From the Stagflation to the Great Inflation: Explaining the US economy of the 1970s

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November 27, 2020

Abstract

This article proposes a history of the evolution of macroeconomists' explanations of the 1970s US stagflation, from 1975 to 2013. Using qualitative and quantitative methods, 1) I observe the different types of explanations coexisting at different periods ; 2) I assess which was the dominant type of explanations for each period ; and 3) I identify the main sources of influence for the different types of explanation. In the late 1970s and early 1980s, supply-shocks and inflation inertia were fundamental concepts to explain stagflation. The interest on this topic progressively vanished after 1985. In the 1990s, it was a totally new literature which emerged almost without any reference to past explanations. This literature focused on the role played by monetary policy in the late 1960s and the 1970s to account for the rise of inflation. New Classical economists' contributions, like Lucas (1976), Kydland and Prescott (1977) or Barro and Gordon (1983a), which were ignored by stagflation explanations in the 1970s/1980s, became major references to account for the 1970s stagflation in the 1990s.

Keywords: Great Inflation; History of macroeconomics; New Classical Economics; Stagflation.
JEL codes: B22, E31, E50.

De la Stagflation à la "Grande Inflation" : Expliquer l'économie des Etats-Unis des années 1970

Résumé

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Cet article propose une histoire de l'évolution des explications de la stagflation états-uniennes des années 1970, de 1975 à 2013. Mariant méthodes qualitatives et quantitatives, 1) j'observe les différents types d'explications coexistant à la même période ; 2) j'identifie quel type d'explications était dominant pour chaque période ; et 3) j'identifie les principales sources d'inspiration pour chaque type d'explication. Dans les années 1970 et 1980, les chocs d'offre et l'inertie de l'inflation sont fondamentaux pour expliquer la stagflation. Mais l'intérêt pour ce sujet disparaît peu à peu après 1985. C'est une nouvelle littérature qui émerge dans les années 1990, sans référence ou presque aux explications des années 1970 et 1980, et se focalisant sur le rôle joué par la politique monétaire durant la période pour expliquer l'augmentation de l'inflation. Les contributions des nouveaux classiques comme Lucas (1976), Kydland et Prescott (1977) ou Barro et Gordon (1983a), qui étaient ignorées dans les explications des années 1970 et 1980, deviennent des références majeures pour rendre compte de la stagflation à partir des années 1990.

Mots-clé : Histoire de la macroéconomie ; Nouvelle Economie Classique ; Stagflation.

Introduction

The 1970s constituted the beginning of a period of significant transformations for macroeconomics. Macroeconomists and historians of the discipline highlight the role in transforming the discipline of the concept of a 'natural rate of unemployment', as well as of what was called the 'Rational Expectations Revolution'. From today's perspective, Milton Friedman's (1968) or Robert Lucas's (1972; 1976) articles constituted path-breaking contributions in macroeconomics. In the 'real world', the US economy encountered a new phenomenon, the stagflation—the combination of GNP stagnation (and high unemployment) with high inflation. [1] The two phenomena were not seen as independent: if critics of the Keynesian consensus of the time were prompt in charging Keynesian ideas for the current macroeconomic situation, the stagflation contributed to the rising influence of Friedman's

1. According to Nelson and Nikolov, we owe the term of 'stagflation' to Iain MacLeod, a member of the Britain House of Commons, who declared on November 17, 1965, regarding the United Kingdom situation:

> We now have the worst of both worlds—not just inflation on the one side or stagnation on the other, but both of them together. We have a sort of "stagflation" situation. (Nelson and Nikolov, 2004, 293-294)

The first occurrence of the term in a title in the Web of Science database is Johnson (1971). The use of the term was spreading progressively in the 1970s.

Monetarism and of the 'New Classical' ideas of Lucas and his co-authors. [2]

However, historians have not yet interested in how economists have explained the stagflation since it has occurred. One doesn't know what the dominant explanation was at the time, neither if a consensus had emerged. No historian has looked to the links between the methodological transformations brought by Friedman or the New Classical macroeconomists and the explanations of the US stagflation that economists have elaborated. Similarly, it remains to assess how explanations from the past have influenced today's views on the stagflation and in what extent these views are different from the 1970s and 1980s explanations.

This article fills this gap by sketching a history of the explanations of the US stagflation. As we shall explore, economists have used different labels to describe the US macroeconomic situation in the 1970s, but I will use the term "stagflation" as a convenient shortcut. The first step of a history of stagflation explanations is to construct a 'dataset' of all academic articles and books that dealt with such explanations (later called the 'stagflation documents'), in order to identify the different explanations emerging through time. [3] In a second step, I have collected all the references cited by the stagflation documents identified in the first step. The qualitative and quantitative analysis of the stagflation documents and of their references allow me: 1) to observe the different types of explanations coexisting at different periods; 2) to assess which explanation prevailed for each period; and 3) to determine the main sources of influence for the different types of explanation. I combine a careful reading of each article and book on stagflation with citations network analysis and quantitative text-analysis.

The first salient observation is that explaining stagflation disappeared from macroeconomists' priorities after the mid-1980s, but the topic became popular again after 1997, when new contributions (notably DeLong, 1997 and Sargent, 1999) renewed interest for stagflation and stimulated new debates. Second, the dominant type of explanations has changed between the two periods (1975-1986; 1997-2013). In the late 1970s and early 1980s, supply-shocks (notably commodities price increase), inflation inertia and the productivity slowdown were put in the foreground to account for the US situation. In more recent years, emphasis has been placed on monetary policy and the failures of the Federal Reserve,

2. Some historians of macroeconomics referred to the stagflation as an indirect impulse for the macroeconomics transformations of the 1970s. For instance, Duarte (2012, 196) argues that "the stagflation of the 1970s made economists question the ability of the Keynesian device to incorporate inflation into their IS-LM framework". Snowdon and Vane (2005, 23) explain that the "stagflation of the 1970s gave increasing credibility and influence to those economists who had for many years warned that Keynesian macroeconomic policies were ... predicated on theories that were fundamentally flawed."

3. I focus on the contributions that mainly targeted an audience of economists. I do not discuss popularisation contributions, nor economists' interventions about stagflation in public debates.

at least to avoid high inflation, and less emphasis has been put on the rise of unemployment—transformations consistent with the change in the label used to describe the period, from the 'stagflation' to the 'great inflation'. This change was not the result of any controversy, with the winning camp imposing its views. In the early 1980s, the 'supply-shock explanation' was dominant and not truly contested, and interest for the stagflation evaporated. It is a totally new literature that emerged in the 1990s, with few references to past explanations. Third, the works of New Classical economists—notably Lucas (1976), Kydland and Prescott (1977), and Barro and Gordon (1983a)—became major references to discuss stagflation, whereas they were mostly ignored in the first period. [4] Ironically, if the New Classical economists and the rational expectations approach disrupted macroeconomics during the stagflation period and contributed to change macroeconomics methodology in the following years, one has to wait the 1990s to see their contributions having a visible impact on the economists' explanations of stagflation. Fourth, in the debates about stagflation in the late 1990s and early 2000s, one observes a dividing line between those who considered that the lessons of stagflation have been drawn, and those who believed a 1970s-style inflation remains likely. Through the lens of stagflation explanations, macroeconomics in the late 1990s and early 2000s did not seem less divided than in the late 1970s and early 1980s.

