any common standard. The *possibility* of incurring a once-for-all rise in the price level of one or two percentage points [due to a too high increase of demand which will then be reversed] cannot be regarded as a high price to pay in order to discover by how much unemployment can be reduced by using the relatively simple tools of fiscal policy.

Lipsey (1965: 218), however, also emphasised that a deeper analysis of the causes of unemployment is necessary as, for example, it is important to know whether or not the current unemployment rate is an idiosyncratic problem or the outcome of a long-term trend. Such an empirical investigation takes centre stage in the remainder of Lipsey's paper.

Lipsey's 1965 analysis fits very well into economic research at that time: In the same year, Okun (1965) and Musgrave (1965) dealt with similar issues. Particularly Okun (1965: 74) pointed at the "Phillips Curve dilemma". Very much in line with Lipsey (1965), Okun (1965: 69) emphasised that "[i]t is the risk—or indeed the fact—of inflation, not any absolute limits to the potency of aggregate demand, that sets the restrictions on our unemployment target." Even though Okun (1965) did not draw any diagram to illustrate the Phillips curve trade-off, the approach Okun (1965: 70) had in mind is comparable to that of Lipsey (1965):

The choice of an unemployment target therefore is a typical economic trade-off, which requires balancing the evil of inflation, on the one hand, with lost production and joblessness on the other. Every graduate student knows the formal solution for such a problem: crank in a preference function and an opportunity locus, and grind out an optimal solution. The preference function here obviously involves some weighing of the welfare costs of a little more danger of inflation versus the benefits of a little bit more production.

Hence, the Phillips curve is "[t]he opportunity locus relevant to our choice" (Okun 1965: 70). However, "hard-core unemployability, bottlenecks, and wage-price pressures" have a potential to "limit our unemployment target" (Okun 1965: 78). Thus, "[i]t is essential that aggregative policies, manpower policies, and wage-price policies be recognized as complementary tools to

achieve noninflationary full employment” (Okun 1965: 80). Hence, as in Lipsey (1965), demand-side policies and supply-side policies go hand in hand and are rather complementary than substitutable means (see also Musgrave 1965: 93ff.).

What stands out is the fact that demand policies are definitely regarded as a powerful tool to remove unemployment at the cost of higher inflation since some kind of a stable Phillips curve trade-off was assumed. Peirce (1965: 98), who summarised the contributions of Okun (1965) and Musgrave (1965), hence concluded that “they were also unanimous in suggesting that aggregate demand should be increased further in order to reduce unemployment.” However, as will be shown in Section 5.3, proposals of such expansionary aggregate demand policies were based on the underlying assumption of involuntary unemployment.

1.3.5 Summary

Lipsey’s 1960 contribution was a pioneering article in two aspects: It not only provided a further empirical investigation of the Phillips relationship, but also offered a model to explain the specific shape of the curve.

Lipsey’s empirical contribution to the Phillips curve was, despite some inaccuracies which gave rise to later criticism, a very important step towards establishing the Phillips curve in the economics profession. This empirical assessment furthermore reflected the change in the methodology at the LSE in the late 1950s. The Phillips curve hence became an “exercise in positive economics” (Laidler 1997: 101). In this sense Lipsey’s contribution was the first one of a whole industry of estimating the curve,³⁶ or, as Phelps (1985: 581) put it: “If you didn’t find the curve you didn’t publish.”

With respect to the theoretical explanation of the Phillips curve the differences between Lipsey’s and Friedman’s approaches are striking: It has been shown that Lipsey’s 1960 model was very different from that of Friedman (1975, 1976) regarding causality and the general setup of the economy. Whereas Lipsey followed Phillips in treating the curve as an adjustment mechanism in disequilibrium situations, so that changes in quantities cause changes in prices, Friedman followed Fisher (1926b)³⁷ regarding causality: unexpected changes in prices cause a temporary deviation of the quantities supplied and demanded from their “natural” levels. Nonetheless, these deviations are not disequilibria as the market remains cleared and no party is off their supply and demand curve. Contrary to Friedman, Lipsey (1960) emphasised the necessity of analysing different micro markets in order to explain the macro relationship.

Lipsey’s and Friedman’s theoretical explanations of the Phillips curve hence are different in many important aspects. Whereas Lipsey’s analysis is an attempt to explain the nature of

³⁶See, for example, Goldstein (1972) and Qin (2011) for an overview and Rees and Hamilton (1967) for important caveats regarding the estimation of the Phillips curve.

³⁷In a series of articles, Fisher (1925, 1926a, b, 1933) argued on empirical and theoretical grounds that a change in the price level influences the level of employment due to contractually fixed wages. Even though Fisher (1926b: 1) spoke of “a matter as intensely human as the employment problem”, the policy implication in his view is not to make use of this trade-off to lower unemployment by means of inflation, but to stabilise the price level in order to avoid fluctuations in employment (see particularly Fisher 1933: 158f.) since Fisher (1926a: 29) remarked that “I firmly believe that we would solve the problem of unemployment for the most part if we could stabilize the dollar.” On Fisher’s 1926b essay, which was reprinted as Fisher (1973), see Donner and McCollum (1972) and Section 2.7.

inflation and its relation to the rate of unemployment, so that the Phillips curve is the outcome of an economy in ongoing disequilibrium, for Friedman the curve shows up as an artefact caused by monetary surprises.

However, and without doubt, there is also a sharp contrast between the disequilibrium interpretation in Lipsey (1960) on the one hand, and the trade-off reading of the Phillips curve in Lipsey (1965) on the other hand.³⁸ In the former contribution a trade-off, if at all, is interpreted as temporary and would not exist if prices were allowed to adjust instantaneously, so that excess demand and excess supply would be non-existent. Moreover, the relation between excess demand and changes in the level of unemployment is explained by the effect of excess demand on the speed of labour turnover. Excess demand positively influences the speed of labour turnover and therefore causes a fall of frictional unemployment.

On the other hand, in the 1965 contribution a long-run trade-off between inflation and unemployment is not only assumed, but also explicitly presented as a tool for economic policy. It is exactly this “menu of choice” interpretation of the curve that one would expect after having read Friedman (1968) and Phelps (1967).³⁹ Indeed, Lipsey’s 1965 contribution built the basis (together with Okun 1965) for Phelps’ famous 1967 essay. Furthermore, Lipsey also emphasised the trade-off view in his textbook (1963: 429, my italics):

The idea that there is a relation between the level of unemployment and the rate of change of prices *opens up the spectre of more or less continuous inflation to governments committed to a policy of full employment*. This suggests that a government may have to *choose between really full employment and a stable price level*.

Such statements indeed give the impression that Friedman’s account of “Keynesian” Phillips curve analysis was correct without much room for a different view. But as the next essays and the concluding discussion will show, the trade-off interpretation was by far more complex and diverse.

The next chapter will take a closer look at the original Phillips curve and its role within Phillips’ research programme. It will particularly highlight the role of the Phillips curve as a relation which shows the speed of adjustment if the economy is in disequilibrium. Furthermore, the trade-off interpretation of the curve which can also be found in Phillips’ writings will be discussed. Chapter 3 will then focus on this trade-off view by investigating Samuelson’s and Solow’s “menu of choice” reading of the curve and the cost-push demand-pull debate about the causes of inflation. It will also shed light on Friedman’s critique regarding this trade-off. Moreover, it will be shown that despite the trade-off view taken in Samuelson and Solow (1960), the Phillips curve was not interpreted as a stable relationship over time. Particularly the possibility of adjusting inflation expectations or hysteresis on the labour market as well as the influence of the rate of unemployment on the rate of growth were discussed as shift parameters of the curve. The last article included in this thesis (Chapter 4) will thus investigate the issue

³⁸Lipsey (1985: 14) remarked with respect to his 1965 contribution that he stayed in the disequilibrium interpretation of the Phillips curve but thought that such “a transitory disequilibrium relation could be perpetuated to produce a result that persisted into the long term.”

³⁹Forder (2010a: 340 and 2014: 127, n. 9) takes a different point of view by emphasising that Lipsey tried to disentangle different kinds of unemployment.

of choosing an optimal point on the Phillips curve with respect to the rate of growth. The discussion in Chapter 5 will then offer a synthesis of the different views. It will be shown that “Keynesians” indeed treated the Phillips curve as a long-run trade-off. However, the Phillips curve trade-off was not understood as an opportunity set for engineering surprise inflation to push the economy beyond full employment, but as constituting a policy dilemma since full employment seemed to imply a positive rate of inflation.

2 A.W. Phillips and His Curve: Stabilisation Policies, Inflation Expectations and the ‘Menu of Choice’

Abstract

This paper investigates the interpretation of the Phillips curve by Phillips himself. It will be shown that Phillips primarily understood his curve as a disequilibrium relation to be used in his models on stabilisation policies and not necessarily as a long-run ‘menu of choice’ between inflation and unemployment, even though Phillips did not oppose and sometimes even appears to have endorsed this interpretation. Inflation expectations are discussed by Phillips as well. Contrary to Friedman, price expectations drive his system from the demand side but not from the supply side of the economy. Nonetheless, price expectations may induce dynamic instability.

Keywords: Phillips curve, menu of choice, trade-off, inflation expectations, unemployment

Acknowledgements

The first version of this paper was presented at the Young Scholars Seminar at the ESHET 2011 Conference in Istanbul, for which financial support to participate was gratefully provided by ESHET. I thank Harald Hagemann, Peter Spahn and Hans-Michael Trautwein for very helpful comments and suggestions. Jean-Sebastien Lenfant encouraged me to submit the paper. Helpful discussion and proofreading from Michael Delmundo Cando, Laura Cardwell, Julian Christ, Larissa Talmon-Gros, Patricia Hofmann, Arash Molavi Vasséi and all the participants of the Ph.D. seminar ‘Money, Employment and Growth’ is also gratefully acknowledged. My colleague Niels Geiger stood out as the most helpful discussant. Annalisa Rosselli and Rodolphe Dos Santos Ferreira provided very helpful comments on another article on the Phillips curve which also helped to improve this paper. I am particularly and deeply indebted to David Laidler and Richard Lipsey for pointing out those small details that make all the difference. Two anonymous referees provided most valuable help to shape the paper into its final form. Of course, all responsibility for the views expressed and for any remaining errors is mine alone. Without the Ph.D. scholarship through the Evangelisches Studienwerk Villigst e.V. (Ph.D. Program Globalization and Employment), this paper would not have been written. It is dedicated to my father.

Any time seems to be the right time for reflections on the Phillips curve.

Robert M. Solow (1976: 3)

2.1 Introduction

Since its discovery by A.W. Phillips in 1958, the interpretation of the Phillips curve has changed remarkably: in 1960, the ‘menu of choice’ reading of the Phillips curve by Samuelson and Solow paved the way for its application to economic policy. The well-known critique of this long-run trade-off between inflation and unemployment and the introduction of adaptive inflation expectations by Phelps (1967) and Friedman (1968)¹ followed soon afterwards. Finally, the incorporation of rational expectations (Lucas 1972, 1973 and Sargent 1973) denied a trade-off even in the short run. Phillips’ use of the curve in his own research programme, however, had little in common with this development: Phillips’ original interpretation of the Phillips curve as depicting an adjustment relation in his stabilisation models was outlined and emphasised particularly by Leeson (1997b) and also by one of Phillips’ closest research fellows, Lipsey (1978). Nonetheless, ambiguous statements by Phillips, especially considering the ‘menu of choice’ interpretation of the curve, are not the focus of attention. This paper thus offers an extensive review of Phillips’ contributions with regard to the Phillips curve aiming at clarifying three core questions: the first issue is whether Phillips interpreted his curve as a stable ‘menu of choice’ between inflation and unemployment. This question is closely related to the second one which is aimed at Phillips’ own preferences towards inflation and unemployment. A third and last issue is whether or not Phillips was aware of the relevance of inflation expectations for his curve. This paper focuses on Phillips’ contributions in a chronological order to provide a better survey of the timing of important ideas and theoretical developments. Starting with Phillips’ theoretical curve, which was published four years before his seminal paper in which he estimated the Phillips curve, the discussion will move along his later contributions. Focus will be placed on the Australian Phillips curve and his inaugural lecture given at the London School of Economics and Political Science in 1961, as both contributions seem to stand in contrast to his previous interpretations of the curve. Finally, Phillips’ influence on the monetarist counter-revolution will be addressed. The conclusion will give the reader one possible interpretation of Phillips’ somehow contradictory views on the Phillips curve.

2.2 Phillips’ Theoretical Curve

Rather unknown among economists today is Phillips’ (1954) paper ‘Stabilisation Policy in a Closed Economy’ in which Phillips presents a further development in the theoretical frame-

¹See Forder (2010) for possible forerunners.

work of his Ph.D. dissertation which was finished in 1953. Phillips, in this paper, introduces and discusses a theoretical Phillips curve. The core issue raised in this contribution concerns the dangers inherent in stabilisation policies: Phillips criticises simple multiplier models as a basis for recommendations for stabilising aggregate production and employment, since only comparative statics are being used. Therefore, the adjustment process and variation of prices and interest rates cannot be dealt with. Baumol (2000: 283) points out that automatic stabilisers were increasingly favoured over discretionary policy at that time, without much research about the impact of such automatic stabilisers on the dynamics of an economic system – a question which became one of Phillips' main research interests (and was also one concern of Friedman, for example 1948: 254f.). Phillips' engineering background proved to be of importance 'as engineers have long known about these dangers in automatic stabilization devices' (Baumol 1961: 21, fn. 1). Thus, Phillips (1954: 290) points out that an economic policy aimed at stabilising the economy may even destabilise the system if the dynamics of the adjustment process are ignored:

It is quite possible that certain types of policy may give rise to undesired fluctuations, or even cause a previously stable system to become unstable, although the final equilibrium position as shown by a static analysis appears to be quite satisfactory.

Phillips bases his own analysis on a model consisting of an accelerator-multiplier interaction, where pioneering work had been done by Samuelson (1939) and Hicks (1950) (see Turnovsky 2011: 68), whereas Phillips now applies methods used in dynamic control theory, which were originally developed in engineering, to analyse and improve the stability of the system (see Bollard 2011: 5). In the first part of his paper, Phillips discusses different kinds of stabilisation policies² under the restrictive assumption that prices and interest rates remain constant. However, Phillips (1954: 293) is not reluctant to accept other stabilisation goals besides price stability and full employment as the 'level of production which it is desired to maintain [...] may be based on a number of other economic, political or social considerations.'

In the second part of his article, Phillips (1954: 307ff.) further discusses his model and different stabilisation policies now assuming flexible prices. Therefore, Phillips introduces his theoretical curve,³ relating the rate of change of factor prices and thus of inflation \dot{P} to the 'error in production' ($P^a - P^t$) in the economy where P^a is actual output and P^t is the target level (with

²Three different stabilisation policies and a combination thereof are considered and introduced by Phillips (1954: 294ff.). All three policies have in common that they react oppositely in sign and proportionally in magnitude to their respective variable: 1. Proportional stabilisation policy (reaction to the current error): This stabilisation policy responds directly to the 'error in production', that is, if actual output differs from potential output. 2. Integral stabilisation policy (reaction to the sum of past errors): This stabilisation policy is a function of the cumulated deviations from the target. 3. Derivative correction (reaction to the rate of change of the error): The last proposed policy rule reacts to the change of the variable chosen to be stabilised. Phillips' (1954) contribution is extended by more realistic time-lag assumptions in Phillips (1957). See also Turnovsky (2000: 297ff.) and Turnovsky (2011: 68ff.) on Phillips' stabilisation policies.

³Laidler (2002: 228) and Lipsey (2010b: 380, fn. 3) remark that Phillips himself had been mainly inspired by the work of Hansen (1951) for deriving his curve.

θ as a proportionality constant as Phillips assumes linearity for small changes in production, simulating his model with θ equal to 0, 0.5, 1 and 2):⁴

$$\dot{P} = \theta(P^a - P^t)$$

Phillips assumes a given quantity and productivity of productive factors so that changes in the level of prices will be mainly influenced by changes in factor prices driven from the demand and not the supply side. Nevertheless, already in this early stage of his work, Phillips (1954: 307f.) addresses central arguments of the later well-known Phillips curve, as his theoretical curve is also non-linear – it becomes nearly horizontal in the case of underutilisation and nearly vertical when facing a very high level of economic activity. This non-linearity of his curve is based on the assumption that the rigidity of factor prices will be higher in the case of a low level of production.⁵ This non-linear approach is in stark contrast to other concepts used at that time: first of all, Lipsey (2000: 233f.) points out that Phillips found the concept of the reverse L-shaped Keynesian supply curve (in price level output space) – being horizontal until full employment is reached – as too restrictive for his analysis of different stabilisation policies, because such a kinked supply curve will lead to a dichotomised model as ‘any level of income [until full employment][...] is associated with stable prices, while any amount of inflation can be associated with full employment income’ (Lipsey 1978: 52). Also, Yamey (2000: 338, fn. 1) remarks that Phillips was in search of a better fitting supply curve even earlier for use in his macroeconomic machine (see Phillips 1950), which was later known as the MONIAC (Monetary National Income Automatic/Analogue Computer),⁶ a term coined by Abba Lerner (see Bollard 2011: 5). Phillips also offers a graphical representation (see Figure 2.1).

Phillips (1954: 307) explains the output level compatible with price stability in the following way, which Pagan (2000: 132) interprets as an early description of the concept of the ‘natural rate of unemployment’ (Friedman 1968: 8):

Even with flexible factor prices, there will be some level of production and employment which, given the bargaining powers of the different groups in the economy, will just result in the average level of factor prices remaining constant [...]

This level of equilibrium output and employment will be lower, which indicates that the curve will shift to the left, ‘the stronger and more aggressive the organisation of the factors of production’ (Phillips 1954: 307).

Interestingly, Phillips (1954: 308), now again discussing different stabilisation policies, explicitly assumes the goal of price stability (zero inflation), however, without any explanation for the selection of this goal. Chapple (1998: 73) speculates that the main reason for choosing the goal of price stability might be that the calculation of the model becomes much easier by setting this value to zero. This argument about easier calculation brought forward by Chapple is

⁴Equation taken from Lipsey (1978: 49f.).

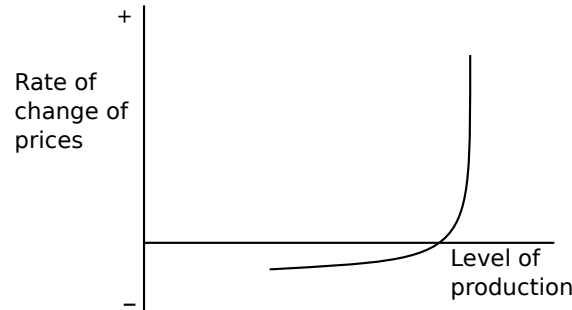
⁵For an explanation of this ad hoc assumption see for example Lipsey (1981: 552f.), who argues with reference to Keynes (1936), that workers care about relative wages. Since a reduction in money wages may not preserve relative positions, whereas an adjustment of the price level will, this indicates nominal but not real wage downward stickiness.

⁶On the MONIAC see the special issue edited by Curzio (2011).

reinforced when Phillips (1954: 308) assumes linearity of his curve for small deviations around this zero-inflation output level.

Figure 2.1: Phillips' Theoretical Curve.

Source: Phillips (1954: 308). Redrawn. See Chapter "Copyright and Permissions" for further information.



Despite having omitted price expectations in his supply curve, Phillips (1954: 311ff.) incorporates price expectations into his demand curve and even attributes an important role to them for the stability of the whole system (see also Leeson 1997b: 166). The system may get destabilised by rising price expectations if economic agents anticipate that the price level will not return to its initial level, which will therefore boost demand and will lead, in a self-fulfilling way, to rising prices (see also Lipsey 1961: 2f. and Phillips 1962: 9f.).⁷ However, price expectations in the way Phelps (1967) and Friedman (1968) incorporated them into their models operate on the supply side of the economy, equilibrating nominal and real values, safeguarding that changes of absolute prices do not influence economic decisions as long as relative prices are being reverted to their real values determined in the real sphere of the economic system (see also Chapple 1998: 74f.). Summing up Phillips' 1954 paper, it is hard to find any evidence that Phillips already had the idea of a shifting Phillips curve as a consequence of inflationary expectations in mind.⁸ Nonetheless, inflation expectations on the demand side can render the whole system unstable.

2.3 The Phillips Curve

In Phillips' most influential paper published in 1958, 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957' – which he himself described as 'done in a week end' (cited from Leeson 1994: 613, who refers to a

⁷This mechanism of price expectations might be influenced by Hicks (1939 [1946]: 204ff.), as Hicks makes the crucial distinction whether or not price changes are expected to be permanent or temporary, whereas expected permanent changes may induce dynamic instabilities (see Boianovsky 2004: 94f.).

⁸Also Lipsey (1961: 8, fn.) explicitly states that the two concepts discussed here are completely different: 'We might observe in passing another argument for cumulative inflation, that in order to achieve some given policy goal, say, a maximum of 1.5 per cent unemployment, it is necessary to produce faster and faster rates of inflation as people come to adjust fully to each new rate. This argument is totally different from the one being considered in the text; it does not say that constant rates of inflation are impossible, only that their efficacy in producing other desired policy objectives diminishes through time.'

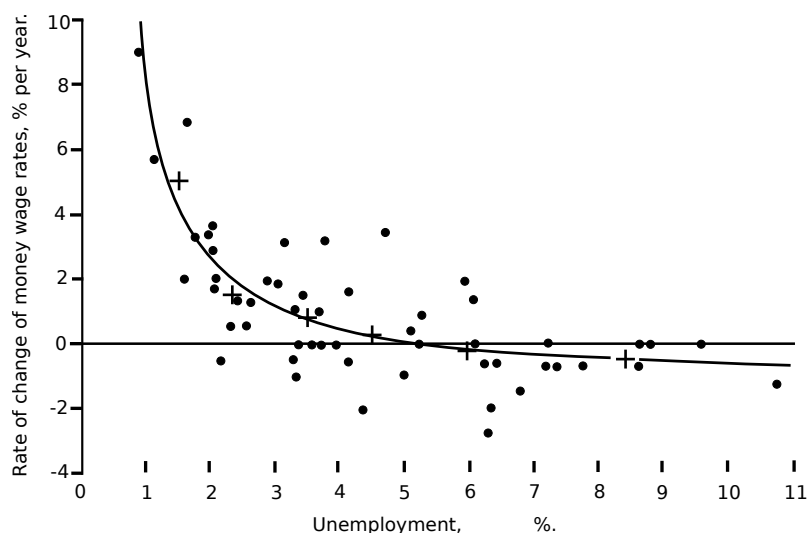
correspondence with Gregory dated 3 December 1992), as a ‘rush job’ (cited from Blyth 1978: xvi) and as a ‘very crude attempt’ (Phillips 1962: 11)⁹ – it becomes clear that Phillips (1958: 283) interpreted his curve as a disequilibrium relation: prices are driven by excess demand or supply, which indicates that not all possible points on this curve would be stable in the long run (see also Lipsey 2000: 238, highlighting that Phillips strongly insisted on this disequilibrium interpretation):

When the demand for a commodity or service is high relatively to the supply of it we expect the price to rise, the rate of rise being greater the greater the excess demand. Conversely when the demand is low relatively to the supply we expect the price to fall, the rate of fall being greater the greater the deficiency of demand. It seems plausible that this principle should operate as one of the factors determining the rate of change of money wage rates, which are the price of labour services.

The curve (see Figure 2.2), therefore, relates unemployment (data mostly from Beveridge 1944: 310ff.), as a proxy for excess demand for labour (see also Phillips 1959b: 2 and Lipsey 1960: 13ff.), to wage changes (in large part based on data from Brown and Hopkins 1950; see Leeson 1997b: 162f. for an extensive list of data sources used). Corry (2002: 167) points out that the switch from the gap between full capacity output and actual output, as a proxy for excess demand, to the unemployment rate was mainly induced by more readily available data on unemployment rates than on output gaps.

Figure 2.2: The Phillips Curve.

Unemployment and the rate of change of money wage rates, United Kingdom, 1861–1913.
Source: Phillips (1958: 285). Redrawn. See Chapter “Copyright and Permissions” for further information.



As Phillips (1958: 299) regards his own curve as a disequilibrium relation, he only emphasises two points on his curve (with respect to productivity increases and external price shocks) – on

⁹Sleeman (2011: 234) therefore speculates that not Phillips himself, but rather James Meade, who was, together with James Durbin, supervisor of Phillips’ Ph.D. thesis, submitted the paper to *Economica*.

the one hand, an unemployment rate leading to stable prices (about 2.5%) and on the other hand, a higher unemployment rate leading to stable wages (about 5.5%).

Nevertheless, at least one statement concerning economic policy can be found with respect to the location and shape of the estimated curve. Phillips (1958: 295) notes that the high average unemployment rate of nearly 11% between 1925 and 1929, which turned out to be necessary to restore the pre-war gold parity by forcing down the price level, 'could have been predicted fairly accurately from a study of the pre-war data, if anyone had felt inclined to carry out the necessary analysis.'

However, concerning the long-run stability of the relation between unemployment and wage-rate changes, Phillips does not take inflation expectations fully into account. Rather, he only discusses cost of living adjustments as playing a crucial role in the wage-negotiation process if price increases – as a consequence of a severe rise in import prices – are large enough to threaten the real wage. This means that only if inflation, due to exogenous shocks, exceeds the rise in nominal wages, will cost of living adjustments have an impetus on nominal wages. As long as inflation remains lower or equal to the rise in nominal wages, 'the introduction of cost of living adjustments in wage rates will have no effect, for employers will merely be giving under the name of cost of living adjustments part of the wage increases which they would in any case have given as a result of their competitive bidding for labour' (Phillips 1958: 284).¹⁰ It should be noted, however, that for the time span Phillips estimated his curve (between 1861 and 1913 in the United Kingdom), inflation was not a permanent phenomenon, so that not laying primary emphasis on this element, which became important later, can be most likely explained (but not justified from a theoretical point of view) by the fact that taking care of inflationary developments was just not necessary (see also Forder 2010: 495f.).

In Figure 2.3, the period from 1861 to 1913, which was used by Phillips to estimate the Phillips curve, is shown dashed. As can be easily seen, inflationary and deflationary periods are both prevalent. However, the curve estimated for this period also fits the two other periods under Phillips' consideration rather well (1913–1948 and 1948–1957), even though inflationary times became more dominant than deflationary ones. Phillips (1958: 297), however, needed to lag unemployment by seven months to get a good fit for the last period (see also Leeson 1997b: 164).

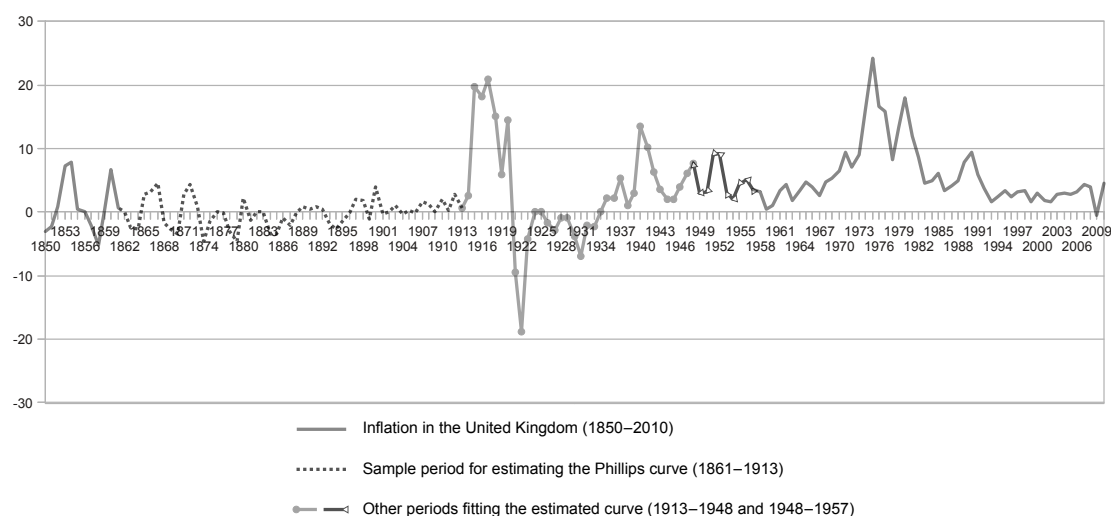
Phillips' assumptions (downward rigid nominal wages and cost of living adjustments as a means to retain a certain real wage), however, do not imply that Phillips thought of completely rigid nominal or real wages. Nominal wages are relatively more rigid downward compared to upward flexibility. Hence, the (theoretical as well as empirical) Phillips curve becomes flatter but not completely horizontal the higher the slack in the economy. Due to rather sticky downward wages in the case of underutilisation, an adjustment in the labour market via unemployment might take years and can therefore induce high economic losses. Phillips has shown this above in the transition to the pre-war gold parity.

Be that as it may, Phillips (1958: 299) is well aware that his investigation of the relation between unemployment and the rate of change of money wages and its interpretation needs to

¹⁰This assumption was under critical discussion shortly afterwards by Lipsey (1960: 8ff.) who rejects Phillips' concept on the grounds of empirical evidence and favours instead the hypothesis that changes of the cost of living directly affect wage changes, which, however, also 'did not perform well' (Lipsey 2000: 236).

Figure 2.3: Inflation in the United Kingdom, 1850–2010.

Retail price index (RPI), growth rate in per cent. Own illustration. Data source: Samuel H. Williamson, *Seven Ways to Compute the Relative Value of a U.S. Dollar Amount, 1774 to Present*, MeasuringWorth, April 2011.



be examined more deeply as he ends the paper with the warning that ‘[t]hese conclusions are of course tentative.’

Unfortunately, Phillips never responded to early critiques emphasising, for example, the cost of living effect on wage determination (Knowles and Winsten 1959), or critiques questioning the data and methods used to estimate the curve (Routh 1959). This can be related to the fact that Phillips regarded his curve not as his primary research interest and most important work (see Bollard 2011: 7). Yamey (2000: 337), editor of *Economica* at that time, remarks that Phillips also refused to comment on other papers published in *Economica* relating to the Phillips curve. Phillips (1968a [2000]: 224) also had the opinion that ‘the first priority for an academic economist should be to get on with the [...] job of trying to find out more about how the economy works and that he should resist the temptation to divert his limited time and energy from this task to general debate on policy issues’, which might explain why he never engaged heavily in later policy discussions.

Phillips, however, actually commented on another important contribution to the early Phillips curve discussion by Dicks-Mireaux and Dow. They present their own investigation of the determinants of wage changes. The most interesting result brought forward is that cost of living effects do not enter wage negotiations fully (the weight of past inflation being around 0.5; see Dicks-Mireaux and Dow 1959: 166). Phillips (1959a: 176f.), in his comment, emphasises once again the importance of achieving price stability and ‘a high level of economic activity and employment’. Regrettably, Phillips does not discuss the newly introduced variable capturing cost of living effects as Phillips focuses on other econometric details. Phillips, however, compares his own results of his 1958 article with those found by Dicks-Mireaux and Dow (1959) and finds them to be quite similar with the exception that his curve is a non-linear one. Noteworthy is the fact that Phillips once again interprets his curve and the results of Dicks-Mireaux and Dow only in the range around price stability.

2.4 The Australian Phillips Curve

Phillips' point of view about different economic goals becomes much clearer in Phillips (1959b), in which he is estimating the Australian Phillips curve. Phillips (1959b: 1) starts his paper – which was presented at the University of Adelaide (see Leeson 1998: 88) but never formally published, as Phillips seemed to be unsatisfied with the estimations due to data problems (see Harcourt 2000: 304, Pitchford 2000: 263 and Sleeman 2011: 228) – with the following statement:

One of the main economic problems in Western countries today is whether it is possible to prevent continually rising prices of consumer goods while maintaining high levels of economic activity.

As labour is quantitatively the most important production factor – and the rate of wage changes therefore the most influential factor for the change in prices – Phillips (1959b: 1) stresses the need for a relation like the Phillips curve for guiding economic policy:

The problem therefore reduces to whether it is possible to prevent the money price of labour services, that is average money earnings per man-hour, from rising at more than about 2 per cent. per year [assumed productivity increase], while maintaining high levels of economic activity and employment.

Wage changes in Phillips' analysis are driven by export and import prices, cost of living adjustments (see below) and by the demand for labour. As the 'demand for labour [...] can be controlled, and is continually being controlled, by Australian monetary and fiscal policy', Phillips (1959b: 3), therefore, points out that 'one of the main purposes of this analysis is to consider what level of demand for labour the monetary and fiscal authorities should seek to maintain in their attempt to reconcile the two policy objectives of high levels of activity and stable prices.'

Phillips now also includes cost of living adjustments explicitly in his estimation equations. Pitchford (2000: 264ff.) tries to interpret this approach as a partial forerunner of Friedman (1968), since now the relation may also be interpreted as relating real wage changes to the level of unemployment. Phillips' (1959b: 3) argument, in a nutshell, runs as follows: the change of nominal wages depends on the excess demand for labour, approximated by the unemployment rate, and is additionally a function of the change of the cost of living, while the cost of living in turn depends on the change of wage rates. Because of this interdependency between wages and prices, Phillips concludes that price changes can be eliminated in an estimated equation, as both wage and price changes are a function of the unemployment rate. Thus, the change in nominal wages already includes past cost of living adjustments (in Australia it was common in the 1950s to decide on such adjustments centralised by an arbitration court) for any rate of unemployment. As Phillips, however, does not take the idea of expected real wages into account (and wage negotiators thus remain completely backward-looking), Pitchford (2000: 266) sees Phillips as being 'part of the way there'.¹¹ Nevertheless, Phillips (1959b: 4) seems to interpret

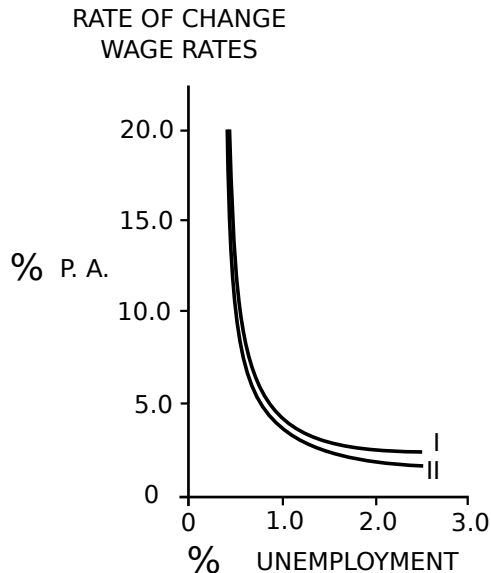
¹¹Friedman, in a letter to Sleeman dated 22 October 1982 (cited from Sleeman 1983: 152, fn. 47), recalls 'having a long conversation with Bill Phillips about this question [the mis-specification of the Phillips curve]' and 'I remember pointing out to Bill that his argument should have been stated in terms of real wages and not nominal wages. My recollection also is that he was persuaded that that was the case though I do not know that he ever stated so in print.'

his curve (see Figure 2.4) as a stable long-run relationship (see also Pitchford 2000: 266; see critically Leeson 1997a: 55) as he is thinking in terms of years and even discusses an inflation rate of 10% in this context:

[...] since we are interested here in long-run policy objectives, not in the short-run prediction of wage changes, we can assume that the fluctuations in export and import prices average out over a long period of years and can therefore be ignored in considering the level of demand for labour at which policy should be aimed. The relations [...] between the rate of change of wage rates and the level of unemployment [...] indicate that, on average over a period of years, wage rates would rise [at the present level of unemployment of about 2.25 per cent of civilian employees] at a little over 2 per cent[.] per year [...] The speed of inflation would increase if the demand for labour were held at a higher level, thus at 1 per cent. unemployment wage rates would rise on average at about 4 per cent. per year which would give about 3 per cent. per year rise in consumers' prices. If demand were held at a level sufficient to reduce unemployment much below this level, the speed of inflation would be very greatly increased. Thus with unemployment at about $\frac{1}{2}$ per cent. we could expect wage and price changes of the order of 10 per cent. per year.

Figure 2.4: The Australian Phillips Curve, 1947–1958.

I: wage changes explained by the unemployment rate with a time lag of three quarters of a year;
II: wage changes explained by the unemployment rate with distributed time lags.
Source: Phillips (1959b: 11). Redrawn. See Chapter "Copyright and Permissions" for further information.



Thus, at an unemployment rate of 2.25%, wage rates will rise in line with an assumed productivity growth of 2%. However, as hourly earnings, which are a better indicator of actual wages paid, will rise by 3.5%, yielding a rate of inflation of 1.5%, Phillips (1959b: 4) concludes

that ‘the two main objectives of monetary and fiscal policy, namely full employment and stable prices, cannot be completely and simultaneously obtained without a change in the present attitudes to and methods of wage determination.’¹² Phillips (1959b: 5) thus suggests supply-side policies to improve the location of the Australian Phillips curve, like ‘measures [...] to increase the mobility and adaptability of labour’ or ‘technical training and retraining’ to come closer to the goal of price stability and full employment. Also the ‘practice of negotiating general wage changes covering workers in widely different groups of industries, occupations and areas’ might be responsible for ‘increasing the level of unemployment which is compatible with stable prices’ as ‘areas which are developing rapidly’ are ‘likely to be dominant in determining general increases in wage rates’ (Phillips 1959b: 5). As already discussed, the unemployment rate (or the level of production) which will lead to stable prices is not assumed to be fixed but depends on conditions of the supply side, like the aggressiveness of bargaining (see Phillips 1954: 307) or, in the case of Australia, general, instead of local or sectoral, wage agreements.

Phillips (1959b: 4), furthermore, heavily opposes wage policies by trade unions (which were quite strong in Australia in the 1950s; see Pitchford 2000: 263), which aim at higher increases in wages than productivity growth, as this would only cause inflation and hurt the ones receiving fixed money incomes. Due to such ‘organised attempts to force up money wages and prices’, the government would then have ‘no alternative but to operate the economy with a higher level of unemployment than would otherwise be possible, to the general detriment of the country and the people, and especially to the weaker and poorer members of the community’ (Phillips 1968a [2000]: 227; see also Phillips 1959b: 5). Moreover, technical progress might be dampened when the ‘share of profits in the national product’ (Phillips 1959b: 5) could be reduced successfully by an aggressive wage policy. Phillips ends this statement with an expression no economist can resist to agree on: Phillips (1959b: 5) rightly regards ‘[t]echnical innovation and capital expansion’ as the main source of the steady increase in productivity and therefore as the ‘only possible source of continuing increases in real wages’ (see also Phillips 1962: 12f.). Phillips (1968a [2000]: 229) also opposes expansive demand policies if the economy is already at full employment, as this will dampen growth due to ‘general shortages and inefficient operation’. Therefore, despite Phillips’ interpretation of the Australian Phillips curve as a stable relationship (and probably as a tool for demand policies), Phillips is well aware of the problems if wages are rising out of line with productivity, thereby causing inflation, as such a wage development will not be sustainable in the long run due to its adverse effects on income distribution and productivity growth.

¹²Despite Phillips’ regular emphasis on these two goals, Phillips never gives a founded definition of full employment (see in particular Phillips 1968a [2000]: 225). Also the first edition of Lipsey’s textbook (1963), which was written while Lipsey was still in regular contact with Phillips, does not discuss critically the concept of full employment, so that one may conclude that defining what full employment really meant was not a major concern at the LSE at that time (correspondence with Lipsey dated 30 September 2011). A first approach of a clear-cut definition with respect to the Phillips curve might be found in Lipsey (1965: 214) and in Lipsey’s second edition of his textbook (1966: 830ff.).

2.5 Phillips' Inaugural Lecture 'Employment, Inflation and Growth'

In his inaugural lecture, given at the London School of Economics and Political Science on 28 November 1961 (Phillips 1962), Phillips (1962: 1) states his position on actual economic developments, showing a clear preference for a stability-oriented policy and condemning high inflation rates, emphasising that the average rate of inflation of 3.7% per year between 1948 and 1960 in Britain is 'undesirable'.

Phillips (1962: 2) also makes reference to his estimated Phillips curve and possible upcoming problems for economic policy. First of all, Phillips stresses the need for established statistical relationships for conducting sound economic policy as there is still a 'lack of adequate quantitative knowledge and understanding of how the economic system works.' A relation like the Phillips curve will also make clear conflicting policy goals, which cannot be solved without altering the driving forces in the background, so that 'some modification of institutions or behaviour' can be necessary to 'alter the relation so as to permit some more desirable combinations of consistent aims.'

Phillips' own reluctance against economic policy based on too simple models, which had already shown up in previous contributions like in Phillips (1954), once again is being put forward by Phillips (1962: 2) warning about the inherent pitfalls of such policies:

If we do not have this knowledge the policy adjustments will almost certainly be inappropriate in magnitude or timing or both and may well cause, as I believe they have often caused in the past, unnecessary and harmful fluctuations in economic activity.