In the first section, I present the methodology for constituting my dataset of stagflation explanations. The second section analyses the debates about stagflation between 1975 and 1986, and demonstrates, with the help of citations network analysis, that the main contributions of the period were those which focused on supply shocks and inflation inertia. The third section describes the main characteristics of the 1997-2013 period for explaining the 1970s US economic situation and analyses how the two periods differ. I then conclude on the lessons that a history of stagflation explanations can offer for the history of macroeconomics in general.

4. Finn Kydland and Edward Prescott imagined an economy with a central bank announcing that monetary growth rate would be set at its optimal value for every period. If agents believe this policy, inflation will be at the level targeted by the Central Bank and unemployment at its natural rate. Thus, in the next periods, the central bank has an interest to renege and to run an expansionary policy to diminish unemployment. Time-inconsistency resulted from the optimal policy in the following periods not being the same as in the first period. Forming expectations rationally, private agents know that the Central Bank would not bind its action to the optimal policy announced in the first period and inflation will be higher than targeted. As long as the monetary authority is not bound by some strict rules, there exists an "inflationary bias" (Kydland and Prescott, 1977, 487), due to inflation expectations. A vast literature on this 'time-consistency' issue emerged after Kydland and Prescott's work. Barro and Gordon (1983a) extended the Kydland and Prescott's model.

1 The Dataset of Stagflation Explanations

1.1 Identifying Stagflation Explanations

The preliminary step to build a dataset of stagflation explanations is to determine what is an 'explanation' of stagflation. My first criterion is that books or articles must devote significant space and attention to the issue of the US macroeconomic situation in the 1970s. If a document deals with a larger period, the 1970s must be discussed in details and their particularities explained. Second, the authors must explicitly claim that they are proposing an explanation of some mechanisms underlying the US stagflation. Theoretical articles are included into the dataset provided that their authors present their model as offering an explanation for the 1970s macroeconomic situation. Third, contributions do not need to be new or original—surveys of literature are included—nor to be published in peer-review journals—I have integrated working papers or articles published in US Federal Reserve Banks journals, for instance, if they have not been later published in peer-review journals. [5] Fourth, contributions do not need to explain all aspects of the stagflation and they could focus only on particular mechanisms and variables, if these mechanisms and variables are regarded as essential to explain the whole phenomenon. Fifth, I have chosen 1975 as the starting date for the dataset. It exists a debate about the beginning of the stagflation, between those who regard the late 1960s as determinant to explain the period, and those who defend that the first oil shock in October 1973 was a crucial event. I consider 1975 as a reasonably good starting date: the period was increasingly regarded as as break with the relative stability of the 1950s and 1960s and such a date of departure allows me to observe both sides of the debate (about the beginning of the stagflation) arguing against each other.

In order to identify the works that will be considered as my dataset, I first took as a point of departure the 2008 NBER conference on "The Great Inflation: The Rebirth of Modern Central Banking"—published in 2013—and checked the bibliography of the conference articles dealing with the US economic situation to find new references about stagflation. I repeated the process with these new references and so on. Considering the relative macroeconomic pluralism of the NBER, and the fact that the conference organisers tried to propose a large spectrum of explanations, I regard this conference as the less arbitrary point of departure to detect as many contributions on stagflation as possible. From the 7 articles of the

5. However, I have excluded explanations presented in macroeconomic textbooks. First, because it represents a tiny part of a manual, most of the time used to explain simple mechanisms. Second because of the difficulty to access to some editions of macroeconomic textbooks. It remains that textbooks are an interesting object to study the diffusion of different views on stagflation.

conference, I iteratively identified 131 articles and books on the US stagflation.

To minimise omissions in my dataset, I also searched for the terms 'stagflation' and 'great inflation' in the titles of articles referenced in the Web of Science (WoS) database. I found 28 articles that were not identified by the first method, and used their bibliography to find 8 new documents. [6]

From the 174 documents in my dataset, 104 are in the WoS database, enabling to have a list of the references these documents cite. [7] The references of the 70 remaining documents were identified by a semi-automatic/semi-manual process and were merged with the WoS references list. [8] I ended up with 572 references cited at least twice by the 174 documents on the US stagflation. 91 stagflation documents were also part of the 572 references—meaning that 83 articles and books on stagflation were either not cited or only once by other articles or books on stagflation.

1.2 The Features of the Dataset on Stagflation Explanations

The research and selection of articles and books on the US stagflation allow one to assess, in the first place, the popularity of the topic through time (Figure 1). A first interesting result is that, after having been a hot topic in the 1970s and early years of the 1980s, as expected, few contributions on the US stagflation appeared after 1985, the year of Michael Bruno and Jeffrey Sachs's extensive book, *The Economics of Worldwide Stagflation* (1985). However, one observes an increase of the contributions on the topic after the mid-1990s, notably after the publication of Bradford DeLong's (1997) article and Thomas Sargent's (1999) book, the latter circulating as a manuscript since 1997 (Peter Ireland, Personal Correspondence, 11/02/2020). [9] In the rest of the article, I will thus focus on the sub-periods when most books and articles were published: the 1975-1986 period (89 documents) and the 1997-2013 period (76).

For the first period, Robert Gordon (1975a, 1977), Edmund Phelps (1978)

6. In the whole process, a couple of articles or books were not findable; I was unable to check if they satisfy my criteria and thus discarded them.

7. WoS does not contain books, conference proceedings, US Federal Reserve Banks' journals or unpublished working papers.

8. Metadata of the bibliographic references were extracted from each document and automatically matched with the WoS database. The non-matched references were cleaned and matched manually with the first WoS references list. Even if I did not have access to some books, I was eventually able to find the bibliography of each of these books and to extract their references.

9. The data on the number of stagflation documents per year should be taken with care after 2008. Even if the proceedings of the 2008 conference were published in 2013 and that the authors integrated references published between 2008 and 2013, one can assume that they tend to cite less articles from this period, as the first version of their work was written in 2008. The number of publications about stagflation may be underestimated in my dataset after 2008.