Such severe fluctuations, inherent in the economy, may especially arise if the coefficient that relates price or wage changes to excess demand or to the rate of unemployment is high (see also Phillips 1954: 313). For example, the system of Phillips' (1961) model, which investigates the short- and long-run equilibrium conditions in a growing economy, may be unstable at some constellations, especially if the parameter on the price-output relation becomes large (indicating high price adjustments to small changes in quantities), which might be the case at very low levels of unemployment (Phillips 1961: 365 discusses different reasonable values of this coefficient referring to his estimated non-linear curve of 1958). Therefore, Phillips (1961: 367ff.) introduces a derivative stabilisation policy, which improves the dynamic stability of the system. In this line of thought, Phillips' well-known statistical relationship can be interpreted as an early attempt of Phillips to gain insights into the macroeconomic system to be later incorporated into his models for stability analysis, rather than the idea of an exploitable trade-off (see also Laidler 1997: 90 and Lipsey 2000: 239).

Interestingly, Phillips (1962: 7f.) assesses an important role for monetary policy (see also Phillips 1954: 315), though he is aware of the dangers of time lags threatening the stability of the economic system by causing 'cyclical fluctuations'. Therefore, monetary policy for Phillips (1962: 8f.) is not the right choice for stabilising short-run economic fluctuations and should be focused on the long run (see also Bergstrom 2000: 192). Phillips (1962: 9f.) preferred the adjustment of direct taxes as a first choice since the adjustment of indirect taxes like a purchase tax

may destabilise demand due to the effect on price expectations as already discussed in Section 2.2. Government spending, on the other hand, may create fluctuations itself as it is too slow in its impact on aggregate demand. Furthermore, it may also 'produce undesirable dislocation of spending programmes' (Phillips 1968a [2000]: 225). Another reason why Phillips (1962: 9) gives no role to monetary policy as a short run stabiliser is that monetary policy in the United Kingdom in the 1960s was dominated by external constraints and therefore not feasible for internal needs. Phillips (1962: 14ff.) thus advocates a more flexible exchange-rate system, allowing a change of the parity in the order of 1% per year (see also Phillips 1968a [2000]: 228f.). Most interestingly, Phillips and Friedman (see for example Friedman 1960: 87f.) have much in common regarding the role of time lags in the monetary transmission process and the hereby inherent destabilising dangers of activist monetary policy. However, for Friedman markets are inherently stable (see Laidler 2012: 14ff.) and will only be shaken by false economic policy (so that a fixed growth rate for the money supply is favoured), but for Phillips stabilisation policies based on the best models available are necessary to cope with potentially unstable markets, as the economic system may lack an adequate adjustment mechanism since prices and wages probably will not adjust immediately – especially in the case of unemployment and under-utilisation. Moreover, Phillips (1954: 308ff.) emphasises that even perfectly flexible prices may destabilise the system as the price signals may induce, as already discussed, dynamic instability themselves. Thus, for Phillips, economic policy is necessary to cope with potentially unstable economic systems (see also Laidler 2002: 227). Therefore, it is most important to analyse the adjustment process in the economy itself to assure dynamic stability, as pointed out by Phillips (1962: 3f., *my italics*) himself:

It is frequently stated, and has indeed been stated with some emphasis by such eminent economists as Walras, Marshall and Wicksell, that such a system [a perfectly competitive market] is *necessarily stable*, i.e., that it always tends to an equilibrium in which the price is such that the rates of production and consumption are equal. The argument is usually very simple. [...] In brief; the existence of any discrepancy between production and consumption causes *a movement in price which tends to correct the discrepancy*. Therefore, the argument runs, *the system is stable*. This argument is, of course, fallacious except on the assumption that the complete response of the rates of production and consumption to any change in price *occurs instantaneously*. If there are any *time lags* in any of the responses *the system will usually fluctuate*. Whether the fluctuations will die away or whether they will increase in amplitude and tend to some regular and sustained limit cycle depends on the precise forms of the time lags, on the slopes of the supply and demand curves and *on the speed at which the price changes* when there is a *given excess demand*.

Phillips (1962: 11) once again turns the discussion to his 1958 contribution, now being more critical about his own work regarding the omission of cost of living effects on wages as long as prices do not rise faster than nominal wages. He indeed does admit that the direct inclusion of cost of living adjustments by other authors, especially regarding the post-war period, is 'probably nearer the truth than the assumption I used'. However, as Phillips argues that changes in the cost of living are most likely the result of earlier wage changes and are therefore already

included in the data and thus in the estimated Phillips curve, an argument as has been shown already brought forward in Phillips (1959b: 3), he (1962: 11) still sees his and other similarly derived curves as 'valid relations for prediction purposes' to 'form some judgement of the likely effects of alternative types of economic policy' (Phillips 1962: 3). This assumption might be reasonable in the case of an erratically changing price level, exhibiting inflation as well as deflation – an inflation environment, as has been shown, which prevailed during the period that Phillips used for estimating his curve. Johnson (1963: 57) therefore warned that the Phillips curve should not be expected 'to hold its shape if an attempt were made by economic policy to pin the economy down to a point on it.' Nonetheless, Phillips (1962: 11) still seems to regard his curve as showing a long-run trade-off between unemployment and inflation, even though Phillips' considerations are almost at any time more related to the costs of a disinflation process than to the gains of inflating the economy:

If it is true that such a relation holds we are faced with a difficult choice. Then we can only reduce inflation, for any given rate of increase of productivity, at the cost of higher unemployment.

Phillips did not realise that although a disinflation process can be costly in the short run if inflation expectations are adaptive, it will end up, given that the coefficient on inflationary expectations is unity and abstracting from hysteresis, with the same unemployment rate again but at a lower rate of inflation.

Turning onto Phillips' preferences towards inflation and unemployment, it becomes clear that Phillips is far from advocating inflationary policy. To the contrary, even though the curve from his point of view predicts long-run costs in terms of unemployment, Phillips (1962: 11f.) is proposing a higher average unemployment rate to fight inflation.

Phillips (1962: 14f.) furthermore makes reference to the seminal article of Samuelson and Solow (1960), who coined the name 'Phillips curve' and introduced the idea of a 'menu of choice between different degrees of unemployment and price stability' (Samuelson and Solow 1960: 192, caption in Figure 2). It is Phillips himself who calls the results of Samuelson and Solow 'tentative' – a curtailment he also made clear about his own conclusions. Phillips, as a reaction to Samuelson and Solow, also presents his own estimates for the United States. For Phillips (1962: 14), however, in the United States '7 to 8 per cent. unemployment would be needed to maintain a stable price level, and that at 4 per cent. unemployment the price level would rise at about 4 per cent. per annum', which is in stark contrast to the results of Samuelson and Solow (1960: 191f.). With respect to their curve, the unemployment rate needed for price stability would be around 5.5% and the price level may rise by 2.25% at 4% unemployment. Phillips (1962: 15) thus concludes that 'if unemployment is reduced, as seems to be hoped, to 4 or 5 per cent., the United States may well have a rather faster rate of inflation than Britain would have with 2 per cent. unemployment.' Phillips thus clearly did not disagree with Samuelson and Solow and their idea of a 'menu of choice' (see also Bergstrom 2000: 193).

However, it should be noted that the main focus of Samuelson and Solow (1960) is not on having found an exploitable trade-off but on other issues, like the prevalent distinction of the time between cost-push and demand-pull theories of inflation (see Solow 2002: 71f.). Also Samuelson and Solow (1960: 193) see their approach as dealing with the short run and are sceptical about the long-run stability of the curve:

It would be wrong, though, to think that our [...] menu that relates obtainable price and unemployment behavior will maintain its same shape in the longer run. What we do in a policy way during the next few years might cause it to shift in a definite way.

So Phillips probably did not oppose the ‘menu of choice’ interpretation of the Phillips curve by Samuelson and Solow as they offered many qualifications regarding the stability of the ‘menu of choice’ in the long run. Furthermore, for Phillips (1962: 14), the main issue behind his comment on Samuelson’s and Solow’s analysis is not focused on the possibility of freely reducing unemployment by accepting inflation, but on the question of whether it will be possible to achieve a ‘balance of internal objectives [employment, inflation and growth] which would be consistent with the maintenance of fixed exchange rates.’ Thus, once again, Phillips interpreted the curve as a tool for economic policy, which needs, however, to aim at feasible long-run constellations in the economy. The rate of unemployment consistent with price stability and the most likely rate of inflation at any given rate of unemployment, both estimates provided by the Phillips curve, were most important for economic policy in times of a fixed exchange rate system like Bretton Woods. Thus, supply side policies can be necessary to lessen the tension between incompatible goals as suggested by Phillips (1962: 15) for the United States.

2.6 Phillips and the Monetarist Counter-Revolution

Unfortunately, there are no statements from Phillips regarding the groundbreaking contributions of Phelps (1967) and Friedman (1968) as Phillips increasingly lost interest in economics and turned his energy onto Chinese studies. The state of his health decreased further and a massive stroke in 1969 forced his retirement (see Blyth 1978: xvi, Leeson 1994: 612f. and Leeson 2007: 218). Alban William Housego Phillips, who was born on 18 November 1914 and died on 4 March 1975, thus was never able to answer to the Lucas critique (1976), even though contemporary colleagues like Holt (2000: 314) assume that Phillips would have challenged the underlying assumptions and the derived results of the rational expectations revolution.

However, the interpretation of the underlying causality of the Phillips curve changed drastically in the wake of the counter-revolution:¹³ whereas for Phillips changes in the rate of unemployment induced changes in wages and prices, for economists like Friedman (1968, 1977), unperceived changes in inflation are the driving force of quantity changes (a line of thought starting with Fisher in 1926). Both ways of reading the Phillips curve are possible, but, on the one hand, change its interpretation, and, on the other hand, require different underlying assumptions. The disequilibrium interpretation used by Phillips is based on an environment without perfect price flexibility so that markets facing shocks in aggregate demand stay in disequilibrium for a longer time span, so that quantities instead of prices react. Lipsey (1960: 16) explicitly states that his theoretically derived Phillips curve ‘shows the *speed at which prices adjust to a disequilibrium* and we shall call it an *adjustment function*.’ From this, it follows that interpreting the Phillips curve as always depicting an ‘intersection of demand and supply curves is contrary to the whole spirit of Phillips’ dynamics where transactions occur *out of*

¹³See also Laidler (1990: 52ff.) and Lipsey and Scarth (2011: xxvff.).

equilibrium because [the] price does not adjust instantaneously' (Lipsey 1974: 69).¹⁴ The inclusion of an expected real wage (and the distinction between anticipated and unanticipated changes) transforms the disequilibrium relation into an equilibrium relation (a short-run aggregate supply curve) as quantities adjust voluntarily (in a now assumed perfectly flexible and competitive market) as a reaction to price signals. Of course, movements on the curve are induced by imperfect information but are nonetheless adjustments towards a new equilibrium which only afterwards turns out to be unsustainable, as economic agents recognise that the expected real wage has not been realised. Lucas and Rapping (1969) were the first ones to fully implement and make use of this different interpretation of the Phillips curve. Being aware of the new implications of their approach, they mention that '[o]thers have attempted to motivate the Phillips curve by appealing to an "out-of-equilibrium" adjustment function. This was the original motivation suggested by Phillips (1958) and later Lipsey (1960)' (Lucas and Rapping 1969: 722, fn. 2). Thus, the critique of Friedman (1968: 8) accusing Phillips of the 'failure to distinguish between *nominal* wages and *real* wages', which brings about the 'basic defect' in Phillips' analysis, should be regarded with caution as the underlying framework and causality changed completely at the same time.

Leeson (1997a: 58ff.), however, finds some evidence that Phillips was an important contributor to the development of adaptive expectations as Friedman (in a correspondence with Leeson dated 25 August 1993) remembers 'discussing with Phillips [in 1952] the question of how to approximate expectations about future inflation and his writing on the back of an envelope the basic equation underlying adaptive expectations' (cited from Leeson 1997b: 166). Leeson refers for support of his hypothesis to Phillip Cagan, who (in a correspondence with Leeson dated 11 March 1997) confirms that 'Phillips had suggested trying a relationship in which the change in expected price change was proportional to the difference between actual and expected price change. [...] This relationship was later called "adaptive expectations" by others' (cited from Leeson 1997a: 59). Cagan (2000: 22) therefore states that 'Phillips deserves credit for what later came to be called "adaptive expectations".'

Leeson (1994: 612), furthermore, takes the point of view that Phillips already developed the idea of the Lucas critique. Court (2000: 465) also points out that an unpublished paper of Phillips (1972 [2000]) shows some similarity to the equations used in Lucas (1976). Phillips, however, contrary to Lucas, seems not to have emphasised 'that the basic problem with optimal control is that economic agents are intelligent maximisers' (Laidler 2001: F527) even though Phillips seems to have recognised that the structure of the model changes after a political intervention. Court (2000: 463f.) bases this argument also on Phillips (1968b [2000]) and on Phillips (1964 [2000]), which is unfortunately only available as a preliminary draft. Court (2000: 465), however, points out that the final assessment on the similarity between Lucas and Phillips 'may best be left to the judgement of the reader' – a proposal which shall be highly endorsed at this place.

¹⁴See Downie in Robinson et al. (1960: 280f.) for such a misinterpretation. For an immediate reaction see Lipsey and Steuer (1961: 149, fn. 1).

2.7 Conclusion

The discussion of Phillips' work revealed some interesting results, as policies based on the Phillips curve in the 1960s, and by extension Phillips himself, are usually associated with inflationary outcomes by exhausting the (assumed) stable trade-off. Despite the fact that Phillips regards his curve as a stable relationship, there is no evidence whatsoever that Phillips favours a high inflation rate or trading off more inflation for less unemployment. On the contrary, Phillips' reflections are almost entirely concerned with the costs of disinflation and how to improve the location of the curve to achieve price stability and a high level of employment at the same time. However, inflation expectations clearly do not enter as a location parameter into his curve. This might be related to the possible interpretation of the Phillips curve by Phillips himself, that wage rate changes already include cost of living adjustments as both are interdependent and therefore both a function of the unemployment rate, which nevertheless neglects possible shifts of the curve as a consequence of changing inflation expectations which result from ongoing positive rates of price changes. As has been shown, however, at the time Phillips estimated his curve, inflation was not a permanent phenomenon so that including inflation expectations as a shift parameter of the curve probably was not regarded as necessary. One might therefore join Friedman (1968: 8) bringing forth that '[i]mplicitly, Phillips wrote his article for a world in which everyone anticipated that nominal prices would be stable'. Even though Phillips indubitably interprets his curve as being stable in low as well as in high demand environments (see in particular Phillips 1959b: 4 and Phillips 1962: 11f.), he never proposed to exploit this trade-off to reduce unemployment as he was fully aware of the dangers of an inflationary policy since self-fulfilling inflation expectations on the demand side in the economy can induce positive feedback and thus dynamic instability. There is, however, no complete transfer by Phillips (1958) of this concept of inflation expectations to the supply side in the labour market: only a severe and exogenous rise in import prices, that is high enough to cause a reduction in real wages, would have an influence on wage behaviour. Workers even then stay completely backward-looking and the relationship between wage changes and unemployment remains stable, as these exogenous shocks only cause higher wage changes than predicted by the relationship, but not a shift of the curve itself. Phillips' (1959b) approach, which explicitly considers cost of living adjustments, but remains nevertheless completely backward-looking, was most likely influenced by the equally backward-looking wage-determination process in Australia (see Pitchford 2000: 267). It must be emphasised, however, that the issue of ongoing frustrated expectations of real wages due to accelerating inflation – in order to keep unemployment below a natural rate – is probably just not in Phillips' mind as such policies are not in line with Phillips' stabilisation goals.

Taking into account Phillips' different interpretations of the curve, it might be that the curve had a two-fold function for Phillips: a tool for economic policy as well as a dynamic adjustment function for stability analysis – two purposes a reaction function like the Phillips curve needs to serve in economic models as explained in an early paper (Phillips 1956: 100) discussing *inter alia* 'the need for quantitative knowledge of economic reactions' (my italics):

It is clear that some quantitative knowledge about the responses in the system is necessary both for rational discussion of the *relative merits of alternative policies*

and for the satisfactory implementation of whatever policy is adopted.

There is another reason, less obvious but no less important, for wishing to obtain quantitative knowledge about the different responses. It can be shown that any interdependent dynamic system may have an *inherent tendency to fluctuate* when subjected to disturbances. Whether it will fluctuate, and the severity with which it will do so, will depend on the quantitative values of all the relationships in the system, including the policy relationships.

Policies from Phillips' point of view, however, should not be mixed up with policies trying to eternally peg the unemployment rate at a certain (overemployment) level. Policies in the sense of Phillips (1956: 100) are different adjustment mechanisms if some economic variables are out of equilibrium due to shocks – in Phillips' (1956: 99) example: higher investment leading to excess demand and inflation – so that the government has, in order to attain certain 'equilibrium objectives' (Phillips 1956: 100) – in Phillips' (1956: 99) example: a fixed exchange rate – to decide on '[t]he extent to which it will be necessary to depress economic activity and employment during the correction process' which 'will depend on the magnitudes and speeds of these responses' (for example given by the later Phillips curve).

Therefore, the 'relative merits of alternative policies' Phillips is talking about are without doubt trade-offs but in the sense that the government may choose between different adjustment paths for interdependent economic variables – at least by fitting Patinkin's (1977: 125) 'regression line'. One practical example considered by Phillips was the attempt to force down the price level to restore the pre-war gold parity which required a high rate of unemployment over many years. The economy thus may move along a stable Phillips curve by policy actions (creating temporary disequilibria), but only with respect to Phillips' partly implicit and partly explicit assumption that the government's final goal is to stabilise the economy around its equilibrium level, that is, for Phillips, full employment and price stability. If both goals cannot be achieved simultaneously, Phillips always proposes supply side policies to improve the location of the curve. So Phillips possibly would have held the same view about the practical implications of the no-long-run trade-off postulate as Solow (1976: 13) stating that '[f]or any span of years meaningful for the formulation and execution of economic policy, it may still be right and necessary to imagine the economy as trading off real output for price stability.'

Nonetheless, a clear distinction has to be made between the Phillips curve in its original form being used to close macroeconomic models by serving as an adjustment relation if the economy is in disequilibrium as a consequence of imperfect markets, and its later implementation as an aggregate supply curve – a reinterpretation which relies on the misperception of the rate of inflation in otherwise perfect markets. Making use of the Phillips curve in its original version, like Phillips did, to simulate the likely effects of stabilising policies, therefore, was far from the later interpretation of exhausting a trade-off but concerned with stabilising an overall unstable economy in which wrong policies will do more harm than good. Thus, the Phillips curve *per se* cannot be regarded as an 'econometric failure on a grand scale' (Lucas and Sargent 1979: 6). As an adjustment relation in Phillips' models, it opened up the analysis of dynamic instability problems which may be even worsened by wrong economic policy. Therefore, it never really was thought to be 'billed as a long-run equilibrium proposition' but as 'a part of a tool kit [...] for analyzing economic events and guiding economic policy in the short run' (Tobin 1968:

51). Unfortunately, the shift to the trade-off view validated the early prophecy by Lipsey (1960: 31, fn. 1) that '[a] premature application to policy can [...] easily discredit a hypothesis that is potentially very fruitful.'

Whereas Phillips brought the formula of adaptive expectations into economic thought, it would be too excessive to speak of a 'Phillips-Friedman-Phelps critique' (Leeson 1997b: 166) as Phillips neither did modify his curve by adding inflation expectations nor did he make the policy conclusions as clear as Friedman and Phelps did. Probably, Phillips also was a forerunner of the core statements of the Lucas critique. However, the striking implications (Patinkin's 1977: 124 'moment of truth') for economic policy were especially outlined by Lucas. These results, of course, in no way disparage Phillips' strong influence on economic theory. One just must be careful interpreting past contributions with the knowledge of today, as the temptation is high to attribute successful ideas to some possible forerunners. So as Keynes' *General Theory* had many alleged predecessors (see Patinkin 1982 for a detailed discussion), the Phillips curve had too – especially as its success became clear: for example, a contribution written by Fisher in 1926 was posthumously reprinted in 1973 with the additional title 'I Discovered the Phillips Curve', even though Fisher actually describes an aggregate supply and not a Phillips curve (see also Lipsey 2010a: 371 and Lipsey 2010b: 384).

The misunderstandings in the Phillips curve discussion reinforce that bothering about 'the wrong opinions of dead men' (Pigou cited from Blaug 2001: 154) can be fruitful, especially if it turns out that those opinions were not so wrong at all.

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3 Samuelson and Solow on the Phillips Curve and the “Menu of Choice”: A Retrospective

Abstract

This paper focuses on the seminal contribution to the Phillips curve discussion by Samuelson and Solow in 1960, which is usually considered as the first trade-off interpretation of the Phillips curve. It will be shown that Samuelson and Solow indeed offer a trade-off view but are very sceptical about the long-run stability of the curve. Nonetheless, a “menu of choice” interpretation cannot be completely denied, even though their trade-off interpretation is heavily influenced by the contemporary discussion on cost-push versus demand-pull inflation. Hence, their approach to the trade-off between inflation and unemployment with emphasis on cost-push inflation is very different to that of Friedman, who only accepts demand-pull forces as a source of inflation. Therefore, contrary to Samuelson and Solow, full employment and price stability in Friedman’s framework are not conflicting policy objectives, so that a trade-off between inflation and unemployment only emerges due to inflationary surprises.

Keywords: Phillips curve, menu of choice, trade-off, inflation expectations, cost-push inflation, demand-pull inflation

Une rétrospective sur Samuelson et Solow à propos de la courbe de Phillips et du “menu of choice”

Cet article fait le point sur la contribution séminale au débat sur la courbe de Phillips rédigée par Samuelson et Solow en 1960. Cette dernière est habituellement considérée comme la première interprétation de la courbe de Phillips en termes d’arbitrage. L’article montre que si Samuelson et Solow expriment en effet ce point de vue, ils sont très sceptiques sur la stabilité à long terme de la courbe. Néanmoins, une interprétation sous la forme d’un “menu of choice” ne peut pas être complètement écartée, même si leur interprétation en termes d’arbitrage est fortement influencée par la discussion contemporaine entre l’inflation “cost-push” vs “demand-pull”. Leur approche sur l’arbitrage entre inflation et chômage avec un accent sur l’inflation “cost-push” est donc très différente de celle de Friedman, qui n’accepte que les forces “demand-pull” comme source de l’inflation. Ainsi, contrairement à l’analyse de Samuelson et Solow, le plein emploi et la stabilité des prix ne sont pas des objectifs de politiques contradictoires dans le

cadre d'analyse de Friedman. Pour lui, un arbitrage entre inflation et chômage n'apparaît que lors d'inflation surprise.

Mots-clés: courbe de Phillips, menu of choice, arbitrage, anticipations d'inflation, inflation cost-push, inflation demand-pull

JEL: B22, E24, E31

Acknowledgements

A first version of this article was part of a working paper presented at the Samuels Young Scholars Program at the History of Economics Society Annual Conference 2012 at Brock University, St. Catharines, Ontario, Canada, June 22-25. I thank Niels Geiger, Harald Hagemann, Richard Lipsey, William Scarth, Peter Spahn, Robert Solow and all participants of the Ph.D. seminar “Money, Employment and Growth” for very helpful comments and suggestions. I am indebted to Laura Cardwell for proofreading. Two anonymous referees provided a most helpful and constructive review process which very much improved the quality of the paper. Financial support by the Evangelisches Studienwerk Villigst e.V. (Ph.D. Program Globalization and Employment) is gratefully acknowledged. As usual, all responsibility for the views expressed and for any remaining errors is mine alone.

Introduction

In one of his last contributions, presented at a conference in August 2006, Milton Friedman spoke on the topic “Trade-offs in Monetary Policy”. In his view (2010, 114), Samuelson and Solow (1960) are still the starting point of interpreting the Phillips curve as offering a trade-off between inflation and unemployment:

Phillips himself did not present the curve as a policy tool, but less than two years later Paul Samuelson and Robert Solow published a celebrated article in the *American Economic Review* (1960) in which they did. Given the long period for which the Phillips curve appeared to hold in Britain, Samuelson and Solow concluded that it could be treated as a long-run structural equation which provided the missing equation that the then conventional Keynesian system needed. They treated it as a menu from which the monetary authorities could choose. By tolerating higher inflation they could experience lower average unemployment and vice versa.

Hence, their idea of a “menu of choice between different degrees of unemployment and price stability” (Samuelson and Solow, 1960, 192, caption in Figure 2) is still regarded as the beginning of applying the Phillips curve to economic policy. This possible trade-off hence tempted politicians to “stay in the saddle by riding the Phillips curve” as it was believed that “there was no longer a unique Full Employment but rather a whole family of possible equilibrium rates, each associated with a different rate of inflation” (Modigliani, 1977a, 3). The subsequent development is well known. Phelps’ (1967; 1968) and Friedman’s (1968) incorporation of inflation

expectations marked the beginning of the end of trading off inflation for unemployment as the model economy now would, in effect, always return to its natural rate of unemployment in the long run.¹

Finally, however, the upcoming concept of rational expectations (Lucas, 1972; 1973 and Sargent, 1973) inclined economists to completely refrain from “Keynesian” Phillips curve analysis and the idea of a “menu of choice” ended up in the drawer, and—at least asserted by some economists—“the undermining of any notion of a trade off between inflation and unemployment delivered the *coup de grâce* to official Keynesianism” (Desai, 1995, 346).²

Samuelson’s and Solow’s contribution as the possible starting point of the trade-off discussion was in the focus of attention of many scholars: The evolution of this trade-off idea and its relation to Samuelson and Solow (1960) is tracked in Humphrey (1985b), Laidler (1997), Leeson (1997) and Forder (2010a).

Humphrey (1985b, 5ff.) takes the point of view that the trade-off interpretation in the 1960s was widespread but makes no reference to Samuelson and Solow as the inventor of the trade-off (but Humphrey, 1985a, 24 does). However, the trade-off interpretation of the Phillips curve takes centre stage in his contribution.

Laidler (1997, 91f.) remarks that already the Radcliffe Report (Committee on the Working of the Monetary System, 1959) hinted at systematic policy trade-offs between different goals of economic policy, in particular unemployment and inflation. Also in the US, the Report of the Commission on Money and Credit (1961) not only pointed, but was particularly aimed at “studying not only the positive nature of those tradeoffs, but also the welfare considerations that might enable the goals to be weighed against one another” (Laidler, 1997, 93). Hence, in particular from the perspective of economic policy, the stage had been set for making use of the Phillips curve as a “menu of choice”. Laidler (1997, 93) therefore interprets Samuelson and Solow (1960) as offering such a trade-off view, even though he admits that they were quite cautious regarding the stability of the Phillips curve.

The political background at the end of the 1950s is covered in Leeson (1997)—a view not shared by Solow (in Snowden and Vane, 1999, 284): Leeson supposes that in the wake of the

¹However, one important difference between Phelps (1967) and Friedman (1968) should not be neglected: Whereas Friedman’s contribution criticised the approach of fine tuning, Phelps focused on modelling economic policy as a dynamic optimisation problem. Economic policy in this approach hence still relied on active management of the economy instead of a constant money growth rule (see Laidler, 2010, 124 and Laidler 2012, 18, n. 19). Phelps (1972) extended this approach which also relied more and more on the formalisation of the decision problem the policy-maker was facing. Johnson (1968, 986) critically discusses this increasing formalisation (for example by using preference functions) as “formalization, while popular, is unfortunately rather empty of economic content, since it simply postulates that society is able to weigh more unemployment against more inflation in some unspecified manner to arrive at a preferred position.”

²The Phillips curve is often regarded as a Keynesian concept (Johnson, 1970, 110: “the only significant contribution to emerge from post-Keynesian theorizing”), however, without being related to the core arguments of Keynes, as it solely provided an explanation for the speed of adjustment if the economy is in disequilibrium (see Lipsey, 1978, 53ff.). Nevertheless, the misinterpretation of the Phillips curve, like the idea of a stable trade-off which should be utilised to push the economy even beyond full employment, not only discredited the Phillips curve in its original interpretation but also the core ideas of Keynes (see e.g. Hahn, 1982, 74f., Meltzer, 1983, 51 and Harcourt, 2000, 305ff.; see Davidson, 1972 for a thorough analysis of Keynes’ framework and Lipsey, 2000, 58ff. for an investigation of the relation of the IS-LM model and the Phillips curve to the Keynesian core).

presidential election campaign Samuelson and Solow (1960) might be interpreted as providing an overdue analysis of the inflationary consequences of the high employment target of the Kennedy administration so that “Samuelson and Solow believed that they had uncovered evidence that suggested that tolerable and stable rates of inflation were associated with high employment; the system also looked reversible—aggregate demand could be manipulated to move the economy down the Phillips curve, if necessary” (Leeson, 1997, 145).

Finally, Forder (2010a), provides an extensive literature review which focuses on how Samuelson and Solow (1960) were interpreted by later writers. In sum, he finds that many authors cited Samuelson and Solow (1960) as an example of the instability of the curve (Bronfenbrenner and Holzman, 1963, 620; Kaliski, 1964, 6, n. 11; Shonfield, 1967, 436f.) or as depicting a relationship between inflation and unemployment (Gray, 1968, 58, n. 1; Smyth, 1971, 426, n. 1) instead of the original wage-change-unemployment relation by Phillips (1958). According to Forder (2010a), the possible trade-off interpretation of Samuelson and Solow (1960), however, barely shows up in the literature. Hence, Forder (2010a, 19) concludes that the contribution by Samuelson and Solow was not as important in the 1960s as one might think at first sight. Thus, the role Samuelson and Solow actually played might be attributed to them with hindsight to fill a gap in the trade-off story which seems to be heavily influenced by Friedman’s Nobel Lecture (Friedman, 1977b) in 1976 (see Forder, 2010b).

Forder (2010a, 19), after an own analysis of Samuelson and Solow (1960), furthermore sums up that “Samuelson and Solow’s was an early attempt to bring together what one might call the accumulated lessons of the experience of the period and to determine the prospects of actually achieving full employment and price stability.” Forder (2010a, 1) thus emphasises that the long-run trade-off interpretation or a pledge for an inflationary policy cannot be found in Samuelson and Solow (1960). Even though Forder’s view is partly shared in this paper, it will be argued that there remains a strong ambiguity in Samuelson and Solow (1960). Furthermore, an often neglected aspect of the previous discussion will be emphasised, namely the direction of causation underlying the Phillips curve, which changed in the wake of the monetarist counter-revolution. Moreover, it will be argued that Friedman’s attack against the trade-off interpretation rested on a completely different view of the economy and of the inflationary process. Therefore, Samuelson’s and Solow’s trade-off interpretation must be judged in the light of the cost-push demand-pull debate, which Friedman did not take into account in his presidential address.

The remainder of this paper is organised in five parts. First of all, in Section 3.1, a short overview about the historical and theoretical background is necessary to provide the basis for the subsequent discussion. In particular, the cost-push demand-pull debate in the second half of the 1950s will be reviewed. Section 3.2 then focuses on Samuelson’s and Solow’s own assessment of this lively discussion in the 1950s. In Section 3.3, the paper will focus on Samuelson’s and Solow’s presentation of the Phillips curve as an alternative tool for analysing the inflationary process. This section will also discuss immediate conference comments to their 1960 paper. Section 3.4 will compare Friedman’s and Samuelson’s and Solow’s trade-off framework. It will be shown that their trade-off view was shaped by the economic issues of the 1950s and hence was very different from Friedman’s trade-off explanation. Finally, Section 3.5 concludes.

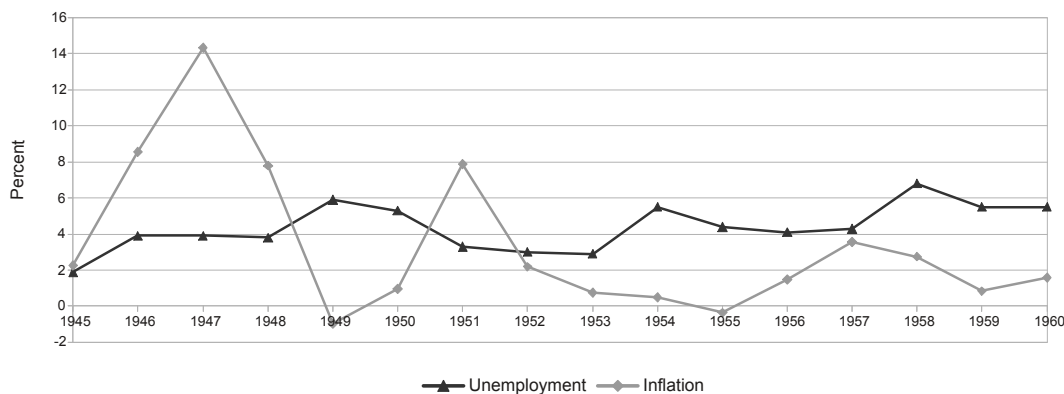
3.1 Historical and Theoretical Background

By the midst of the 1950s the economics profession was confronted with the pressing issue of why the economy was facing rising prices despite ongoing slack in the economy (see Figure 3.1)—an ongoing inflation which was usually called “creeping inflation”.³ Thus, at least at first sight, it seemed that a new kind of inflation entered the stage which did not emerge solely because of “too much money chasing too few goods”. In general, it was feared, as pointed out for example by Lewis (1959, 311), that this “creeping inflation” might accelerate without bounds (see for example Lipsey, 1961 who focuses on this discussion and argues on empirical grounds that inflation can indeed be stable and will not necessarily become explosive). In search of a remedy for this new kind of inflation, the underlying causes of inflation attracted attention of the economics profession. Hence, a lively debate evolved which led to numerous approaches on how to describe best the inflationary period since the mid-1950s.⁴ Bowen (1960,199) summarises this discussion pointing at the many different linguistic distinctions which emerged to identify the specific character of each cause of inflation:

A distinguishing characteristic of much recent thinking and writing in the general area of price behavior has been the rapid proliferation of inflation “types.” It is no longer fashionable to speak simply of “inflation”; instead, one must specify whether he means “cost inflation,” “demand inflation,” “excess-demand inflation,” “wage inflation,” “money inflation,” “structural inflation,” “log-rolling inflation,” “buyers’ inflation,” “sellers’ inflation,” “mark-up inflation,” “administered-price inflation,” and so on.

Figure 3.1: Inflation and Unemployment in the US, 1945–1960.

Own illustration. Source: Unemployment data: U.S. Bureau of the Census (1975, 135), Series D 85–86, “Unemployment: 1890 to 1970”; notes: persons 16 years old and over; prior to 1947 14 years old and over; new population data in 1953, 1960, 1962. Inflation: Consumer Price Index; data from Samuel H. Williamson, “Seven Ways to Compute the Relative Value of a U.S. Dollar Amount, 1774 to present”, MeasuringWorth, April 2013; for data details see Lawrence H. Officer, “What Was the Consumer Price Index Then? A Data Study”, available at www.measuringworth.com.



³For example, Holzman (1959, 324) titled his review on different contemporary contributions dealing with this inflationary period (amongst others the report of the Joint Economic Committee, 1958) “creeping inflation”.

⁴An extensive literature review on this episode can be found in Bronfenbrenner and Holzman (1963).

Bowen (1960, 199) also singles out “the most popular single dichotomy”, that is, “the distinction between ‘cost inflation’ and ‘demand inflation.’” Such a distinction seemed useful “to decide what (if any) public policy measures should be adopted to curb mild inflationary pressures which occur side-by-side with non-frictional unemployment” (Bowen, 1960, 204). Whereas demand inflation (for example due to rising investment demand) can be cured in a straightforward way by restrictive monetary and fiscal policies, fighting cost-push inflation (for example aggressive wage claims by trade unions) by the means of restrictive demand policies involves accepting higher rates of unemployment. Thus, as pointed out by Newman (1958, 243), “[t]he price level-employment dilemma was brought into the arena of public discussion following the start of the so-called ‘creeping inflation’ of 1956–1957.” Wage and price controls hence were often favoured by cost-push adherents (see the discussion in Bronfenbrenner and Holzman, 1963, 595). In particular, the inflationary period between 1955 to 1958 became to be regarded as “exhibit A” (Bronfenbrenner and Holzman, 1963, 629) by cost-push theorists (for example, Machlup, 1960, 132 considers this period to belong to cost-push inflation whereas 1945–1948 and 1950–1952 are regarded as demand-pull periods). However, while the different proposed concepts to describe the causes of this new inflation seemed to be sharply separated at first sight, from a more founded analytical perspective the distinction between cost-push and demand-pull inflation turned out to be quite difficult.

For example, Selden (1959, 10) proposes that a shift of the supply curve in a certain market may be called cost inflation, while demand inflation could be identified as a shift of the demand curve. Selden also tries to empirically separate both inflationary types. However, in his view (1959, 19), a rising velocity of money along with overly expansive monetary policy (see also Johnson, 1959, 1034) were more responsible for inflation than cost-push factors in this period. On the other hand, however, it was also brought forward that in particular the velocity of money (Fleming, 1961, 515) and also the supply of money (Machlup, 1960, 127) may rise endogenously due to the dynamics of cost-push inflation.

With regard to the problem of separating these two different approaches, Bowen (1960, 201ff.) provides a well-founded analysis emphasising the difficulties of such an attempt. Problems arise in particular due to non-linear and interdependent supply and demand curves (see also Poole, 1960). For example, the ability of trade unions to succeed in enforcing their wage claims (cost-push) may depend on the state of demand for the products of this industry (demand-pull). How far these wage claims will be translated into cost-push inflation, however, will depend on other factors on the supply side as well. Furthermore, cost-push inflation in one particular industry due to rising wages may at the same time show up as demand-pull inflation in another industry where the higher income of workers is being spent. Bowen (1960, 204) thus concludes that “[a]ttempts to use the ‘cost inflation’ versus ‘demand inflation’ distinction as a way of classifying inflations must be abandoned.” At the same time, this implies, however, that, without the knowledge about the exact causes of inflation, policy prescriptions are prone to be inadequate.

This overall sceptical view on the distinction between cost-push and demand-pull inflation and on the difficult task of finding a remedy for inflation was also the main research question of the contribution by Samuelson and Solow (1960) as will be shown in the next section.

3.2 Samuelson and Solow on Cost-Push and Demand-Pull

In line with other contemporary authors, for Samuelson and Solow (1960,177) inflation in the period 1946–1948 seems to be best explained by demand-pull inflation, while the period 1955–58, however, remains a “puzzling phenomenon”. Their own research objective is twofold: On the one hand, “to emphasize the types of evidence which can help decide between the conflicting theories” and, on the other hand, to discuss “some policy implications that arise from the different analytical hypotheses.”⁵ Thus, after a short summary of contemporary demand-pull and cost-push approaches, for example Lerner (1958) and Schultze (1959), Samuelson and Solow (1960, 182) stress the “problem of identification” on how to decide empirically which kind of inflation the economy is facing (my italics):

If I believe in cost-push, what should I expect to find in the facts that I would *not* expect to find were I a believer in demand-pull?

For example, the data may show that money wages rose faster than productivity which might be interpreted as cost-push inflation. However, as also demand-pull inflation can make wages rise faster than productivity—and so the clause starting with “*not*” in the quote above is not fulfilled—the criterion “wages rising faster than productivity” is not appropriate to decide between these two types of inflation.

Samuelson and Solow (1960, 183) then go on and emphasise another difficulty on how to separate both inflationary types. In particular, the timing of wage and price increases is not an appropriate criterion either for identifying cost-push or demand-pull inflation as it is not possible to determine a “normal initial standard from which to measure”. Therefore, a wage-push might be interpreted as autonomous but might also be just the result of earlier excess demand for labour if the timespan under consideration is extended accordingly. Furthermore, Samuelson and Solow (1960, 184) emphasise that an analysis based on shifts of demand and supply curves is equally prone to the problem of interdependencies as wages are cost and income at the same time. Thus, inflation may be self-sustaining due to spillovers and feedback to and from other sectors of the economy, or in the words of Samuelson and Solow (1960, 184) “it may be that one of the important causes of inflation is—inflation.”

Samuelson and Solow (1960, 185) thus conclude that other tools might serve better for analysing the problem they are facing: On the one hand “the behavior of real demand under inflationary conditions” and, on the other hand, “the behavior of money wages with respect to the level of employment”—this last relation being, of course, the Phillips curve. However, they are pessimistic about the stability of both relations. In particular, rising prices over some time may spur further inflation by altering the economic system (Samuelson and Solow, 1960, 185):

[T]here seems to us to be some doubt that ordinary reversible behavior equations can be found, and this very difficulty points up an important question we

⁵Solow (in Solow et al., 2009, 73) points out that the 1960 paper was devoted to the debate between cost-push and demand-pull inflation (see also Solow, 1976, 4, Solow in Snowden and Vane, 1999, 284 and Solow, 2002, 71f.). Solow also commented on other articles covering this cost-push demand-pull controversy, for example Holzman (1960).

have mentioned earlier: that a period of high demand and rising prices molds attitudes, expectations, even institutions in such a way as to bias the future in favor of further inflation.

Hence, with regard to the (in-)stability of the behaviour of real demand, the experience of an endogenous rise of the velocity of money from 1955 to 1957 leads them to the conclusion “that the whole distinction between cost-push and demand-pull begins to evaporate” (Samuelson and Solow, 1960, 186)—an issue, as has been shown in Section 3.1, which was also brought forward by other authors in the 1950s.

In sum, until now, the arguments and evidence presented by Samuelson and Solow (1960) fit pretty well into the climate at the end of the 1950s and no statement as such is innovative or original in its own way. This assessment, however, changes as soon as we take a closer look at their treatment of the Phillips curve in the next section of this paper.