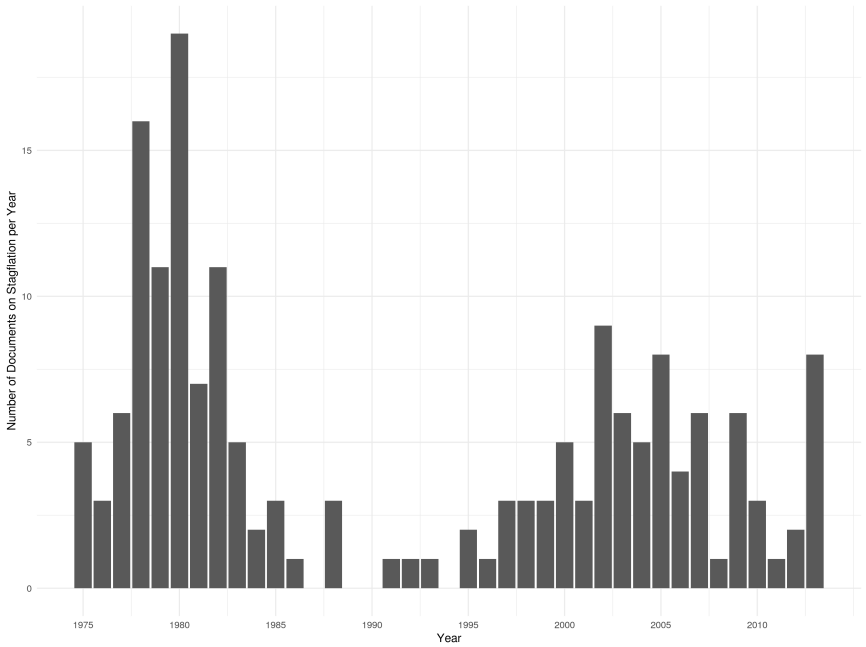

Figure 1 – Number of articles and books on the US stagflation per year.

and George Perry (1978) were the most cited documents on stagflation by the documents of our dataset (Figure 2). DeLong's and Sargent's contributions are the two most cited references for the 1997-2013 period, ahead of Clarida et al. (2000) and Orphanides (2003). [10] In the recent period, one observes that all the most cited references about stagflation are relatively recent references, with the exception of Blinder (1982). [11]

Stagflation documents published between 1997 and 2013 actually cited 'old' references, but not the ones that are in the stagflation dataset. After John Taylor's (1993) "Discretion versus Policy Rules in Practice", we find Kydland and Prescott's (1977) work on the time-consistency problem—see also Barro and Gordon (1983a) just below—as well as Friedman's (1968) AEA presidential address, and the famous Lucas critique (Lucas, 1976). These references, which were crucial in the transformations of macroeconomics in the 1970s and early 1980s, constituted

10. Because 1) academic documents tend to refer to more recent works and 2) the most recent documents of our dataset tend to cite more references than older documents (20.6 references in average for the 1997-2013 period against 6.2 references for the 1975-1986 period), I cannot display an 'aggregate' count of the citations for the whole period. The most cited references would be the references cited by the more recent stagflation documents.

11. Blinder (1982) actually represents the most emblematic reference on stagflation from today's viewpoint, as it is mainly cited by post-1997 references—notably to dismiss the primacy of oil-shocks to explain the period (see DeLong 1997, 267-270).

major influences of more recent explanations of stagflation. Interestingly, despite their central position for macroeconomics in general, as well as their importance for explaining stagflation in the 1997-2013 period, these references were rarely discussed in the debates around stagflation in the late 1970s and early 1980s. [12] Indeed, the issues of the natural rate of unemployment, rational expectations or the time-inconsistency problem were not central—even if not totally ignored—to account for the stagflation during the 1975-1986 period.

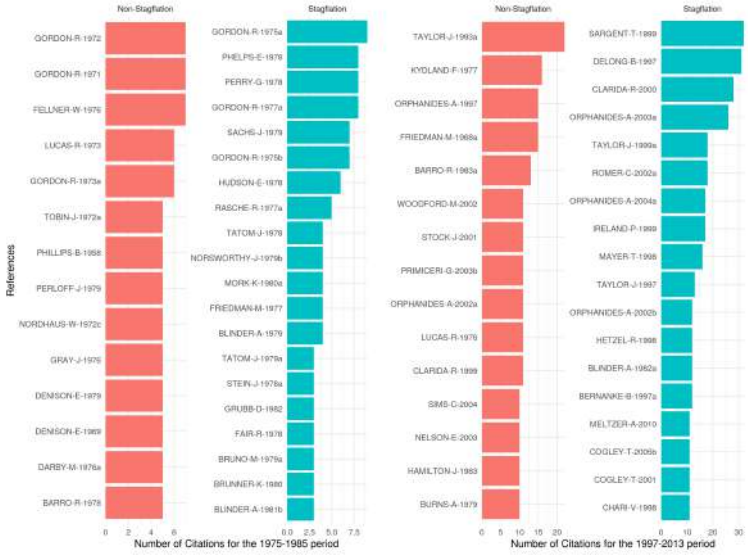

Figure 2 – Most cited references by the stagflation documents per period.

2 The First Period of Stagflation Explanations: Supply-Shocks at the Foreground

To understand what were the different explanations of stagflation and which ones dominated, I use citations network analysis. The mere reading of the 174 documents, even if primordial, is not sufficient to draw an accurate picture of the different debates about stagflation and their evolution. Citation analysis constitutes a way to limit a biased reading of this literature, by cross-checking the story that emerged from this reading. It also enables us to observe which explanations

12. Even when we take into account that more recent documents tend to refer to more articles, new classical contributions and Friedman (1968) were less cited, in proportion, in the first period (See the Online Appendix, Figure 6). As for Kydland and Prescott (1977), they were not cited at all during the 1975-1986 period.

are central or marginal, as well as to analyse the links between these different explanations.

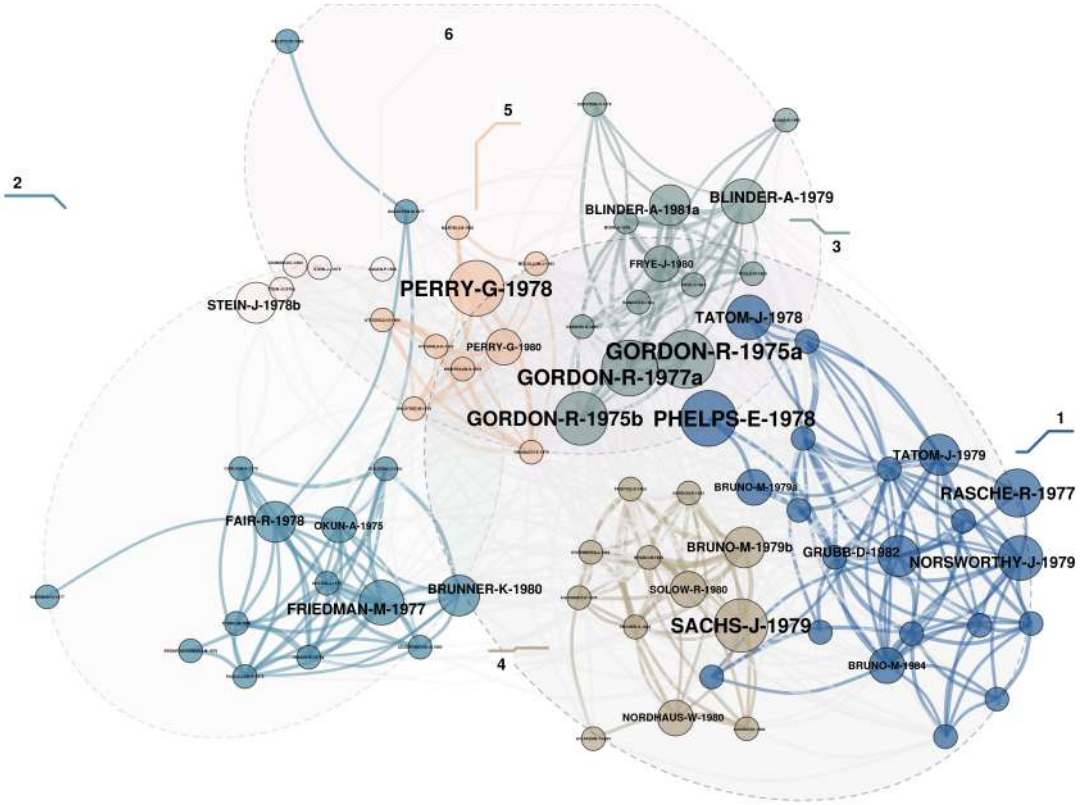

Figure 3 – Bibliographic coupling network of the 89 documents on the US stagflation, between 1975-1986.

The bibliographic coupling method links the documents of the stagflation dataset according to the number of references they share in their bibliographies. [13] The basic idea is that the more references documents share in common, the closer they should be, whether it is because of their topic, the thesis they defend, or their methods. Nonetheless, it exists many different motivations behind citing a reference and the fact that two documents share several references does not necessarily say much about the meaning of their proximity. Rather than helping us to understand how two articles are linked together, a bibliographic coupling network brings a macro-picture of the general structure of a corpus. What matters is rather the number of communities, the density of their links (within and between communities), and the position of nodes and communities in the core/periphery structure

13. For another example of the use of bibliographic coupling in the history of economics, see Claveau and Gingras (2016).

of the graph. [14] Figure 3 displays the resulting network for the 1975-1986 period and map the different explanations of stagflation during the 1975-1986 period. [15]

2.1 Mapping the stagflation explanations between 1975 and 1986

At the left periphery of Figure 3, communities 2 and 6 gather articles discussing the Keynesian-Monetarist controversy and the supposed disappearance of the Phillips curve. Phillips (1958), Phelps (1967, 1968) and Friedman (1968) were thus central references in the community 2, as well as Keynes's *General Theory*. The most cited article of Community 2 (by other stagflation documents of the period), Friedman's (1977) Nobel lecture, constitutes, according to Forder's (2014, 2) history of the Phillips curve, one of the first statements of the standard narrative about the evolution of the inflation-unemployment trade-off. [16] This narrative, in which Friedman's (1968) own article played a crucial role for dismissing the existence of a long-run trade-off, has shaped the way macroeconomists used to think

14. I have also used co-citation analysis, which links references that are cited together by the stagflation documents, to cross-check the results of the bibliographic coupling analysis (Online Appendix, Figure 2). The Online Appendix also gathers visualisations on the most cited references per community (Figure 4), a measure of the strength of the links between each communities of the bibliographic coupling network (Figure 5), as well as a measure of the links between the bibliographic coupling communities and the co-citation communities to support the description of stagflation explanations in the period (Figure 3).

15. Edges weights have been normalised to take into account the size of documents bibliography (see the Online Appendix for details). The structure of the network results from the *Force Atlas 2* algorithm, which is a force-directed algorithm—it brings closer nodes who are linked, depending on the weight of the edge, and it moves away the nodes with no link. The size of the nodes depends of the number of citations of the document by the other documents of the 1975-1986 corpus. The Leiden algorithm is used to identified different communities with dense links (Traag et al., 2019). The algorithm identified six communities (differentiated by colour of nodes) with a resolution of 1, and three larger communities (the nodes in the ellipse zones) with a resolution of 0.5. The graph displays the name of the most cited nodes for each community, which are labelled according to the name of the first author—See the Online Appendix for complete references.

16. The narrative could be summarised like this:

> Phillips (1958) discovered a negative relation between inflation and unemployment; then, either under the influence of Samuelson and Solow (1960) or otherwise, policymakers treated it as offering a selection of inflation-unemployment combinations from which they could choose, depending on their ... aversion to the two evils; much work was done investigating this tradeoff and, because of it, inflationist policy was pursued until Phelps (1967) and Friedman (1968) revolutionized thinking by pointing out that continuous inflation would change expectations and thereby shift the Phillips curve so that there was no long-run tradeoff. (Forder, 2014, 1)

about the debates of the 1960s and 1970s.[17] At the end of his Nobel lecture, Friedman proposed some paths of explanation for the rise of both inflation and unemployment in the recent years. He quickly discarded supply shocks as a relevant culprit and rather highlighted that the rising volatility of inflation would affect the allocation of capital and thus GDP growth.

Okun (1975) took the same point of departure as Friedman, that is the history of the Phillips curve in the 1960s. He considered that the "short-term Phillips curve has shifted upward" in the late 1960s, and thus that economists "are all accelerationists now" (Okun, 1975, 356)—leaving aside the issue of the existence of a long-run trade-off.[18] However, contrarily to Friedman, Okun did not explain shifts in the short-run Phillips curve by the adjustment of expectations strictly speaking and workers being fooled by the rising inflation. Okun distinguished "auction markets", where prices adjust quickly, from "customer markets", which relied on institutions and habits and where prices were rigid (Okun, 1975, 358-359). A higher rate of inflation would push customer markets agents to change the wage-price setting process and adjust prices more often.[19] This mechanism is consistent with the basic accelerationist story, but "very different from that implied by a natural unemployment rate and a particular expected inflation rate" (Okun, 1975, 382). The main implication was that a disinflation policy could be really costly, as unemployment would increase and stay at a high level for a long time, until the agents on the customer markets adjust their behaviour. In community 6, Jerome Stein (1978) and Philip Cagan (1980) criticised the monetary policy following the 1973 oil shock, which they saw as accommodating permanently the temporary effect of the shock on inflation. Thus, they argued against Modigliani and Papademos's (1976) argument for more expansionary monetary policy after 1974. Stein (1979) also criticised the defence of income policy to fight against stagflation, notably by Sydney Weintraub.