3.3 The Role of the Phillips Curve

Samuelson and Solow (1960, 186f.) start their investigation of the Phillips relationship with a short review of Phillips (1958). They note that “[h]is findings are remarkable” as the curve estimated for the period 1861–1913 also fitted other periods (1913–1948 and 1948–1957) well. Furthermore, Samuelson and Solow (1960, 1867) focus on Phillips’ results about the level of unemployment needed to assure stable wages (5 per cent of unemployment) or stable prices (2–3 per cent).⁶ For the US, they only mention the studies by Schultze (1959) and Garbarino (1950)⁷, which are either “too casual” or “hardly a full-scale analysis”. Thus, Samuelson and Solow (1960, 187ff.) present their own empirical analysis, at first on the relation between money wage changes (in manufacturing) and unemployment, which will be later on transformed into a relation between inflation and unemployment. They suggest that 8 to 10 per cent of unemployment might be necessary to assure stable money wages. However, and this is the more interesting argument, Samuelson and Solow (1960, 187) point out that such a relation might be unstable on theoretical grounds. In particular, money wage stickiness⁸ might be endogenous:

But would it take 8 to 10 per cent unemployment forever to stabilize the money wage? Is not this kind of relationship also one which depends heavily on remembered experience? We suspect that this is another way in which a past characterized by rising prices, high employment, and mild, short recessions is likely to breed an inflationary bias—by making the money wage more rigid downward, maybe even perversely inclined to rise during recessions on the grounds that things will soon be different.

⁶The original values in Phillips (1958, 299) are 5.5 and 2.5 per cent respectively.

⁷As there are no exact references in the whole contribution of Samuelson and Solow (1960), Garbarino (1950) is the author’s best guess based on available contributions in JSTOR by Garbarino in the year specified by Samuelson and Solow (1960, 187).

⁸Solow (1975, 59) argues on these grounds that the absence of severe depressions (due to stabilising economic policy) in the last decades might have contributed to the inflationary bias modern economies are facing.

Thus, their overall sceptical view about a too simple-minded description of the inflationary process is pronounced once more. However, also based on the empirical evidence available, they suggest other causes for an unstable relation over time. For example, in the period 1933–1941 money wages did not fall despite high and ongoing unemployment. One explanation brought forward by Samuelson and Solow (1960, 189) is that “one could argue that by 1933 much of the unemployment had become structural, insulated from the functioning labor market, so that in effect the vertical axis ought to be moved over to the right.”⁹ Compared to Phillips’ rather stable relation, Samuelson and Solow (1960, 189) thus remark that there is “the strong suggestion that the relation, such as it is, has shifted upward slightly but noticeably in the forties and fifties.”¹⁰ In the first two decades of the 19th century, the unemployment rate needed to stabilise money wage rates was—according to their estimates—4 to 5 per cent (stable prices 3 per cent, assuming an increase in productivity of 2 to 3 per cent). However, for the period since 1946 to the late 1950s around 8 per cent of unemployment seemed to be necessary to achieve stable wages (5 to 6 per cent with respect to price stability).

As concerns economic policy, Samuelson and Solow (1960, 187) try to answer their own question of “[w]hat policy decisions might conceivably lead to a decrease in the critical unemployment rate at which wages begin to rise or to rise too fast?” One possible approach is to reduce imperfections on the labour market especially with respect to the mobility of labour (between regions but also between sectors) which seems to be higher in the UK than in the US (see Samuelson and Solow, 1960, 190). The mobility of labour, however, depends “heavily on the pull of job opportunities elsewhere” and hence is influenced by the overall state of aggregate demand.¹¹ Samuelson and Solow (1960, 190) thus emphasise “that a deliberate low-pressure policy to stabilize the price level may have a certain self-defeating aspect.”

Be that as it may, with regard to the cost-push demand-pull debate, Samuelson and Solow (1960, 191) see themselves as taking an intermediate position—and this is where finally the Phillips curve comes into play since the curve shows that neither pure demand-pull nor pure cost-push inflation is at work in the economy.¹² The Phillips curve thus is regarded as an alter-

⁹Today, this issue of long-term unemployed who lose their disciplining effect on the wage claims of those still employed is one cause of “hysteresis” (Blanchard and Summers, 1986). In particular Ball (1999, 231) emphasised this mechanism.

¹⁰Laidler (2010, 123, n. 2) hence remarks: “The US data presented by Samuelson and Solow (1960) are much less convincing in their support for the relationship’s existence. That these authors’ conjectures about the existence of a trade-off were taken so seriously on the basis of such flimsy empirical analysis is a minor mystery in the history of postwar empirical economics”. Unfortunately, Samuelson and Solow do not provide much information about data sources used and the timespan under consideration. Keeping this in mind it seems as if the scatter plot, from which conclusions about a shifting Phillips curve were drawn, contains data from the beginning of the 19th century to 1958. King (2008, 318, n. 5) supposes that the earliest data is from 1890. See Hall and Hart (2010, 5f.) for data sources most likely used.

¹¹Also Samuelson (in Burns and Samuelson, 1967, 124f., 139f.) points at such beneficial effects of a “long, steady expansion” for the location of the Phillips curve as structural unemployment might be reduced successfully in this way.

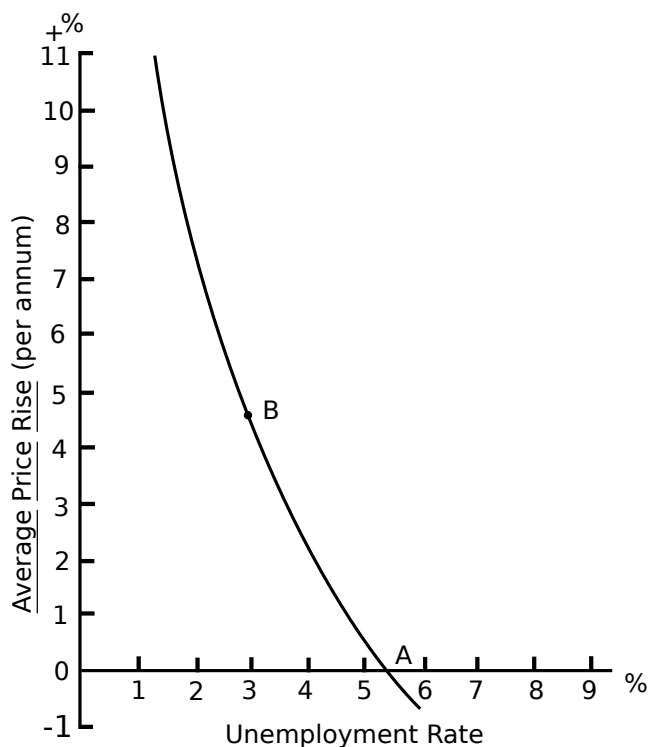
¹²Solow (in Solow et al., 2009, 73) points out that they “thought that a more useful distinction was between movements along the Phillips curve and shifts of the Phillips curve” as inflation caused by excess demand could be explained by movements along the curve, whereas cost-push influences on inflation would shift the relation between inflation and unemployment (see Solow 2002, 73). This, however, as Samuelson and Solow (1960, 189) remark, would only be a correct interpretation of the Phillips curve if “the relation we have been

native tool to analyse the inflationary process and to draw policy conclusions. The US Phillips curve (see Figure 3.2) hence is interpreted as showing “the different levels of unemployment that would be ‘needed’ for each degree of price level change” (Samuelson and Solow, 1960, 192).¹³

Figure 3.2: The Menu of Choice.

Source: Samuelson and Solow (1960, 192). Redrawn. See Chapter “Copyright and Permissions” for further information.
The original caption reads:

“MODIFIED PHILLIPS CURVE FOR U.S.
This shows the menu of choice between different degrees of unemployment and price stability,
as roughly estimated from last twenty-five years of American data.”



discussing represents a reversible supply curve for labor along which an aggregate demand curve slides. If that were so, then movements along the curve might be dubbed standard demand-pull, and shifts of the curve might represent the institutional changes on which cost-push theories rest.” As “[t]here are two parties to a wage bargain” Samuelson and Solow (1960,190) remain sceptical about the “identification of the relationship as merely a supply-of-labor phenomenon.”

¹³Solow (2002, 73) recalls that Samuelson and he himself explicitly chose not to fit a multiple regression: “It is a remarkable fact that we made no attempt to fit a multiple regression. I was teaching econometrics regularly at the time, so we knew how; but we both thought that running regressions after so much eyeballing of the data would be inappropriate. Neither of us would have thought the simple bivariate relation to be an adequate representation.” Thus, their paper was “no great show of econometrics” (Solow, 1976, 4). The curve hence seemed to mainly serve illustrative purposes as Solow (1979, 39) points out: “Then, using no more than a couple of rules of thumb and educated guessing, we converted those post-war observations into a hypothetical relation between the rate of price inflation and the unemployment rate.” Peston (1971, 130, n. 15), however, notes that sketching such a smooth line was “foolhardiness” and that “this was one of the first articles to take the two dangerous steps of drawing the Phillips curve as a smooth relationship without a scatter of points around it, and to replace the change in wages with the change of prices on the vertical axis.”

Samuelson and Solow (1960, 192) emphasise two points on their curve, whereas they call these results “guesses”:

- Point A: To assure price stability, an unemployment rate of 5 to 6 per cent seems to be necessary, which indicates that at this rate of unemployment wages do not increase by more than the growth rate of productivity which Samuelson and Solow consider to be 2.5 per cent per year: “That much unemployment would appear to be the cost of price stability in the years immediately ahead.”¹⁴
- Point B: To achieve an unemployment rate of 3 per cent (a “nonperfectionist’s goal”), inflation of up to 5 per cent per year has to be accepted: “That much price rise would seem to be the necessary cost of high employment and production in the years immediately ahead.”

However, Bronfenbrenner and Holzman (1963, 627) remark that structural and frictional unemployment at that time for the US was usually estimated to be 3 per cent of the labour force. This means that the 3 per cent goal, which is not in line with price stability, is not necessarily an over-employment target but rather compatible with the notion of full employment.¹⁵ On the other hand, it becomes clear that Samuelson and Solow (1960, 193) do not regard an unemployment rate of 5 to 6 per cent needed for price stability as the full employment level as they “expect that the tug of war of politics will end us up in the next few years somewhere in between these selected points. We shall probably have some price rise and some *excess* unemployment” (my italics).

That the relation may shift due to economic policy is in focus of attention once again. Samuelson and Solow (1960,193) emphasise:

Aside from the usual warning that these are simply our best guesses we must give another caution. All of our discussion has been phrased in short-run terms, dealing with what might happen in the next few years. It would be wrong, though, to think that our [...] menu that relates obtainable price and unemployment behavior will maintain its same shape in the longer run. What we do in a policy way during the next few years might cause it to shift in a definite way.

¹⁴See Klein and Bodkin (1964, 393f.) for comparable estimates. Phillips (1962, 14f.) discusses Samuelson’s and Solow’s results. His own estimates for the US, however, “made lead me to think that the situation in the United States is less favourable than this. I estimate that 7 to 8 per cent. unemployment would be needed to maintain a stable price level, and that at 4 per cent. unemployment the price level would rise at about 4 per cent. per annum.”

¹⁵See Gordon (1965, 45ff.) for a contemporary discussion about the level of unemployment considered to be full employment in the US.

Most noteworthy is their focus on the consequences of a low-pressure economy. In particular, Samuelson and Solow (1960, 193) hint at the possibility of adjusting inflation expectations¹⁶ as a beneficial by-product¹⁷ of this low-pressure economy:

Nevertheless, it might be that the low-pressure demand would so act upon wage and other expectations as to shift the curve downward in the longer run—so that over a decade, the economy might enjoy higher employment with price stability than our present-day estimate would indicate.

On the other hand, the problem of hysteresis on the labour market may cause an inflationary bias in such a low-pressure economy as pointed out once more by Samuelson and Solow (1960,193):

But also the opposite is conceivable. A low-pressure economy might build up within itself over the years larger and larger amounts of structural unemployment (the reverse of what happened from 1941 to 1953 as a result of strong war and postwar demands). The result would be an upward shift of our menu of choice, with more and more unemployment being needed just to keep prices stable.

Samuelson and Solow (1960, 193) also focus on whether or not a low-pressure economy might be able to compensate the loss of output (compared to a high pressure economy) in the long run: On the one hand, a low-pressure economy “could succeed in improving the efficiency of our productive factors” and thus may even forge ahead. However, also a falling behind of the low-pressure economy is conceivable (Samuelson and Solow, 1960,193):

On the other hand, if such an economy produced class warfare and social conflict and depressed the level of research and technical progress, the loss in growth would be compounded in the long run.

¹⁶Solow, in a letter to Sleeman in 1982 (cited from Sleeman, 1983, 152, n. 47, Solow’s brackets), states: “I think a reading of our (i.e. Samuelson and Solow’s) AEA paper (which started off by worrying about cost-push vs. demand-pull) will suggest that we already realized that both past and expected future price movements could have an influence on wage behavior.” Solow (2002, 73) thus remarks that “we were obviously wondering about something like an expectations-augmented Phillips curve”, even though “we did not see it as being as central as it became later” (Solow in Snowdon and Vane, 1999, 285). In the same vein, Solow (in Solow et al., 2009, 76) points out: “We said explicitly that it is unlikely that one could successfully exploit the Phillips curve in the long run. We even mentioned the possibility that it was inflationary expectations that would shift the curve adversely if one tried. But I think we had something more general in mind: that the mere experience, however you process it, whether through expectations or the development of norms or behavior, would have that effect. So when I read Milton’s address, that part didn’t come as much of a surprise, though Milton dwelt on that point much more than we had thought to do so.” Solow (2002, 74), however, emphasises that these qualifications should not be misread as a forerunner of the vertical long-run Phillips curve as “[n]either of us ever had much confidence in the accelerationist model when it was finally formulated”.

¹⁷Also Samuelson (in Burns and Samuelson, 1967, 163) points at the positive effects of a (temporary) low-pressure economy for the Phillips relationship: “I think it might be argued that the optimal policy in a mixed economy like ours might be intermittent periods of letting a certain amount of slack develop, then getting the benefit of this slack in breaking inflationary expectations, and then going on strong.” In the same vein, Solow (1962,14) remarks that a period of high unemployment and stable prices might be beneficial for reducing unemployment without strong wage pressure compared to “a time when the expectation of inflation is fresh and strong”.

In sum, the focus of Samuelson and Solow (1960) on the Phillips curve must be interpreted as an alternative way of analysing the inflationary process in the 1950s compared to the, in their view, not fruitful discussion about cost-push versus demand-pull inflation. Their assessment of different combinations between inflation and unemployment is well balanced: On the one hand, they are well aware of the dangers of an ongoing “creeping inflation” and especially point out the problem that an economy subject to such permanent price increases may breed an inflationary bias. On the other hand, they are sceptical about fighting inflation by engineering a low-pressure economy: Even though there are some advantages (as for example the beneficial effect on inflation expectations), Samuelson and Solow (1960, 193) also stress the possibility of structural unemployment or below average technical progress. Taking into account this discussion of endogenous possible shifts, it becomes clear that they did not treat the Phillips curve as a stable relationship.

Also immediate comments at the conference¹⁸ questioned the long-run stability of the curve even though all commentators seem to have understood Samuelson and Solow as offering such a “menu of choice”. In particular Chandler (1960, 213f.) doubts the usefulness of Samuelson’s and Solow’s “quantitative ‘guesstimates’” for practical policy and emphasises the issue of endogenous changes in the behaviour of interest groups as soon as economic policy tries to maintain a certain level of employment. Moreover, a policy focused on creating short periods of high growth may also create high rates of price increases and therefore inevitably restrictive policy which could lead to severe social losses as “[t]he resulting disappointment of widely held highly inflationary expectations could be quite damaging to employment, output, and growth” (Chandler, 1960, 215).

On the other hand, Laidler (2003, 22, n. 9) points out that another commentator, Lerner (1960), “gently chides them for not recommending the purchase of less unemployment with more inflation.” Without doubt Lerner (1960, 217) discusses such a trade-off:

One can apply the economic principle of equalizing marginal cost and marginal benefit, indulging in creeping inflation as long as the value of the additional output is greater than the damage from the additional inflation involved.

Nonetheless, Lerner (1960, 217) is fully aware of the accelerationist hypothesis as he points out that “[a]s adjustment is made to the inflation it has to run faster and faster to keep output in the same place.” Inflation for Lerner (1960, 217) is not an obstacle for proposing expansionary policies as the distributive effects of inflation are considered to be the lesser of the two evils as “a 3 per cent cut in output is much worse than a 3 per cent inflation which can never do more than redistribute a fraction of 3 per cent of the output. A small part of the difference in output would be sufficient to correct the injustices since much of the redistribution will cancel out or will be in desirable directions.”

The last commentator, Pechman (1960, 218), while being very sceptical about the results derived by Samuelson and Solow, also interprets the contribution of Samuelson and Solow as discussing “the ‘terms of trade’ between unemployment and price stability. By this I mean the

¹⁸The conference was the seventy-second annual meeting of the American Economic Association, held in Washington, D.C., from December 28 to 30, in 1959. The topic of the Samuelson-Solow session was: “Problem of Achieving and Maintaining a Stable Price Level” (see American Economic Association, 1960, ix).

cost in terms of a higher rate of unemployment of achieving price stability or, alternatively, the cost in terms of higher prices of reducing unemployment to a tolerable level.” The trade-off notion thus was certainly there at the conference and also taken up by commentators. Even though Samuelson and Solow can be interpreted as offering a “menu of choice” between inflation and unemployment, it will be argued in the next section that their trade-off view is very different from that of Friedman.

3.4 Friedman vs. Samuelson and Solow on the “Menu of Choice”

To fully understand the divergent interpretations of the Phillips curve trade-off by Friedman and Samuelson and Solow, it is necessary to discuss two major differences between both lines of thought: On the one hand, it must be discussed if and how the underlying causality changed with Friedman’s critique as the direction of causation is crucial for the interpretation of the trade-off itself. On the other hand, it seems necessary to judge Samuelson’s and Solow’s possible trade-off interpretation in the light of the late 1950s and the cost-push demand-pull debate.

As concerns the underlying causality, it seems that Samuelson and Solow (1960) did not change the direction of causation of the Phillips curve: Like Phillips (1958, 283) himself, Samuelson and Solow (1960, 189) state that “[w]age rates do tend to rise when the labor market is tight, and the tighter the faster.” Thus, changes in the rate of unemployment are regarded as the driving force of the relationship, which indicates that causality runs from unemployment to inflation and not from (unanticipated) inflation to unemployment.¹⁹

This different theoretical understanding of causality to explain movements on the Phillips curve is most important as the interpretation of the Phillips curve by Samuelson and Solow points to its role as an adjustment relation for an economy in disequilibrium, which was particularly brought forward by Lipsey (1960, 1974), and not to an aggregate supply curve of labour based on the misperception of relative prices or on the confusion of nominal and real wages as in Friedman (1975, 41ff.).²⁰

Friedman (1968), however, was ambiguous about the underlying causation—or at least there is a certain tension in his argument: On the one hand, unemployment is, as in the original Phillips curve, treated as a proxy for excess supply or demand on the labour market so that the Phillips curve remains a disequilibrium relation as “transactions occur *out of equilibrium* because price does not adjust instantaneously” (Lipsey, 1974, 69). On the other hand, reducing unemployment below the natural rate is only possible due to misperceptions of the “true” real

¹⁹This view is bolstered by Solow, in a letter to Sleeman in 1982 (cited from Sleeman, 1983, 130, n. 4, omission by Sleeman himself), in which he explicitly refers to the disequilibrium interpretation of the Phillips curve: “From the very beginning I regarded the Phillips curve as analogous to any price adjustment equation driven by excess supply or demand” and “I have always thought of . . . the Phillips curve as a model of disequilibrium states with causality running from RHS to LHS.”

²⁰This was also emphasised by Solow (in Solow et al., 2009, 77): “What Milton did without ringing any bells to warn you, was simply to take it that the causality ran the other way, that it’s the deviation of the rate of inflation from the expected rate of inflation that pushes the unemployment rate away from the ‘natural’ rate. Phillips is about disequilibrium in the labor market. There is no question about that [...]. After Milton’s address, everybody treated this as an equilibrium matter, looking in the reverse direction.”

wage on the side of workers since inflation expectations adjust only slowly. Thus, given their perceived price vector the reaction of the labour force is as if workers are moving on their supply curve (and firms respectively moving on their demand curve)—the Phillips curve thus becomes an equilibrium relation embedded into a framework of full price flexibility. Friedman (1975, 41ff.) finally chose sides and opted for the direction of causation from prices to quantities and therefore for the equilibrium interpretation (see Laidler, 1990, 55 and Laidler, 2012, 20ff.; see also De Vroey, 2001). But even before Friedman’s full commitment to the Fisher-type causality (see Fisher, 1926) regarding the Phillips curve, Lucas and Rapping (1969) reinterpreted the Phillips curve as an aggregate labour supply curve.

Thus, if there was any trade-off idea involved in the paper by Samuelson and Solow then it did not rest on the grounds of cheating workers and producers alike by creating unexpected inflation. The most important weakness of this contribution thus may be the fact that there is no fully developed underlying theoretical framework²¹ for explaining movements on the curve and thus for how it may be possible to pin the economy down to a point on it.

Moreover, it seems that their view of the trade-off is much more different than the “modern” version and becomes only visible in light of the previous discussion of cost-push and demand-pull inflation. Of course, their overall ambiguity makes other interpretations feasible as well, but contrasting Friedman’s and Samuelson’s and Solow’s view from another perspective might prove helpful.

The “menu of choice” in Samuelson’s and Solow’s view only exists as inflation is a mixture of cost-push and demand-pull forces. Thus, the economy may either enjoy price stability and unemployment or full employment and rising prices. These rising prices at full employment, however, are not the result of general excess demand (which cannot be full employment by definition) but are caused by many different market imperfections, most notably the unequal distribution of demand over different sectors (those with excess demand pushing inflation, but those facing excess supply not reducing their prices accordingly) and labour markets involving trade unions and other bargaining elements so that “price inflation does not wait for full employment” (Burns in Mitchell, 1951, xxi; see also Solow, 1978, 203 with reference to the 1960s). Samuelson’s and Solow’s emphasis on the Phillips curve concept hence can be interpreted in the sense that it provided “[a] more eclectic model of imperfect competition in the factor and commodity markets” in order “to explain the fact of price and wage rises before full employment and full capacity have been reached” (Samuelson and Solow, 1960, 180).

This “cruel dilemma” (Tobin, 1967, 101) for the policymaker thus only exists as price stability and full employment are not possible at the same time. In Friedman’s presidential address, however, neither cost-push forces nor other market imperfections mentioned above play a role for the rate of price increases. Additional evidence can be found in Friedman (1966a), in which he first introduced the concept of the “‘natural’ level of unemployment” (Friedman, 1966a, 60). In his discussion of the feasibility of guideposts, Friedman (1966a, 57) denies that there

²¹Also Solow (1976, 4f.) admits: “It did not occur to me then that the Phillips curve (or perhaps Phillips surface would be better, to signal that more than the unemployment rate governs the rate of wage increase) needed any subtle theoretical justification. It seemed reasonable in a commonsense way that the change in the money wage, like the change in any other price, should respond to the demand-supply balance in the labor market.” This very basic explanation is the same as in Phillips (1958, 283). A first model to derive the curve is provided in Lipsey (1960, 12ff.).

is any issue of “premature inflation” due to cost-push forces. This result is based on Friedman’s argument that “[i]nsofar as market power has anything to do with possible inflation, what is important is not the *level* of market power, but whether market power is *growing* or not.” Hence, cost-push inflation, if at all, is only a temporary issue.²² Inflation in Friedman’s sense, but in the terminology of the late 1950s, is pure demand-pull inflation since “[i]nflation is always and everywhere a monetary phenomenon” (Friedman, 1966b, 18). In such an inflationary environment, however, a long-run trade-off clearly is not only non-existent, it is also completely unnecessary since full employment and price stability then are not incompatible policy objectives. The negative slope of the (short-run) Phillips curve in Friedman’s framework hence only exists as unexpected inflation alters the supply of and demand for labour. The “cruel dilemma” in such a framework boils down to a deliberate choice of the best rate of inflation, be it price stability or not. Thus, in such an economy “[t]he problem of macroeconomic policy is the transparent one of dosage” (Samuelson in Burns and Samuelson, 1967, 55).

In contrast, in Samuelson and Solow (1960), the negative slope of the short-run or long-run (as this distinction is not applicable here) Phillips curve exists due to inflationary pressures even before full employment is achieved so that “the days of happy and simple Keynesianism” (Samuelson in Burns and Samuelson, 1967, 46) are over.²³

The “menu of choice” in Samuelson’s and Solow’s analysis hence is not opening up an opportunity set to maximise social gain, but to the contrary shows the social loss as both objectives are not compatible at the same time. In effect, the policymaker and society as a whole would be better off if such a “menu of choice” never existed. Samuelson’s and Solow’s (1960, 192) “nonperfectionist’s goal of high enough output to give us no more than 3 per cent unemployment”—a level which was, as already noted, in line with contemporary estimates of frictional unemployment and hence full employment—is simply not attainable without accepting some inflation. Friedman thus did not only change the direction of causation, but also altered the underlying causes of inflation by denying the issue of permanent cost-push inflation, which in the original trade-off interpretation prevented the economy from reaching and keeping full employment without any rise in the price level. This becomes clear by looking at Friedman’s (1966a, 60) critique about the assumptions of why guideposts are necessary (and why there exists a trade-off between inflation and unemployment in the sense of Samuelson and Solow):

Hence, the alleged case for the guidelines seems to me to rest on two basic fallacies: first, that market power is a source of rising prices, and second—on the belief that somehow or other you can fool the people all the time—that by increasing the rate of monetary expansion, you can thereby induce people to maintain a permanently lower level of unemployment.

However, in Friedman’s presidential address the first “fallacy” is not mentioned at all, whereas the second “fallacy” took centre stage. Thus, Friedman, by only accepting the concept of demand inflation, removed any qualified reason to discuss a trade-off as in such an economic

²²This view was criticised by Ackley (1966, 71), who points at the connection between the state of demand and the possibility for making use of market power. See also Solow (1966a, 44) and in particular Solow (1968, 4f.) regarding the issue of ongoing wage push.

²³See also Samuelson in Burns and Samuelson (1967, 53ff.) and Tobin (1967, 101f.).

setup there is no need to choose between inflation and unemployment. Furthermore, the second “fallacy” was never there as such. It rather emerged artificially due to Friedman’s implicit change of causality. In a Samuelson-Solow economy, monetary expansion may remove unemployment. Inflation, however, is an unwelcome by-product of this process, but it is not the cause of this lower unemployment rate. This becomes very clear by Solow’s (1966a, 64) immediate reaction to Friedman’s (1966a, 60) critique:

I don’t think I’m guilty of the fallacy of which Milton charges me—of believing that inflation generates employment. I’m not arguing that. I’m arguing that demand pressure, whether it is generated by monetary or other means, generates both inflation and employment. And that is what creates the dilemma [...].

As a final assessment of Friedman’s critique, it is worth discussing the results by Forder (2010a, 19), stating that Samuelson and Solow filled “a gap in a story” and that “Friedman’s Nobel Lecture is no more than mythologizing” (Forder, 2010b, 344). Some of the results of this paper are in line with Forder’s statement: First, the discussion has shown that Samuelson and Solow are very cautious about the stability of the curve and that there is no inflationary position taken in their contribution.²⁴ Second, Friedman not only reinterpreted the underlying causality but also the inflationary process itself. The latter point seems to be even more important as it is in particular this combination between cost-push and demand-pull inflation which gives rise to the specific trade-off interpretation in Samuelson and Solow (1960). Both trade-off views hence are completely different in both the underlying assumptions and the consequences of making use of the trade-off. In Friedman’s view, the trade-off allows the economy to temporarily deviate from full employment by inflationary surprises but breaks down as soon as inflation expectations adjust. In Samuelson’s and Solow’s framework, there is indeed the possibility of a trade-off even in the long-run (besides their qualifications on the possible instability of the curve) but only in the sense that the policymaker has to accept the higher rate of inflation at full employment—a rate of inflation which arises mainly due to market imperfections.²⁵

However, the way Samuelson and Solow present their argument indeed causes the impression of a trade-off between inflation and unemployment in the sense of Friedman. At least their Phillips curve diagram is described in such a way as if the policymaker has the explicit choice between the two discussed combinations—and there is no clear statement to the reader that the choice stops here. Hence, in principle, any point on the curve is feasible, even though Samuelson and Solow warn that inflation expectations may adjust or that there might be hysteresis. Solow (2002, 74) therefore also acknowledges that “the prosecution has a case too. It is that the qualifications are just qualifications, and the reader is left with the impression that the recorded Phillips curve really does provide [. . .] ‘a menu of choice’.”

Furthermore, Solow (2002, 73) admits that “we were interested in the possibility that the Phillips curve might represent an exploitable trade-off between unemployment and inflation”, while also noting that “we were very skeptical about the durability of any such trade-off”.

²⁴Solow furthermore became an opponent to Johnson’s expansionary policies in the second half of the 1960s (see Solow, 1966b describing his change of mind and Solow, 1992, 163f. as a retrospective).

²⁵Market imperfections are also a determinant of Friedman’s (1968, 8) “natural rate of unemployment”. However, contrary to Samuelson and Solow, market imperfections for Friedman define the level of wages but play no role for the dynamics of wages in general.

Moreover, it also seems to be the case that both Samuelson and Solow had some kind of confidence in this interpretation, too, as Solow (1979, 38) remarks:

I remember that Paul Samuelson asked me when we were looking at those diagrams for the first time, “Does that look like a reversible relation to you?” What he meant was, “Do you really think the economy can move back and forth along a curve like that?” And I answered, “Yeah, I’m inclined to believe it,” and Paul said, “Me too.”

As has been shown, one favourable way of reading Samuelson’s and Solow’s “menu of choice” interpretation is based on taking into account the cost-push and demand-pull inflation discussion which heavily alters the trade-off interpretation since this view points at the conflict between inflation and full employment. Nevertheless, the authors unfortunately missed to take a clear position and to present a solid theoretical model of their “menu of choice”, so that different interpretations are indeed possible. This issue also showed up at the conference as all commentators more or less interpreted their contribution as offering in a favourable way the possibility of trading off inflation for unemployment.

3.5 Conclusion

As this discussion has shown, it should be stressed that there is indeed a strong ambiguity in the work of Samuelson and Solow (1960), for on the one hand the idea of getting less unemployment by accepting more inflation (and vice versa) is sketched. On the other hand, it has been argued that the trade-off interpretation in light of the cost-push versus demand-pull debate in the 1950s probably needs to be reformulated: The trade-off concept in their view shows the rate of inflation that has to be accepted for increasing employment up to its full-employment level. This unavoidable rise in prices is not the cause but the outcome of full employment due to various imperfections in the economy. The main issue hence is that “of an inflationary bias of the economy at full employment” (Ackley, 1966, 78). The Phillips curve thus provided an alternative view on the inflationary process and therefore “served to dispose of the rather sterile ‘cost push’-‘demand pull’ controversy” (Modigliani, 1977a, 3).²⁶ Hence, the Phillips curve “can be used to portray a modified cost-push model” (Samuelson, 1961, 383) in the sense that the slope of the curve is an in-between case of pure demand-pull inflation (vertical curve at full employment) and pure cost-push inflation (horizontal curve until full employment, that is, no demand-inflation until full employment).²⁷ Therefore, the choice between unemployment and inflation resembles a dilemma²⁸ as Samuelson (1961, 383) explains to his students in his textbook:

There is, so to speak, a choice for society between reasonably high employment with maximal growth and a price creep, or reasonably stable prices with

²⁶Phillips (1958, 298f.) makes use of his curve to separate cost-push and demand-pull inflation, too.

²⁷See also Samuelson (1970, 808ff.).

²⁸As pointed out by Bronfenbrenner and Holzman (1963, 626, n. 57) it was Reder (1948) who first used the term “dilemma” (in Reder, 1948, 47 “policy dilemma”) to describe the problem of achieving full employment and price stability at the same time.

considerable unemployment; and it is a difficult social dilemma to decide what compromises to make.

Even though the paper of Samuelson and Solow is very cautious when it comes to the stability of the curve and particularly considers inflation expectations and hysteresis, the overall climate at that time seems to have been less worried about these qualifications as Solow (1995, 199) concedes that “[t]he eclectic American Keynesians of the 1960s were not sufficiently alert to the force of inflationary expectations. They expected more from the Phillips curve than it could deliver in practice.” Probably some contemporaries thus acted in the spirit of “hydraulic Keynesianism” (Coddington, 1976, 1265). However, also Solow (1995, 199) admits that their presentation of the policy possibilities was too optimistic. On the other hand, as has been shown, immediate reactions at the conference to the contribution questioned the possibility of a long-run trade-off without accelerating inflation (see also Leeson, 1998).

However, the causality of the curve was still regarded by Samuelson and Solow as running from quantities to prices. Inflation thus was considered to be the outcome of lower unemployment and of adjustment processes in the economy (a view explained in Tobin, 1972, 9ff.) and not the cause and starting point like in Friedman’s presidential address in 1967 and even more pronounced in his later work (see Friedman, 1975, 1976, 1977b).

Also Solow (1995, 199) admits that the famous Phillips curve article which despite all qualifications still seems to offer this trade-off possibility “is one of the things I would do differently now”—probably as its ambiguity not only opened up the trade-off interpretation of the Phillips curve in general, but as it also prepared the stage for Friedman, who remembers that “the basic idea grew out of the discussions about guidelines and, in particular, out of the Samuelson and Solow paper on the Phillips curve” (Friedman in Taylor, 2001, 124).²⁹ Likely, it was precisely this ambiguity of the contribution by Samuelson and Solow which made it tempting for Friedman to do “what we all do when we try to differentiate our products; namely, to set up straw men (Friedman, 1977a, 13).³⁰

However, as has been argued in this paper, the theoretical core assumptions of Friedman’s and Samuelson’s and Solow’s approaches are very different. For Samuelson and Solow a trade-off only exists as it is not possible with the given structure of the economy (in particular with respect to cost-push forces) to achieve full employment and price stability at the same time, which is contrary to Friedman’s reading of the trade-off interpretation based on pure demand-pull inflation. Accordingly, full employment and price stability in Friedman’s concept do not exclude each other and the (short-run) negatively sloped Phillips curve is nothing more than an artificial outcome of policy surprises.

A modern interpretation of Samuelson’s and Solow’s reading of the Phillips curve would be very close to the reasons given by today’s central banks on the choice of a positive inflation target. These reasons in favour of a positive inflation target include, amongst others,

²⁹Friedman (1968, 9) also exemplarily chooses an unemployment target of 3 per cent for his critique, which, as has been shown, is one of the targets—the one not in line with price stability but with full employment—discussed by Samuelson and Solow: “Let us assume that the monetary authority tries to peg the ‘market’ rate of unemployment at a level below the ‘natural’ rate. For definiteness, suppose that it takes 3 per cent as the target rate and that the ‘natural’ rate is higher than 3 per cent.” The natural rate is assumed to be 4 per cent in Friedman (1966a, 60).

³⁰This quote, of course, is not directed at his own work, but at a discussion of Modigliani (1977b).

wage rigidities, business cycle fluctuations, or also a flexible environment for economic growth (see Horváth and Matěju, 2011, 268). As has been shown, all these arguments also play a role in the contribution by Samuelson and Solow even though cost-push forces are by far more pronounced than today. This interpretation of Samuelson and Solow (1960) is supported by a remark of Samuelson (1960, 265) about monetary policy in the 1950s (my italics):

A careful reading of the Federal Reserve positions suggests the authorities are willing to entertain the hypothesis that there are important *cost-push* mechanisms operating in the present system. As Solow and I indicated at the 1959 meeting of the American Economic Association, in our paper [Samuelson and Solow, 1960] dealing with the apparent “Phillips curve” that roughly relates American wage increases to the degree of unemployment in our system, I agree that *tendencies toward sellers’ inflation* and related *inflexibilities in the face of demand changes* do seem to throw up something of a *dilemma* for fiscal and monetary policy. [...]

With *important cost-push forces assumed to be operating*, there are many models in which it can be shown that *some sacrifice in the requirement for price stability is needed* if short- and long-term growth are to be maximized, if *average long-run unemployment is to be minimized*, if optimal allocation of resources as between different occupations is to be facilitated.

In sum, the main idea behind the “menu of choice” for monetary policy in the 1950s and 1960s was very close to that of today: Due to various deviations of the real world economy from its perfect theoretical counterpart, zero inflation and full employment are difficult to achieve at the same time. This view, by downplaying these real world deficiencies, was opposed by Friedman. In his framework, Samuelson’s and Solow’s pessimistic dilemma view was reinterpreted as offering an occasion for opportunistic but myopic policy surprises to push the economy away from full employment and price stability to over-employment at the cost of surprise inflation.

Nonetheless, it should be clear after this exhaustive journey that if a policymaker had the choice between Samuelson’s and Solow’s imperfect economy giving rise to a “menu of choice” and Friedman’s perfect economy with no choice at all, every policymaker should choose the latter one since the optimal choice would be not having a choice.

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4 Growth as an Objective of Economic Policy in the Early 1960s: The Role of Aggregate Demand

Abstract

This paper sheds light on economic policy discussions in the early 1960s about whether there is an optimal level of demand to maximise the rate of growth. This discussion was influenced by the cold war, which urged policy makers particularly in the USA to achieve higher rates of growth than the Soviet Union. As it was assumed that good demand management can damp the business cycle, regulating and deciding upon the level of demand pressure in the economy was regarded as an important tool for economic policy. The main debate therefore evolved around the question whether or not the economy should be run at high demand pressure and inflation to foster growth or if some slack in the economy and deflationary tendencies are a prerequisite for a prosperous growth path.

La croissance, objectif de la politique économique au début des années 1960: le rôle de la demande agrégée

Cet article traite des discussions du début des années 1960 concernant la détermination d'un niveau de demande optimal susceptible de maximiser le taux de croissance. Ce débat eut lieu dans le contexte de la guerre froide où les décideurs, notamment aux États-Unis, étaient tenus de réaliser des taux de croissance supérieurs à ceux de l'Union soviétique. Supposant qu'une maîtrise appropriée de la demande pouvait infléchir le cycle économique, la régulation et la décision du niveau de la pression de la demande étaient considérées comme un instrument majeur de la politique économique. Aussi, le débat a principalement consisté à déterminer si l'économie pouvait ou non fonctionner en présence de fortes pressions inflationnistes et des niveaux de demande élevés, favorables à la croissance, ou si un certain ralentissement de l'économie et des tendances déflationnistes constituaient une condition préalable à une trajectoire de croissance prospère.

Acknowledgements

I thank John Black, Olivier Bruno, Harald Hagemann, Niels Geiger, Richard Lipsey, and two anonymous referees for most helpful comments and suggestions. All responsibility for the

views expressed in this paper as well as for any remaining errors is of course mine alone.

Keywords: Economic policy, growth, aggregate demand, trade-off, Phillips curve

Mots clefs: politique économique, croissance, demande agrégée, compromis, courbe de Phillips

JEL classification: B22, E61, O40

4.1 Introduction

Today, policy discussions in the 1960s are usually associated with the idea of a long-run trade-off between inflation and unemployment given by a stable Phillips curve—a belief that was heavily countered by Phelps [1967] and Friedman [1968]. The debates in the 1960s, however, went farther than just arguing about the optimal combination between unemployment and inflation, that is, in today's terms, moving along a stable Phillips curve. There also was a lively discussion on the medium to long-run consequences of running the economy at different levels of demand pressure and hence at different combinations of unemployment and inflation. These debates focused on the impact of the rate of inflation on allocative efficiency, on the role of strong demand for capital formation and labour market dynamics, as well as on the overall impact of the state of demand on technical progress.

The discussion in the 1960s was based on three elements: First of all, growth became a most important policy objective due to the Cold War. Many contributions in the 1960s thus focused on the rate of growth from the point of view of economic policy and not necessarily from a founded theoretical analysis. Second, even though nearly all authors were aware that growth in the long run crucially depends particularly on technical progress, investment was nevertheless regarded as the driving force of the growth process taking place within the timespan important for economic policy. As investment was assumed to depend on the level of aggregate demand, regulating the demand pressure by fiscal and monetary policies seemed to be a promising approach to foster economic growth. In this view, stabilisation policies and active demand management did not only have a short-run influence but were also important for the medium to longer run. These two elements, that is, growth as an objective of economic policy and the important role of demand policies, will be discussed in Section 4.2.

The third element in this debate was the perceived trade-off between the rate of inflation and the rate of unemployment as given by the Phillips curve. Even though most contributions did not make reference to Phillips' [1958] seminal paper, the conflict between the two variables was at the heart of the discussion. This trade-off emerged due to various imperfections in the economy, most notably cost-push forces (for example, aggressive unions), causing inflationary pressures even in the case of excess unemployment. Regulating the level of aggregate demand in this debate thus not only meant to achieve the objective of high rates of growth, but also to balance the rate of inflation versus the rate of unemployment (see, for example, Fellner [1960: 94ff.]).