Articles in communities 2 and 6 echo the usual 'school of thought' view of the 1970s, with Monetarists attacking the Keynesian consensus (Duarte, 2016). Nonetheless, the network analysis shows that they were relatively peripheral in the literature explaining stagflation.[20] At the core of the network we find Gordon's

17. This narrative is also central for those post-1997 explanations of stagflation which regards the belief in a long-run trade-off as the fundamental cause of the stagflation (see Romer and Romer, 2002b).

18. For Okun, both inflation and unemployment were now stuck at higher levels than in the early 1960s. If it gave some weight to Friedman's argument, it did not mean that it would exist a natural rate of unemployment.

19. Okun (1975, 388) underlined later in the article the role played by raw materials price inflation and the dollar devaluation of the early 1970s.

20. Different analyses in the Online Appendix confirm this: communities 2 and 6 mainly cited articles from isolated communities in the co-citation network (Online Appendix, Figure 2). Communities 2 and 6 are also relatively isolated from communities 1,3,4 and 5, which share

(1975a) and Phelps's (1978) theoretical models which dealt with what monetary policy could do after supply shocks. Gordon presented his article as "an attempt to reconcile the views of Milton Friedman and Arthur Okun": "inflation in 1973 and 1974 can be regarded as a combination of an underlying 'hard-core' inflation, inherited from the 1960s and perhaps aggravated by the rapid pace of economic expansion between 1971 and 1973, with a set of four temporary 'bubbles"' (Gordon, 1975a, 183-184)—the "bubbles" being the shortfall in farm supplies, the oil shock, the end of price and wage controls and dollar depreciation. As for Okun, rigidity in price and wage adjustment was crucial: when wages and prices adjust only progressively, supply shocks trigger a loss in real output. The central bank has thus an interest in accommodating the supply shocks to limit the output loss, but indexation leads to a wage-price spiral. Supply-shocks associated with wages and prices indexation can thus lead to a rise of both inflation and unemployment. An amended Phillips curve framework similar to the one used by Gordon and Phelps—inflation could be caused by an excess in aggregate demand, but also by past inflation (or 'inflation inertia') and supply shocks—quickly diffused through textbooks. [21] Indeed, two major macroeconomic textbooks were published for the first time in 1978 and proposed a dynamic Aggregate Supply - Aggregate Demand (AS-AD) framework, with the combination of negative supply shocks, inflation inertia, and restrictive monetary policy, to account for the US stagflation (Gordon 1978, chapter 8 and Dornbusch and Fischer 1978, chapter 15). [22]

Outside of these theoretical works, Gordon (1975b; 1977) and George Perry (1978; 1980) proposed, in the *Brookings Papers on Economic Activity*, empirical decomposition of wage and price equations to analyse the impact of supply shocks, as the role of wage indexation to price, in transmitting these shocks to inflation. Blinder's (1979) book was similar: he proposed a meticulous analysis of the 1970s macroeconomic data. He explained the first phase of accelerating inflation (1972-1974) by rising food and energy prices, and Nixon wage-price controls. The second peak of 1978-1979 came again from the rise of food and energy prices, as for the rise of mortgage interest rates—which were counted in the CPI at the time. [23] The main papers in Community 4 (Nordhaus, 1980; Sachs, 1979; Solow, 1980), while also defending the importance of supply shocks in the rise of unemployment and

stronger links together (Figure 5).

21. The formalisation of the effect of past inflation—in other words, inflation inertia—is equivalent to the use of adaptive expectations, but did not refer to expectations strictly speaking, that is a "conscious cognition of the future" (Forder, 2014, 86). It rather reflected the existence of institutional settings and habits, which led to different consequences for policymaking (see Goutsmedt and Rubin 2018).

22. In Gordon's 1970s publications, a large place was also devoted to George Perry's (1970) argument of a rise of structural unemployment, due to demographic changes (Goutsmedt and Rubin, 2018).

23. Blinder (1982) completed with new data the analysis of the second peak.

inflation, adopted a more international perspective by comparing the effects of these shocks and the policy response to them in different OECD countries.

In the late 1970s and early 1980s, Michael Bruno and Jeffrey Sachs published, separately or jointly, several articles about stagflation. These articles constituted the basis for what would become *Economics of Worldwide Stagflation* (Bruno and Sachs, 1985). Outside of the international dimension and the analysis of the different policy options for each OECD country, depending on the real wage behaviour, they also focused on the supply-side effects of supply shocks. They studied how the oil shocks could discourage investment, impacting in turn the productivity and growth rate of OECD economies. The relation between energy prices and productivity was also central for most of the articles in community 1 in the bibliographic coupling network. [24]

For most economists in the 1970s and early 1980s, supply shocks—whether it was food price shocks, oil shocks, the productivity slowdown, or the perturbation induced by Nixon's wage-price controls—were crucial for creating the conditions leading to the stagflation. Inflation inertia, resulting from wage negotiations, long term contracts and habits, rather than expectations strictly speaking, explained the transmission of these shocks to a permanent high level of inflation, but also the high costs in terms of unemployment likely to appear if one wanted to reduce inflation. Of course, monetary policy was also scrutinised. Some authors regarded monetary policy—and quite rarely fiscal policy—as having been too expansionnary in the late 1960s and early 1970s. However, they had to argue against the supply-shock explanation, or to justify why it was not the fundamental cause of the stagflation according to them (Rasche and Tatom 1981, for instance). Actually, when monetary policy was under the spotlight, it was charged for the Fed non-accommodating reaction to the 1973 oil shock (Gordon, 1977; Perry, 1978; Phelps, 1978; Sachs, 1979). It was the main motivation for Blinder's book, whose the "basic message" was "that U.S. policymakers, faced with a difficult situation in 1973-1975, made a bad job of it" (Blinder, 1979, xii).

2.2 The place of New Classical Economics

Interestingly, the works of New Classical economists, which became influential in macroeconomics in the 1970s, appeared unimportant for explaining stagflation

24. Outside of communities 2 and 6, other authors with Monetarist views, like John Tatom and Robert Rasche, are gathered in community 1, with articles published in the *Federal Reserve Bank of St. Louis Review*. They focused on the impact of oil shocks on prices and productivity (Rasche and Tatom, 1977; Tatom et al., 1979), and did not discuss issues relative to the Phillips curve and the natural rate hypothesis. Nonetheless, Rasche and Tatom (1981), like Brunner et al. (1980) for instance, explicitly rejected accommodating monetary polices after supply shocks with permanent effects.

at this time. Major works of Lucas (1972, 1976) or of Kydland and Prescott (1977) were ignored. [25] Brunner et al. (1980) represented the only *explicit* attempt to explain stagflation by using the natural rate hypothesis, rational expectations, the Lucasian supply function (Lucas and Rapping, 1969) and a mechanism similar to Lucas's misperception mechanism (Lucas, 1972). In this model, stagflation was explained by agents' inability to distinguish immediately between a permanent and a transitory supply shock.