Hence, at least on theoretical grounds, inflation and unemployment were thought to be closely connected to the rate of growth even though three different lines of thought can be distinguished: on the one hand, many economists believed that a high-pressure economy would be beneficial for the rate of growth. Most arguments pointed at the stimulating environment for

investment due to inflation lowering the real rate of interest and a high level of demand stabilizing sales perspectives. These arguments were based on a Keynesian understanding of growth theories, that is, the Harrod-Domar model [Harrod, 1939; 1948; Domar, 1946; 1947] in which investment plays an important role for the rate of growth. However, many arguments were not backed up by deeper analysis (see, for example, Scitovsky and Scitovsky [1964: 440]). On the other hand, in particular Paish [1958; 1962; 1968] pointed out the positive effects of strong competitive pressures brought about by some slack in the economy. Growth in this framework did not depend on accelerator-type investment dynamics, but on the consequences of strong competitive pressures on firm-level efficiency and the need for innovations in order to survive in an overall weak market. A third line of thought remained very sceptical about a strong influence of the overall level of demand pressure on the rate of growth. Many economists, in particular those focusing on Phillips curve analysis and related policy questions, stayed close to Keynesian growth arguments, but based their sceptical view on empirical evidence which seemed to show that the rate of inflation and unemployment have, if at all, only a small influence on the rate of growth. These three different views will be discussed in Section 4.3.

Section 4.4 will focus on a most interesting contribution by Black [1959] which disentangles these different views within the Phillips curve framework. The conclusion will outline what might be learned from the discussion in the 1960s and what might have been lost since Friedman's introduction of a "natural rate of unemployment" into the Phillips curve concept.

4.2 Growth as an Objective of Economic Policy and the Role of Stabilisation Policies

4.2.1 Growth as a Policy Objective in Times of the Cold War

The discussion about the role of the overall state of demand for the rate of growth started in the 1950s, but became particularly pronounced in the early 1960s due to the slow rate of growth in the USA compared to the Soviet Union, and in the UK compared to the rest of the industrialised world [Wilson, 1961: 4; Johnson, 1963a: 46]. The rate of growth hence became a first priority objective of policy [Tobin, 1964: 1] particularly in the USA due to the Cold War, which also made economists talk about the "Soviet challenge" [Baran, 1960: 119] or the "Russian threat" [Baumol, 1958: 57]. Whereas the USA only reached an average growth rate of 3.3 per cent in the 1950s, the USSR achieved 7.6 per cent [Klein and Bodkin, 1964: 410].² Furthermore, the Cold War made it necessary to discuss growth as a matter of national security in the USA [Newman, 1958: 245; Lewis, 1958: 377; Rostow, 1960: 110; Smith, 1960: 272; Commission on Money and Credit, 1961: 9; Johnson, 1963c: 280; Wilson, 1963: 604ff.; Klein and Bodkin, 1964: 369; Tobin, 1964: 5]. A high rate of growth was regarded to be of utmost importance, since "a major objective of economic growth is to provide an expanding base for actual or potential national security outlays" [Kendrick, 1964: 242].

²It is worth noting that some economists were less concerned with the apparently high growth rates of the Soviet Union. Particularly Nutter [1962] pointed at the possibility of inaccurate statistics which probably overstated Soviet growth rates and at special factors (for example "the expansion of territory and resources") which might have boosted growth rates of the Soviet Union in the short run.

Not only the rate of growth as such, but also technical progress was regarded as an essential factor in times of the Cold War. As both were assumed to be interrelated—“if technology helps growth, growth in turn helps technology, and on technology defence largely depends” [Wilson, 1963: 605]—the rate of growth became the dominant policy objective. This obsession with growth went so far that the rate of growth in many contributions was often treated “as an end in itself” [Alhadeff et al., 1964: 531]. Even the “Golden Rule of Accumulation” by Phelps [1961] as an important contemporary contribution to growth theory on how to achieve maximum consumption was either just ignored or bypassed by many authors. Furthermore, individual decisions on saving and investment as the ultimate benchmark for an optimal rate of growth [Tobin, 1964: 2; Kendrick, 1964: 244] were also discarded in most contributions. For example, Musgrave [1958: 609] was clearly aware that “the ultimate objective of economic activity is consumption” but at the same time remarked about the “optimal rate of growth in the economy” in light of the high Russian growth rates that “this may be answered more or less easily by reference to Russia: Whatever we do, the Russian rate of growth is likely to exceed ours, simply because they are at a much earlier stage of the game; therefore, if we want to maintain our relative advantage, we had better grow as fast as we can.”

Due to this competition with the Soviet Union, Fellner [1960: 98] emphasised that policies aiming at a higher rate of saving in order to foster growth do not necessarily “violate the time-preference scales of the public” as positive external effects of a higher rate of growth (for example on defence) are not taken into account by private decisions. Thus, the optimal rate of growth was not regarded to be determined by individual preferences any longer, but became subject to economic policy. Denison [1962: 69] even went as far as to suggest “that the public be persuaded that acceleration of growth must be made an overriding national goal. Moreover, it must probably be persuaded of this for reasons other than the increase in individual welfare—probably reasons related to the external situation facing the country.” In the same vein, Anderson and Cornwall [1961: 174] emphasised that “[i]f we wish to maintain our market system and at the same time to avoid being outstripped by the Soviet Union, some way will have to be found to manipulate the market forces to achieve the desired growth goals.” Time preferences, thrift, and individual decisions as such hence were accepted as indicating an optimal rate of growth in a fair-weather world, but given the threats of the Cold War even Tobin [1964: 6] was not reluctant to state that “[s]ome hazards are great enough to bias our choice to favor the future over the present” as “[a] high GNP might be the difference between victory and defeat rather than the difference between more or less consumption.”

Growth as a policy objective hence involved strong interventions into the free market economy. This development was met with much scepticism. In particular Friedman [1959], who pointed at the importance of individual decisions so that “[w]hatever rate of change in the statistical aggregate [output] results from the effort of freemen to promote their own aspirations is the right rate,” feared that the Cold War might create a difficult and dangerous environment for economic policy as “departures we must make to survive” may overcharge the corrective forces of a free society. Johnson [1963b: 139] even went as far as to remark that “the recent emphasis on the desirability of a high rate of growth seems to me to involve grafting on to a free enterprise system standards appropriate to a planned economy with military and political ambitions.” Johnson [1963a: 47] therefore critically noted that “[t]he movement towards some form of economic planning for growth has gone farthest in the United Kingdom, with the es-

establishment of the National Economic Development Council” of which also Richard Lipsey, a pioneer of Phillips curve analysis [Lipsey, 1960], was part of the staff [Lipsey, 1997: xxiv]. The National Economic Development Council [1963b: viii] explicitly had the aim “to increase the rate of sound growth.” Such a rate of growth was set to be equal to 4 per cent of national output [National Economic Development Council, 1963b: iii]. In the USA, particularly the Joint Economic Committee [1958] and the Commission on Money and Credit [1961] published studies about the possibility of achieving a high rate of growth while maintaining price stability and full employment.

4.2.2 The Role of Demand Management and Stabilisation Policies

Growth not only became a most important objective of economic policy, it also was thought that economic policy has the appropriate tools to influence the rate of growth by managing the economy accordingly. This optimism is most visible in Samuelson’s [1955: 337] statement that “[w]ith proper fiscal and monetary policies, our economy can have full employment and whatever rate of capital formation and growth it wants.” This optimism about fine-tuning the economy is also very pronounced in Anderson and Cornwall [1961: 174] as they remarked that “[m]ost economists by now are accustomed to think of the government as an agency for damping fluctuations and at least edging the economy toward full employment.” The economics profession in the 1960s hence was very optimistic about managing the economy and there was the belief that good demand management “ironed out the business cycle” [Harrod, 1967: 19]. In the same vein, Wilson [1961: 3] stated that “the trade cycle, if it has not been altogether conquered, has been much subdued”. It is therefore not surprising that there was also an edited volume published on the possible obsolescence of the business cycle [Bronfenbrenner, 1969: v]. In sum, stabilisation policies had two short-term objectives: On the one hand, “to regulate the pressure of demand for labour” and on the other hand, “to keep the fluctuations of the unemployment percentage within fairly narrow limits” [Godley and Shepherd, 1964: 26]. Fine-tuning the economy with respect to choosing and regulating the pressure of aggregated demand hence seemed achievable by stabilisation policies so that “[i]t is for the Government to decide at what pressure it wishes to run the economy, and to try to keep it there” [Godley and Shepherd, 1964: 26]. This optimistic attitude towards managing the economy is described by Minsky [1968: 45] in retrospect about the early 1960s noting that it was believed that “business cycles as they had been known would be a thing of the past” and that “the perfected tools of economic policy would ‘fine-tune’ the economy so that, period by period, it would stay on a course of sustained growth.”

Thus, “sustained growth” relied on successful stabilisation policies to damp the business cycle and to keep the economy at full capacity output (see, for example, Smith [1957: 53ff.]; Phillips [1961: 367f.]). This implied that economic policy needed to assure that the growing output of the economy will also be demanded [Musgrave, 1958: 607; Klein and Bodkin, 1964: 377]. In this sense, economic stability not only meant to keep the economy “at a happy mean”, that is, to damp the ups and downs, but to assure “a level of activity very close to full employment” [Turner, 1958: 671]. Stabilisation policies thus had the difficult task to maintain ongoing full employment with minimal fluctuations, which required a sophisticated analysis of the interrelationships between economic variables and appropriate tools to analyse the impact of

different policies. One of the first economists to incorporate such new methods regarding stabilisation policies was Phillips [1954; 1957], who applied tools from engineering to the issues of economic stability [Turnovsky, 2000: 296ff.]. Phillips [1962: 9f.] furthermore was convinced that confidence about economic policy is an important stabiliser itself. Phillips' intuition is that expectations about a sound policy, especially aggressive in fighting severe slumps, will stabilise investment and as such the whole economy because of the thereby created confidence that exactly such an enormous downturn will not be likely to last for a long time. Also Balogh [1958: 232] pointed at the necessity of stabilisation policies to create confidence as otherwise there might be "shocking consequences", that is, a strong economic downturn, so that "only foolish people will not let sleeping accelerators lie". Stabilisation policies hence were regarded as necessary to dull Harrod's "knife-edge" [Solow, 1956: 65]. Samuelson [1957: 569] thus emphasised that preventing the "excesses of the boom" but also "offsetting slumps" will be beneficial for economic growth (see also Kendrick [1964: 239]). Stabilisation policies to achieve a maximal rate of growth were also believed to be necessary in an otherwise neoclassical growth context. For example, Cornwall [1963: 1f.] remarked that the long-run growth rate will depend on supply-side factors if full employment can be achieved by a perfectly functioning price system. If, however, full employment cannot be assured by the market system itself, demand policies are a powerful and necessary tool to increase the rate of growth so that "the system moves toward a long-run equilibrium growth rate determined solely by supply factors, as in the neo-classical world" [Cornwall, 1963: 21]. Thus Cornwall [1963: 2] pointed out that demand policies actually make it possible that the maximum growth rate (restricted by conditions on the supply side) can be fully realised so that "growth can and should be looked upon as a problem of adequate demand as long as an economy is subject to periodic recessions" (see also Nelson [1966: 1186] for a comparable approach and Johnson [1963a: 65f.] for a related and critical comment on economic policy in Canada).

However, not all economists at that time thought that damping cyclical fluctuations is a necessary condition to achieve high rates of growth. For example, Fishman and Fishman [1958: 65] pointed out that "[d]evoted followers of Schumpeter may . . . question whether it is possible to maintain growth without cyclical fluctuations, and whether any attempts to eliminate or even sharply reduce cyclical fluctuations may not result in economic stagnation" as "Schumpeter believed that there is an inherent causal relationship between economic growth and cyclical fluctuations, and that cyclical fluctuations are the mechanism through which growth occurs." Samuelson [1957: 566] hence speculated that "[p]erhaps the booms and the busts of the last century were the inevitable costs of progress, the necessary price we must pay for vital growth." In the same vein, Newman [1958: 246] pointed at the "surging and pulsating character" of a growing economy and hence at a possible "conflict between growth and employment as objectives of economic policy."

This conflict seemed to be most pronounced if restrictive demand policies were necessary to fight inflationary pressures arising due to cost-push forces, that is, for example, unions pushing up wages independently of the state of demand (see Bronfenbrenner and Holzman [1963: 600ff.] on the cost-push demand-pull debate in the 1950s and 1960s). This dilemma of fighting cost-push inflation by increasing the rate of unemployment made economists think about the long-run consequences of such a restrictive policy. For example, Rostow [1960: 111] asked: "Does control of inflation require in our democratic society a damping of the rate of growth?" In this

respect Hoover [1960: 377] remarked about a study of the Joint Economic Committee [1959] that this contribution puts forward the “central thesis of the sacrifice of growth on the altar of price stabilization” (see also Wilson [1961: 3f.] and National Economic Development Council [1964: 8] regarding the stop-and-go policies in the UK). In this sense, the Phillips curve trade-off was augmented by a third dimension [Smithies, 1958: 611; Phillips, 1962: 11; Klein and Bodkin, 1964: 386; Scott and McKean, 1964: 2]. Scitovsky and Scitovsky [1964: 429f.] hence pointed out that “[t]he most controversial question . . . is how inflation on the one hand and unemployment on the other affect the rate of growth of the economy.” Also the Commission on Money and Credit [1961: 12] remarked that “the possibility of conflict among these goals is a very real one.”

In sum, the discussion about an optimal level of demand pressure was influenced by the Cold War (which made the rate of growth a most important policy goal), the belief in stabilisation policies to overcome the business cycle and to keep the economy at a specific utilisation level (which made the level of demand an important policy tool), and the possible conflict between unemployment, inflation, and growth (which made the optimal level of demand a difficult policy choice). Three different views about this optimal level of demand will be distinguished in the next section.

4.3 Three Different Views

4.3.1 The Keynesian View

The view most prevalent in many contributions might be labelled Keynesian since the authors of these contributions particularly stress the role of demand-induced investment for the rate of growth. The rate of investment, as in Harrod’s [1936; 1939] growth model, was at least implicitly assumed to depend on the (expected) growth of aggregate demand. For example, the National Economic Development Council [1963a: 44f.] remarked that “[t]he incentive to invest is also likely to be greater when demand is high than when there is a good deal of excess capacity.” The National Economic Development Council [1964: 7] hence stated that “growth is encouraged by a high pressure of demand.”

This high level of demand was assumed to generate inflation via the Phillips relation as employers compete for the last remaining factors of production. On a positive side, this higher rate of inflation was viewed to be beneficial for growth as profits may be higher if wages lag behind prices (see Klein and Bodkin [1964: 411]; for empirical falsification of this argument, see Bach [1958: 37], Kessel and Alchian [1960: 43ff.], and Reuber [1962: 220f.]). This effect might even increase labour supply if workers are trying to keep their standard of living by working more [Bach, 1958: 36]. Also, the real rate of interest might be lowered if the nominal rate does not adjust fully to the higher rate of inflation, so that the marginal efficiency of capital rises and therefore induces further investment [Kaldor, 1959: 289ff.; Scitovsky and Scitovsky, 1964: 463f.]. The rise in prices, it was argued, may create an “optimistic atmosphere” [Baumol, 1958: 51] or a “general spirit of optimism” [Smithies, 1958: 612f.]. This positive effect of inflation for the rate of growth, however, was doubted by many scholars since it implied some kind of money illusion. In particular Johnson [1963d: 64] opposed this line of thought as “[t]his argument assumes that the rate of interest at which entrepreneurs can borrow is unaffected by

the expectation of inflation, implying that though borrowers are aware of inflation lenders are not" (see also Wilson [1961: 15]; Johnson [1966: 24]).

The beneficial influence of a strong demand pressure on investment, however, is only the most apparent one, and the proponents of maintaining excess demand emphasised additional advantages of such a policy since most authors were fully aware that long-run growth also depends on growth of the labour force and, even more importantly, on technical progress. The level of demand was assumed to influence the rate of technical progress due to various reasons: First of all, strong demand may cause shortages and bottlenecks, in particular on the labour market. On the one hand, these bottlenecks were viewed as obstacles to further expansion, but on the other hand it was thought that they would induce research and the application of new means of productions to overcome the shortages. This mechanism was, for example, emphasised by the National Economic Development Council [1963a: 45] stating that "labour shortage provides a strong incentive to invest in labour-saving equipment which will raise productivity." In the same vein, Scitovsky and Scitovsky [1964: 441] remark "that physical shortages of a productive factor are the most powerful inducements for developing and adopting new methods of production that economize that factor. A full-employment situation, therefore, by creating both a general shortage of labor and specific bottlenecks of specific skills and types of labor is especially favorable to labor-saving innovations and growth." As every such innovation involves risks and usually huge investments in new machinery, Scitovsky and Scitovsky [1964: 441] argue that the willingness to implement these innovations will be greater if there is high confidence that economic activity will remain on a high level (see also Turner [1958: 682]; Harrod [1967: 16f.; 1969: 325]). Furthermore, Scitovsky and Scitovsky [1964: 434] point out that full employment will make unions and workers accept the introduction of such labour-saving technical progress in a cooperative way (see also Balogh [1958: 231]; National Economic Development Council [1963a: 45]). Based on the same arguments as outlined above, the Commission on Money and Credit [1961: 43] concluded that "measures to stimulate aggregate demand to attain low levels of unemployment are basic to an adequate rate of economic growth."

The Commission on Money and Credit [1961: 43] also remarked that the induced technical progress usually would lay off workers. Therefore, inter-sectoral or inter-industry movements of labour become necessary. This labour mobility was assumed to depend positively on demand pressure, so that "a strong demand for labour increases mobility and therefore the efficiency of resource allocation and indirectly the rate of growth" (Johnson [1963d: 64]; see also Samuelson and Solow [1960: 190]; National Economic Development Council [1963a: 27]). Thus, a high demand pressure (a low rate of unemployment), was regarded as beneficial for overall growth as structural adjustments might be easier and the overall dynamism of the economy could be higher. In this line of thought, Reuber [1962: 12] emphasised that "the problems of adjusting to changing economic conditions, whatever the source of these changes, is much more difficult when the economy has considerable excess capacity than when it is running at full steam" (see also Bach [1958: 38]). In sum, technical progress and the necessary structural adjustments were assumed to be facilitated by a high demand pressure. At least in theory, a high rate of investment met a high rate of technical progress so that the stock of machinery, which was regarded as the factual incorporation of this technical progress (see also Johansen [1959]; Solow [1960]) received frequent updates and improvements (see, for example, Fellner [1960: 94]). Furthermore, high mobility of labour was assumed to accompany this progressive economic setup.

This positive relation between growth and the level of demand made the Keynesian view prone to the Phillips curve trade-off. A high level of demand seemed necessary to assure high rates of economic growth, while inflation, at least at a certain point, was still regarded as an evil. This conflict was especially pronounced if an increase in the unemployment rate seemed necessary to achieve price stability, as then inflation had to be traded off against unemployment *and* a high rate of growth. This problem led Turner [1958: 684] to conclude that “growth cannot be reconciled with price stability” (see also Balogh [1958: 239]; Fishman and Fishman [1958: 70f.]). Wilson [1961:9] furthermore pointed at the issue that an anti-inflation policy inflation might overshoot and therefore cause a loss in output and growth (see also Klein and Bodkin [1964: 425]). Chandler [1960: 214f.] therefore cautioned that policies which will “maximize the short-run rate of growth” may lead to such a high rise in prices that necessary restrictive policies will be accompanied by a “disappointment of widely held highly inflationary expectations” which “could be quite damaging to employment, output, and growth”. The Keynesian view hence faced the dilemma that there seemed to be an inherent conflict between unemployment and the rate of growth on the one hand, and the rate of inflation on the other hand.

4.3.2 The Paishian View

In contrast to the Keynesian view, some economists proposed that an overall restrictive policy would be necessary to foster growth. This view was particularly held by the British economist Frank W. Paish, at that time professor at the London School of Economics. Paish [1962: 331f.] supposed that “the permanent maintenance of the small proportion of unused capacity suggested here would be more likely to increase than decrease the rate of growth of capacity.” For Paish [1962: 94], especially very high levels of employment raise the problem of “bottle-necks” in the economy which were thought to be an obstacle for growth, as well as a cause of inflation and misallocation (see also Baumol [1958: 50ff.]; Wilson [1961: 17]; National Economic Development Council [1963a: 44]; Phillips [1968: 229]). Furthermore, Paish [1968, 22] argued that overall efficiency would be increased by a higher level of unemployment and slack of demand as there is “the need for firms to be efficient in order to survive”. Those firms which were able to stay in the market due to high demand are now sorted out or forced to raise their efficiency as their “costs of production are above the average” [Paish, 1962: 94f.; see also Paish, 1958: 104f.]. Paish [1968: 22] therefore concluded that “[a] condition of excess demand . . . provides an ideal climate for keeping inefficient firms alive and thus for slowing down the improvement in the average efficiency of the system as a whole.” Furthermore, the Commission on Money and Credit [1961: 42] remarked that it might also be possible that high demand renders the use of old machinery and less skilled labour necessary and profitable, with negative effects on average productivity. Moreover, full employment may cause higher demand for consumption goods but not for investment goods. Therefore, Bronfenbrenner [1963: 115f.] stated that “[i]nsofar as full employment is associated with high consumption while rapid growth requires high saving and investment, there is a trade-off here too.” Klein and Bodkin [1964: 417] thus came to the conclusion with respect to the USA that “[t]his is the American problem in a nutshell—too much consumption and too little capital formation holding down the rate of economic expansion.”

Also Long [1960: 152ff.] pointed at the positive effects of a higher rate of unemployment: From the late 1940s to the late 1950s in the USA, real GNP per worker rose faster at high lev-

els of unemployment while at the same time inflationary pressures were weak [Long, 1960: 153]. This might be explained by the following three different effects of a higher rate of unemployment [Long, 1960: 156]. First of all, there is a “lubrication effect”: A larger worker pool is advantageous for an economy in continuous development as emerging enterprises then have the possibility to acquire more workers than usually released by dying industries (see also Minsky [1961: 2]). This larger worker pool thus makes a high rate of growth compatible with price stability as otherwise rising industries would have to bid away resources from other sectors which would result in wage and price increases. Second, there is an “insecurity effect” in the sense that a high level of unemployment will discipline wage demands of workers and unions and will furthermore discourage unnecessary job hopping. Third, the “pencil-sharpening effect” will set in: Slack in the economy and thus increased competition will force employers to increase productivity and to resist high wage claims in order to keep costs down. In sum, all three effects of a higher unemployment rate might be considered beneficial for achieving both a high rate of growth and price stability.

Sumner [1968: 304ff.], however, criticised these arguments and conclusions. Particularly the effect of permanent slack in the economy on investment is in the focus of attention as there are good reasons to assume that permanently unused capacity will be detrimental for overall long-term expectations and therefore for investment and the rate of growth (see also Scitovsky and Scitovsky [1964: 442]). Also a study by Junankar [1970: 290] directly aimed at investigating Paish’s hypothesis came to the conclusion that “[i]n all the models investigated spare capacity affected investment adversely. Thus the policy implications . . . are that in order to stimulate investment and through it growth, the economy should be run within the full capacity zone.”

The advantage of Paish’s view with regard to economic policy is that growth and price stability are not conflicting policy objectives as they are in the Keynesian case. To the contrary, the resulting price stability due to excess capacity was assumed to be an important prerequisite for growth. For example, Jacoby [1958: 645] points at the issue that inflation distorts investment decisions by making the distinction between real and nominal values more difficult (see also Eckstein [1958: 361]). Furthermore, inflation may lower the rate of saving [Jacoby, 1957: 20]. Price stability also was assumed to indirectly have positive effects on the rate of growth: a specific contemporary argument against running the economy at high levels of employment and in favour of price stability was the difficult task of maintaining a balance-of-payments equilibrium in a fixed exchange rate system like Bretton Woods—a particular issue at that time in the UK [Wilson, 1961: 17ff.]. Disequilibria in the balance of payments might especially arise in periods of high growth as imports also rise strongly (for example, to overcome bottlenecks; see National Economic Development Council [1963a: 44]), while exports may be hampered by the domestic rise in prices (see the empirical investigation by Ball et al. [1966]). Thus, there was a perceived trade-off between growth and keeping the balance of payments in equilibrium [National Economic Development Council, 1964: 6; Klein and Bodkin, 1964: 414f.]. This was also emphasised by Dow [1964: 399ff.]: Running the economy at a low demand pressure and thus at higher unemployment and in its wake greater price stability was regarded as a precondition for achieving a high rate of growth while keeping the balance of payments in equilibrium. Thus, some excess capacity and therefore “greater price stability seems desirable, partly for its own sake, but largely as a means of getting the growth of exports to pay for the imports needed for faster growth” [Dow, 1964: 403].

Harrod [1963: 89], however, remained critical regarding the suggested beneficial consequences of low inflation due to slack in the economy: If investment is forestalled as a reaction to excess capacity, the growth rate will be equally weak and inflationary pressures thus may arise regardless of high unemployment as “it is easier to prevent an inflationary rise of incomes if you are growing at a higher rate.”

In sum, the Paishian view suggested some excess capacity to increase the rate of growth while keeping inflation in check. The trade-off in this line of thought hence was very different to that of the Keynesian view: Growth and low inflation on the one hand, a higher rate of unemployment on the other hand.

4.3.3 The Sceptical View and Empirical Evidence

Besides these two lines of thought, there were also economists who were very sceptical about any influence of the overall level of demand on economic growth. For example, Johnson [1963b: 141] stated that “there is no a priori reason why, other things equal, the rate of growth should vary with the average level of unemployment” and that “there is no a priori reason for expecting a higher normal level of employment, accompanied presumably by a higher rate of price increase, to produce a higher rate of growth.” These economists remained sceptical not necessarily on pure theoretical grounds, that is, they not always based their arguments on the neoclassical growth model [Solow, 1956; 1957; Swan, 1956] in which the steady state rate of growth depends solely on the growth rate of the labour supply and technical progress.

Most notably, Phillips [1962: 13f.] stayed within the Keynesian growth model, but his calculations about the implications of a higher average unemployment rate and hence a smaller amount of investment led him to the conclusion that the effects of running the economy at a (slightly) higher rate of unemployment are “extremely small”. Furthermore, the resulting “possible extra incentive or compulsion to invest in cost-reducing equipment” [Phillips, 1962: 14] might counter any negative effect of a higher rate of unemployment. Thus, for Phillips [1962: 14], the rate of growth depends on structural factors like “the willingness to save, and the more general influences of educational improvement, research, and so on”. On all these structural determinants of the rate of growth “very small changes in aggregate demand and unemployment” would not have a big influence. In sum, Phillips [1968: 229] concluded that “[i]n my view the objective of . . . growth is almost independent of the objectives of short-term economic management”.

Tobin [1964: 4ff.] also took the point of view that full employment and the rate of growth are not interrelated goals. An economy may profit if unemployment is removed, as this enables a generally higher consumption path without trading off consumption today against consumption tomorrow. However, in the long run, it is the growth of capacity and not fluctuations in its utilisation that determine the rate of growth. Furthermore, a too high demand pressure above the growth rate of capacity will be frustrated by inflation. Demand policy hence should be focused on the optimal combination between unemployment and inflation (as given by the Phillips curve) and not on influencing the rate of growth. In this sense, Tobin [1964: 4] concluded that “[f]ull employment is, therefore, not a reason for faster economic growth; each is an objective in its own right.”

Most economists remaining sceptical based their position on empirical research and evidence. For example, Johnson [1963c: 279] remarked with respect to the bad growth performance of both the USA and the UK, while there was high unemployment in the USA and low unemployment in the UK, that growth and the rate of unemployment do not seem to be interrelated.

Most interestingly, the very first study which explicitly calculated gains and losses of lower unemployment and higher rates of inflation, Reuber [1962], did not further discuss the influence of different levels of unemployment and inflation on the rate of growth as Reuber [1962: 7] came to the conclusion “that there is no discernible relationship between the long-run rate of economic growth and either the stability of prices or the level of unemployment” (see also Reuber [1962: 87ff.]; Reuber [1964: 113f.]). Therefore, the Phillips curve only shows a trade-off between unemployment and inflation on which economic policy has to focus [Reuber, 1962: 10]. The rate of growth thus should be fostered “by other branches of government equipped with instruments that are better suited for influencing such factors as education and long-run capital accumulation, on which the long-run rate of growth seems mainly to depend” [Reuber, 1964: 115].

With respect to the role of inflation for the rate of growth it was found empirically that the influence of the rate of inflation was negligible in most cases [Bach, 1958: 34ff.; Eckstein, 1958: 373; Bhatia, 1960: 108ff.; Wilson, 1961: 6ff.; Allais, 1969: 378]. However, some exceptions are worth mentioning: even though mild inflation as such might even be beneficial for growth [Johnson, 1963b: 140f.; Johnson, 1963d: 61; Conard, 1964: 95f.], sudden and unanticipated changes, that is, a high variance in the rate of inflation, were found to be an obstacle for growth [Klein and Bodkin, 1964: 412]. Even deflation, if steady and predictable, may not conflict with rapid growth [Friedman, 1958: 251ff.; Johnson, 1963d: 64]. Dorrance [1966, 94] thus concluded that the rate of inflation becomes only important in times of strong increases or decreases as “rapid inflation seriously inhibits growth.”

4.4 Growth and the Phillips Curve

To disentangle these different views about the factors responsible for growth, Black [1959] reviewed this debate in a Phillips curve framework. Actually, Black [1959: 146] chose an upward-sloping aggregate supply curve in employment-inflation space (see Figure 4.1). The relation hence is not exactly a Phillips curve, but is nevertheless much in line with the main idea of the Phillips curve that higher demand pressure causes wages and thus prices to rise. Moreover, the curve strongly resembles the one used by Phillips [1954: 307f.].³ Additionally, the reason for the shape of the curve comes close to the bargaining power explanation given by Phillips [1954: 307f.] as Black [1959: 146] also points at the higher bargaining power of different groups in the economy the closer the economy is to full employment. Furthermore, an unequal distribution of demand across sectors (very much in line with Lipsey [1960, 17ff.]) and the emergence of

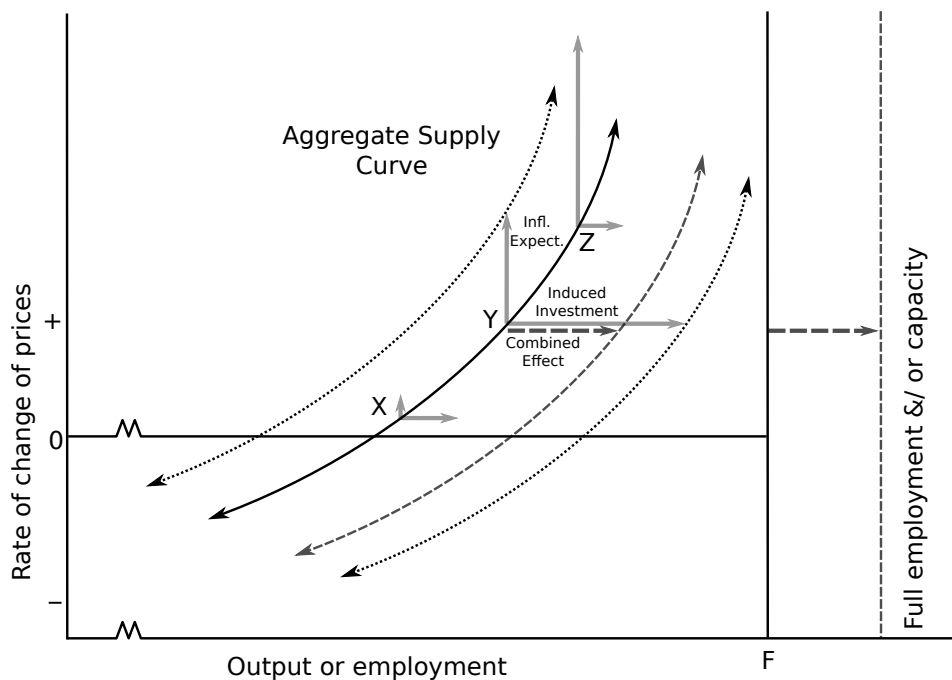
³Black [1959: 145, n. 1] also thanked Phillips for “comments and suggestions” so that it can be assumed that Phillips probably was not too opposed to Black’s assumptions. However, John Black, in a letter to the author dated 2 February 2014, remarked that “I simply cannot recall what he said, on paper only as we never met.” Therefore, one should not “infer any approval from Phillips.”

bottlenecks are additional reasons why inflationary cost-push pressures arise in the economy before full employment is reached. In general, the stronger the market imperfections are, the more pronounced the conflict between inflation and unemployment becomes [Black, 1959: 149].

The location of the curve is assumed to depend on two forces: The curve as well as the level of full employment (which coincides with full capacity utilisation) F will be shifted horizontally to the right due to technical progress and population growth.⁴ Moreover, it can be endogenously shifted to the right by induced investment which depends on the (previous) level of demand [Black, 1959: 149]. Vertical shifts arise due to adjusting inflation expectations, “as both buyers and sellers get attuned to regarding a given rate of increase of prices as normal”.⁵ In sum, both shifts are not independent of the level of aggregate demand and the thereby achieved rate of inflation and the level of employment (and output). However, horizontal and vertical shifts are opposing forces. Whereas horizontal shifts to the right allow a higher rate of aggregate demand at the same rate of inflation, upward shifts of the relation increase the conflict between inflation and unemployment. Therefore, given the three parameters of the relation, that is, the slope of the aggregate supply curve, the strength of induced investment, and the elasticity of inflation expectations, Black [1959: 150] points out that there might be an “optimum rate of growth of monetary demand, which will serve in the long run to maximise the rate of growth of actual output”. This idea of an optimum level of aggregate demand is depicted in Figure 4.1.

Figure 4.1: The Trade-Off Between Inflation, Employment, and Growth.

Source: Own illustration based on Black [1959: 149]. Redrawn and modified.
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⁴Following Leeson [1997: 158f.], these horizontal shifts might be also in line with Phillips [1954: 307f.].

⁵Lewis [1958: 379ff.] also discusses some of these shifts in a price-level output diagram.

At the aggregate demand level Y , the rightward shift of the curve due to induced investment and the upward shift due to adjusting inflation expectations (dotted supply curves) are such that the combined forces (dashed arrow) correspond to the maximal possible rightward shift of the schedule (dashed curve) and at the same time of the full capacity boundary (dashed vertical line). A higher level of aggregate demand such as Z does not induce the same capacity-expanding effect of investment⁶ while at the same time inflation expectations are strongly elastic (in the figure this would even cause a combined upward shift of the relation). On the other hand, a lower level of demand X , while causing only a minor adjustment of inflation expectations, may fail to induce a strong rise in investment so that the combined rightward shift of the relation will be weaker than that in Y .

Black [1959: 152] hence concluded that with this model it becomes possible to disentangle different views about the interdependencies between unemployment, inflation, and growth. Believers in classical economic principles and of “a dynamic version of the quantity theory of money” would argue that there is no pronounced conflict between inflation and unemployment (so that the curve is more like a kinked supply curve) and that inflation expectations are strong. Investment decisions in this line of thought are not based on recent output levels, but on the long-run profitability of investment projects which depend on secular productivity developments and the interest rate. Thus, any increase in aggregate demand will not succeed in accelerating the rate of growth as the vertical forces are always stronger than the horizontal ones. Keynesians, however, build their proposal of increasing aggregate demand upon the assumption that inflation expectations are rather inelastic or at least that induced investment more than compensates any upward shift of the relation. An increase in aggregate demand hence is optimal even in the case of a conflict between inflation and unemployment as there is always a positive level of demand pressure to maximise the rate of growth.

4.5 Conclusion

The discussion has shown that there was a lively debate in the 1960s about the optimal demand pressure to maximise the rate of growth. Three elements of this debate stand out and are worth recalling: First of all, the cold war made the rate of growth a most important policy objective. This overriding importance of the rate of the growth made it acceptable to discuss means to foster a growth rate higher than indicated by individual preferences. One of those instruments considered was—besides encouraging and promoting research, education, and technical progress—the level of demand pressure. The state of aggregate demand was considered important as demand-dependent investment was regarded as one of the driving forces of growth. The second element of this debate was the belief that it is indeed possible to choose the level of demand via fiscal and monetary policies. This element hence included an optimistic view regarding the power of stabilisation policies to damp cyclical fluctuations and to fine-tune the economy. Together, these two elements built the basis for the discussion about an optimal pres-

⁶Black [1959: 150f.] referred to Hayek’s business cycle theory [Hayek, 1931] and his emphasis on the misdirection of investments in times of the boom (see for a discussion Hagemann and Trautwein [1998: 299f.]). Hence, even though the absolute amount of investment might be higher in Z than in Y , the actual effect on enhancing productive capacity will not necessarily be greater.

sure of demand to maximise the rate of growth (see, for example, Anderson and Cornwall [1961: 163]). However, the choice of the aggregate demand pressure not only had implications for the rate of growth, but also for the level of unemployment and the rate of inflation. This third element in the debate, the Phillips curve, pointed at the possible conflict between all three goals as discussed by Black [1959].

Many economists believed that a high demand pressure will have the benefit of removing unemployment as well as fostering growth by creating an optimistic outlook and due to positive effects of a higher rate of inflation on investment. Bruno and Easterly [1996: 139] therefore summarise that “the traditional view that inflation was destructive [to growth] no longer seemed so compelling. It was the Golden Age of the Phillips Curve, in which inflation and growth were positively related” (see also Brown [2001: C32]). This Keynesian view can be called a “carrot theory” [Lipsey, 2010: 171] which relied on the idea that “the best way to get more investment is to have a rising demand for end-products and an assurance that this will continue. Look after the aggregate demand for end-products and investment will look after itself” [Harrod, 1967: 11]. However, the assumptions on which these arguments rested are questionable, in particular the non-adjustment of the nominal rate of interest to a higher rate of inflation.

Critiques of this approach, most notably Paish, did not target this assumption in particular. Rather the argument that technological change will proceed faster and investment will be higher in a buoyant economy was criticised by the Paishian view. This line of thought feared that a high demand pressure and the absence of the risk of failure will weaken market forces as it will free firms from the competitive pressure to innovate in order to survive. This view hence can be called a “stick theory” [Lipsey, 2010: 171] which was based on the assumption that “[f]or a high rate of growth of output per man-hour we need an economic climate in which all producers are under continual pressure to keep down their costs” [Paish, 1968: 22]. This view, however, can be criticised in the sense that a temporary crisis may indeed assure the survival of the fittest. But ongoing slack in the economy may sooner or later harm the willingness to invest and to take the risk usually associated with innovations.

Both approaches have in common that growth was considered as a variable that can be influenced in the short and medium run by appropriate demand policies. It is, however, striking to note that many contributions did not take fully into account the neoclassical proposition that in the long run the rate of growth solely depends on population growth and technical progress, so that, for example, a higher rate of saving and investment will only have transitional effects. Not only this issue, but also the fact that many contributions ignored important theoretical concepts like the “Golden Rule” might be best explained by the pressing issues of the Cold War, so that policy debates focused on the years immediately ahead. In this respect Tobin [1964: 9] emphasised that even if in the long run there is no choice about the rate of growth, but only about consumption levels, the transitional period might be very long so that practically and within the timespan of economic policy, society can choose among different rates of growth. Moreover, there was a theoretical gap (to be closed by Cass [1965] and Koopmans [1965], based on Ramsey [1928]) with regard to the choice of the optimal growth path in a transitional period to the “Golden rule” consumption level. Johnson [1964: 24] critically remarked about this issue that “[i]t is of little help to know where one should be going, if one is not told when one ought to arrive.” The definition of an optimal rate of growth as an objective of economic policy hence was regarded as more difficult than other goals of economic policy like full employment

and price stability [Musgrave, 1958: 597; Commission on Money and Credit, 1961: 31; Reuber, 1962: 35f.; Johnson, 1963d: 65f.]. The Cold War furthermore might explain the general emphasis on the rate of growth of output, and not always the rate of growth of per-capita income: For example, Kendrick [1964: 249] remarked that although per-capita income is a better measure for the quality of growth (see also Klein and Bodkin [1964: 379]), growth of output as such (even in the case of declining per-capita income at the same time) is nevertheless “of significance from the military . . . viewpoint”.

However, not all demand-oriented contributions regarded a high level of demand as the only necessary and sufficient condition for a rising output level. Technical progress, for example, was considered as a “key factor” by the National Economic Development Council [1963b: 29ff.] and the Commission on Money and Credit [1961: 34] emphasised the importance of education “to take full advantage of” technical developments. Nonetheless, even these long-run growth forces like technical progress and ongoing increases in general efficiency (for example improved labour market dynamics) were assumed to also depend partly on the level of aggregate demand. In particular, investment was regarded as an important way to incorporate technical progress into the economy.

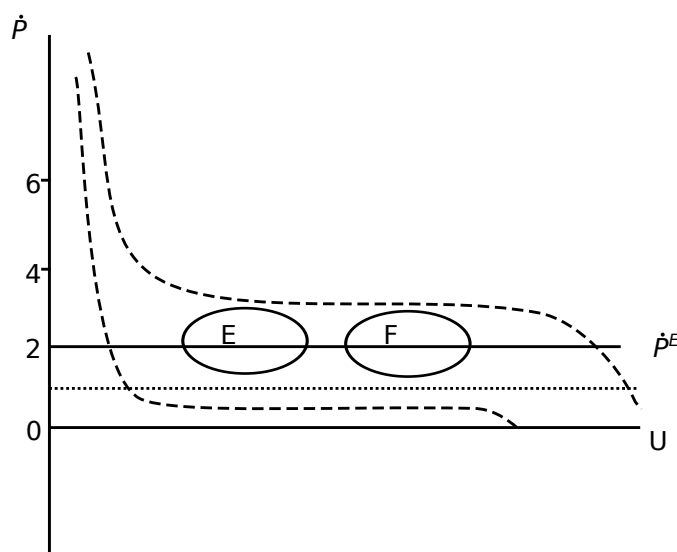
A third group of economists doubted that the pressure of demand has a strong and remarkable influence on the rate of growth. These economists took the point of view that growth depends particularly on technical progress and that the temporary effects on output due to a rise in the utilisation level of available resources needs to be distinguished from the long-run growth of capacity. Also Phillips belonged to this group, even though he argued within the framework of Keynesian growth models. Nevertheless, Phillips believed that the driving forces of growth are research and education and not demand-induced investment. Empirical studies found only a small influence of the rate of unemployment or of the rate of inflation on economic growth—at least as long as the variance of inflation remained low.

The contribution by Black [1959] tried to disentangle these different views within the Phillips-curve framework and focused on the optimal demand pressure in order to maximise the rate of growth. The trade-off between inflation, unemployment, and growth hence took centre stage. This debate found its end in the late 1960s with the introduction of Friedman’s “natural rate of unemployment” as the more the economy was regarded in the sense of Friedman [1968], the less did a discussion of these issues make sense—as the choice between inflation and unemployment vanished so did the thereby connected questions. Since then, monetary policy is assumed to be neutral (also with regard to the rate of growth) as pointed out by Friedman [1968: 11]. In the framework of Black [1959], this implied that now the economy was regarded as in the classical case, built upon the assumption of elastic price expectations and low induced investment (and without a structural conflict between inflation and unemployment).

However, some modern theoretical approaches, like evolutionary theory based on the assumption of endogenous and path-dependent technical change, still point at the likely case of an important role of the state of aggregate demand and the long-run consequences of monetary and fiscal policies. Factors like capacity utilisation, the level of unemployment, and the rate of inflation in such a framework can still cause long-run impacts in the economy [Lipsey and Scarth, 2011: xxxff.]. On these grounds Lipsey [2010, 167ff.] suggested that the concept of a unique natural rate of unemployment should be replaced by a non-accelerating inflation band of unemployment (see Figure 4.2).

Figure 4.2: The Non-Accelerating Inflation Band of Unemployment.

Source: Lipsey [2010: 168]. Redrawn. See Chapter “Copyright and Permissions” for further information.



This implies that various combinations between inflation and unemployment can be possible since the system will not have a unique equilibrium (a natural rate of unemployment) any more, as different levels of unemployment can be compatible with the expected rate of inflation (credibly fixed by the central bank) around which the actual rate of inflation fluctuates. Therefore, the economy may end up, depending on the overall environment including endogenous technical change and economic policy, in the range of the ellipse *E* but also *F*, both solutions being compatible with an expected rate of the credible inflation target of the central bank (here: 2 per cent).⁷

In such a framework, some arguments of the debate in the 1960s, for example under which circumstances—in this discussion high demand as in the ellipse *E* or strong competitive pressure as in *F*—technical progress will be incorporated faster into the economy are probably worth to be considered even today.

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5 Discussion

As has been shown in the three papers replicated in the Chapters 2 to 4, the Phillips curve was usually not understood as offering the opportunity of pushing the economy away from full employment towards overemployment by means of inflation as the quote by Meltzer in the general introduction (Section 1.1) suggested, but as a policy dilemma of choosing between the mutually conflicting goals of price stability and full employment.¹ The following discussion will focus on this important detail, while also highlighting other notable results of my research. It will be argued that the main issue evolved around the perceived incompatibility between price stability and full employment, which particularly emerged due to a non-linear Phillips curve and cost-push forces such as bottlenecks or strong unions. Furthermore, making use of the trade-off was recommended on the basis of (assumed) involuntary unemployment, for which an increase in aggregate demand seemed to be the appropriate cure even though this kind of policy implied a positive rate of inflation (Section 5.1 to 5.4).

In contrast to this “Keynesian” “dilemma view” in which the economy was trapped between the long-run choice of full employment or price stability, Friedman argued that such a long-run trade-off between inflation and unemployment does neither exist nor would it be necessary at all, since price stability and full employment are not conflicting policy objectives (Section 5.5).

Hence, from his point of view, “Keynesians” aimed at an over-full employment target by making use of surprise inflation. On the other hand, Friedman’s criticism was regarded as inappropriate and in deny of the whole issue by “Keynesians”, since in their view Friedman simply redefined the full employment level as that level to be in line with price stability, so that no conflict between the two policy objectives exists by definition.

Section 5.6 will illustrate these different positions and will show that both lines of thought essentially had the same notion of the concept of full employment, which, however, implied different inflationary outcomes for various reasons. Moreover, it will be argued that the “Keynesian” explanation of a long-run Phillips curve trade-off did not rest on the assumption that inflation expectations do not fully adjust due to irrational behaviour, but due to the necessity of restoring market-clearing relative prices.

Furthermore, as will be shown in Section 5.7, Phelps’ approaches to the Phillips curve dilemma are much closer in many respects to the “Keynesian” view, even though no long-run trade-off exists. Furthermore, modern New Keynesian models incorporating rational expectations and optimising households point at a very similar “cruel dilemma” if the baseline model is extended by comparable assumptions to those of the 1960s, such as different degrees of price stickiness within a multi-sector economy (Section 5.8).

¹Also Keynes, late in his life, became more and more concerned with this possible incompatibility of both goals (see Hagemann 1988: 208f.).

5.1 Price Stability versus Full Employment

It became very clear in all three papers that many economists had a strong preference for price stability, even if this implied that full employment cannot be attained at the same time. Probably the best and most prominent example within the Phillips curve discussion is Phillips himself. As has been shown in Section 2.5, Phillips did not make use of the curve to advocate inflationary policies, but instead proposed a lower employment level in order to fight inflation. Thus, there was clearly a trade-off interpretation of the curve prevalent as soon as Phillips focused on questions of actual economic policy. Phillips' contribution was also interpreted by contemporary economists in this way as, for example, Bodkin et al. (1966: 39) remarked that "Phillips pointed out the implications of the fitted relationship for the issue of a possible conflict between the objectives of full employment and price level stability." But, as is also the case with Samuelson and Solow (1960), this trade-off was not perceived as a tool-kit to steer the economy towards any level of economic activity by creating unexpected inflation. To the contrary, the Phillips curve as a quantitative assessment of a beforehand rather qualitative debate seemed to reveal the unpleasant fact that the two policy goals of full employment and price stability are mutually conflicting objectives. Since Phillips' original curve for the United Kingdom remained in effect stable for nearly one hundred years, the incompatibility between the two policy goals seemed to be very hard to overcome. On the other hand, especially Samuelson and Solow were much more sceptical regarding the stability of the curve, since endogenous forces such as hysteresis and even inflation expectations were discussed. Nonetheless, a trade-off between price stability and full employment still existed, since the outcome of a low-pressure or high-pressure economy was not clear at all. While inflation expectations might worsen the trade-off in a high-pressure economy, other dynamics on the labour market, such as an increase in the mobility of labour, might work in the other direction. Thus, in some sense, the choice was not regarded to be just important for the short run, but indeed was thought to have influences on the long-run state of the economy.

This long-run effect of the choice between a high and low demand-pressure economy was, as has been shown in Chapter 4, an important policy issue in the 1960s in many contributions. The Phillips curve thus was interpreted as not only showing a trade-off between price stability and full employment, but also indirectly between different rates of economic growth. By taking the influence of the state of demand on the rate of growth into account, particularly the "Keynesian" "cruel dilemma" became even crueller since price stability seemed to be neither compatible with full employment nor with a high rate of economic growth.

Of course, Phillips as well as Samuelson and Solow and many other economists proposed measures to shift the curve closer to the point of origin, but throughout most contributions there was much scepticism or even pessimism regarding the possibility to achieve the compatibility of full employment and price stability at the same time. However, as was also remarked in Section 2.4, Phillips never gave a definition of full employment. Furthermore, as has been shown in Subsection 1.3.4, the definition of full employment within the Phillips curve trade-off became subject to the policymaker's or society's preferences. This issue will be elaborated more deeply in the next paragraphs.

5.1.1 The Difficulty of Defining “Full Employment”

Solow (1962: 2) very clearly stated the problem of arriving at a useful definition of full employment since in his view “[t]here is no simple and unambiguous measure of employment which will tell us when it is ‘full’”.² This issue arose since all different types of unemployment became in effect endogenous to overall demand pressure: As has been shown in Subsection 1.3.2 the amount of frictional unemployment in Lipsey’s (1960) analysis depended negatively on excess demand. Furthermore, the discussion of Lipsey’s (1965) contribution in Subsection 1.3.4 revealed that deficient-demand and also structural unemployment became endogenous concepts subject to the policymaker’s preferences. Modigliani (1986: 20) thus correctly stated that the “acceptance of the Phillips Curve implied that the notion of a well defined ‘full employment and associated «equilibrium unemployment»’ had to be abandoned.” Indeed, in the same year as Friedman gave his Presidential Address, Tobin (1967: 102) stated that the concept of full employment vanishes due to the Phillips curve trade-off since “[w]e now think of a zone of unemployment rates, each one associated with a certain rate of continuing inflation—the less the unemployment the higher the rate of inflation.”³

A complementary example to Lipsey’s view, that preferences regarding unemployment and the associated costs of removing it define the full employment level, is to be found in the study by Klein and Bodkin (1964: 377) since they remarked that “[w]hether employment is high or not is a question that cannot be answered definitely and in isolation. A certain degree of unemployment measured, for example, as a percentage of labor force unemployed may be relatively high for one type of economy and relatively low for another. The concepts of normal unemployment, frictional unemployment, reasonably full employment, and related ideas must be defined in terms of an entire economic and social setting.” In this sense, full employment was not an objective target but subject to society’s preferences. Klein and Bodkin (1964: 378) hence pointed out that “[n]ational political tolerance of high unemployment is probably much lower in Britain than in the United States.” Gordon (1965: 28, 43ff.), for example, reported that actual values for the unemployment rate considered to be full employment between 1946 to 1962 were lower in Europe (2-3 per cent) than in the US (4 per cent) and that in general full employment was widely regarded as being more important than price stability with the exception of Germany. Bowen (1965: 21) thus noted, while referring to the Phillips curve and the rather high unemployment rate of 5 per cent in 1964 in the USA compared to other countries, that “[w]hatever the reasons, it appears that the United States has in effect ‘purchased’ a relatively stable price level by tolerating a relatively high level of unemployment.”

In the same vein, Okun (1962: 1), in his well-known “Okun’s law” contribution, emphasised that potential output as well as full employment are not objectively defined, but are to be understood as part of the Phillips curve trade-off:

Potential GNP is a supply concept, a measure of productive capacity. But it is not a measure of how much output could be generated by unlimited amounts of aggregate demand. The nation would probably be most productive in the short-run

²See Rees (1957: 16ff.) for a contemporary, but pre-Phillips curve, overview of different definitions of full employment.

³A very close idea is expressed in Solow (1962: 3) and also in Tobin (1995b: 36).

with inflationary pressure pushing the economy. But the social target of maximum production and employment is constrained by a social desire for price stability and free markets. The full employment goal must be understood as striving for maximum production without inflationary pressure; or, more precisely, as aiming for a point of balance between more output and greater stability, with appropriate regard for the social valuation of these two objectives.

Thus, the definition of full employment as that level of unemployment which leads to price stability, as for example proposed by Ohlin (1949: 5), came under attack since it was not certain that “reasonably low levels of unemployment” (Rees 1957: 40) would be achieved.⁴ Johnson (1963: 63) thus doubted the practical relevance of such a definition of full employment and took side for the trade-off view:

Given the existence of the Phil[l]ips curve (or at least of a relationship of some kind between unemployment percentage and rate of wage increase), and the empirical tradeoff between price stability and unemployment, it is of course always possible to define full employment as that level of unemployment which is consistent with price stability, and so to conclude that full employment and price stability are not at all inconsistent. But there is nothing sacred or commandingly desirable about the percentage of unemployment at which prices are stable, unless one starts from the postulate that price stability has crash priority over other objectives [...].

In sum, full employment within the Phillips curve discussion was not clearly defined. However, contemporary estimates of the unemployment rate in line with some notion of full employment implied that full employment and price stability are conflicting policy objectives. An analysis of the inflationary consequences of these estimates of full employment will shed light on the magnitude of the perceived policy dilemma.

5.1.2 The Inflationary Consequences of Full Employment

Probably one of the most influential and prominent examples of a contemporary full employment objective in the 1960s is that of the Council of Economic Advisers (1962: 46) who stated that “[i]n the existing economic circumstances, an unemployment rate of about 4 percent is a reasonable and prudent full employment target for stabilization policy. If we move firmly to reduce the impact of structural unemployment, we will be able to move the unemployment target steadily from 4 percent to successively lower rates.”⁵ The Report was described by Solow (1995: 195) as “a fair example of what people like me believed in 1961” which also included to push the economy out of “operating with excess supply, involuntary unemployment, and underutilized capacity.” This goal was also defended by Tobin (1995a: 134f.) as an estimate of

⁴Tobin (1983: 28) thus correctly remarked that “[w]hat Keynesians of that day were not prepared to do was to identify as full employment equilibrium the point of price or inflation stability on the Phillips curve”.

⁵Laidler (1997: 95, n. 13) noted about the vagueness of this goal that “Arthur Okun was a member of the Council staff during 1961, and a consultant thereafter for several years. The 4 per cent unemployment target was, according to Ronald Bodkin, Okun’s colleague at Yale from 1962 until 1965, an informal assessment of what might be possible, rather than the outcome of any systematic empirical study of the matter.”

the “natural rate of unemployment” at that time. Furthermore, he also pointed at the misinterpretation that “Keynesian” economic policies were based on the creation of inflation:

Our central macroeconomic objective was to lower unemployment, 7 percent in January 1961, to 4 percent, our tentative estimate of the inflation-safe unemployment rate. [...] Critics looking back on the 1960s accuse the Kennedy-Johnson economists of naïve belief in a Phillips trade-off and of policies explicitly designed to purchase lower unemployment with higher inflation. The criticism is not justified. The council did not propose to push unemployment below what came to be known as the “natural rate.”

Such a view that “Keynesian” employment policies were based on the creation of inflation is to be found in Lucas and Sargent (1978: 56), who pointed at the “deliberate” inflationary character of economic policy in “Keynesian” models:

A key element in all Keynesian models is a “tradeoff” between inflation and real output: the higher is the inflation rate, the higher is output (or equivalently, the lower is the rate of unemployment). For example, the models of the late 1960s predicted a sustained unemployment rate in the United States of 4 percent as consistent with a 4 percent annual rate of inflation. Many economists at that time urged a deliberate policy of inflation on the basis of this prediction.

However, as will be more deeply elaborated in Section 5.4 and 5.6, inflation was regarded as an unwelcome by-product of a full-employment policy. For example, also after Friedman’s Presidential Address, Tobin and Ross (1971: 23) were convinced that the 4 per cent target was an appropriate full employment estimate, even though it can only come about by accepting some inflation:

One of the most dismal and best verified observations of modern economics is that there is ordinarily a trade-off between the rate of inflation and the rate of unemployment. Less of one means more of the other. Hence, full employment (which means an unemployment rate between $3\frac{1}{2}$ and $4\frac{1}{2}$ percent) can, on the average, be sustained only with 4 to 5 percent inflation. Price stability ([...] meaning annual inflation of no more than 1 to 2 percent) is possible only with more than 5 percent unemployment.

Another full employment target, as was argued in Section 3.3, was the 3 per cent unemployment rate discussed by Samuelson and Solow (1960), which also was inflationary since it implied a rate of inflation of 4 to 5 per cent.⁶ Also other contemporary economists regarded such an unemployment rate to be in line with full employment: For example, Bodkin (1966: 279) explicitly suggested to take an unemployment rate of 3 per cent “as the ‘frictional’ level of unemployment and interpret this to be the ‘full employment’ level of the unemployment rate”. This goal was without doubt influenced by Samuelson and Solow (1960), since in Bodkin et al. (1966: 46) Samuelson’s and Solow’s 3 per cent goal is interpreted as a “[a] full-employment policy”. Klein

⁶Samuelson’s and Solow’s estimates were later refined by Perry (1964, 1966), though the order of magnitude and the interpretation regarding the incompatibility of both goals remained.

and Bodkin (1964: 378) arrived at a similar estimate of full employment being “representative of purely frictional unemployment”. Also Scitovsky and Scitovsky (1964: 433) concluded that “we get approximately 3 percent of the labor force as an estimate of the short-time and irreducible unemployment in a dynamic economy—an economy whose composition is ever changing, in which labor is mobile, and people move in and out of the labor force.” Scitovsky and Scitovsky (1964: 429) thus remarked about Samuelson and Solow (1960) and their estimate of the inflationary effects of an unemployment rate of 3 per cent that “a 5 percent annual price rise would be the cost of full employment”. Hence, the 3 per cent unemployment rate considered by Samuelson and Solow (1960) was interpreted by contemporary economists as a reasonable guess of the full employment level despite the fact that it implied a positive rate of inflation.

A comparison of Samuelson’s and Solow’s results with contemporary opinions of economists about the employment and inflation objective in the next section will reveal some interesting insights about the perceived conflict before the discussion became framed within the Phillips curve trade-off.

5.1.3 Samuelson and Solow and the Perceived Policy Dilemma

The Joint Economic Committee (1958a) published the results of a survey conducted among “economic experts at colleges and universities” about the perceived conflict between the employment objective and price stability. The survey was conducted in 1958 from 10 September until the end of October. Since the famous Phillips curve article was published in November 1958 the results are not influenced by Phillips’ or Samuelson’s and Solow’s findings.

Table 5.1 shows that the greater fraction⁷ of economists thought that the goals of “relatively high employment and relatively high stability of the general price level” are compatible in the short run and even more regarded them to be compatible in the long run.

Table 5.1: Opinions About the Compatibility of “Relatively High Employment and Relatively High Stability of the General Price Level”.

Source: Joint Economic Committee (1958a: 3). Own calculations.

	Compatible	Not Compatible
Short Run	62.4%	37.6%
Long Run	74.9%	25.1%

An interesting detail to note is that no question was asked with respect to the definition of “relatively high employment” (as in Table 5.1) or “maximum employment” (as in Table 5.2). This suggests, in line with the other following questions, that the employment target was understood as being part of a trade-off, particularly with respect to the goal of price stability (as in Table 5.3).

⁷The Joint Economic Committee (1958a) published the shares of each fraction in per cent including non-responders. The following values thus were recalculated on the sole basis of responders.

Table 5.2: Opinions About Which Goal Should Be Favoured If Both Goals Are Not Fully Compatible Policy Objectives.

Source: Joint Economic Committee (1958a: 4). Own calculations.

Goal to Be Favoured	Percentage
Maximum Employment	74.4%
Price Stability	25.6%

For those who considered both goals to be mutually conflicting,⁸ the majority clearly favoured the achievement of the employment goal as indicated in Table 5.2.

On the other hand, those who held the view that both goals can be achieved simultaneously (as in Table 5.1) were also asked to indicate which level of unemployment they were ready to accept for achieving price stability. As can be seen in Table 5.3, the opinions about which level of unemployment was acceptable in order to achieve price stability differed considerably. For example, Samuelson's and Solow's (1960) estimate that 5 to 6 per cent of unemployment might be needed to achieve price stability would have seemed acceptable to approximately 60 per cent.⁹ On the other hand, this result also implies that for roughly 40 per cent the Samuelson and Solow Phillips curve for the US would have been interpreted as a "cruel dilemma", since price stability could have been only achieved by unacceptably high rates of unemployment.

Table 5.3: Opinions About the Maximum Level of Unemployment Acceptable "for Achieving a High Degree of Price Stability".

Source: Joint Economic Committee (1958a: 3). Own calculations.

Maximum Level of Unemployment Acceptable "for Achieving a High Degree of Price Stability"	Percentage
Under 3 percent	3.9%
3 percent and under 4 percent	16.6%
4 percent and under 5 percent	19.8%
5 percent and under 6 percent	32.5%
6 percent and under 7 percent	13.1%
7 percent and under 8 percent	4.5%
8 percent and under 10 percent	4.9%
10 percent	4.1%
11 percent through 20 percent	0.6%

⁸That is, all economists, who answered with "not compatible" in Table 5.1. However, from the data provided by the Joint Economic Committee (1958a), it seems that many also answered to this question even though they answered with "compatible" in Table 5.1.

⁹That is, all economists in Table 5.3 from "5 percent and under 6 percent" to "11 percent through 20 percent".

Due to the fact that a not so small fraction of economists (14.1 per cent)¹⁰ indicated that they were willing to accept rather high unemployment rates even above 7 per cent, Miernyk (1960: 521) pointed at the problem of an “erosion in the concept of ‘full employment’ in this country” about which Kaufman (1960: 173) remarked that “[f]ull employment is being sacrificed at the altar of price stability.” These views further strengthen the argument that the definition of full employment became subject to individual preferences regarding the two policy goals of full employment and price stability, even though some were critically arguing that the concept of full employment allows “no ‘buying-off’ to solve a goal conflict” (Meidner 1969: 164).

From a different perspective, the estimate of Samuelson and Solow (1960) that full employment, that is, 3 per cent of unemployment, would be accompanied by 4 to 5 per cent of inflation was clearly not in line with the definition of price stability as indicated in Table 5.4.¹¹ Only 16.1 per cent of economists¹² would have regarded such a high rate of inflation to match their definition of price stability. Hence, from this perspective the contribution by Samuelson and Solow (1960) must have disappointed the beforehand rather optimistic view of many economists that both goals are indeed compatible.

Table 5.4: Opinions About the Rate of Inflation Considered to Be in Line With a “Satisfactorily ‘High Degree of Price Stability’”.

Source: Joint Economic Committee (1958a: 3). Own calculations.

Rate of Inflation Considered to Be in Line With a “Satisfactorily ‘High Degree of Price Stability’”	Percentage
Under 1 percent	9.5%
1 percent and under 2 percent	29.9%
2 percent and under 3 percent	27.0%
3 percent	17.5%
4 percent	4.4%
5 percent	7.3%
6 percent through 10 percent	4.4%

The reasons for this possible incompatibility between the two policy objectives were lively discussed within the debate on whether inflation was mainly driven by cost-push or demand-pull forces. This debate will be reviewed in the following section.

¹⁰That is, all economists in Table 5.3 from “7 percent and under 8 percent” to “11 percent through 20 percent”.

¹¹See also Robinson (1959: 452) summarising the very similar views about the maximum rate of inflation in line with price stability as discussed in Joint Economic Committee (1958b).

¹²That is, all economists in Table 5.4 from “4 percent” to “6 percent through 10 percent”.

5.2 The Cost-Push Demand-Pull Debate

The cost-push demand-pull debate was in focus within the discussion of the Samuelson and Solow paper in Section 3.2. A further and deeper analysis of the different lines of thought is conducted in Schwarzer (2015d). Many economists worried that full employment and stable prices seemed to be incompatible from the outset, that is, without severe interventions into the market economy (for example, by imposing wage and price controls) or without implementing profound structural measures (such as increasing labour mobility). Inflation in this line of thought hence was not the outcome of a too high level of aggregate demand, but emerged despite non-frictional unemployment due to various market imperfections and thus was called “premature inflation” (Solow 1966a: 42).¹³ Solow (1966a: 42) hence noted that “[t]his tendency creates a dilemma for public policy.” In this view, the economy was prone to an inflationary bias at full employment, so that both objectives of full employment and price stability seemed to be mutually conflicting.

As has been shown in Section 2.4, this “cruel dilemma” was also very prevalent in Phillips’ own writings. The whole trade-off discussion in his work is framed within this pessimistic view. The aggressive bargaining behaviour of unions was regarded as one of the main reasons (besides the important role of cyclical and sectoral fluctuations as discussed in Subsection 1.3.3) for this incompatibility of both goals.

On the other hand, as has been pointed out in Section 3.4, particularly Friedman took the point of view that unions and market power in general cannot explain inflation without excess demand, since only a rise in market power can be inflationary. Temporary cost-push pressures on the way to full employment thus might be reasonable, but once the optimal wage is set full employment can be achieved without endangering price stability. For Friedman hence no “cruel dilemma” exists. Therefore, no steps to solve the dilemma (for example, guideposts) are necessary. Since inflation in Friedman’s reasoning can only come about by a too high increase of the money supply, only the concept of pure demand-pull inflation is accepted.

As is shown in Schwarzer (2015d), Friedman’s arguments were interpreted by the adherents of the dilemma view as falling back into the L-shaped supply curve framework and thus as being of no help with respect to the perceived policy dilemma (see also Section 5.4). Indeed, it was fully recognised and acknowledged that inflation ultimately can only come about by an increase in the money supply (or by a higher velocity). However, the starting point of this increase in the money supply was not regarded to be due to the deliberate attempt of the monetary authority to achieve some excess demand and thus a rise in the activity level above full employment, but due to strong unions pushing up wages and prices, which, if not accommodated, would result in severe unemployment. Even though this problem was also noted by

¹³Also Keynes (1936: 301) remarked: “That the wage-unit may tend to rise before full employment has been reached, requires little comment or explanation. Since each group of workers will gain, *cet. par.*, by a rise in its own wages, there is naturally for all groups a pressure in this direction, which entrepreneurs will be more ready to meet when they are doing better business. For this reason a proportion of any increase in effective demand is likely to be absorbed in satisfying the upward tendency of the wage-unit.” Kalecki (1943: 326) thus argued “that unemployment is an integral part of the ‘normal’ capitalist system” in order to achieve price stability (among other goals).

Friedman (1963: 39 and 1966b: 31), it was not interpreted as an issue of much importance, since unions would not have the inherent tendency to press for ever higher undue wage increases.

Thus, even though Friedman's "natural rate of unemployment" is influenced by cost-push factors such as market power and other market imperfections, these market imperfections only determine the level of wages (and thus the level of employment), but do not, as in the dilemma view, have an ongoing effect on the rate of change of wages.¹⁴ Cost-push forces such as strong unions thus are responsible for a higher level of real wages and therefore for a higher "natural rate" compared to a fully competitive labour market. However, at this "natural rate" there is no ongoing inflationary pressure for higher wages. As is argued in Schwarzer (2015d), Friedman's concept of the "natural rate of unemployment" can be regarded as an elegant way to avoid the dilemma problem by redefining the full employment level and by arguing within a different framework of the inflationary process which by assumption excludes any cost-push forces of inflation. In this view, for Friedman the "natural rate of unemployment" and the unemployment rate in line with price stability both coincide with the full employment level (assuming inflation expectations to be zero). Thus, simply by definition there is no dilemma any more and the only kind of inflation that can emerge at the full employment level is that of demand inflation. This sort of inflation, however, can easily be cured by restrictive monetary policy.

But does this kind of reasoning imply that "Keynesians" aimed at over-full instead of full employment? At least from Friedman's statements this seems to be the implicit and explicit accusation: As pointed out in the conclusion of Chapter 3, the unemployment rate considered by Samuelson and Solow to be more or less in line with full employment (3 per cent) is interpreted by Friedman as being lower than the "natural rate of unemployment". This, of course, might be just coincidence, but Friedman (1966a: 60) also explicitly accused Solow that "he wants to cut out these price rises [due to aggressive unions] in order to be able to maintain a higher level of aggregate demand than would otherwise be consistent with price stability", that is, as is made clear in the next sentences, the "natural rate of unemployment". In this respect, the "Keynesian" notion of full employment was interpreted by Friedman to be lower than the "natural rate of unemployment". Hence, in Friedman's view, a policy which tries to peg the "Keynesian" unemployment rate regarded to be in line with full employment is "committed to a path of perpetual inflation at an ever-increasing rate" (Friedman 1966a: 60f.). Thus, from Friedman's perspective the "Keynesian" approach aimed at achieving over-full employment by means of aggregate demand management while keeping inflation in check by incomes policies.

But Solow (1966a: 41f.) and other adherents of the dilemma view framed the issue differently by remarking that "[t]he problem is that modern mixed capitalist economies tend to generate unacceptably fast increases in money wages and prices while there is not general excess demand." Furthermore, Solow (1966b: 64) remarked that not strong unions are necessarily responsible for the dilemma by emphasising that "I am not resting my case on a theory of cost-push inflation. [...] The case it seems to me rests only on the *degree of tightness in the economy at which the price level begins to rise unacceptably rapidly*." In this view, the issue at hand was that there is inflationary pressure at full employment or even despite *underemployment*. From this perspective, Friedman's criticism was interpreted as denying the whole issue. By redefining the full employment level as that level of unemployment in line with price stability,

¹⁴This important point was brought to my attention by Solow in a letter of August 2013.

the dilemma to choose between price stability and full employment disappeared. Friedman's approach thus was regarded as shifting the full employment level to the right within a Phillips curve framework.

However, before these two different perspectives can be reconciled (Section 5.6), two important issues regarding the Phillips curve debate in the 1960s are to be analysed and discussed: The important role of involuntary unemployment (Section 5.3) and the non-linearity of the Phillips curve (Section 5.4), which can give rise to an inflationary bias at full employment (and in the "Keynesian" view also at the "natural rate of unemployment"), even if, as in Tobin (1972b: 14), strong unions are not regarded as the main source of ongoing inflation.

5.3 The Role of Involuntary Unemployment

When a trade-off between unemployment and inflation was discussed, it was not assumed that the economy had already settled at full employment so that the trade-off would have to be regarded as one between reducing voluntary unemployment at the cost of inflation. Particularly within the cost-push demand-pull debate the amount of unemployment in line with price stability was assumed to consist not only of frictional unemployment, since otherwise no such dilemma would have emerged.

Thus, in the "Keynesian" Phillips curve analysis price stability did not automatically imply full employment, but was also compatible with involuntary¹⁵ unemployment—"an individual and social evil" (Council of Economic Advisers 1962: 44). Full employment in this line of thought thus was not just defined as that level of unemployment at which prices would be stable—a point of view, for example, taken by Lucas (1978: 355):

As recently as the 1960's it was widely believed that there was some level of aggregate unemployment with the property that when unemployment exceeded this rate, expansionary monetary and fiscal measures would be noninflationary, while at rates below this critical level they would lead to inflation. One could then identify unemployment rates at or below this full-employment level as frictional or voluntary, and unemployment in excess of this level as involuntary.

Probably the best example of the role of involuntary unemployment within the Phillips curve discussion can be found in the contribution by Reuber (1962) as is outlined in Schwarzer (2015a). Reuber for the first time calculated the costs and benefits of different positions on the Phillips curve by focusing on the Canadian economy. His trade-off model thus is exactly that kind of approach criticised by Phelps and Friedman and there clearly is no other possible interpretation than that of a stable trade-off between inflation and unemployment. Furthermore, Reuber is indeed proposing to reduce unemployment by nearly 5 percentage points (from the prevailing unemployment rate in Canada of 7.2 to 2.25 per cent) at the cost of accepting an

¹⁵Notably, well-known economists before Keynes (1936: 15f.), that is, particularly Cassel and Wicksell, also focused on the issue of involuntary unemployment (see Boianovsky and Trautwein 2003). However, involuntary unemployment due to a lack of demand in these theories is more connected to disequilibrium phenomena during business cycles than to Keynes' notion of involuntary unemployment at macroeconomic equilibrium (see Boianovsky and Trautwein 2003: 428f.).

inflation rate of 3.75 per cent instead of price stability (which would require an unemployment rate of 5 per cent). Thus, Reuber's contribution seems to be "exhibit A" for proposing an inflationary policy in order to reduce unemployment beyond that level compatible with price stability.

However, his contribution is very explicit about the kind of unemployment which should be removed by the Phillips curve trade-off: For Reuber (1962: 35), full employment is achieved when the "owners of productive services, including labour services, succeed in voluntarily selling as much of these inputs as they want at the prevailing market price" and if "all members of the population able and willing to work at the going wage rate can find a job" (Reuber 1962: 87). This definition of full employment clearly points at the absence of involuntary unemployment.¹⁶ Hence, with respect to the policy choice between inflation and unemployment, this distinction between both types of unemployment becomes crucial as remarked by Reuber (1962: 35):

Involuntary unemployment occurs to the extent that inputs being voluntarily offered at the prevailing price are not being purchased. The return from idleness to such factors is presumably less than the return from employment; otherwise they would not be offered on the market. Accordingly the efficiency of the economy will be improved if this involuntary unemployment is eliminated. This is in contrast to voluntary unemployment where the gains from idleness apparently outweigh the returns of employment at the prevailing price; consequently the efficiency of the economy would not be enhanced by forcibly reducing this type of unemployment.

From this it follows that reducing voluntary unemployment in Reuber's study is not on the agenda since the removal of voluntary unemployment by accepting inflation would only cause a net loss in sum.¹⁷

Thus, it is involuntary unemployment which should be removed by expansionary economic policy, since Reuber (1962: 151) also emphasised with respect to the contemporary economic situation in Canada that "[h]eavy unemployment is caused by an inadequate demand for labour." Of course, before proposing such an increase in aggregate demand, Reuber also investigated whether the high unemployment rate in Canada was not caused by other factors than a deficiency of demand. Indeed, clearly separating deficient-demand involuntary from structural unemployment might be difficult as also noted by Reuber (1962: 81). However, due to the historically high rate of Canadian unemployment, even though it was accompanied by a strong growth of the labour force, Reuber (1962: 49) emphasised that growth of demand did not equally expand so that Reuber (1962: 55) chose to speak of "excess unemployment" and "high involuntary unemployment" (Reuber 1962: 219).

Furthermore, Reuber (1962: 267) emphasised that unemployment, contrary to inflation, is a macroeconomic concern which must be dealt with by aggregate demand policies, since individ-

¹⁶Lucas (1978: 355), not surprisingly, rejects the concept of involuntary unemployment. Indeed, for example, in Lucas and Rapping (1969b: 748) non-frictional unemployment is fully voluntary. See De Vroey (2004) for a further discussion.

¹⁷The assumption of involuntary unemployment as the main reason for proposing a reduction of unemployment within the Phillips curve discussion was also later defended by various authors. See, for example, Rees (1970b: 238, n. 1).

ual action will not be sufficient if aggregate demand is lacking, while inflation can be regarded as an issue with which each individual can successfully deal with on its own:

The population itself by anticipating price inflation can eliminate most of the distributive effects of unanticipated price changes; and, indeed, during periods of steadily rising prices in the past has done so to a significant degree. There appears to be much less scope for the population by its own devices to cope with the distributive effects of unemployment, be it anticipated or not.

In this sense, involuntary unemployment has to be regarded as one important feature of the trade-off discussion, since this kind of unemployment can and should be cured by aggregate demand management. Indeed, no one other than Solow (1962: 4) also stated regarding unemployment in the USA “that the truth lies with the inadequate-demand school”,¹⁸ so that “[a]n expansion of aggregate demand is certainly necessary and very likely sufficient to reduce the unemployment rate to 4 per cent of the labor force” (Solow 1962: 8), even if this implies some inflation (see Solow 1962: 14).

On the other hand, for the line of thought following Friedman’s arguments “unemployment was seen as a primarily *microeconomic* concern” (Dixon 1995: 70) and thus not as an objective of macroeconomic policy as in Reuber’s analysis. In Friedman’s reasoning macroeconomic policy to push the economy to full employment is superfluous as such a policy is neither necessary nor appropriate (see Subsection 5.6.2.3).

As will be shown in the following discussion, the assumption of involuntary unemployment remained an important element for arguing in favour of making use of a long-run trade-off between unemployment and inflation even after Friedman’s and Phelps’ contributions to the trade-off debate. Before the focus will shift to this issue, another important reason for the assumption of a long-run trade-off and the Phillips curve dilemma will be discussed in the next section.

5.4 The Non-Linearity of the Phillips Curve

The issue of involuntary unemployment at price stability already gave rise to the Phillips curve dilemma, which was further complicated by the assumption of and empirical evidence for a non-linear Phillips curve. This non-linearity had important implications not only for the rate of inflation at full employment, but also for the role of stabilisation policies and for the high perceived costs of achieving price stability.

As pointed out in Chapter 2, Phillips himself stressed the non-linearity of the curve many times. Besides being important for stability analysis (for example, Phillips 1961: 365ff.; see Section 2.5), the non-linearity also had important policy implications since a higher rate of wage changes (or inflation) than predicted by the curve will be realised if the economy fluctuates as remarked by Phillips (1958b: 299):

¹⁸Also Viner (1963: 22), an economist certainly not renowned for following simple-minded “Keynesianism”, spoke of involuntary unemployment regarding the US economy at the beginning of the 1960s.

Because of the strong curvature of the fitted relation in the region of low percentage unemployment, there will be a lower average rate of increase of wage rates if unemployment is held constant at a given level than there will be if unemployment is allowed to fluctuate about that level.

This issue was also noted by Samuelson and Solow (1960: 190). Thus, removing cyclical fluctuations by active stabilisation policies was one possibility to lessen the inflationary bias due to the non-linearity of the curve (see also Hansen 1962: 337). In this respect, the notion of keeping unemployment at a given level did not necessarily point at the usual trade-off interpretation, but first of all at the beneficial effects of removing fluctuations around that level (as also discussed in Subsection 4.2.2).

However, not only cyclical fluctuations but also demand fluctuations among different sectors in the economy were discussed as another important reason for the perceived inflationary bias. This mechanism was also emphasised by Phillips (1962: 12), whereas the main references for this argument are Schultze (1959) and Lipsey (1960) as discussed in Subsection 1.3.3.¹⁹ Even though Schultze (1959: 45) did not base his argument explicitly on a non-linear Phillips curve (as in Lipsey 1960: 17ff.), but in essence on the same grounds by assuming downwardly sticky wages or prices, the effect is similar: Since a shift of demand between sectors will cause a rise of wages and prices in sectors receiving additional demand, while in those sectors which face a reduction of demand prices do not fall equally strong, a rise in the general price level occurs even without excess aggregate demand. From this it follows, in Schultze's (1959: 134) words, that "[c]reeping inflation is associated with the dynamics of resource allocation", and therefore the normal outcome of a growing and changing economy. Such a built-in inflationary bias, however, implied a "conflict between high employment and stable prices" (Rees 1958: 654).

The whole Phillips curve discussion hence was embedded into a dynamic model or analysis and not restricted to a static labour-supply labour-demand framework as in Friedman's approach which was discussed in Subsection 1.3.2.

This dynamic view of the Phillips curve can be best explained by focusing on Lipsey's contributions once again: not only due to his role within the Phillips curve discussion, but also since the following arguments were written down before Friedman's attack on the curve, so that they are not suspicious of being just an *ex post* justification for a long-run trade-off. Particularly in Lipsey's textbook (1963; 1966)²⁰ it becomes clear that, even without induced excess demand because of a too expansionary economic policy, the economy may face temporary sectoral excess demand and inflation due to changing consumers' preferences and bottlenecks in the economy.

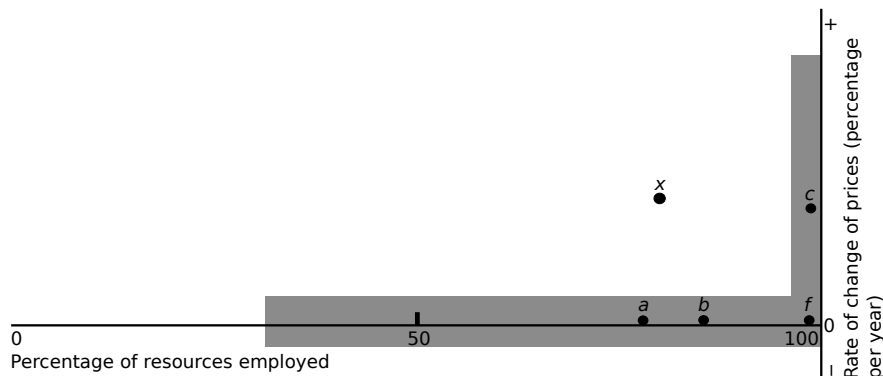
¹⁹Lipsey, during a personal conversation in Vancouver on 23 June 2013, remarked that he was not aware of Schultze's contribution at the time he wrote his 1960 piece. The role of separated labour markets, wage and price rigidities, and the implications for the rate of inflation were widely discussed throughout the 1950s, 1960s, and 1970s. See, for example, Rees (1950: 260), Clark (1951: 20), Hansen (1957: 78), Henderson (1962: 340f.), Dow (1964: 360, n. 2), Olivera (1964: 323), Archibald (1969: 129), Thirlwall (1969: 66ff.), Archibald (1970: 213f.), Rees (1970b: 236), and Brechling (1973). For a further discussion see Forder (2014: 76ff.).

²⁰Even though the discussion focuses on the second edition of Lipsey's textbook, very similar statements can be found in the first edition. For an analysis of the role of the Phillips curve in different textbooks over time see Forder (2015).

As the starting point for his discussion, Lipsey (1966: 703) focuses on the L-shaped supply curve (see Figure 5.1) and its favourable policy implications, since the L-shaped supply curve is described as “[t]he relation between changes in the price level and the volume of employment when there is no policy conflict between full employment [point *f* in Figure 5.1] and stable prices.” For example, a constellation as given by point *x*, that is, a positive rate of inflation despite a considerable amount of unemployed resources, is excluded in this approach.