However, most references to the contributions of New Classical economists were critical. For instance, Perry (1978, 261) presented the "mainline model" explaining the "stubborn inflation" of the 1970s: demographic changes and rising effects of lagged inflation on current wage changes, explained by adaptive behaviour rather than by forward-looking expectations. He then turned towards "alternative views" (Perry, 1978, 279) that he dismissed one by one. "Misperceptions, perfect markets and rational expectations" constituted the last of the four views, gathering rational expectations models, as well as search models and Fellner's (1976) credibility model (Perry, 1978, 284-288). Perry regarded rational expectations model with misperceptions as unable to explain the persistence of inflation observed in data. Phelps (1978, 217-219) also attacked the "classical theory", its ignorance of the slow adjustment of wages and prices which led to its refusal of accommodation policy in case of supply shocks. Interestingly, for Phelps, it was these "rehabilitated conceptions of money-wage behavior" Phelps (1978, 217) that spread within the Federal Reserve and led to its non-accommodation policy after the first oil shock. However, most of the time, references to the relevance of New Classical ideas to explain stagflation remain allusive or nonexistent. For their part, Friedman's natural rate and his accelerationist story did not seem a fatal blow for explaining stagflation in a Keynesian framework. The argument that lagged inflation had an impact on current inflation appeared quite natural, and the issue of the existence of a long-run trade-off was not that essential.

The contrast between the state of macroeconomics in general and the stagflation literature is sharp. If we look at the pattern of citations of Lucas (1972, 1976), and Kydland and Prescott (1977), but also of Friedman (1968), it appears that their annual number of citation increased constantly in the ten years following their publication and reached much more higher levels than works on stagflation like Gordon (1975a) or Phelps (1978). [26] For each year, I have run a chi-2 test comparing the share of citations of each article—that is the number of time it was cited over the total number of citations of all the references in the whole corpus—both

25. Lucas (1973) or Barro (1978) are notable exceptions, as they were cited several times in our corpus (Figure 2), but they are not the most cited and influential works of New Classical economists.

26. The Online Appendix displays their normalised level citations in the WoS database (Figure 6).

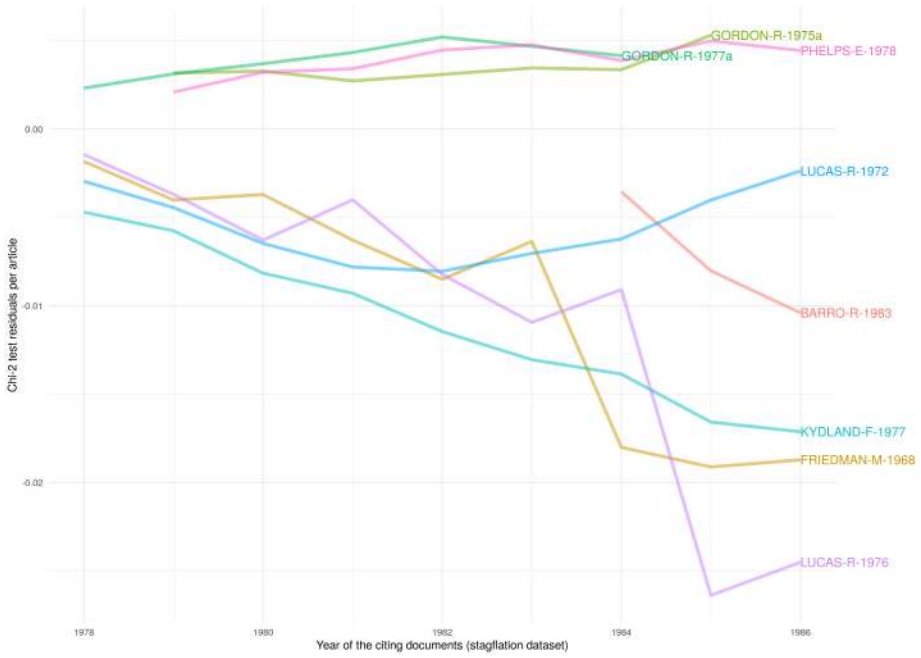

Figure 4 – Residuals of annual chi-2 test comparing the citations in stagflation corpus with the citations in the corpus of all articles in economics.

in my stagflation corpus and in the WoS economics corpus in general (Figure 4). [27] Popular articles on stagflation display positive chi-2 residuals: logically, they were over-cited in the stagflation corpus in comparison to economics in general, as they dealt directly with stagflation. Conversely, while Friedman (1968), Lucas (1972, 1976) and Kydland and Prescott (1977) were more and more popular in economics in general over the 1970s and early 1980s, they remain barely cited by articles and books on stagflation—which is why the chi-2 residuals are increasingly negative. It is worth noting that Kydland and Prescott's article was not cited at all before 1991—whereas it became a central reference within the stagflation corpus in the 1990s (Figure 2 but also the Online Appendix, Figure 7).

However, the focus changed in the late 1990s, with a new literature emerging on the US stagflation. Analysing the role of the Fed's monetary policy in the 1970s became central. This change would go hand in hand with a rising popularity of Friedman's work, as well as with the use of New Classical contributions that were ignored or rejected in the 1980s to explain stagflation.

27. The chi-2 test allows me to check if the distribution of citations of a set of articles by my stagflation corpus corresponds to the distribution of citations of these same articles by a reference corpus (here, economics articles in general). The residuals of the chi-2 test indicates which articles are over- or under-cited in my corpus, in comparison to their citations in economics in general.

3 The 1970s Economic Situation as a Monetary Policy Issue (1997-2013)

3.1 The Reappearance of the Stagflation Topic

As we saw earlier (Figure 1), after the mid-1980s, contributions about stagflation became rarer. Time passing, it became a less pressing issue and perhaps many economists had the feeling that "the case had been made and needed no more proof" (Alan Blinder, Personal Correspondence, 14/02/2020). Laurence Ball (1991, 1995) was one of the rare economists to address the issue. He observed that facts like oil shocks triggering inflation and disinflation causing a recession were accepted by economists "without scrutiny", although "these phenomena [were] surprisingly hard to explain—especially if one insist[ed] on assuming rational expectations" (Ball, 1991, 439). He also regarded "inflation inertia" and "wage-price spirals" as unable to account adequately for these facts and thus proposed a "combination of New Classical and New Keynesian theories—a model with both credibility problems and staggering" (440). One of the models he proposed was inspired by Barro and Gordon (1983b), which was an extension of Barro and Gordon (1983a) to the issue of central bank reputation. In his following article on the topic, Ball (1995) pursued his attempts to associate the time-consistency literature with the empirical observation of inflation inertia.