Figure 5.1: Lipsey’s Textbook L-Shaped Supply Curve.

Source: Lipsey (1966: 703). Redrawn and amended. See Chapter “Copyright and Permissions” for further information.



Lipsey (1966: 704), however, points out that this theory “has not stood up well to testing”, so that a competing theory, the Phillips curve, is presented (see Figure 5.2).

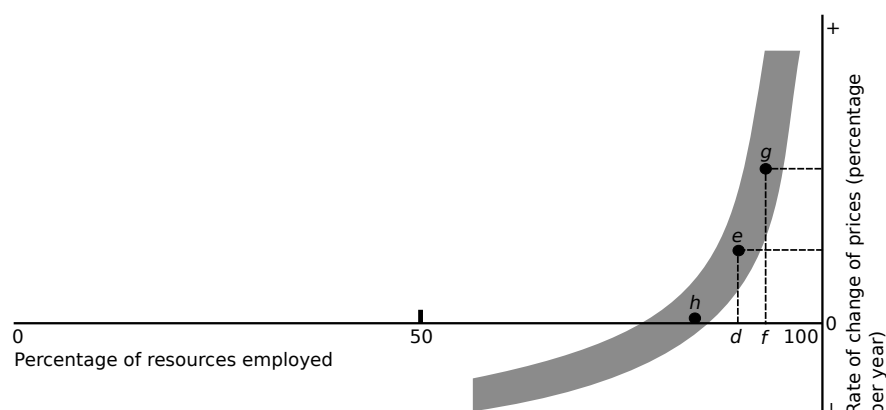
The grey shaded area shows the relationship between employment and inflation. Lipsey (1966: 704) remarks while describing the relation that “[t]he closer the economy is to full employment, the more likely it is that any change in demand will cause a price change and the less likely it is that it will cause an employment change, but, no matter how high the level of resource use is, it is always possible to expand the rate of production a little bit, so that a rise in demand is always accompanied by some rise in output.” This description suggests the usual trade-off interpretation at first. But Lipsey (1966: 704f., my italics) goes on noting that “the economy does not suddenly move from a situation of *underemployment* of resources and *constant* prices to a situation of *full* (constant) employment with *varying* prices; instead, the economy moves by degrees from one to the other.” Hence, constant prices are related to underemployment while full employment and price stability once again are depicted as being mutually conflicting.

Also the original caption of Lipsey’s textbook Phillips curve explicitly points at this dilemma as it is “[t]he relation between changes in the price level and the volume of employment when there is a policy conflict between full employment and stable prices.” On the other hand, any position on the curve other than price stability is interpreted as a disequilibrium in the economy by Lipsey (1966: 705):

Situations such as the one shown by points *e* and *g* [in Figure 5.2] [...] represent *disequilibrium positions*: if the inflation does eventually eliminate the excess demand, the level of resource utilisation will fall back to that compatible with a stable price level [point *h*].

Figure 5.2: Lipsey's Textbook Phillips Curve.

Source: Lipsey (1966: 703). Redrawn and amended. See Chapter "Copyright and Permissions" for further information.



At least at first sight, this statement by pointing at excess demand interferes with the notion that full employment should be an equilibrium and not a disequilibrium phenomenon. Furthermore, Lipsey (1966: 705) argues that such a disequilibrium situation can be maintained by economic policy:

This [inflation eliminating excess demand] does not affect the fact that, if the central authorities are prepared to take steps to allow the inflation to continue, they can achieve a level of unemployment lower than that which would obtain if there were no inflation. Also, the more rapid the rate of price inflation the authorities are willing to take steps to maintain, the lower the rate of unemployment they need to accept. Of course, to *maintain* a level of unemployment below h per cent, the authorities must take steps to ensure a continuing disequilibrium with continuing inflationary pressures in the economy.

This Phillips curve interpretation resembles the trade-off view criticised in particular by Friedman (1968).

However, a deeper analysis shows that the relationship between inflation and unemployment was thought to be far more complex and took place within a framework different to that of Friedman. Fortunately, Lipsey (1966: 717ff.) indeed gave a detailed account of the model he had in mind to explain this kind of relationship. In his view, the underlying dynamics in an economy which can be best described by a relation as in Figure 5.2 emerge due to a slowly adjusting economy subject to continuous shocks: Since movements of factors of production are slow compared to changing demand patterns, bottlenecks are most likely to develop in different markets at different points in time (this explanation is also used in Lipsey's trade-off contribution of 1965: 245 which was discussed in Subsection 1.3.4). Thus, if aggregate demand is increased in order to remove unemployment it will not be equally distributed among all markets, so that some markets may still face excess supply while others are operating at their

capacity limit.²¹ This unequal distribution of demand hence pushes up the aggregate price level (as shown in Subsection 1.3.3) despite unemployment in the economy (Lipsey 1966: 718):²²

As aggregate demand goes on increasing, excess demand will develop in some market and price will begin to rise in that market. This will happen while there is still excess supply in other markets. As aggregate demand goes on increasing, more and more markets will begin to develop excess demand. In everyday language we might say that bottlenecks and shortages begin to develop in some parts of the economy. Eventually, prices will be rising in enough markets to offset the effects of price reductions in other markets, so that the average level of prices will begin to rise. As long as excess supply exists in any market, the level of resource utilisation can be increased (i.e., the level of unemployment lowered) by raising aggregate demand. But the more markets there are in which excess demand already exists, the more any further rise in demand will serve merely to increase excess demands in these markets (and so speed up the rate of inflation) and the less it will serve to reduce excess supplies in other markets (and so increase the level of resource use). Thus, the higher the level of aggregate demand, the greater the effect on price and the less the effect on employment of yet further increases in demand.

Lipsey (1966: 718f.) points out that there are indeed deeper underlying reasons why excess demand develops more rapidly in one market than in other markets. For Lipsey, the main source is not to be found in a static short-run analysis but in the dynamics of economic change (for example changes in consumers' preferences) in a growing economy:

Should we be surprised by this [that some markets face excess supply while others excess demand]? No, not as long as the economy is subject to the kinds of changes that necessarily accompany economic growth. As productivity grows, some supplies expand faster than other supplies, and as real incomes grow, some demands expand faster than other demands. Except in the most unlikely of circumstances, we would expect these changes to bring about a reallocation of resources. Since such changes do not happen instantaneously, we would expect some markets to be exhibiting excess supplies while other markets exhibit excess demands.

²¹This is contrary to the argument surrounding the L-shaped supply curve: Here, the underlying assumption is that all individual markets behave in the same way and demand is equally distributed between these markets (see Lipsey 1966: 717f.). This implies that "the economy must be in equilibrium when the economy is at the point of full employment without inflation indicated by f [in Figure 5.1]" (Lipsey 1966: 717).

²²A very close concept is described in Keynes (1936: 300f.) as "semi-inflation":

If there is a perfect balance in the respective quantities of specialised unemployed resources, the point of full employment will be reached for all of them simultaneously. But, in general, the demand for some services and commodities will reach a level beyond which their supply is, for the time being, perfectly inelastic, whilst in other directions there is still a substantial surplus of resources without employment. Thus as output increases, a series of "bottle-necks" will be successively reached, where the supply of particular commodities ceases to be elastic and their prices have to rise to whatever level is necessary to divert demand into other directions.

Hence, inflation in the aggregate is the outcome of necessary adjustments of relative prices to reflect changes in the distribution of demand between sectors. Due to the non-linearity of the Phillips curve in each sector, this inflation emerges as an unwelcome, but nevertheless unavoidable, outcome of economic change as pointed out by Lipsey (1966: 719):

If the theory of price is correct, we do expect that prices will work as a mechanism to direct resources to where demand is greatest so that there is a continual movement in the direction of equilibrium, but since the equilibrium values are themselves always changing, we never expect equilibrium to exist simultaneously in all markets. Thus we should not really be surprised that the empirical evidence at the macro level refutes the idea of the L-shaped curve [...] [Figure 5.1] and supports the idea of the smooth curve shown [...] [Figure 5.2].

The Phillips curve in Lipsey's textbook hence did not offer a trade-off between unemployment and inflation in the sense that a policymaker can force a lower unemployment rate than a "natural rate", that is, full employment, by accepting a deceptive acceleration of inflation. Rather, the curve shows that full employment (macro-equilibrium) is not necessarily compatible with zero inflation due to the various underlying inflationary forces of a growing and changing economy (micro-disequilibria). In this sense, ongoing sectoral disequilibria and price adjustments at full employment are the natural outcome of a dynamic economy.²³ Interestingly, Lipsey (1978: 57) remarked that also Phillips shared this kind of explanation:

In private conversation Phillips always stressed the fact that economic growth would leave the economy in a perpetual state of disequilibrium which, because disturbances were continually occurring, would leave individual markets chasing a moving target that they never reached. For this reason he saw markets in microdisequilibrium, even when the economy was in some sense in macroequilibrium. This, rather than the behaviour of a labour search model, was to him the most important explanation of why the ceiling level of output was only asymp[t]otically approached, as with the Phillips curve, rather than being a constraint that suddenly bound absolutely, as in the dichotomized version of the model [L-shaped supply curve].

Lipsey (1966: 842), however, emphasised that a deeper analysis of this conflict and a search for possible solutions is indeed necessary as "the policy conflict between inflation and unemployment is one of the most serious problems of macroeconomic policy." Hence, Lipsey (1966: 851) pointed out that "[u]ntil successful policies for reducing or eliminating the conflict have been

²³This explanation of a trade-off was also included in the first US edition of Lipsey's textbook (Lipsey and Steiner 1966: 717ff.). However, the trade-off is more pronounced in the second edition as Lipsey and Steiner (1969: 773) speak of a "trade-off between full employment and stable prices". Bottlenecks and structural changes are still regarded as the main source of inflationary pressure on the way to full employment (see Lipsey and Steiner 1969: 771). Hence, the Phillips curve shows a trade-off as "[i]t is clear that price rises occur well before full-employment levels are reached" (Lipsey and Steiner 1969: 773). The chapter on this trade-off interpretation of the Phillips curve was also included in the third edition of his UK textbook (Lipsey 1971: 709ff.), even though it was written in 1970 and hence considerably after Friedman (1968). In the fourth edition (Lipsey 1975: 803ff.), Friedman's critique is finally addressed.

designed, it is necessary to choose between the two competing policy objectives. How much inflation is it worth having in order to gain a further reduction in unemployment?" This choice, however, depends on individual preferences and hence "the final choice of how we value these two goals relative to each other becomes a political one." Even though it is a political choice, Lipsey (1966: 857f.) is in favour of a full-employment policy since "we cannot argue about the advantages and disadvantages in the case of full-employment policy since the only alternative to having a full-employment policy administered by the government is to let unemployment settle at whatever level the private market determines. The evidence of history is that this will mean accepting quite high rates quite often."

As has been shown, Lipsey throughout his contributions indeed presented the Phillips curve as offering a long-run trade-off between inflation and unemployment. Without doubt at least a conflict between full employment and price stability is clearly stated. But there is no trade-off in Friedman's sense, which builds upon unexpected inflation as an instrument to reduce unemployment in the short run. Lipsey's approach rather describes the dynamic adjustment mechanisms in a growing and changing economy. Inflation hence is a by-product of an economy moving towards its full employment level, reaching bottlenecks at any stage of this process. Furthermore, even at full employment demand patterns are constantly changing and sector-specific shocks occur. Since the necessary adjustments on the supply side take time and as relative price changes rely on the upward movement of prices due to nominal downward rigidities, ongoing inflation at full employment is the outcome to be expected.

In Lipsey's own words (1966: 850f.), the conflict between both policy goals emerges as "[o]ne reason why inflation sets in before full employment is reached is that in a growing, changing economy, the pattern of consumers' demand is constantly changing, and with it also the pattern of derived demand for factors." Hence, if the adjustment on and between markets were instantaneous, the reason for this conflict would vanish. But, as Lipsey (1966: 851) goes on "[s]uch re-allocations of resources take time and often entail the retraining of labour and its movement from one geographical area to another. [...] Thus, if aggregate demand expands, shortages and bottlenecks and consequent inflationary pressure will develop, even though there are unemployed resources. If movement of these resources could be speeded up considerably, then bottlenecks and shortages would be less likely to occur in expanding areas until over-all unemployment were at a very low level."²⁴

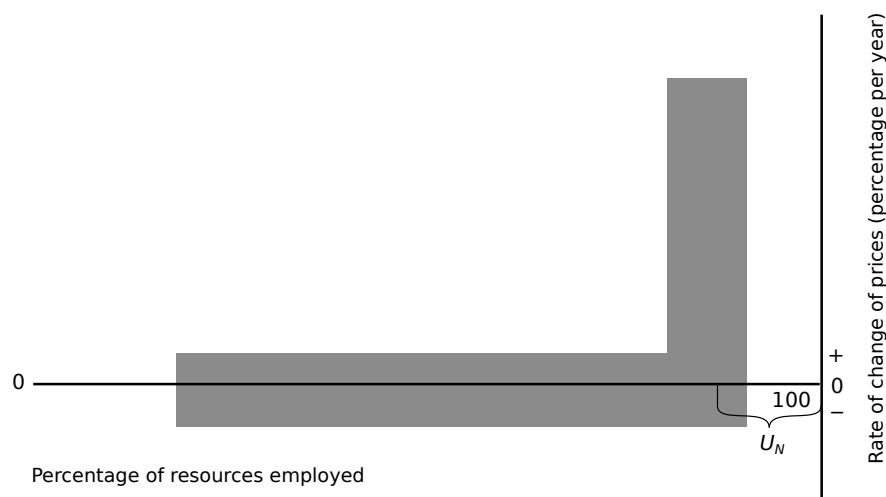
Lipsey's trade-off interpretation of the Phillips curve hence should be regarded as the expression of a conflict between full employment and price stability. Whereas the conventional wisdom (as in Meltzer's quote in Section 1.1) regarding the trade-off implies an optimistic notion about using the tools of aggregate demand management to arrive at a desired unemployment rate at the cost of or even by the means of high(er) inflation, Lipsey's assessment of the trade-off view is a rather pessimistic one: Due to various reasons, and be it only the limited speed of sectoral labour movements, an ever changing economy cannot attain full employment without inflation.

²⁴Brechling (1973: 360), however, noted that dispersion among sectors persisted "over considerable periods of time" in the USA as well as in the UK (see also Brechling 1967). In this respect, Thomas and Stoney (1971: 97ff.) came to the conclusion that the average annual wage change in the UK for the years from 1950 to 1966 had been higher by 2 percentage points due to such unemployment dispersion.

This assessment of Lipsey's work is reinforced by Lipsey's reaction to the Phelps-Friedman critique in the fourth edition of his textbook (Lipsey 1975). Friedman's and Phelps' explanation of the inflation of the 1970s in Lipsey's (1975: 804) view is based on an "orthodox demand-pull theory" extended by inflation expectations. Due to this assumption of pure demand-pull inflation, all other sources of inflation in a growing and changing economy which are the driving forces of Lipsey's interpretation of the conflict between full employment and price stability are ignored by Phelps and Friedman. Therefore, in Lipsey's (1975: 803) view, Friedman and Phelps do not argue within the Phillips curve framework, but instead propose "[a] revival of the L-shaped relation" by modifying the conflict-free L-shaped supply curve as they add a "natural rate of unemployment" to this concept. In his textbook, this figure (see Figure 5.3) is titled accordingly as "[t]he new theory of the L-shaped relation with a non-zero natural rate of unemployment (U_N)" (Lipsey 1975: 804).

Figure 5.3: The "Natural Rate" as an L-Shaped Supply Curve Concept.

Source: Lipsey (1975: 804). Redrawn and amended. See Chapter "Copyright and Permissions" for further information.



The "natural rate" in this diagram just replaces the one hundred per cent mark at the kink as the maximal attainable and inflation-free level of employment. If demand is pushed beyond this level then policy-makers will "bring about an inflation that explodes into ever faster rates of price increases" (Lipsey 1975: 803). But there is no further change to the diagram such as the distinction between a short-run and a long-run Phillips curve. This indicates that Lipsey indeed interpreted Phelps and Friedman as falling back into a framework of pure demand-pull inflation. Not only Lipsey, but also Bodkin et al. (1966: 280, n. 2) explicitly interpreted this upcoming line of thought this way.²⁵ Furthermore, as is shown in Schwarzer (2015d), also other economists had very similar views regarding Friedman's reinterpretation of the Phillips curve.

²⁵Bodkin et al. (1966: 280, n. 2), of course, did not refer to Phelps (1967) or Friedman (1968), but to Coyne (1958: 10), the Governor of the Bank of Canada from 1955 to 1961, who took the point of view that there is no conflict between full employment and price stability so that "[t]he idea that readiness to create or tolerate inflation can make a useful contribution to the problem of maintaining a high and expanding level of employment and output, is in danger of becoming the great economic fallacy of the day." For a further discussion see Schwarzer (2015a).

In sum, Lipsey did not alter the Phillips curve diagram by including the distinction between the vertical long-run curve and the non-vertical short-run Phillips curve. Indeed, his choice to present the critique of Phelps and Friedman in the conflict-free L-shaped supply curve diagram shows how much weight Lipsey put on the underlying reasons for the Phillips curve conflict—a conflict which is still presented as the outcome of a growing and changing economy (see Lipsey 1975: 801ff.).

This emphasis on embedding the Phillips curve into a dynamic economy is crucial. As Phelps (1968a: 682) correctly noted, bottlenecks cannot account for ongoing inflationary pressure as soon as the economy has adjusted. However, as Lipsey (1978: 58, n. 9) remarked, the idea of a growing and changing economy was also the basis for Tobin's 1971 Presidential Address (1972b: 9ff.), in which factors such as "new products, new processes, new tastes and fashions, new developments of land and natural resources, obsolescent industries and declining areas [...] keep markets in perpetual disequilibrium" (Tobin 1972b: 10). Due to these ongoing sectoral disequilibria even at full employment it follows that necessary relative price adjustments always occur. But since the Phillips curve is non-linear these price adjustments imply that "[f]ull employment in the sense of equality of vacancies and unemployment is not compatible with price stability" (Tobin 1972b: 10).

Tobin (1972b: 2, *my italics*) hence remarked that "various criteria of full employment coincide in a theoretical full *stationary* equilibrium", for example, the absence of involuntary unemployment ("Keynesian" full employment) and the "natural rate of unemployment" (Friedman's notion of full employment). Thus, the full employment level in both lines of thought is the same within such a *static* analysis. However, since "[t]he economy is in perpetual sectoral disequilibrium even when it has settled into a stochastic macro-equilibrium" it follows that this "full long-run equilibrium" in which the rate of inflation would play no role for unemployment "is not an equilibrium that the system ever approaches" (Tobin 1972b: 11). Hence, as soon as the assumption of a *static* economy is dropped in exchange for a *dynamic* perspective, a trade-off between full employment and price stability emerges once again and the "natural rate of unemployment" as that rate which is "compatible with zero or some other constant inflation rate" (Tobin 1972b: 2) therefore "dictates higher unemployment".

Thus, as in the cost-push demand-pull debate, Friedman's introduction of the "natural rate of unemployment" was interpreted as shifting the full employment target to the right (in a Phillips curve diagram) in order to make the "natural rate" compatible with price stability. Of course, if money wages and prices are as flexible upwards as they are downwards (an assumption within Friedman's framework as will be shown in the next section), then no trade-off in such a dynamic economy will exist. Thus, with flexible wages and prices no inflationary bias is to be expected even in a constantly growing and changing economy, so that full employment and price stability are not mutually conflicting policy objectives.

Unfortunately, after Friedman's Presidential Address the issue of an inflationary bias at full employment which may give rise to a long-run trade-off between full employment and price stability became mixed up with the important role of not fully adjusting inflation expectations in order to arrive at a long-run trade-off. Also "Keynesians" started to argue within Friedman's framework, so that they shifted their emphasis on the possibility of non-adjusting inflation expectations in general and thus got involved in an unnecessary uphill battle. The next section will shed light on this debate.

5.5 The Phillips Curve After Friedman: A “Keynesian” Uphill Battle?

The introduction of Friedman’s “natural rate of unemployment” was particularly connected to the incorporation of (adaptive) inflation expectations having a unit weight in the Phillips curve. But, as is argued in more detail in Schwarzer (2015d), Friedman’s “natural rate” concept also denied any issue of an inflationary bias at full employment, particularly due to aggressive unions. However, a closer look at the definition of the “natural rate of unemployment” reveals that Friedman also included all other possible cost-push forces into this definition and so bypassed the widely discussed issue of premature inflation and of an inflationary bias at full employment.²⁶

Since the absolute value of the “natural rate of unemployment” is subject to all kinds of market imperfections, including those imperfections giving rise to an inflationary bias in a growing and changing economy, particularly the “stochastic variability in demands and supplies” or also “the costs of mobility” (Friedman 1968: 8), it can be argued that any reason for an inflationary bias at full employment is defined out of existence. In other words, the “natural rate of unemployment” has to be so high that the disinflationary or deflationary tendencies due to a lack of aggregate demand counter any other possible (cost-push) sources of inflationary pressure. In this sense, Tobin’s view (as outlined in Section 5.4) that full employment at the “natural rate” implies a lower volume of employment than the “Keynesian” full employment level is quite correct.

However, in contrast to “Keynesians”, Friedman did not assume that there is a strong asymmetry with respect to upward and downward wage and price flexibility (which implies a linear Phillips curve). Thus, even though Friedman also took sectoral demand and supply shifts into account, there is no need for a positive rate of inflation in order to facilitate price adjustments. To the contrary, Friedman (1968: 13, *my italics*) feared that a permanent rise in the price level will not facilitate relative price adjustments, but will rather render wages and prices more (downwardly) sticky. Hence, the achievement of price stability²⁷ will preserve the important

²⁶Similar to the disclaimer on Keynes in the Preface, I would like to add a short disclaimer on Friedman. It is not argued within this thesis and in other papers of mine that Friedman wilfully defined away the “Keynesian” problem of an inflationary bias at full employment. It is, however, argued that it was perceived in this way by many adherents of the dilemma view. Furthermore, I would take side with Friedman regarding the impossibility of ongoing wage pushes by unions if unions actually can be understood as being subject to the usual optimal pricing behaviour of monopolies. Then indeed only rising market power but not a high level of market power can be inflationary (see critically Solow 1968: 5). However, even though many arguments presented here are in line with the reasoning that there is no inherent conflict for Friedman between full employment and price stability, also Friedman in some contributions expressed doubts about the compatibility of both goals: For example, the problem posed by price rigidities for achieving full employment without inflation was emphasised in Friedman (1948: 254f.). Nelson (2008: 103ff.) furthermore remarked that price rigidities play an important role throughout Friedman’s contributions. On the other hand, Friedman’s explanation of the short-run trade-off seems to rest on a framework of price flexibility (see, for example, Tobin 1995b: 33, n. 1). This was also the view of Modigliani (1977: 4f.) which Friedman (1977a: 12f.) strongly disputed. But see Modigliani’s rejoinder in Friedman (1977a: 19f.).

²⁷Besides the positive effects of price stability outlined in the quotation, Friedman (1977a: 12) also remarked that “[t]he major reason for favoring zero inflation is that I believe it is almost impossible to have a political set-up which will be consistent with steady-state inflation, unless that steady state is zero, or close to it.”

(downward) flexibility of wages and prices:

Our economic system will work best when producers and consumers, employers and employees, can proceed with full confidence that the *average level of prices* will behave in a known way in the future—preferably that it will be *highly stable*. Under any conceivable institutional arrangements, and certainly under those that now prevail in the United States, there is only a *limited amount of flexibility in prices and wages*. We need to *conserve this flexibility* to achieve changes in relative prices and wages *that are required to adjust to dynamic changes in tastes and technology*. We should not dissipate it simply to achieve changes in the absolute level of prices that serve no economic function.

Thus, in order to facilitate those relative price adjustments necessary in a changing economy, that is, to “keep the machine well oiled” (Friedman 1968: 13), it is price stability which will assure and foster the necessary flexibility of prices and wages so that no “cruel dilemma” exists even in the case of a dynamic economy. On the other hand, for “Keynesians”, a positive rate of inflation was assumed to be a solution for downward, and thus to a certain extent also relative, price and wage inflexibility.²⁸ In this respect, Friedman started from the assumption of a limited but apparently sufficient downward flexibility, which becomes endangered by permanent positive rates of inflation, while “Keynesians” started from the assumption of an insufficient downward flexibility which necessarily must lead to a positive rate of inflation as a second-best solution if full employment is to be achieved.

However, as will be argued within the next paragraphs, “Keynesians” fought an uphill battle after Friedman’s Presidential Address, since now it was Friedman’s view of the Phillips curve trade-off which framed the discussion. Friedman’s new framework not only included the well-known emphasis on the mechanism of surprise inflation and thus a change in causality of the Phillips curve with prices leading quantities, but particularly also the implicit assumption that full employment is compatible with price stability from the outset.

A deeper analysis of the reaction of the economics profession to Tobin’s (1972b) restatement of the long-run trade-off will show how far the pendulum has swung in favour of Friedman’s interpretation. Even though Tobin’s contributions at the beginning of the 1970s do not match the view of Lipsey and other economists in all details, they are nonetheless a fair representation of how the Phillips curve was understood by “Keynesians”. However, there is one important element which is by far more pronounced by Tobin: money illusion.

This important role of money illusion for the “Keynesian” Phillips curve was also emphasised by Friedman (1975: 17):²⁹

²⁸But, as pointed out in Section 3.2, Samuelson and Solow (1960: 187) emphasised—very much in line with Friedman’s concerns—that money wage stickiness might be endogenous, so that periods of low unemployment may “breed an inflationary bias”.

²⁹As has been noted in the Preface, Keynes emphasised that workers not only care about their absolute real wage, but also about their relative position. Thus, since a reduction of the nominal wage of an individual would not only reduce the real wage of this individual, but also worsens the position of this individual compared to other workers, such a reduction of the nominal wage is usually resisted. On the other hand, if a rise in the price level occurs, all workers are worse off, though the relative positions remain unchanged. Therefore, a rise in the price level is more acceptable to the individual worker than a fall of the nominal wage.

Indeed the whole Keynesian argument for the possibility of a full employment policy arose out of the supposition that it was possible to get workers (at least in the 1930s when Keynes wrote *The General Theory*) to accept lower real wages produced by inflation that they would not have accepted in the direct form of a reduction in nominal wages.

Exactly this mechanism is brought forward in Tobin (1972b: 4) by stating that “Phillips curve doctrine [...] is in an important sense the postwar analogue of Keynesian wage and employment theory, while natural rate doctrine is the contemporary version of the classical position Keynes was opposing.” Even some years before, and thus at the same time as Friedman started to attack the long-run Phillips curve, Tobin (1967: 103) remarked that “[t]he Phillips curve idea is in a sense a reincarnation in dynamic guise of the original Keynesian idea of irrational ‘money illusion’ in the supply of labor. The Phillips curve says that increases in money wages—and more generally, other money incomes—are in some significant degree prized for themselves, even if they do not result in equivalent gains in real incomes.” From this it follows that the “Phillips curve doctrine implies that lower unemployment can be purchased at the cost of faster inflation” (Tobin 1972b: 4). Hence, if workers care more about (relative) nominal wages than about the real wage as such,³⁰ then a lower unemployment rate becomes possible due to non-adjusting wage demands to the higher rate of inflation and the fall of the real wage. Tobin (1972b: 4f.) thus argued that a rise in aggregate demand and the rate of inflation can lower the rate of (involuntary) unemployment.

However, already before Tobin’s Presidential Address was given and published, closely related arguments had been stated by Tobin and Ross (1971), which spurred a further debate between Tobin and Ross (1972), Tobin (1973) and Tullock (1972, 1973). This debate will be reviewed in the next paragraphs to show how the discussion became blurred between inflation as a means of relative price adjustments and as a tool to lower real wages in general.

In their essay, which was published in *The New York Review of Books* and thus addressed a broader audience, Tobin and Ross (1971: 23) remarked that “[t]he cruel choice between two evils, unemployment and inflation, has become the major economic issue of the day.” This incompatibility between full employment and price stability is once again, as discussed in Section 5.2, explained by “strong unions and corporations”. However, as in Tobin (1972b), even without market power an inflationary bias in the economy will result by assuming downwardly sticky wages and prices paired with shifting demand between sectors. Due to these nominal downward rigidities of wages and prices “there is only one direction in which they can move in response to changing economic conditions” (Tobin and Ross 1971: 23) to allow for relative price adjustments. In this sense, Tobin and Ross (1971: 26) emphasised that “even in the best of circumstances, the unpleasant fact remains that full employment implies creeping inflation.” Nominal but not real downward stickiness of wages and prices, which suggests some sort

³⁰ Alchian (1970: 44, n. 27) pointed out that this kind of behaviour does not point at irrational money illusion within a search model of labour market dynamics: A cut in money wages provides different information to the individual than a rise in the general price level, since the cut in money wages is perceived as an individually lower wage (with wages at other firms potentially still higher), while the rise in the price level suggests that real wages everywhere else have also fallen. Thus, within a search model of the labour market, employees would chose unemployment due to a fall in their money wage in order to search for a better paid job, while they would stay at the present firm (and thus chose employment) if there is a rise in the general level of prices.

of money illusion, thus points at the beneficial role of inflation for restoring market clearing *relative* prices.

But instead of sticking to this argument, Tobin and Ross (1971: 23) also focused on another effect of money illusion which comes about if wages in *general* do not adjust fully to the rate of inflation by arguing that “[i]nflation is a peaceful and anonymous resolution of these inconsistent and conflicting claims” which arise when “unemployment is low” so that “labor and management can claim wages and profits which add up to more than 100 percent of the value of output they produce at current prices” (see also Tobin 1972b: 13). Hence by inflation these undue claims are discounted so that they stay within the budget constraint of the economy. But this necessarily assumes that both parties suffer from money illusion in the sense that both parties seem to be content with a higher nominal, but in effect the same real sum of wages or profits. Tobin and Ross (1971: 24) thus noted with respect to Friedman’s critique that his “argument rests on an appealing but unverified assumption: that you can’t fool all of the people all of the time. If labor and business are making inconsistent demands, then in Friedman’s view a mere renumbering of prices and wages through inflation will not resolve the conflict.” Tobin and Ross (1971: 24) hence emphasised that “[s]o long as wages and prices are set in dollars, and money retains its age-old power to deceive, inflation can be used to resolve economic conflict.” Furthermore, it is indeed recognised that “‘money-illusion’ is a transient phenomenon” (Tobin and Ross 1971: 24). However, since “the period of adjustment is measured in decades rather than years” it follows that “the Phillips trade-off is real enough for the practitioners of economic policy” (Tobin and Ross 1971: 24). This kind of money illusion thus does not point at the beneficial effect of inflation for restoring market-clearing relative wages and prices, so that a non-adjustment to the current rate of inflation can be fully in line with economic rationality, but is indeed compatible with Friedman’s approach that a permanently lower level of unemployment can only come about by non-adjusting inflation expectations in general so that the absolute real wage is lower throughout the economy than it would be without such money illusion.

In his comment Tullock (1972: 426) hence critically remarked about these statements that “[i]t is one of the virtues of Tobin’s latest presentation of the ‘Keynesian’ position [...] that he quite frankly bases his reasoning on the possibility of fooling the workers.” Even though Tullock (1972: 427) noted that Keynes’ approaches and “Keynesianism” are not quite the same, he nevertheless emphasised that in order to have the desired effect of reducing unemployment by unexpected inflation “[t]he Keynesian who wishes to fool the workers must conceal that desire as carefully as did Keynes himself.” According to Tullock (1972: 430), however, while Keynes argued for reflation if unemployment is caused by a contractive shock to the money supply, “Keynesians” made use of inflation “as a treatment for all unemployment.” Tullock (1972: 429) thus noted that Tobin’s “article is an exceptionally lucid and candid presentation of the straights to which Keynesians have been reduced.”

Indeed, the arguments of Tobin and Ross (1971) were poorly presented, notwithstanding the fact that the target audience was not the economics profession but the general public.

Tobin and Ross (1972: 432f.) replied to Tullock by pointing at the same asymmetric dynamics and implications of sectoral disequilibria as in Tobin (1972b), which “do not betray any permanent or fundamental money illusion” (Tobin and Ross 1972: 433). Thus, they (1972: 432) emphasised that “[w]e do not advocate deception as a national policy” and that “[w]e do not

even believe in ‘money illusion.’” But as in Tobin’s Presidential Address (1972b: 4f., 13), it is assumed that a one-time increase in the rate of inflation may lower the level of real wages in general while the real wage then would rise in line with productivity (see Tobin and Ross 1972: 436).³¹

Despite this emphasis on money illusion, Tobin and Ross (1972: 433) stressed that their proposal is based on the assumption of involuntary unemployment since “[i]f we thought that unemployment of 6 percent of the labor force was voluntary and optimal, we would not ad-

³¹This result needs some clarification (see the misunderstanding in Tullock 1972: 427). Assume a standard wage change Phillips curve $\hat{w}_t = \gamma + \alpha(u^* - u_t) + c\hat{p}_t^e$ with the rate of change of wages \hat{w} , a threshold rate of unemployment u^* at which the rate of inflation \hat{p} starts to rise (since wages begin to rise stronger than productivity growth γ), and the realised rate of unemployment u , while the subscripts t and $t - 1$ denote periods. The coefficient α determines the slope of the short-run Phillips curve while productivity growth in each period is assumed to be the same and exogenous. This productivity growth is assumed to be fully transformed into nominal wage growth. The weight of inflation expectations \hat{p}^e in the Phillips curve is given by the coefficient c , which is 1 in the “natural rate” framework, somewhere between 0 and 1 in the case of a long-run trade-off, and 0 if the short-run and long-run Phillips curve coincide. If adaptive inflation expectations are assumed then $\hat{p}_t^e = \hat{p}_{t-1}^e + \delta(\hat{p}_{t-1} - \hat{p}_{t-1}^e)$ with δ as a learning or adjustment coefficient. If $\delta = 1$ then $\hat{p}_t^e = \hat{p}_{t-1}$ which will be assumed in the following equation without having an important effect on the general result (see for a contemporary discussion Solow 1969: 3ff.). The Phillips curve thus is given by $\hat{w}_t = \gamma + \alpha(u^* - u_t) + c\hat{p}_{t-1}$. If prices are driven by unit-labour costs then $\hat{p} = \hat{w} - \gamma$ in any period. From this it follows that the Phillips curve becomes $\hat{w}_t = \gamma + \alpha(u^* - u_t) + c(\hat{w}_{t-1} - \gamma)$. Equilibrium requires that inflation expectations are fulfilled, that is, $\hat{p}_t^e = \hat{p}_t$ or given the above assumption of simplified adaptive inflation expectations $\hat{p}_{t-1} = \hat{p}_t$ which implies that $\hat{w}_{t-1} = \hat{w}_t$. Substituting \hat{w}_{t-1} with \hat{w}_t and solving for \hat{w}_t the equilibrium change of wage rates is given by $\hat{w}_t = \frac{\alpha}{1-c}(u^* - u_t) + \gamma$. Thus, if $0 \leq c < 1$ there is a stable rate of inflation or deflation even if the realised unemployment rate deviates from u^* . Nominal wages then rise in line with the realised (equilibrium) rate of inflation $\frac{\alpha}{1-c}(u^* - u_t)$ and with productivity growth γ , so that real wages rise one for one with productivity. However, until this stable rate of inflation is realised and thus an expectational equilibrium achieved, wage changes did not take full account of the rate of inflation due to the assumption that inflation expectations do not have a unit weight in the Phillips curve. The cumulated loss over time (which can be calculated by summing up the difference between actual and expected rates of inflation in each period) will be exactly the difference between the old and new stable rate of inflation. Thus, even though nominal wages in the end rise in line with the realised rate of inflation and productivity growth (so that real wage growth matches productivity growth in equilibrium), the *level* of the realised growth path of real wages is lower than before. This implies that in each period realised real wages are lower in their level as they would be without money illusion, that is, if $c = 1$. The question thus is whether or not one should interpret the result that real wages rise in line with productivity even if there is money illusion in the sense that “[t]his does not mean that labor is losing out” (Tobin and Ross 1971: 24; see also Tobin and Ross 1972: 436 and Solow 1968: 8), or if the permanently lower level of real wages implies that “it is necessary to impose upon the workers a continuous reduction in their wages by way of inflation” (Tullock 1973: 827) since the old growth path of real wages is not achieved. In order to decide between these two views, the crucial question is why nominal wages actually tend to rise faster in both views the lower the rate of unemployment becomes. If this rise in the change of wage rates is due to the assumption that workers are only willing to supply more labour at a higher (expected) real wage as in Friedman’s view, then money illusion clearly fools the workers. On the other hand, if the rise of wage rate changes is due to adjustment processes of an economy in continuous states of disequilibria as in Tobin’s view, then it is not perfectly clear if workers are fooled or not, since then a rise in the change of wage rates cannot be simply interpreted as a demand for higher real wages in general (see also the discussion in Tobin 1972b: 5ff.). The analysis above furthermore shows that Friedman’s (1966a: 60) statement that the “‘natural’ level of unemployment” is the unemployment level “at which *real* wages would have a tendency to behave in accordance with productivity” is not a sufficient condition for arriving at a unique “natural rate” as long as c is not equal to 1.

vocate measures to reduce it.” In their (1972: 433) view, the “natural rate of unemployment” which is compatible with zero inflation does not point at voluntary unemployment, “it just defines it so”. From this it follows that “if the unemployment is involuntary, then there are gains in eliminating it and these must be balanced against the inflationary costs” (Tobin and Ross 1972: 434).

In his reply, Tullock (1973: 828) once again framed the discussion within the “natural rate” model, without taking into account the sectoral disequilibria argument and the inflationary bias which can occur due to non-linear sectoral Phillips curves.³² Thus, instead of focusing on the argument that sectoral shifts of demand necessarily cause a rise in the general price level if there is downward wage and price stickiness, Tullock once again pointed at the deliberate creation of inflation to lower real wages in general.

As has been pointed out before, the arguments in favour of a long-run trade-off were poorly presented. In Tobin and Ross (1972: 433), but also especially in Tobin’s Presidential Address, Tobin (1972b: 3) indeed remarked that “a general rise in prices is a neutral and universal method of reducing real wages, the only method in a decentralized and uncontrolled economy. Inflation would not be needed, we may infer, if by government compulsion, economy-wide bargaining, or social compact, all money wage rates could be scaled down together.” Therefore, “[p]rice inflation [...] is a neutral method of making arbitrary money wage paths conform to the realities of productivity growth, neutral in preserving the structure of relative wages” (Tobin 1972b: 13). However, these excessive wage claims are presented as the result of ongoing sectoral disequilibria and the struggle of workers to preserve their relative position which may even lead to a wage-wage spiral (see Tobin 1972b: 11ff., 1973: 983f. and 1995b: 37f.), so that “[w]hen labor markets provide as many jobs as there are willing workers, there is inflation, perhaps accelerating inflation” (Tobin 1972b: 9).

Thus, even though Tobin based his main message on the notion of inflation as an adjustment mechanism for sectoral disequilibria, the idea that it is indeed possible or even necessary to lower all real wages in general is discussed as well.³³ In sum, Tobin’s arguments were in line with those of earlier economists arguing in favour of a long-run trade-off, or to be more precise, about the unfortunate implication of an inflationary bias at full employment due to a non-linear Phillips curve as was discussed in Section 5.4. Nonetheless, the presentation of these arguments could have been more clear and straightforward, that is, without pointing at the important role of inflation for restoring a market clearing real wage. Though this argument might be worth a consideration from a theoretical point of view, it is nevertheless essentially based on money illusion since workers are assumed to care more about their relative than about their absolute real wage³⁴—an assumption surely misplaced regarding the intention to counter Friedman’s

³²Also Tobin (1972a: 859) discussing Friedman (1970, 1971) critically remarked about the Phillips curve used in Friedman’s analysis that “[a]ggregation is always risky, but it seems particularly inappropriate to pretend that aggregate variables obey the relationships that would be expected in a single homogeneous product and labor market.”

³³This fall in the real wage, however, ultimately follows from the assumption of a positive but diminishing marginal product of labour, so that the removal of involuntary unemployment (for example by an increase in aggregate demand) may bring about a fall of the real wage (see Tobin 1972b: 4). A lower real wage thus is an effect but not the cause of a lower unemployment rate.

³⁴See Leontief (1936: 195f.) and Keynes (1937: 209).

attack on the Phillips curve.

However, not only Tobin, but also other “Keynesians” started to argue within Friedman’s framework, that is, making a case for a long-run Phillips curve trade-off based on money illusion. The best example is Solow. As was discussed in Chapter 3, Samuelson and Solow (1960) had been very cautious regarding the possibility of a long-run trade-off due to the likely adjustment of inflation expectations. Furthermore, they argued within the “inflationary bias” framework. Solow (1969), on the other hand, directly aimed at addressing Friedman’s propositions by focusing on an econometric test of the no-long-run trade-off postulate. Since the data suggested that there is not a complete adjustment of inflation expectations to past inflation rates, he (1969: 17) concluded that “there is a trade-off between the speed of price increase and the real state of the economy. It is less favorable in the long run than it is at first. It may not be ‘permanent’; but it lasts long enough for me.” In a comparable contribution, Solow (1968: 8) remarked about the results of different econometric studies with respect to inflation expectations that “the degree of money-illusion [...] is surprising.” Regarding his own results Solow (1968: 14) noted that “[f]or time spans that matter, there is no natural rate of unemployment” so that “a genuine trade-off between inflation on [the] one hand and employment and output on the other” remains.