The few articles about stagflation that appeared in the early 1990s were dominated by the time-consistency issue. In a more historical and empirical style than Ball, Parkin (1993) also regarded time-consistency models as serious candidates to account for the period: in case of a rise of the natural rate of unemployment (as it was observed in the late 1960s and early 1970s), the 'inflationnary bias' described by Kydland and Prescott (1977) is supposed to increase. Taylor (1992) acknowledged that the time-consistency issue plus a rise of the natural rate was one of the main explanations of the US inflation. However, he favoured a second explanation: the "faulty inflation-unemployment models" which claimed that it existed a permanent negative trade-off (Taylor, 1992, 5), and led to underestimate the costs of inflation. These two types of explanations—the first one nonexistent in the stagflation corpus between 1975 and 1986, the second only raised at rare occasions by opponents to the Keynesian consensus—would then become major explanations of the post-1997 period.

The year 1997 constituted a turning point in the history of stagflation explanations, with the publication of DeLong (1997) and the circulation of the first manuscript of Sargent (1999). Both would become the two most cited references on stagflation (see Figure 2) and would stimulate new debates on the US inflation of the 1970s. DeLong (1997) proposed a detailed history of the evolution of eco-

nomic policies in reaction to the rise in inflation. He notably assessed the validity of different explanations of the stagflation: first, he dismissed the supply-shock explanation (citing Blinder 1982)—even if he acknowledged the importance of bad luck for the period—as it did not explain how the shock transmitted to core inflation despite the 1974-1975 recession, which played in the other direction; second, he rejected the Kydland and Prescott's story, because he had found nothing in the Federal Reserve deliberations that could support their story. According to DeLong, the most important factors were economists' theories and their optimism about the capacity of the government to reduce unemployment, but above all the "shadow of the Great Depression" (DeLong, 1997, 255) and the political pressure to favour the reduction of unemployment before any other objective. In his discussion of DeLong's article, Taylor (1997) supported DeLong's favoured explanations, even if, as in 1992, he underlined that he saw the theories of economists as the main driver. He also joined DeLong's criticism against the time-consistency story, that he regarded as "the most frequently cited reason why monetary policy led to excessively high inflation" (Taylor, 1997, 277).

In comparison to DeLong (1997), Sargent's *Conquest of Inflation* was more theoretical and mathematically formalised. Sargent explained the late 1960s and 1970s inflation by policymakers' belief in an exploitable trade-off between inflation and unemployment, and then the progressive change of this belief which led the Fed to reduce inflation. Two different stories could be told from this point. The first one involved the Federal Reserve "learning" the natural rate of unemployment by "*a priori* reasoning" (Sargent, 1999, 1), following the works of Phelps (1967), Friedman (1968) and above all Lucas (1972, 1976) . However, Sargent favoured a second story, called the "vindication of econometric policy evaluation": the Fed progressively tried harder to fight inflation, thanks "to the success of the econometric and policy-making procedures that Lucas challenged in his Critique" (Sargent, 1999, 3). In other words, it was 'bad' theories which led policymakers to run over-expansionary policies in the late 1960s and early 1970s, but it was not 'good' theories (meaning Friedman's natural rate of unemployment and the Lucas critique) that led them to try harder to reduce inflation in the late 1970s and early 1980s. Policymakers rather observed changes of parameters in estimated Phillips curves: they learned from data that the Phillips curve was shifting upwards and, whatever the underlying mechanism explaining this shift, it convinced them to stop trying to exploit a potential trade-off. In the following years, Sargent would pursue this line of research with Timothy Cogley, developing models of a rational policymaker, choosing optimal policies in function of what he learned from data and the different economic theories of the time (Cogley and Sargent, 2001, 2005b,a).

Finally, Bernanke et al. (1997) constitutes another important publication in

1997: using VAR techniques, they argued that US recessions in 1973-1975 and 1980-1982 were a consequence of the Fed's answer to the oil shocks, and not of the oil shocks themselves. All these contributions, developed from different motivations and with different methodologies, fostered a renewal of interest for the stagflation period.

3.2 Mapping Stagflation Explanations between 1997 and 2013

To gain a better idea of the relations between the different explanations of stagflation in the 1997-2013 period, I proceed like in the second section with a bibliographic coupling networks analysis (Figure 5). [28]

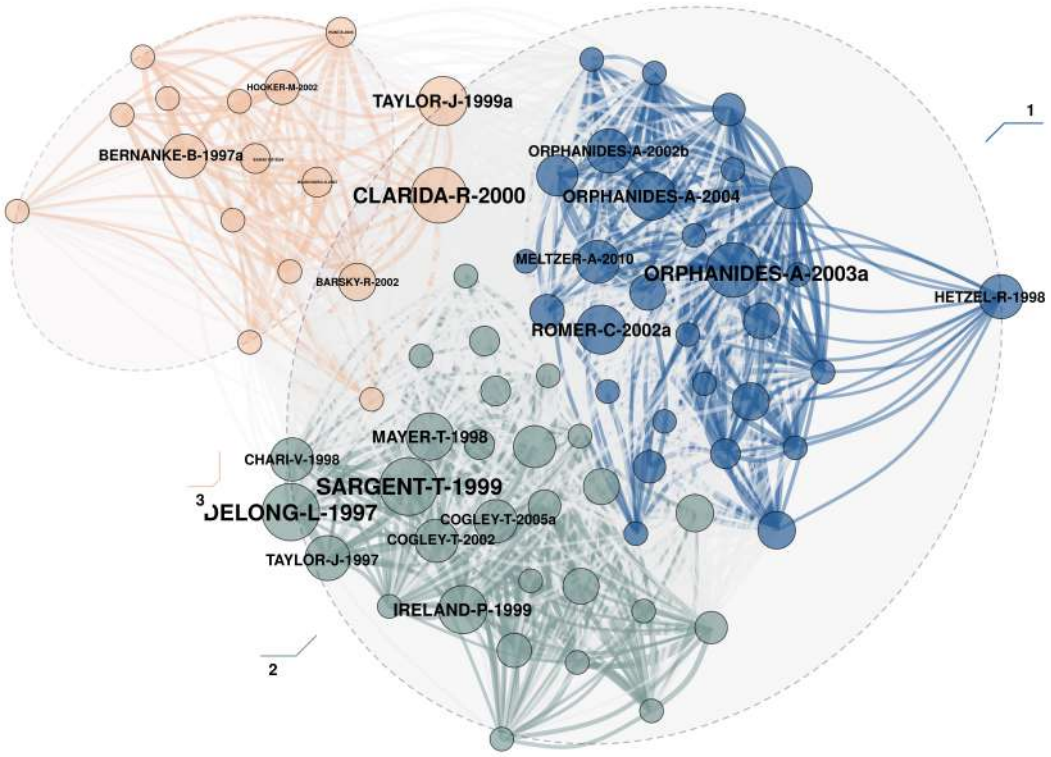

Figure 5 – Bibliographic coupling network of the 76 documents on the US stagflation, between 1997-2013.