Even though Solow (1978: 208f.) also pointed at the likely inflationary bias if wages and prices are downwardly sticky so that the only way of relative price adjustments is via inflation, his 1969 contribution with its emphasis on not fully adjusting inflation expectations in general nevertheless shows that the overall framing of the trade-off remained within Friedman’s “natural rate” model and not within the “Keynesian” disequilibrium-dynamics approach.³⁵ But as has been shown, in Friedman’s model there is “[n]o tradeoff, no choice, no agonizing decisions” (Tobin 1972b: 15) from the outset, so that arguing within Friedman’s framework by pointing at the empirical evidence for not fully adjusting inflation expectations did not do a favour to the “Keynesian” issue of the perceived incompatibility between full employment and price stability. This emphasis on the importance of money illusion is even more surprising since “Keynesians” and Friedman, as will be argued in the next section, essentially had much in common regarding the notion of full employment from a theoretical point of view, even though the inflationary outcomes were different and from each individual perspective the notion of full employment diverged.

5.6 Full Employment and Inflation: “Keynesians” and Friedman

5.6.1 A Synthesis

This section will illustrate the different perspectives about the Phillips curve dilemma to show how each line of thought was perceived by the opposing one. Figure 5.4 focuses on the “Keynesian” perspective of the trade-off discussion. Since this diagram picks up only one among

³⁵Indeed, also within the NIRU model of Modigliani and Papademos (1975) a long-run trade-off is assumed on the basis of not fully adjusting inflation expectations in the sense of Friedman (see Schwarzer 2015b).

many, but from the evidence presented here the most prominent, explanation for a trade-off between price stability and full employment, some qualifications are necessary which will be discussed in Subsection 5.6.2. This and the following diagrams thus are to be understood as highly stylized illustrations of the different perspectives about the trade-off between inflation and unemployment.³⁶

In the “Keynesian” perspective unemployment fluctuates (with assumed equal amplitude) between a low “Keynesian” unemployment rate U_{KL} and a high “Keynesian” unemployment rate U_{KH} . The mean unemployment rate over the cycle matches the “Keynesian” full employment target F_K which, due to the negatively sloped non-linear Phillips curve, would be in line with price stability (indicating no excess supply or demand on the labour market as outlined in Subsection 1.3.2 and thus in line with the notion of full employment) if there were no fluctuations.³⁷ Because of the non-linearity of the curve, these cyclical fluctuations around the “Keynesian” full employment level cause a positive rate of inflation \hat{p}_K . Thus, a “cruel dilemma” emerges since full employment and price stability are mutually conflicting policy objectives.

A different (but complementary) interpretation which would bring about the same inflationary result is based on the assumption (as discussed in Subsection 1.3.3) that aggregate demand is unequally distributed among the sectors in the economy, so that (in a two sector model) one sector faces excess demand (U_{KL}) whereas the other one faces excess supply (U_{KH}). Once again due to the non-linearity of the curve the same inflationary outcome \hat{p}_K would emerge.

Note that no “cruel dilemma” is to be endured if cyclical fluctuations can be successfully countered by active stabilisation policies or if unemployment dispersion can be completely removed in the second interpretation. Indeed, particularly Phillips himself but also many other economists suggested such measures exactly on these grounds.³⁸

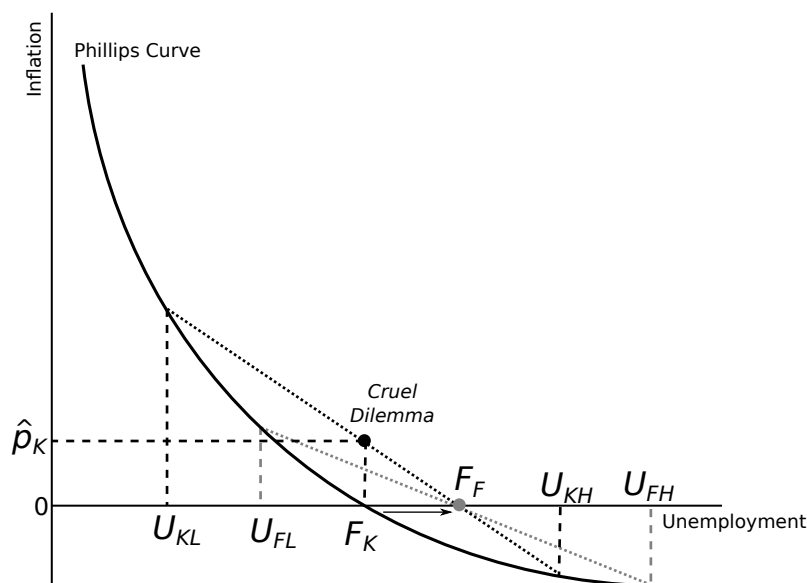
³⁶At least the illustration of the “Keynesian” perspective is very much in line with the diagrams in Gray and Lipsey (1974) and thus with the views of one of the most important proponents (Lipsey) of this reasoning for a trade-off between price stability and full employment. Gray and Lipsey (1974: 4, n. 4) also emphasised in line with Tobin (1972b) that “[t]he natural rate of unemployment is much harder to define in a growing economy where technology, real income and the pattern of demand are all changing continuously so that, given finite adjustment times, the economy will be in a perpetual state of disequilibrium.”

³⁷However, in some contributions the full employment level (frictional unemployment) was not thought to be where the Phillips curve crossed the horizontal axis and thus would be in principle in line with price stability in a non-fluctuating economy as in the diagram, but was located to the left (see, for example, Bowen 1960a: 205) and thus pointed at a positive rate of inflation even in the absence of cyclical or sectoral fluctuations. On the other hand, such diagrams were used to illustrate the main issue of the incompatibility of both goals (in Bowen due to institutional cost-push forces, that is, inappropriate wage- and price-setting institutions). Hence, to infer from such diagrams that the “Keynesian” full employment was necessarily an overemployment target not in line with price stability would go too far. Furthermore, also other full employment concepts can be interpreted as an overemployment or excess demand target: For example, for Beveridge (1944: 18) full employment “means having always more vacant jobs than unemployed men, not slightly fewer jobs” which implies excess demand for labour.

³⁸However, for Lipsey (1960: 19, n. 4) it is not quite clear that successful stabilisation policies would help to eliminate the inflationary bias due to sectoral unemployment dispersion since “[i]t might be expected that a stable period would give time for the classical adjustment mechanism—movements of labour between markets and changes in relative prices—to reduce the degree of sectoral inequality. On the other hand, it might well be that cyclical fluctuations in employment aided the markets in adjusting to changes in demand and in techniques, and that the removal of these fluctuations would increase the average degree of inequality existing

Figure 5.4: Full Employment and Inflation: The “Keynesian” Perspective.

Source: Own illustration.



From the Keynesian perspective, Friedman’s introduction of the “natural rate of unemployment”, due to being compatible with price stability by definition, thus was understood as effectively shifting the full employment level to the right (to F_F) as indicated by the arrow. In order to achieve price stability the economy thus has to fluctuate (with assumed equal amplitude) between U_{FL} and U_{FH} (dashed grey lines). This higher mean unemployment becomes necessary due to the non-linearity of the curve. Friedman’s proposals hence were interpreted as sweeping aside the “cruel dilemma” by definition, since by incorporating all kinds of market imperfections into the “natural rate of unemployment” his notion of full employment became compatible with price stability from the outset.

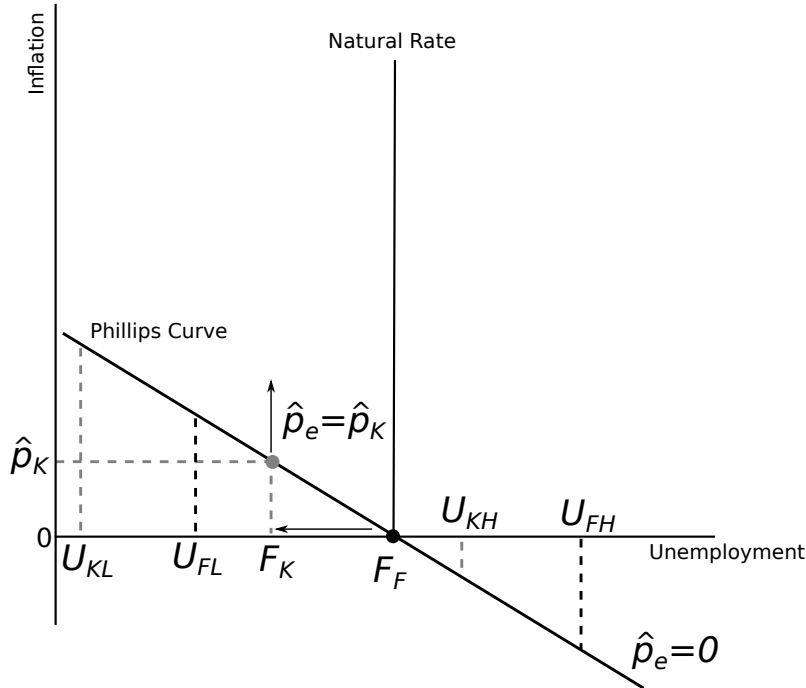
From Friedman's perspective, however, the "Keynesian" full employment level was interpreted as an overemployment target (see Figure 5.5). As pointed out before, Friedman did not assume perfect, but at least sufficient price flexibility. Furthermore, there is no indication that an asymmetric price reaction is assumed, that is, that there is no relative downward stickiness of prices and wages. The relation between unemployment and inflation thus is illustrated as a downward sloping linear Phillips curve. Price stability and Friedman's full employment level F_F hence are compatible, even if there are cyclical or sectoral fluctuations between U_{FL} and U_{FH} . In his view, the rate of inflation \hat{p}_K thus cannot be the outcome of such fluctuations around the full employment level as in the "Keynesian" perspective. Instead, \hat{p}_K can only be understood as an engineered unexpected inflation so that the economy can be steered away from its "natural rate of unemployment" F_F . From his perspective, the "Keynesian" full employment level F_K (associated with the inflation rate \hat{p}_K) thus must be an overemployment goal, which also implies a bias towards keeping the range of economic fluctuations closer to the point of origin (U_{KL} and U_{KH} ; grey). The adjustment of inflation expectations will shift

between markets.”

the short-run Phillips curve upwards (as indicated by the upward arrow), so that accelerating inflation becomes necessary in order to keep the economy at F_K .

Figure 5.5: Full Employment and Inflation: Friedman’s Perspective.

Source: Own illustration.



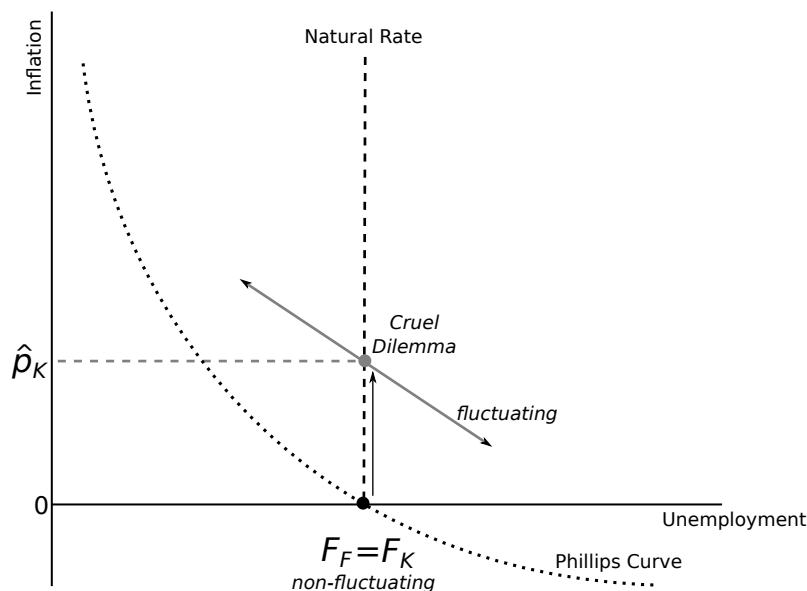
However, from the point of view of the history of economic thought, both lines of thought were essentially pointing at the same full employment level, that is, frictional unemployment, but the inflationary outcomes were quite different. Even though it has been argued in this discussion that no objective definition of full employment within the Phillips curve trade-off framework existed, the important role of involuntary unemployment (see Section 5.3) for proposing expansionary policies also made clear that “Keynesians” aimed at pushing the economy towards its voluntary unemployment rate, that is, the frictional unemployment rate (see Subsection 5.1.2): For example, Lewis (1958: 377) explicitly stated that “[o]ur employment objective is to minimize all but so-called frictional unemployment.” As another example, the Commission on Money and Credit (1961: 28) emphasised “that an appropriate target for low level unemployment to use as a guide for monetary, credit, and fiscal measures is one somewhere near the point where the number of unfilled vacancies is about the same as the number of unemployed” which points at the absence of involuntary unemployment due to a deficiency of demand (see Commission on Money and Credit 1961: 38). Nonetheless, even then “there would still be many unemployed, and there would probably be some upward pressure on wages and prices” (Commission on Money and Credit 1961: 38f.).

This general notion that full employment is achieved if unemployment is at its frictional level is very much in line with Friedman’s (1975: 14) view that “[u]nemployment is zero –

which is to say, as measured, equal to ‘frictional’ or ‘transitional’ unemployment, or to use the terminology I adopted some years ago from Wicksell, at its ‘natural’ rate.”³⁹

Figure 5.6: Full Employment and Inflation: A Synthesis.

Source: Own illustration.



Even if this general similarity of the notion of full employment is accepted, the inflationary outcomes were different within both lines of thought. This issue is illustrated in Figure 5.6. The “Keynesian” and Friedman’s full employment level (F_K and F_F) in this diagram coincide at Friedman’s “natural rate of unemployment”. This full employment level is in line with price stability in both views if there are no cyclical or sectoral fluctuations, that is, if a “static” economy is assumed. However, whereas in the “Keynesian” Phillips curve debate full employment seemed to be only achievable by accepting some rate of inflation \hat{p}_K as soon as a dynamic economy prone to cyclical or sectoral fluctuations (as indicated by the arrows; grey) is assumed (due to the non-linearity of the curve), for Friedman any rate of inflation (including price stability) is essentially in line with full employment even if such fluctuations occur. The “Keynesian” system thus was prone to an inflationary bias as illustrated by the upward arrow, so that the “cruel dilemma” emerged, while no such endogenous inflationary force is to be found within Friedman’s framework.

Nonetheless, the general compatibility of the two views about the underlying characteristics of the full employment level should not cause the impression that both lines of thought are not very different. Indeed, they are and some qualifications are necessary.

³⁹Modigliani (1986: 23) even remarked that “Friedman’s famous ‘natural rate’ [...] broadly coincides with Keynes’ ‘full employment’.” Moreover, also Friedman (in Snowden and Vane 1999a: 130f.) stated that his “natural rate” and Keynes’ concept of full employment are very similar. See also Tobin (1997: 5ff.). Of course, the underlying reasons for frictional unemployment are not necessarily similar among different lines of thought. For example, Schumpeter regarded frictional unemployment to be caused by the process of “creative destruction” while Beveridge particularly highlighted the importance of frictions in the labour market (see Boianovsky and Trautwein 2003: 390f. and 2010: 255).

5.6.2 Qualifications

5.6.2.1 Different Views About the Structure of the Economy

Friedman (1966a: 55) remarked that the “natural” rate of unemployment is equal to the notion of a “structural” or a “normal” or an “average” rate of unemployment in “a well-adjusted economic system”. This definition not only implies that the rate of inflation is in line with inflation expectations, but also that the price system adjusted accordingly. Only then is it the case that “there is an infinitely large number of monetary policies and price behaviour which will keep unemployment at its natural level—once people’s anticipations are adjusted to that pattern of price behavior” (Friedman 1966a: 61).

In his Nobel Lecture, Friedman (1977b: 464ff.) discussed the possibility that the Phillips curve becomes positively sloped at high rates of inflation, so that a high rate of inflation causes a higher “natural rate of unemployment” since the whole economic and institutional structure needs time to adjust in order to fully deal with this high rate of inflation and the likely effect of a higher variance thereof (for example, the optimal length of contracts might change). But in the long run the original “natural rate of unemployment” will be restored. Thus Friedman (1977b: 468) remarked that “the long-run Phillips curve would again be vertical and we would be back at the natural-rate hypothesis, though perhaps for a different range of inflation rates than that for which it was first suggested.” From this it follows, however, “that once these institutional changes were made, and economic agents had adjusted their practices and anticipations to them, a reversal to the earlier monetary framework or even the adoption in the new monetary framework of a successful policy of low inflation would in its turn require new adjustments, and these might have many of the same adverse transitional effects on the level of employment.” Friedman thus understood his “natural rate of unemployment” as that rate at which inflation expectations are satisfied and to which the whole economic system adjusted.⁴⁰ Therefore, even steady deflation is in line with keeping the economy at its “natural rate”. As already pointed out, Friedman’s preference for price stability rested on the assumption that the flexibility of wages and prices is sufficient to keep the economy at full employment despite cyclical or sectoral fluctuations. Furthermore, Friedman (1958: 252) also was very sceptical about the possibility that inflation facilitates relative price adjustments since “once it becomes widely recognized that prices are rising, the advantages [...] will disappear”.

The “Keynesian” analysis, on the other hand, started with the assumption of a given structure of the economy including slow adjustments on the supply side as well as nominal downward rigidity. The non-linearity of empirically estimated Phillips curves (see Subsection 1.3.1) seemed to bolster this view. Thus, as remarked by Solow (1995: 199), “[i]n those days the Phillips curve was the particular way we coped with the idea of imperfectly flexible wages.” Given this institutional structure, price stability was not in line with full employment from the outset and thus seemed to be no practical target for economic policy if not accompanied by supply side adjustments (which were, of course, endorsed; see Section 2.4 and 3.3).

As was discussed in Lipsey’s 1965 trade-off contribution in Subsection 1.3.4, shifting the curve closer to the point of origin by supply side policies to lessen or even remove the conflict

⁴⁰Solow (1986: S31) thus remarked that “the vertical long-run Phillips curve story [...] does, however, put quite a lot of strain on the notion of ‘fully adjusted’.”

between both policy goals also comes at a cost (such as retraining) which society must be willing to bear. Hence, the trade-off between price stability and full employment prevailed, since accepting the cost of more inflation for less unemployment could be regarded as a substitute to costly supply side policies. In this sense, there was indeed a trade-off interpretation of the Phillips curve.

Without such structural measures, achieving price stability seemed only possible by accepting involuntary unemployment on the average since “an attempt to restrict aggregate demand so severely as to eliminate all risk of an increase in the general price level might well involve keeping the economy far below full employment” (Council of Economic Advisers 1962: 47).

Friedman’s framework thus excludes any policy dilemma if the economy is given enough time to adjust, while the “Keynesian” approach focused on the inflationary consequences of the, at that time prevailing, structure of the economy as given by empirical research such as the Phillips curve.

5.6.2.2 Accelerating Inflation at Full Employment

A further important issue to be discussed is that Tobin (1972b: 9) pointed at the possibility of accelerating inflation at full employment (see Section 5.5), which is in contrast to Friedman’s stable rate of inflation at the “natural rate of unemployment”, and in general suggestive of the notion of overemployment by means of deception.

Figure 5.7 once again shows the “Keynesian” perspective by incorporating a non-linear Phillips curve and fluctuations between U_{KL} and U_{KH} around the full employment level F_K .⁴¹ Note that full employment and price stability are compatible if there are no cyclical fluctuations. If it is assumed that the initial long-run Phillips curve (light grey) is in line with an expected inflation rate of zero, then cyclical fluctuations cause a gap between the expected and the realised inflation rate \hat{p}' . By assuming adaptive expectations as in Friedman’s writings, fully adjusting inflation expectations shift the curve upwards (dark grey). If cyclical fluctuations persist, then once again a gap between expected inflation (\hat{p}') and realised inflation (\hat{p}'') emerges. The following adjustment thus shifts the curve upwards again (black). Keeping the economy at F_K therefore is possible only by accelerating inflation which involves a continuous disappointment of inflation expectations.

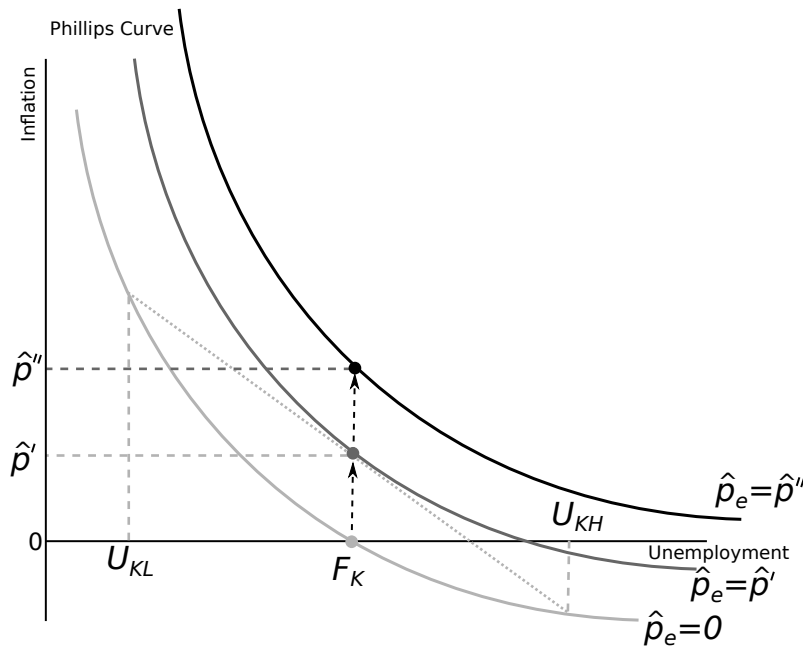
Based on this reasoning, accelerating inflation indeed has to follow from targeting any other mean unemployment rate (taking into account cyclical fluctuations) other than that in line with price stability (given that inflation expectations are zero initially). Due to the non-linearity of the curve this mean unemployment rate lies to the right of F_K . In this respect, Friedman’s “natural rate of unemployment” which is in line with a stable rate of inflation (including complete price stability) is indeed higher than such a “Keynesian” full employment level.

In line with Tobin’s view that full employment might cause accelerating inflation, Gray and Lipsey (1974: 17) argued that their analysis shows that the “natural rate of unemployment”, which they regard to be located at F_K , is not compatible with a stable rate of inflation but must necessarily lead to accelerating inflation.

⁴¹The following discussion is based on Gray and Lipsey (1974).

Figure 5.7: Accelerating Inflation at Full Employment.

Source: Own illustration.



Even though their result comes about due to a misinterpretation of Friedman’s “natural rate”,⁴² it is nonetheless very helpful from the point of view of the history of economic thought since this misunderstanding emphasises the perceived different inflationary outcomes even though both lines of thought essentially aimed at the same level of full employment, that is, the “natural rate of unemployment”. Indeed, this misunderstanding shows how “Keynesians” kept sticking to their notion of full employment (compatible with their interpretation of Friedman’s “natural rate”), while criticising Friedman’s view that this full employment level can be in line with price stability, since from the “Keynesian” perspective the “natural rate” at F_K implied a positive if not accelerating rate of inflation.

As has been argued, both concepts are indeed similar in a “static”, that is, not fluctuating economy, but may diverge in a “dynamic”, that is, fluctuating economic environment. Nonetheless, from this perspective the “Keynesian” full employment target (if not accompanied by successful stabilisation policies which eliminate all cyclical fluctuations) loses much of its appeal due to the built-in acceleration of inflation if inflation expectations adapt fully.

⁴²Since at the “natural rate” expectations must be realised by definition, no acceleration of inflation due to constantly adjusting inflation expectations will occur. Gray and Lipsey (1974), however, did not single out this necessary condition for the “natural rate” but instead interpreted Friedman’s (1968: 8) explanation of the “natural rate” as “the constant rate of unemployment that would emerge in an unchanging economy when all markets were in equilibrium but where there was some unemployment due to labour turnover” (Gray and Lipsey 1974: 17), which for them indicates that the “natural rate” is located at F_K . This unemployment rate is in line with Lipsey’s 1960 notion of frictional unemployment and zero excess demand or supply as discussed in Subsection 1.3.2. However, Gray and Lipsey (1974: 17) were aware that it might be “merely [...] a terminological dispute” (which it indeed was).

As has been shown in Section 2.2, the issue of accelerating inflation due to adjusting inflation expectations was also discussed by Phillips and by many other contemporary economists. But the discussion was often focused on the goods market where buyers, who expected rising prices, prepone their purchases and thus essentially cause the rise in prices they expected, so that a “general ‘flight from cash’” (Brown 1955: 195) emerges (see, for example, Bronfenbrenner 1954: 32, Bowen 1960b: 336, and also the discussion in Scitovsky and Scitovsky 1964: 447).⁴³

This mechanism to explain accelerating inflation in Phillips’ writings thus is very different from the one under discussion which is based on Friedman’s framework of adaptive expectations having a unit weight in the Phillips curve so that keeping unemployment lower than the “natural rate” can only come about by accelerating inflation.

“Keynesians”, however, argued that accelerating inflation can be the outcome of keeping the economy at full employment (as in Figure 5.7). This issue of accelerating inflation at full employment was not only emphasised in the various contributions by Tobin already discussed, but also put forward many times by Lipsey (1978, 1982, 1984, 1990a, b). In retrospective, this line of reasoning might be regarded as an attempt to provide an explanation or even justification for an unavoidable acceleration of inflation at full employment after Friedman’s critique. In this respect, Friedman’s accusation that “Keynesians” targeted an overemployment goal which led to accelerating inflation in the 1970s was turned on its head by “Keynesians” who argued that full employment at the “natural rate” may involve accelerating inflation on reasonable grounds.

Even though this approach of getting full employment or the “natural rate” in line with accelerating inflation was based on a misinterpretation of the “natural rate” concept, this line of reasoning perfectly shows how the “Keynesian” discussion became more and more trapped within Friedman’s framework. By arguing within Friedman’s “natural rate” concept, the “Keynesian” full employment level can only be in line with either accelerating inflation or with a stable rate of inflation if inflation expectations in general do not fully adjust, that is, if there is indeed money illusion.

This result, however, comes about since it is assumed that cyclical, and not sectoral, fluctuations are responsible for the inflationary bias. The story looks quite different if the alternative explanation for an inflationary bias at full employment is assumed, that is, if sectoral shifts in demand cause sectoral disequilibria as already outlined in Lipsey (1960) and discussed in Subsection 1.3.3 and Section 5.4. Figure 5.7 can also be interpreted on such a sectoral level: If some sectors are facing excess supply (U_{KH}) while others excess demand (U_{KL}), the mean unemployment rate once again is at F_K and the emerging inflation rate is \hat{p}' . But contrary to the previous analysis, no acceleration must occur as also emphasised by Rees (1970b: 237):

The importance of this point is that the rise in the price level need not accelerate in order to affect unemployment. So long as the pricing behaviour of firms is asymmetrical for price cuts and price increases, moderate inflation generates

⁴³Forder (2010b: 502) shows that the role of inflation expectations on the supply side was also widely discussed at the time. See also Young et al. (2004: 115). The clearest description of the accelerationist hypothesis before Friedman might be attributed to Lindahl (see Boianovsky and Trautwein 2006a: 881f.), even though Lindahl did not argue within the framework of a “natural rate of unemployment” (see Boianovsky and Trautwein 2006a: 891ff.).

higher output and employment than price stability, even when it is fully anticipated.

Since relative price adjustments are necessary but not possible due to downwardly sticky wages and prices, it is perfectly reasonable for the bargaining groups of some sectors to have money illusion in the sense that this higher rate of inflation does not become fully incorporated into the pricing behaviour of every sector (particularly those facing excess supply; see Tobin 1972b: 11f. and 1995b: 38f.). Thus, \hat{p}' can be a stable rate of inflation provided that only nominal but not real downward stickiness is assumed in those sectors facing excess supply.⁴⁴

As has been shown, “Keynesians” and Friedman in principle held the same view regarding the notion of full employment, that is, voluntary frictional unemployment. “Keynesians”, however, attached by far more importance to pushing the economy towards this full employment level as will be argued in the next subsection.

5.6.2.3 “Natural” or “Unnatural” Unemployment?

An important difference between the two lines of thought is that Friedman (1977b: 459) regarded a high “natural rate of unemployment” not necessarily as something to worry about:

There is a tendency to take it for granted that a high level of recorded unemployment is evidence of inefficient use of resources, and conversely. This view is seriously in error. A low level of unemployment may be a sign of a forced-draft economy that is using its resources inefficiently and is inducing workers to sacrifice leisure for goods that they value less highly than the leisure under the mistaken belief that their real wages will be higher than they prove to be. Or a low natural rate of unemployment may reflect institutional arrangements that inhibit change. A highly static rigid economy may have a fixed place for everyone whereas a dynamic, highly progressive economy, which offers everchanging opportunities and fosters flexibility, may have a high natural rate of unemployment.

Very much in line with Friedman’s statements on the optimal rate of growth (as given by individual preferences; see Subsection 4.2.1), Friedman (1959) took a similar perspective with respect to the optimal level of employment:

The appropriate goal for employment is the fullest opportunity for each individual to use his own resources in accordance with his own aspirations and to develop his capacities to the fullest, subject only to the condition that he not interfere with the opportunity for others to do likewise. This is vastly more difficult to achieve and to describe than full employment, defined in terms of the number of people having something called a job regardless of its adaptation to the capacities and

⁴⁴Of course, additional assumptions which are beyond the scope of this discussion might be of importance for the emerging rate of inflation and its stability: For example, price (and income) elasticities and cost functions as well as the level and growth of labour productivity of the different sectors might be very important. Furthermore, the speed of movement between the different sectors as well as the specific wage-setting mechanism of each sector (for example, wage-setting should be independent of wage developments in other sectors) are other issues to be taken into account.

aspirations of the jobholder. There is little problem of achieving full employment in a prison or a slave state.

Thus, one is inclined to argue that for Friedman—and in contrast to “Keynesians”⁴⁵—the goal of full employment does not necessarily correspond to a low rate of unemployment. Furthermore, Friedman (1963: 40) expressed serious doubts about the concept of full employment as such:

I have been using the word “full employment,” as if it were a well-defined term. It is far from that; it is almost impossible to define full employment in a way that is logically precise, and yet corresponds to what we have loosely in mind. The reason is partly that we really do not want full employment, but the opposite. What almost all of us would like is a kind of world in which we could have all the good things in life without working any more than we wanted to. Employment is a means, not an end.

Furthermore, there is an important difference regarding the necessity to accurately estimate the full employment level—a point more deeply elaborated in Schwarzer (2015b).⁴⁶ Since Friedman was confident that the “natural rate of unemployment” will always be achieved by a constant growth rate of the money supply, there is no need in Friedman’s framework to estimate the “natural rate”. Indeed, estimates might be counterproductive, since monetary policy might be prone to more destabilising activism if it tries to target an (outdated) estimate of the “natural rate of unemployment” (see Friedman 1968: 10f., 14f.). Thus, for Friedman (1996) “an accurate estimate [of the natural rate] is not necessary for a proper monetary policy.”

This kind of reasoning is in contrast to the main ideas of Phillips himself and of subsequent contributions, particularly those of Modigliani and Papademos (1975, 1976, 1978) who developed the “Non-Inflationary Rate of Unemployment” (NIRU) as a “Keynesian” alternative to the “natural rate” concept. While both the NIRU and the “natural rate” are in principle compatible with the same full employment level, within the NIRU concept the necessity of active stabilisation policies to steer the economy towards the NIRU is emphasised. The important role assigned to active aggregate demand management thus is by far more pronounced than within the “natural rate” framework: Of course, and as pointed out by Friedman himself, temporary deviations from his “natural rate” are possible even though “‘temporary’ may be a fairly long period” (Friedman 1966a: 59). It might even take “a couple of decades” (Friedman 1968: 11) until full adjustment to a change in the rate of inflation is made. The long run thus refers from a theoretical point of view to a situation “when expectations are on the average realized” (Friedman 1977b: 469). From a practical point of view, however, deviations from the “natural rate” are possible and “it may take a long chronological time before they are reversed and finally eliminated as anticipations adjust” (Friedman 1977b: 470). Solow (1976: 5) hence emphasised this

⁴⁵For example, Harrod (1967: 17) emphasised that “I prefer the Swedish target, which they cannot of course achieve fully, of having the unemployed at 0%. [...] We should have a similar target, if we are to be entitled to rank ourselves as civilized.”

⁴⁶This issue of arriving at a meaningful employment target still plays an important role today. For example, the Federal Reserve System (2012)—known for its dual mandate of achieving “maximum employment” and “stable prices”—stated with respect to the employment goal that “assessments of the maximum level of employment” for which the “longer-run normal rate of unemployment” plays an important role “are necessarily uncertain and subject to revision.”

difference between the theoretical indisputability of the neutrality of money in the long run on the one hand and the practical implications for economic policy on the other hand as “the real question is not so much whether that argument is true as whether it is relevant in calendar time. It is very important to realize this. Failure to realize it has triggered innumerable wasted words.”

In a nutshell, Friedman’s view about the economy in general and the “natural rate” and full employment in particular was that individual preferences will determine these market outcomes, so that there is no reason to estimate the “natural rate” or the full employment level. Indeed, since no perfectly precise definition of full employment exists,⁴⁷ no measurement seems possible and no target can be set. However, this poses no problem for his framework, since knowledge about the exact value of the “natural rate” is not necessary for a proper monetary policy because the economy will always home in at the “natural rate of unemployment” by its own devices. The “Keynesian” issue of an inherently unstable economy (see Section 2.2) giving rise to involuntary unemployment thus plays no role within the self-stabilising “natural rate” framework in which all unemployment is in effect voluntary. However, since the “natural rate of unemployment” is that rate of unemployment at which inflation expectations are realised, full employment in such a framework first of all refers to a state of equilibrium with respect to expectations, but not necessarily—as emphasised in the Keynesian view—to an equilibrium regarding quantities supplied and demanded on the labour market at the going real wage.

Thus, in contrast to Friedman, “Keynesians” and many economists during the Phillips curve discussion were much more concerned with the issue of how to achieve full employment and also how to define and measure it. As has been shown in Subsection 5.1.1, however, the definition of full employment was indeed vague since the Phillips curve seemed to provide an infinite amount of possible full employment candidates if full employment is defined as that rate of unemployment just low enough that inflation does not become unacceptable. Nonetheless, the general issue of how to define and measure the full employment level did not induce “Keynesians” to abandon active aggregate demand policy altogether. Rather, an estimate of the full employment level seemed just necessary for sound economic policy.

In sum, Friedman’s “natural rate of unemployment” not only provided a unique full employment level once again, but also deprived the Phillips curve of the perceived policy dilemma. This happened in two ways: First, by arguing that demand management can do nothing about the rate of unemployment in the long run, so that less unemployment than given by the current “natural rate” can only be achieved by supply side policies (see Friedman 1968: 9 and 1975: 24). This view was, for example, expressed by Laidler (1975: 46f.):

Does this [the natural rate hypothesis] then mean that the pursuit of high employment must be given up as an aim of policy in this country? This is the popular caricature of the monetarist position. The implication of the natural unemployment rate hypothesis is that, if higher employment levels than are consistent with

⁴⁷In the same vein, Lucas (1978: 355) remarked about the definition of full employment that “[n]either of these approaches leads to an operational definition of full employment. Neither yields a coherent view as to why unemployment is a problem, or as to the costs and benefits involved in economic policies which affect unemployment rates. The difficulties are not the measurement error problems which necessarily arise in applied economics. They arise because the ‘thing’ to be measured does not exist.”

a vertical long-run Phillips curve are desired, *the way to achieve them is to operate with policies directed towards the structure of the labour market and not with “demand management” policies.* [...]

Monetarist analysis suggests that it is the tools of high employment policy, rather than its goals, which must be changed.

However, this position does not necessarily stand in conflict with the “Keynesian” view since nearly any economist proposed supply-side policies to make both goals more compatible with one another (see Subsection 1.3.4 and Section 2.4 and 3.3). In the meantime, a positive rate of inflation seemed to be the price to pay for full employment in an imperfect economy prone to an inflationary bias.

While these “monetarist” proposals were not in stark contrast to the “Keynesian” position, the second way of depriving the Phillips curve of its dilemma interpretation certainly was: Friedman’s view suggested that full employment is compatible with price stability from the outset, so that the “natural rate” is not only to be regarded as the only feasible, but also as a desirable goal of economic policy.⁴⁸ This view, as Dixon (1995: 70) pointed out, thus had important implications for the conduct of economic policy regarding unemployment as “[t]he terminology ‘natural rate’ served to divert attention from the word ‘full’, and hence to accept that in equilibrium there might be unemployment, and indeed that since this unemployment was ‘natural’ it was not necessarily a bad thing.”

Friedman’s framework hence not only emphasised (adaptive) inflation expectations and the vertical Phillips curve at the “natural rate”, but also deprived the Phillips curve of the policy dilemma. Friedman’s reinterpretation, by being based on the assumption of solely voluntary unemployment at the “natural rate”, however, implied that causality had now to run from unexpected inflation to unemployment, whereas in the “Keynesian” view, by being based on involuntary unemployment, causation ran from unemployment to inflation (see Nevile 1979: 111; see also Rees 1970a: 309 discussing Lucas and Rapping 1969a, b).

There is, however, one important contributor to the Phillips curve discussion who incorporated and combined “Keynesian” elements of imperfect markets with the “monetarist” adaptive expectations approach: Edmund Phelps. A closer look at his writings as is done in the next section will reveal important differences to Friedman and will also strengthen the argument that the “Keynesian” dilemma debate became framed within a different theoretical approach.

5.7 Phelps versus Friedman: Refining or Reframing the Trade-Off?

Phelps’ contributions to the Phillips curve (Phelps 1967, 1968a, 1970, 1972) are discussed in greater detail in Schwarzer (2015c). This section thus will focus on important elements in Phelps’ writings closely connected to the argument that the Phillips curve was reinterpreted within a different theoretical framework particularly by Friedman. As has been shown, Friedman not only criticised the long-run trade-off but also emphasised the view that active eco-

⁴⁸Solow, in a letter to the author in August 2013, thus remarked that “[t]he use of the clever phrase ‘natural rate’ [...] conveys the idea of desirability without actually saying so.”

nomic policy is not necessary at all since the economy will always home in at the “natural rate of unemployment” (see Leijonhufvud in Snowden 2004: 125f.). Moreover, economic policy is not regarded to be stabilising due to time lags as well as data and model uncertainty (to say nothing of politico-economic concerns). Furthermore, in Friedman’s framework no inherent conflict between price stability and full employment exists. Friedman thus never proposed to make use of the short-run Phillips-curve trade-off.

In this sense, Friedman’s contributions stand in strong contrast to Phelps’ writings, particularly Phelps (1967, 1972). Even though Phelps (1967) also incorporated adaptive inflation expectations into the Phillips curve and arrived at a vertical long-run relation, Phelps (1967: 255) nonetheless avoided the connotation “natural” and chose to speak of an “‘equilibrium’ unemployment ratio” instead. Even though both unemployment rates share the same necessary condition that inflation expectations must be fulfilled, they can be different with respect to the level of unemployment. While Friedman essentially assumed that the “natural rate” is completely decoupled from the rate of inflation,⁴⁹ Phelps’ “‘equilibrium’ unemployment ratio” is not necessarily so (see Phelps 1971: 42ff.; see also Phelps 1970: 160f. and 1972: 35ff.). One possible cause of this influence of the rate of inflation on Phelps’ “‘equilibrium’ unemployment ratio” is that the height of the inflation tax on money holdings may affect labour supply decisions. Another important reason is the possibility of hysteresis (see Phelps 1972: 73ff.). Furthermore, individual decisions on the labour market, for example due to risk aversion, may lead to a sub-optimal aggregate outcome (see Phelps 1972: 83ff.). In this respect, Phelps did not regard the emerging “‘equilibrium’ unemployment ratio” as an optimal and exogenously given unemployment rate of which departures due to aggregate demand policies will not increase economic welfare as in Friedman’s view.

For these reasons, but also due to the fact that Phelps was much more optimistic about fine tuning the economy, Phelps’ contributions to the Phillips curve are not to be regarded as a critique about the trade-off, but as a refinement. Indeed, especially Phelps (1967, 1972) strongly endorsed to make use of the trade-off even if the trade-off will vanish in the long run and even if the trade-off is based on deception. Since the gain in employment due to surprise inflation is only temporary, but the resulting higher rate of inflation in effect eternally, it is society’s time preference which becomes important. The higher the time preference, the more inflationary economic policy should be *ceteris paribus*. Phelps’ 1967 contribution thus extended the beforehand rather timeless Phillips curve trade-off (as in Subsection 1.3.4) by an analysis incorporating many periods.

The interesting detail with respect to the “cruel dilemma” is that Phelps also assumed that the motive of the policymaker is to increase aggregate demand in order to remove involuntary unemployment. This involuntary unemployment, however, is not spread throughout the economy, but is located in some sectors of the economy due to separated markets and an unequal distribution of demand (as discussed in Subsection 1.3.3 and Section 5.4). These assumptions thus are still very much in line with the “dilemma view”. But the important effect of a positive rate of inflation, the facilitation of relative price adjustments, does not play a role in this model. Instead, since real wages in all sectors are implicitly assumed to be downwardly rigid,

⁴⁹As outlined in Subsection 5.6.2.1 it should be mentioned that Friedman (1976: 232ff. and 1977b: 459ff.) indeed discussed the possibility of a positive slope of the long-run Phillips curve for high rates of inflation.

all nominal wages (and not just those in sectors facing excess demand) adjust to the new rate of inflation. Until this catching up with the new rate of inflation has finished, however, there is “involuntary over-employment” (Phelps 1967: 266) since people “work too much [...] as a consequence of incorrect expectations” (Phelps 1967: 266, n. 1) so that they “over-estimate the real-wage content of their current money wage bargains” (Phelps 1968b: 293). This is particularly true for excess demand sectors where no involuntary unemployment was prevalent at the beginning. Furthermore, due to the adjustment of inflation expectations the trade-off is only a short-run one and, in contrast to the “dilemma view”, there is no long-run effect of a positive rate of inflation on the rate of unemployment. Thus, even though the reason (involuntary unemployment) to opt for a positive rate of inflation is nearly the same, the mechanism by which inflation alters the rate of unemployment is very different. In Phelps (1967) it is unexpected inflation (as in Friedman’s writings) which increases the activity level of the economy in general, while in the “dilemma view” changing demand patterns and other sectoral shocks bring the economy into ongoing disequilibria which cause inflation in the aggregate due to non-linear Phillips curves at the sectoral level, so that relative price adjustments can only come about by rising prices in those sectors facing excess demand.

Such a mechanism, however, was described in Phelps’ second main contribution to the Phillips curve: Phelps (1968a: 704f.) pointed out that nominal downward rigidity may make a case to opt for a positive rate of inflation in order to facilitate relative wage adjustments. Thus, for some small rates of inflation, money illusion may be prevalent and a long-run trade-off thus can exist. This concept hence is very much in line with the “Keynesian” view, even though Phelps also makes use of the term “money illusion” which at first sight implies that the behaviour of economic subjects (by not taking full account of the rate of inflation) is not in line with economic rationality, even though it perfectly can be if money wages are downwardly sticky for whatever reason, so that market-clearing relative wages and prices can only be restored by a rise of wages and prices in excess demand sectors.

In sum, Phelps’ contributions strikingly show how “Keynesian” elements and arguments were reinterpreted. Though sectoral disequilibria as in Subsection 1.3.3 are discussed in the 1967 paper, it is nonetheless assumed that it is unexpected inflation throughout the whole economy which exerts an influence on the employment level. Inflation is thus deprived of its “lubricating effect” (Rees 1970b: 236) and the trade-off cannot be a long-run one. Even though the 1968 model is much closer to the traditional view in many respects (for example, the Phillips curve is interpreted as a disequilibrium relation), the possibility of a long-run trade-off is discussed as being based on money illusion and thus has a negative connotation from the outset.

Nonetheless, due to this complete reinterpretation of the curve, that is, by making a distinction between a short-run and a long-run Phillips curve, Forder (2014: 211) argues that Friedman and Phelps had not necessarily “killed off the idea of a long-run exploitable relationship” but rather “invented the idea of a short-run exploitable relationship.” While this statement does not really fit to Friedman, who never thought about using the short-run trade-off based on deception for economic policy, it is certainly true with respect to Phelps’ writings. Contrary to Friedman, Phelps’ contributions to the Phillips curve are focused on making use of inflationary policies to push the economy away from its potentially suboptimal equilibrium level. In this sense, Phelps, though usually regarded as being close to Friedman’s view, explicitly treated the Phillips curve as a tool for trading off (surprise) inflation for (over-full) employment. As has

been shown, such a trade-off view was not that prevalent in the 1950s and 1960s, since it was the incompatibility between full employment and price stability that was mainly discussed. Inflation thus was not thought to be useful as an instrument of deception, but as a mechanism of relative price adjustments.

The remaining question is whether or not the “Keynesian” interpretation of the Phillips curve as representing a “dilemma” due to an inflationary bias at full employment still has some relevance today. Within the next section it will be argued that it has, even though the negative connotation vanished.

5.8 The “Cruel Dilemma” – Still Alive?

As has been shown in this thesis, the “Keynesian” “cruel dilemma” was defined out of existence with the introduction of Friedman’s “natural rate of unemployment”. Barro and Gordon (1983a: 601), however, take a different point of view (although missing the point as will be shown below) by noting that “[s]ome people have argued that policymakers do not face a ‘cruel choice’ between inflation and unemployment in a natural rate environment. This argument is misleading in a context where monetary institutions do not allow for policy choice to be committed.” Of course, in their model (see also Barro and Gordon 1983b) an inflationary bias exists since the central bank faces a commitment and time-inconsistency problem (see Kydland and Prescott 1977). Thus, due to a myopically optimising central bank which makes use of surprise inflation, a positive average rate of inflation even at full employment or at the “natural rate” will evolve. Even though the outcome is comparable, the underlying mechanism and concept is very different. First of all, as in Friedman’s reinterpretation, the causality of the Phillips curve runs from unexpected inflation to unemployment, that is, monetary policy is based on “the potential for creating inflation shocks, *ex post*” (Barro and Gordon 1983b: 101).⁵⁰ Furthermore, in the Barro-Gordon model, the central bank’s motive to inflate the economy is that the “natural rate of unemployment” is higher than a benchmark distortion-free equilibrium unemployment rate due to market imperfections such as unemployment insurance or income taxation (see Barro and Gordon 1983a: 593 and 1983b: 103). From this it follows that “more government is inflationary” (Barro and Gordon 1983a: 600). However, while the policymaker’s motive to opt for a positive rate of inflation at first sight seems to be the same as in the “Keynesian” dilemma model, there are important differences. In the Barro-Gordon model surprise inflation does only have a (short-run) positive effect on the amount of employment, which otherwise would not have been supplied, for example, due to government imposed taxes which render additional employment unattractive. Hence, if the (voluntary) employment level is considered to be too low within this model, then the solution to this problem is not to be found in aggregate demand management, but in removing these distortions: “if income taxes produce a distortion in individual labour supply so that private and social benefits of work do not conform, one might consider a tax reform, but not expansive monetary policy” (Spahn 2016). On the other hand, within the “Keynesian” dilemma view inflation serves the purpose of facilitating relative

⁵⁰For a critical inquiry regarding this assumption that monetary policy directly controls the rate of inflation (as in Barro and Gordon 1983a: 594), which completely neglects the usually slow monetary transmission mechanism, see Goodhart and Huang (1998: 378f.) and Spahn (2016).

price adjustments at full employment. Furthermore, the proposal of an increase in aggregate demand (which may bring about inflation) was based on the assumption of involuntary unemployment due to a lack of demand. Hence, while in the Barro-Gordon model inflation can be used to reduce (voluntary) unemployment only in the short run by fooling people, it has important long-run employment consequences in the dilemma model due to the lubricating effect of inflation which does not rest on economic policy surprises. From this it follows that the emerging dilemma in the Barro-Gordon model is clearly different from the approach of the 1960s.

A more recent inquiry about the possible beneficial effects of inflation on employment by Akerlof et al. (1996) explicitly builds upon the assumptions of the “cruel dilemma” by making reference to Schultze (1959), Samuelson and Solow (1960), and Tobin (1972b). Due to nominal downward wage rigidity, which is explained by fairness considerations and the like,⁵¹ firm-specific shocks have a larger effect on employment if there is complete price stability compared to an economy which experiences a positive trend inflation.⁵² As in the dilemma view, inflation acts as a substitute for downwardly flexible wages, since with nominal downward rigidities, but without positive trend inflation, real wages will remain too high for too long after a firm-specific shock, so that a loss in employment occurs. Therefore, very much in line with the results of the discussion in Section 5.6, Akerlof et al. (1996: 25f.) make a distinction between the NAIRU⁵³ and the “LSRU (lowest sustainable rate of unemployment)”. While both rates coincide assuming no downward wage rigidity (so that there is no dilemma as in Friedman’s framework), no unique NAIRU exists in the case of downwardly rigid wages since then, as in the “Keynesian” view, a long-run trade-off between inflation and unemployment emerges. Achieving a zero rate of inflation thus comes at the cost of an increase in the rate of unemployment between 2.1 and 2.6 percentage points (compared to the unemployment rate emerging at 3 per cent of inflation; see Akerlof et al. 1996: 31, 50).

Knoppik and Beissinger (2003) focused on testing this hypothesis. For Germany, nominal downward wage rigidity implies that a positive rate of inflation (up to 3 percent) indeed has some beneficial effect on the “lowest sustainable rate of unemployment”. The results from their empirical analysis suggest that the LSRU is higher by 1 percentage point if zero inflation is targeted. Despite strong nominal downward rigidities in Germany,⁵⁴ the effect thus remains rather small. This is explained by the fact that there is positive nominal wage growth even at zero inflation due to productivity growth⁵⁵ (see Knoppik and Beissinger 2003: 636), so that relative wage adjustments are still possible despite nominal downward rigidities. Nonetheless,

⁵¹See also the discussion in Spahn (2000: 21f.) why nominal downward rigidities can be reasonable from a microeconomic point of view.

⁵²See for a discussion Beissinger and Möller (2000: 99f.).

⁵³The NAIRU (non-accelerating inflation rate of unemployment) and the “natural rate of unemployment” are used synonymously by Akerlof et al. (1996), even though there are important differences as outlined in Schwarzer (2015b).

⁵⁴Knoppik and Beissinger (2009) show that nominal downward rigidity is also widespread in Europe.

⁵⁵The important role of productivity growth was incorporated into the Phillips curve framework in Kuh (1967). Archibald et al. (1974: 117), however, argued that changes in productivity alter the demand for and/or supply of labour and thus excess demand, so that productivity changes as such should not be an explanatory variable of wage rate changes unless productivity changes improve the measurement of excess demand.

the accumulated loss in output and employment over time of a zero inflation target can still be considered to be substantial.

However, as pointed out by Gordon (1996: 62), Mankiw (1996: 69), and Ball and Mankiw (1994: 249), the results of Akerlof et al. (1996) (and those of Tobin 1972b as discussed in Section 5.4) may not hold if a zero inflation target is actually implemented. Downwardly sticky wages might just be the result of a positive average rate of inflation, while nominal downward flexibility may emerge if complete price stability is achieved.⁵⁶ This argument is close to Friedman’s concern (see Section 5.5) that an ongoing positive rate of inflation will increase nominal rigidities, while the achievement of price stability will preserve the not perfect, but albeit sufficient, flexibility to achieve full employment and price stability at the same time.

In this line of argument, Stüber and Beissinger (2012: 878) extended the research of Knoppik and Beissinger (2003). The model incorporates the idea that in a low inflation environment with downwardly rigid wages firms will take into account that high nominal wage increases and their effects on real wages cannot be reversed easily and timely. Thus, by paying attention to the inflationary environment, firms adjust their nominal wage increases accordingly.⁵⁷ Based on the empirical evidence presented in their article, Stüber and Beissinger (2012: 878) concluded that the adjustment of firms’ behaviour indeed compensates for the otherwise expected positive effects on real wage growth and on aggregate real wages in a low inflation environment, which would usually cause a loss of employment.

In contrast to the results just presented, no “cruel dilemma” exists in models featuring full price flexibility, that is, in New Classical (for example, Lucas 1975) and Real Business Cycle models (for example, Kydland and Prescott 1982 and Long and Plosser 1983). Activist economic policy, and particularly monetary policy, in these models hence only disturbs otherwise optimal market allocations (see Spahn 2016). Furthermore, since unemployment is assumed to be essentially voluntary, the “Keynesian” motive for removing involuntary unemployment by accepting the inflationary side-effect vanished. The Phillips curve trade-off in these models thus boils down to the short-lived effect of surprise inflation, which pushes the economy into some state of over-full employment. However, this increase in employment has to be considered to be involuntary, since given the correct information about the rate of inflation the additional labour would not have been supplied.

Also in the standard New Keynesian model no “cruel dilemma” exists, so that the optimal rate of inflation is essentially zero.⁵⁸ This emphasis on price stability can be explained by the disturbing effect of a non-zero average rate of inflation on relative prices due to the assumed sluggishness of price adjustments (see Woodford 2003: 383, 396, 405ff. and Schmitt-Grohé and Uribe 2011: 689). This result comes about since the usually assumed Calvo (1983) pricing does

⁵⁶A different issue is whether or not fully flexible wages are desirable from the point of view of macroeconomic stability. As pointed out in Section 2.5, Phillips noted that a high degree of price and wage flexibility may indeed be destabilising. See for a discussion of this issue also Spahn (2000: 22).

⁵⁷A related approach regarding price setting is discussed in Ball and Mankiw (1994). Since rigidities endogenously depend on the inflationary environment, no “cruel dilemma” emerges.

⁵⁸This result holds true even though there is a long-run trade-off between inflation and unemployment in the basic New Keynesian model since price setters discount future price developments and profits, so that expected inflation does not have a unit weight in the Phillips curve (this long-run trade-off being nonetheless small). See Clarida et al. (1999: 1676, n. 38), Woodford (2003: 187), and McCallum (2004: 21f.).

not allow adjustments to trend inflation for all firms (see Woodford 2003: 213). However, if indexation is allowed in the New Keynesian model then a stable positive rate of inflation has no such negative effect (see Woodford 2003: 403).⁵⁹ Thus, in contrast to the role of inflation within the “cruel dilemma” model, relative price adjustments are not facilitated by but rather become necessary because of a positive average rate of inflation, which disturbs the relative price structure. Furthermore, the beneficial effect of inflation in the dilemma model particularly rests on the assumption of a non-linear Phillips curve, so that price rigidities are asymmetric, while the New Keynesian model is based on symmetric price rigidities.

However, by incorporating asymmetric rigidities,⁶⁰ by introducing not only price but also wage stickiness (as in Erceg et al. 2000), or by taking into account sector-specific shocks, the zero inflation target ceases to be optimal also in the New Keynesian model. Rather, it can be shown that optimal monetary policy in such cases should stabilise the output gap or a price index which gives more weight to sectors with stronger rigidities (see Woodford 2003: 417f., 435ff. and 2011: 803ff.), since then even a small price reaction can be a sign of a great output gap in the rigid sector while price changes in the flexible sector may be just due to equilibrating relative price adjustments (see Mankiw and Reis 2003: 1069f.).⁶¹

Both solutions, that is, output-gap stabilisation or targeting a tailored price index, however, imply that the average rate of inflation as faced by consumers can be different from zero by following this optimal policy (at least during the adjustment period). Since the central bank still stabilises some kind of price index which, however, does not represent the development of the cost of living (as measured by a price index based on expenditure shares) any more (see Mankiw and Reis 2003: 1069f. and Woodford 2011: 811f.), no “cruel dilemma” might exist at first sight (since the targeted price index is close to being stable), even though the cost of living might be rising.⁶² This solution hence merely defines away the issue as posed by the debate of an inflationary bias at full employment even though there is essentially no difference between the results of modern and past approaches. For example, shifts in relative demand within a multi-sector model may pose the same issue of a (short-run) trade-off between economic activity and inflation to monetary policy as a cost-push shock in a one-sector model (see Woodford 2011: 808).

⁵⁹Furthermore, with complete indexation the costs associated with relative price dispersion vanish, so that deflation (as in Friedman 1969) can be optimal (see Schmitt-Grohé and Uribe 2011: 694). This result is also derived if complete price flexibility is assumed (see Woodford 2003: 479 and Schmitt-Grohé and Uribe 2011: 684). For a discussion of the optimal rate of inflation within different models see also King and Wolman (1996).

⁶⁰The asymmetry of rigidities is usually modelled by assuming sector-specific Calvo “lotteries” (time-dependent rigidities). Thus, price changes in these models are different between sectors with respect to their timing (see, for example, Carvalho 2006: 5, 22 and Woodford 2011: 805), but there is no other asymmetry or non-linearity of the Phillips curve, such as relative nominal downward stickiness, assumed. For a multi-sector model which features menu costs instead and thus is state-dependent see Nakamura and Steinsson (2010).

⁶¹The same result holds true in the case of a monetary union, so that each sector can be understood as representing a member nation (see Benigno 2004).

⁶²For example, in the two-sector model of Aoki (2001: 68ff.) no negative welfare implications arise from this approach, since average consumer price inflation plays no role in the utility function of the household due to a lack of money in the model, so that the typical “inflation tax” does not emerge. Thus, optimal monetary policy stabilises the output gap and inflation in the sticky-price sector (“core inflation”), while paying essentially no attention to price changes in the flexible-price sector, which arise due to necessary relative price changes caused by shocks (for example, oil price shocks).

The “cruel dilemma” hence arises since monetary policy cannot stabilise the output gap and inflation at the same time if a shock occurs. Of course, this does not point at a long-run trade-off between a zero output gap and price stability (since monetary policy is usually assumed to be neutral in the long run; see Boianovsky and Trautwein 2006b: 183), but still at a short-run one during the stabilisation period. Nonetheless, since in the original “cruel dilemma” ongoing (and even endogenous) shocks to the economy are assumed, the short-run issue of trading off inflation for unemployment essentially becomes a long-run one, since each time the policymaker either has to accept the resulting effects on employment or on inflation.

Thus, by incorporating central arguments of the Phillips curve discussion of the 1960s, a conflict between the objectives of price stability and full employment (or of closing the output gap in modern models) once again exists. Hence, from a theoretical perspective a (long-run) trade-off which does not rest on the irrationality of economic agents, but on the dynamics of relative price adjustments within non-perfect markets, can also be derived in the current mainstream model based on microfoundations and rational expectations.

Of course, it can be rightly argued that the outcome of a model always depends on the underlying assumptions, so that the fact that also the New Keynesian model can be adjusted in such a way as to arrive at the desired result of a “cruel dilemma” proves nothing in itself. From this perspective, the issue of whether or not a long-run trade-off between price stability and full employment exists is an empirical question. Unfortunately, taking full account of all empirical results regarding the relation between these two objectives would require a thesis on its own. There is, however, some *prima facie* evidence that policymakers still pay attention to the “cruel dilemma”, though it is not always communicated that way. The non-zero inflation target of modern central banks⁶³ is often justified by referring to the same arguments as in the “cruel dilemma”: For example, the Reserve Bank of Australia (2013) emphasises business cycle fluctuations, while the Bank of Israel (2007: 19) explicitly points at the facilitation of relative price adjustments due to a positive inflation target if there are nominal downward rigidities (see also Section 3.5). These issues also played a role during the evaluation of the monetary strategy of the European Central Bank (1998) and its goal of a “below, but close to, 2%” rise of the Harmonised Index of Consumer Prices (HICP) for the Euro area (see European Central Bank 2003a, b). Even though nominal downward rigidities and the emerging inflationary bias have no pronounced role in the official statements of the European Central Bank, inflation differentials and the beneficial role of a positive inflation target for relative price-level adjustments within the Euro area have (see European Central Bank 2011: 67). In this sense, the argument for a positive inflation target in order to facilitate relative price adjustments is also part of the strategy of the European Central Bank.

Of course, other reasons for aiming at a positive inflation target exist, such as the zero lower bound (see Bernanke and Mishkin 1997: 109f.).⁶⁴ Nonetheless, if complete price stability were possible without any effects on output and employment then it would not be reasonable to opt for a positive inflation target—a point of view also endorsed very recently by Snower (2015: 109). Of course, officially no “cruel dilemma” exists since the low but non-zero rate of

⁶³See the overview in Roger (2010: 47) and Hammond (2012: 9).

⁶⁴For an earlier elaboration of this argument see Vickrey (1954, 1959).

inflation is still interpreted to be in line with price stability.⁶⁵ In this sense, the “cruel dilemma” of the 1960s is still alive but lost its negative connotation.

Even though the lubricating effect of a small positive rate of inflation can also be derived within current models and even though this mechanism played an important role for the long-run trade-off explanation in the 1960s, it would be too narrow to conclude that the whole Phillips curve debate boils down to this issue of relative price adjustments. As has been shown in this thesis, also other explanations for a long-run trade-off, particularly the possibility of non-adjusting inflation expectations in general, were discussed. Thus, Friedman’s account of the Phillips curve debate is not just to be downplayed as a “Phillips Curve myth” (Forder 2010a, 2014). A more balanced view is appropriate and will be elaborated in the following concluding chapter.

⁶⁵See Svensson (1999: 197ff.) for a discussion about the notion and definition of “price stability”. Furthermore, current methods of estimating consumer price inflation tend to overstate the “true” rate of inflation (see European Central Bank 2011: 66f.; see critically Wynne and Rodriguez-Palenzuela 2004). But this problem, which “makes the terms of trade seem less favorable than they really are” (Rees 1959: 91), was also prevalent and lively debated in times of the “cruel dilemma” (see Reinsdorf and Triplett 2009: 30 and Rippy 2014).

6 Summary and Conclusion

When Lucas and Sargent (1978) presented their demolishing criticism about “Keynesian macroeconomics”, in which this line of thought was labelled as being “of *no* value in guiding policy” (Lucas and Sargent 1978: 50), since the underlying doctrine was “fundamentally flawed” (Lucas and Sargent 1978: 49), the Phillips curve had already lost its “dilemma” interpretation which was one of the central elements discussed in this Ph.D. thesis. Furthermore, since the Phillips curve became embedded into “An Equilibrium Model of the Business Cycle” (Lucas 1975), so that the relation between economic activity and inflation only shows up due to monetary shocks, the macroeconomic implication was turned on its head: The “Keynesian” view that inflation emerges at full employment due to relative price adjustments necessary in a growing and changing economy—an argument not even discussed in Lucas and Sargent (1978)⁶⁶—was replaced by the surprise inflation mechanism, so that it is unexpected inflation which pushes the economy away from full employment.

Not surprisingly, Solow (1978: 203ff.) and Modigliani (1978: 194ff.) expressed their disagreement with Lucas and Sargent (1978). However, Modigliani (1978: 194) also noted about the conference that “I have been following all the speakers and discussants as though I were following a match. Whoever was speaking was right, and the next one was right too. So, now I must reconcile all these ideas.”

In some sense, Modigliani’s impression of being torn between different views—all of them right in their own way—comes close to this author’s final thoughts about the Phillips curve debate and how to arrive at a conclusion: Making use of the Phillips curve as a short-run adjustment function as in Phillips’ writings seems to be as reasonable as to interpret it as a long-run trade-off between full employment and price stability as in Lipsey’s and Tobin’s contributions, while Friedman’s critique and Lucas’ extensions are not less appealing from a theoretical point of view. Indeed, this summary will show that each interpretation had its merits within the specific framework it was being discussed, while arguing that the policy implications which followed from each line of thought cannot be assessed without taking into account the underlying assumptions such as involuntary unemployment or less than perfect price flexibility.

Chapter 2 put the Phillips curve in context by focusing on Phillips’ research programme in general and on his contributions to the Phillips curve in particular. It turned out that Phillips interpreted his curve in two different ways: On the one hand, Phillips referred to his curve as a disequilibrium relation which indicated the speed of adjustment (strength of wage rate changes) if the economy is out of equilibrium (as indicated by the unemployment rate). This view was also particularly emphasised by Lipsey (1960). Phillips made use of the estimates of

⁶⁶Lucas, in a correspondence with the author dated 16 August 2015, remarked that he has no memory of Tobin’s 1972b paper.

his empirical curve to calibrate his complex and sophisticated models on stabilisation policies. In this respect, the curve was interpreted as a short-run adjustment relation.

On the other hand, in Phillips' contributions to actual economic policy issues the curve is clearly interpreted as a stable long-run relation, which can be used to guide economic policy regarding the achievable combinations of inflation and unemployment. This does not imply though, that Phillips thought about making use of an inflationary policy in order to reduce unemployment without limits. To the contrary, the curve indicated the limits of economic policy, that is, the unemployment rate that had to be accepted for price stability. Knowles and Winsten (1959: 114), though exaggerating and in general being very critical about Phillips' estimates, are thus nevertheless essentially correct by remarking that "[i]n isolation, the curve could be taken to suggest the existence of a Natural Law operating with the inevitability and precision of the laws of classical physics and, if we were to look no further, it might indeed seem plausible that to condemn $2\frac{1}{2}$ or $5\frac{1}{2}$ per cent of industrial workers to idleness was the price of halting a too rapid rise in wage rates." Regarding the price to pay for price stability, economists of the 1950s and 1960s indeed thought about doing "business with the dragon—buying some reduction in the degree of inflation by feeding him a certain number of jobs" (Lerner 1967: 3).⁶⁷ The Phillips curve thus "lent support to the notion that full-employment is incompatible with a constant price level" (Eagly 1964: 171). It hence was interpreted as offering a more or less stable "menu of choice": "The dishes listed in the left-hand column of the menu are states of over-full, full or less than full employment; the column of prices on the right-hand side gives the cost in terms of inflation that must be paid for each" (Rees 1970b: 227). But this "menu of choice", as was argued in the paper on Samuelson and Solow in Chapter 3, must be interpreted in light of the cost-push demand-pull debate in which the Phillips curve seemed to show that full employment and price stability are mutually conflicting policy goals.

The trade-off interpretation hence is undeniably visible and Phillips also did not bother to criticise Samuelson and Solow (1960) for their "menu of choice" reading of the curve, which, however was part of the "cruel dilemma". Forder (2014: 208) argues that Phillips did not complain about how his curve was being used as a trade-off relationship because he died in 1975, at a time at which, according to Forder, the interpretation that the Phillips curve represented such a long-run exploitable trade-off (the "myth" in Friedman's 1976 Nobel Lecture) had not yet been popular among economists. Thus, in his view, Phillips had no reason to criticise contemporary economists since there was no such trade-off view and thus nothing to complain about. However, as has been shown in Section 2.5, Phillips did not express his disagreement with Samuelson and Solow (1960) and other economists since he essentially fully agreed with their view about the trade-off as given by the Phillips curve. In this sense, the statement that "Phillips himself is nothing but an innocent bystander" (Forder 2014: 209) is at odds with the results presented here about Phillips' view of the trade-off between price stability and full employment, which unfortunately emerged due to cost-push forces as he made clear in his paper on the Australian Phillips curve (Section 2.4).

In sum, the "cruel dilemma" and the question of "what terms of trade actually prevail" (Rees

⁶⁷Since "[t]he unemployed are thus the innocent lambs led to slaughter through conventional stabilization tactics" (Weintraub 1972: 117), some economists such as Wallich and Weintraub (1971) favoured a (tax-based) incomes policy instead of reducing aggregate demand.

1959: 91) was a pressing issue in an already ongoing discussion about “Full Employment at Whatever Cost” (Viner 1950). Rees (1959: 91), for example, also fits perfect into this trade-off view (my italics; see also Rees 1958: 654):

It is clear that there is some level of unemployment high enough to check price rises by curtailing the demand for goods and services and to check wage rises by curtailing the demand for labor. But much depends on how high this rate is and whether it is regarded as tolerable or excessive. More broadly, we may ask *on what terms can decreases in unemployment be exchanged for increases in prices?* This question concerns not merely the “*terms of trade*” at a single point but the way they change as the unemployment rate varies.

For example, we might find that a 4 per cent average unemployment rate over the whole business cycle implies an average annual price rise of 2 per cent but that a 5 per cent average unemployment rate is consistent with price stability. In this case we might regard *price stability as worth the cost*. However, we might find that increasing the average unemployment rate from 4 to 5 per cent reduces the average rate of price rise from 2 per cent to 1.5 per cent. In this case we might *prefer the lower rate of unemployment*.

The trade-off view was discussed in more detail in Chapter 3. Even though Samuelson and Solow (1960) clearly argued within the “cruel dilemma” and were sceptical about the stability of the curve, there is nonetheless a (long-run) trade-off interpretation of the Phillips curve as was also conceded by Solow (2002: 74) in retrospective. Jones (1968: 4) (and later Frisch 1977: 1293) are thus essentially correct by remarking that “some noted economists [Samuelson and Solow] have suggested that we can choose between different degrees of unemployment and price stability.” Furthermore, all commentators discussing the Samuelson and Solow paper at the conference (see Section 3.3) clearly argued within a trade-off framework even though there are differences to Samuelson and Solow (1960), as, for example, Lerner basically based his reasoning on an accelerationist model.⁶⁸

This accelerationist version of the Phillips curve replaced the “dilemma view” after Friedman’s attack. Friedman’s position not only stood in contrast to the economic debates in the 1950s and 1960s with respect to the Phillips curve trade-off, but also regarding the influence of the rate of unemployment and that of inflation on the rate of growth as was discussed in Chapter 4. The “cruel dilemma” in the “Keynesian” view (Subsection 4.3.1) became aggravated by taking the negative implications of a low-pressure economy for the rate of growth into account, since it was assumed that “today’s actual output influences tomorrow’s productive capacity” (Okun 1962: 2). Thus, Plosser’s (1989: 52) view that the “Keynesian” approach was based on a static economy is not correct. On the other hand, the “Paishian” position (Subsection 4.3.2) was

⁶⁸The evolution of Lerner’s view is an interesting story itself. Lerner (1949: 194) pointed out that through unanticipated inflation “[p]eople are induced to do things other than what they really intend” which particularly also includes the higher supply of labour as “[w]orkers may be induced by high or by rising money wages to work harder than they would if they were clearly aware of the shrinking purchasing power of money”. On the other hand, Lerner (1967: 3) was more in favour of making use of the trade-off “[s]ince it is marginal equivalence which gives us an optimum, we should strive for the point between low and high full employment where the harm from additional inflation is just equal to the good from the accompanying increase in employment.”

much more comfortable: From Paish's point of view price stability came only at the negligible cost of a higher rate of unemployment, while the rate of growth was maximised by the constant pressure on producers to increase productivity. Friedman and other economists such as Phillips and Reuber were either convinced by theoretical reasoning or by empirical evidence that the rate of growth is independent of short-run variables such as inflation and unemployment (Subsection 4.3.3). This, however, did not also imply that a long-run trade-off between inflation and unemployment was dismissed at the same time. To the contrary, particularly Phillips himself, but also other economists, such as Reuber, indeed discussed policy issues on the basis of a stable Phillips curve while others critically argued that "[s]uch a loose relation is not very useful to the policy-maker" (Reynolds 1960: 197).

In sum and with respect to the first research question about whether or not the Phillips curve was interpreted as a stable long-run relationship which offered a "menu of choice" between inflation and unemployment (and even growth), it has to be conceded that such a trade-off view indeed was prevalent in the 1950s and 1960s. Particularly Reuber's 1962 and Lipsey's 1965 contributions are outstanding examples of such a long-run trade-off view (Section 5.3 and Subsection 1.3.4). Thus, Lipsey's piece is correctly cited by Phelps (1967: 255, n. 1) and Rothschild (1971: 271) as providing such a Phillips curve trade-off. Indeed, Lipsey (2016) himself explicitly stated that [s]ometime in the 1960s many economists came to see the Phillips curve as providing a stable trade-off between inflation and unemployment." Also "Lipsey did adopt this trade-off version" even though "inflationary points on the Phillips curve represented disequilibrium points that had to be maintained by monetary policy that perpetuated the disequilibrium by suitable increases in the rate of monetary expansion"—a point of view Lipsey also expressed during a personal conversation.⁶⁹ Hence, from the evidence presented in this Ph.D. thesis it must be stressed that calling the usual story about the Phillips curve, which is particularly influenced by Friedman's contributions, a "myth" or "fake history" as Forder (2014: 2, 4) does, goes a little bit too far,⁷⁰ though in general not all of Forder's results and those of this thesis stand in strong contrast with each other.

This is particularly true for the second research question, which focused on the underlying reasons why such a trade-off was discussed and how the Phillips curve was perceived and interpreted with respect to economic policy. Many economists regarded the Phillips curve as representing a conflict between full employment and price stability, so that either involuntary unemployment or a positive rate of inflation had to be accepted. Furthermore, and also stressed by Forder (2014: 76ff.), inflation was regarded as the outcome of relative price adjustments between different sectors in a growing and changing economy and subject to asymmetric price rigidities as implied by a non-linear Phillips curve. Enforcing price stability thus came at the cost of severely choking a breathing economy. Hence, when economists of the 1950s and 1960s discussed the possibility of making use of aggregate demand management to keep the economy at a certain rate of unemployment (Section 4.2), the motive was to remove those fluctuations which were regarded as being responsible for the inflationary bias of the economy (see, for example, Duesenberry 1962: 139). Therefore, instead of a "natural rate of unemployment"

⁶⁹Personal conversation in Vancouver on 23 June 2013.

⁷⁰This point of view is shared by Laidler (2015), who remarks that "Friedman did not simply make up his account. It had a basis in reality, albeit a partial and selective one".

“Keynesians” were rather thinking of a “natural rate of inflation” (Hahn 1995: 51).

Money illusion in the sense of not fully adjusting inflation expectations in general, though being discussed as one possible mechanism of a long-run trade-off already before Friedman, thus was not central to this explanation. However, money illusion became the cornerstone of Friedman’s critique. From Friedman’s perspective and within his framework, no other explanation of a long-run trade-off made sense since he was convinced that full employment does not stand in conflict with price stability for two reasons: On the one hand, price flexibility in his view, though not being perfect, seemed to be sufficient to assure relative price adjustments without having to rely on a rise in the general price level. Indeed, ongoing positive inflation could negatively affect this price flexibility, so that achieving price stability would also safeguard price flexibility (Section 5.5). On the other hand, other “Keynesian” cost-push forces such as strong unions were dismissed as unreasonable within his framework, since such forces can only show up as a one time surge of the price level (if accommodated by monetary policy and if downward price flexibility in other sectors is insufficient), but cannot be responsible for ongoing inflation. Thus, full employment and price stability cannot be conflicting policy objectives even in the case of strong unions. These cost-push forces, however, may influence the level of real wages and hence that of the “natural rate of unemployment”.

One element of the “Keynesian” “cruel dilemma”, that is, strong unions pushing up wages at full employment, thus was removed by incorporating union power into the “natural rate of unemployment” and as such making it a determinant of the full employment level. Indeed, it has to be conceded that an employment level which renders (real) wage aspirations of unions completely out of touch with productivity necessarily must lead to inflationary pressures (if wage growth is not restricted by incomes policies). In this sense, Friedman is completely right that such a level of employment can only come about by surprise inflation in the short run and hence by accelerating inflation in the long-run. The outcome of such a myopic policy, that is, a higher positive rate of inflation, however, was also regarded by Phillips (1959: 4) as nothing worth to strive for:

I would question whether it is really in the interests of workers that the average level of hourly earnings should increase more rapidly than the average rate of increase of productivity, say about 2 per cent. per year. The capitalist has control of the prices of the main products entering into consumption. The wage earner cannot prevent him from adjusting his prices in response to increasing costs. And if wages and prices rise together so that we have a steady inflation, it is not the capitalist who will lose by it.

Besides showing that Phillips was clearly aware of the dangers of a wage-price spiral, this quote also indicates that it was well understood that a short-run trade-off can also come about by different adjustment speeds between wages and prices and hence without relying on the non-adjustment of expectations or on signal extraction problems (as in Lucas 1972: 116 and 1973a: 333), which emerge by adding “a certain amount of the right kind of confusion to the system” (Lucas 1981: 562).

In sum, however, Friedman’s critique did not only emphasise the importance of inflation expectations (for which his contributions to the Phillips curve are usually remembered), but also turned the whole issue on its head (largely unnoticed by the economics profession): Since full

employment and price stability are not conflicting policy objectives, the whole “Keynesian” issue disappeared. Inflation since Friedman is regarded as the tool with which the economy can be pushed away from full employment (though this policy is not advocated by Friedman), but not as the unavoidable outcome of an economy at full employment. “Keynesians” after Friedman thus fought an uphill battle by arguing within Friedman’s dilemma-free framework and by emphasising the possibility of general money illusion, while more or less ignoring previous arguments such as sectoral disequilibria and involuntary unemployment. It has been shown that a less-than-perfect adjustment to the rate of inflation, that is, money illusion, might be perfectly reasonable in those sectors facing excess supply if there are nominal downward rigidities for whatever reason. This important distinction between money illusion in specific sectors of the economy as a lubricant to restore market-clearing relative prices and money illusion which will lower the real wage throughout the economy, however, was not very pronounced in many contributions (for example, in Tobin’s writings as discussed in Section 5.5). Furthermore, “Keynesian” contributions after Friedman’s critique tried to prove the existence of a long-run trade-off by referring to such general money illusion without clearly pointing at the role of inflation for facilitating relative price adjustments. The focus on this kind of general money illusion must have confirmed the view that “Keynesians” of the 1950s and 1960s tried to make use of inflation (see, for example, Haberler 1972: 236 with reference to Tobin 1972b) to push the economy towards any unemployment rate within the limits as given by the Phillips curve. However, as has been shown, this was not the case. Hahn (1982: 74f.) is thus generally quite correct:

It is puzzling to find it put forward as a discovery that a higher inflation rate will not increase the full-employment level of employment: Keynes and Keynesians would not have claimed otherwise. The fact is, of course, that when trade-offs were discussed the unemployment on the horizontal axis was thought of as involuntary. Even so, a trade-off may not exist; this will have to be discussed. But the Lucasians, by denying the possibility of involuntary unemployment – indeed, they profess not to know what it means – have given no reason why anyone should be interested in their trade-off even if it existed.

In fact, the world that they describe quite plainly needs no macro-policy. Keynesians were concerned with the problem of pushing the economy to its natural rate, not beyond it. If the economy is there already, we can all go home.

The crucial issue, however, is whether “Keynesians” and their critics had the same notion about the “natural rate of unemployment”. While it has been shown in Section 5.6 that both lines of thought essentially aimed at the same “natural rate of unemployment”, but expected different inflationary consequences, it was also emphasised that a clear definition of full employment within the Phillips curve discussion and hence in modern terms of the “natural rate of unemployment” did not exist (Subsection 5.1.1). The policymaker’s preferences about inflation and unemployment essentially defined the full employment level. In this respect, Hahn’s statement neglects an important caveat, so that Phelps’ (1974: 31f.) rather sarcastic comment that “[w]hat the romantics among the Keynesians believed, however, was that *within wide limits* the norm of ‘full employment’ was what the nation wished to make it”, is not so wide off the mark as well. Indeed, Lindahl (1962: 96f.) emphasised that the post-war inflation had been also caused

by the aim of “a stable price level and full employment” which allows too much room for interpretation since “it may be interpreted to mean that as full employment as possible is to be sought within the framework of a stable price level, or that the price level must be kept as stable as is compatible with the preservation of full employment.”

Even though modern macromodels usually assume a fixed “natural rate of unemployment”, it has been argued with respect to the third research question about today’s relevance of the original Phillips curve discussion that some elements are still of importance for and also discussed within current models (Section 5.8). First of all, Phillips’ approach to automatic stabilisation policies is very close to modern stabilisation principles such as the Taylor rule or inflation targeting.⁷¹ Furthermore, closely related policy issues to the “Keynesian” “cruel dilemma” of the 1950s and 1960s actually are discussed within New Keynesian models as altering the otherwise optimal strategy of aiming at complete price stability. Moreover, modern approaches to the issue of hysteresis and in some sense endogenous growth theories are very close to the discussion about the optimal demand pressure in order to maximise the rate of growth as has been argued in Section 4.5. In this respect, the Phillips curve cannot be understood as a stable long-run relationship, but as a short-run one which may constantly shift due to different endogenous forces as discussed in Samuelson and Solow (1960). Solow, “[a] defender of the Phillips Curve” (Phelps 1971: 33), emphasised this view while critically remarking about the idea of a stable “natural rate of unemployment” that “neither theory nor observation offers support for this. If I am right, one is driven back to something much closer to our 1960 short-run view.”⁷²

Indeed, it has been emphasised throughout this thesis that many arguments are still of relevance today. In this sense, the discipline of the history of economic thought provides important insights also with respect to current economic thinking and contemporary issues. Of course, as in Friedman’s quote at the beginning of this thesis, some might take the point of view that it is not “the task of modern theoretical economics to ‘explain’ the theoretical constructs of our predecessors, whether or not they have proved fruitful” because “a surer route to sterility could scarcely be imagined” (Lucas 1978: 355). On the other hand, since “[e]very orthodoxy, including my own, needs to have a kick in the pants frequently, to prevent it from getting self-indulgent, and applying very lax standards to itself” (Solow 1978: 204), the profound and critical analysis of different lines of thought is to be regarded as an important contribution to economics.

As has been shown, the Phillips curve discussion of the 1950s and 1960s indeed would have greatly profited from a more rigorous theoretical analysis by clearly stating the different assumptions underlying each argument. This probably would have avoided many confusing debates and, quite ironically, would have strengthened the “Keynesian” point of view even after Friedman’s critique as was argued in this thesis on the basis of current mainstream models which closely resemble the “cruel dilemma”.

Perhaps, however, the whole debate about the Phillips curve—and about the two social “evils” inflation and unemployment—which caused so many digressions, misunderstandings, and “revolutions”, just confirms Samuelson’s (1955: 334) sentiment that “[t]he science of economics does not provide simple answers to complex social problems.”

⁷¹Phillips in 1956 (cited from Young et al. 2004: 124) indeed remarked that he “concentrated on the sort of problem that would face a central bank or other regulating authority in attempting to control the aggregates in a system.” See also Asso and Leeson (2012).

⁷²Letter to the author in August 2013.

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