First, the network is more connected and denser than that of the period 1975-

28. The Online Appendix (Figures 10 to 13) gave again additional elements to support my claims here.

1986: density equals 0.71 for the 1997-2013 period, against 0.19 for the former period. [29] The documents of the 1997-2013 period share many more references in common and appear as a well defined literature, with a common background and focusing on similar problems.

Nonetheless, community 3 is slightly marginal. Documents in it focused on the impact of oil price shocks, with Bernanke et al. (1997) as the main reference, but also Hamilton's (Hamilton (1983)) time series analysis of oil shocks effects after WWII and Bruno and Sachs (1985). [30] Several articles within this community supported the major role played by oil shocks to explain the stagflation. Barsky and Kilian (2002) and Clarida et al. (2000), who are at the margins of the community, criticised the oil shocks explanation. [31] Barsky and Kilian (2002, 137) attacked the "traditional explanation of the stagflation of the 1970s found in intermediate textbooks [which] is an adverse shift in the aggregate supply curve that lowers output and raises prices", and which "lent credence to the popular view that exogenous oil supply shocks in 1973-1974 and 1978-1979 were primarily responsible for the unique experience of the 1970s and early 1980s." They argued that the large international rise of money supply was the true cause of the stagflation, and actually provoked the rise of oil prices.

While Barsky and Kilian engaged directly with the 1970s/1980s explanations of the stagflation, most of the recent literature neglected these explanations and focused uniquely on the role played by monetary policy, rather than supply shocks. The Leiden algorithm distinguishes two other communities in the bibliographic coupling network. The first one encompasses two different types of literature. Athanasios Orphanides and John Williams proposed several contributions on the US stagflation. Orphanides (2003), the fourth most cited document of our dataset, argued that the stagflation resulted from the Fed's over-estimation of the output gap, due to the productivity slowdown. Orphanides's article showed that, in a situation of imperfect information and mismeasurement, activist monetary policy rules—like the Taylor rule (Taylor, 1993)—would have not yield better results. Many contributions in the first community thus discussed the use of monetary policy rules to describe the Fed's behaviour in the 1970s.

Another object of debates in this community was the opposition between the "ideas hypothesis" of Romer and Romer (2002b) and Romer (2005) on the one hand, and Meltzer's (2005) political explanation of the stagflation on the other

29. A graph density corresponds to the number of edges divided by the number of possible edges.

30. See the Online Appendix, Figure 12, for the most cited articles by each community of the bibliographic coupling network.

31. The two articles belong to the community 3, but with a resolution of 0.5 in the Leiden algorithm, they leave the group to be clustered with the large group on the right of the graph (see ellipse zones), meaning they are clearly at the intersection of the two groups

hand. Romer (2005) defended that "bad ideas" (the belief in a permanent trade-off between inflation and unemployment in the 1960s) played an important role in bad monetary policies. Or, in other words, economic ideas are important to understand the motivations behind economic policies, and thus ideas have an impact on macroeconomic variables. Meltzer (2005) belittled the significance of the ideas explanation, as he regarded the political context as the main factor behind the stagflation. The priority gave by politicians to unemployment rather than to inflation explained the pressure imposed by the Congress and the successive Presidents upon the Fed, which was forced most of the time to follow expansionary policies.[32] This sub-group in the first community relied on contributions to the Fed history, like Hetzel (1998, 2008), Mayer (1998) or Meltzer (2010) and cited many times Arthur Burns's (1979) recollection of his time as president of the Fed (see the Online Appendix, Figures 10 and 12).

The second community, around DeLong (1997) and Sargent (1999), partly focused on the issue of expectations and of the time-inconsistency problem. While DeLong and Sargent opposed to the time-inconsistency story of Kydland and Prescott (1977) for explaining US inflation in the 1970s, Ireland (1999) defended it. The time-inconsistency was also central for a new type of explanation of the stagflation, based on the concept of an "expectation trap" and relying on multiple equilibria and self-fulfilling expectations (Chari, 1998; Christiano and Gust, 2000; Albanesi et al., 2003; Christiano and Fitzgerald, 2003). In a regime of discretionary policy, some events (like an oil shock) could encourage private agents to expect more inflation. To avoid a recession, the monetary authority could be pushed to accommodate these expectations, which would thus become self-fulfilling. Inflation would persist through time and the Central Bank would be stuck in an expectation trap until it accepted the costs of a recession to reduce inflation.

These two core communities are largely entangled and shared many common references.[33] Even if different explanations of the stagflation are defended (the role of economic ideas or political pressure, the mismeasurement of economic variables, or a change in the implementation of monetary policy), they share a common focus on the role played by monetary policy.

32. Nelson (2005) and Di Cecio and Nelson (2013) can be ranged in Romer's side here, even if the "bad ideas" were not the belief in the long run trade-off, but the domination of a non-monetary view of inflation. On the other side, Weise (2012), for instance, defended that the political environment of the time with politicians afraid by high interest rates and high unemployment, had to be taken into account in addition to the "erroneous beliefs" of the Fed.

33. In the co-citation network (Figure 10 of the Online Appendix), highly cited references are central in the graph and at the intersection of two or three communities—that is less the case for the references cited by community 3 of the bibliographic coupling network, testifying of the relative marginal situation of the oil-shock topic. Regarding the strong links between communities 1 and 2, they could be seen as a unique community, as it is the case when one slightly reduces the resolution of the clustering algorithm.

3.3 Assessing the Transformations since the First Period

To supplement the picture of the transformations of stagflation explanations, I have also turned to quantitative text-analysis of the stagflation corpus. Text-mining allows me to extract words and bigrams of 171 documents of my dataset and observe the evolution of the terms used to describe stagflation. [34]

The frequencies of the use of words inform us on how the treatment of stagflation has changed (Figure 6). It confirms the switch of focus from supply shocks in general to monetary policy. The increasing frequency of the use of "monetary policy" since the 1990s was accompanied by a higher frequency of "expectation" and related words. It peaked during the 1990s that were characterised, as we have seen, by a rising influence of the new classical literature, and notably Kydland and Prescott (1977) and Barro and Gordon (1983a). [35] Interestingly, the expression "oil shock" has been more widely used in the more recent period. We have seen that, even if marginal, several works in the recent period addressed the issue of oil shocks to question their impact on growth and inflation, but also to analyse if the same effects could have occurred with the early 2000s oil shock. For economists in the 1970s, the oil shocks were just one of the many supply shocks that have hit the US economy. They proposed a broader perspective which took into account many factors, and not just the oil shocks, to explain the stagflation. [36]

The most symbolic consequence of this change of focus for explaining stagflation is the abandonment of the term 'stagflation' itself. Indeed, except in some contributions that dealt with oil shocks, 'stagflation' was progressively replaced by the 'great inflation' to label the US economic situation of the 1970s (Figure 6). During the NBER 2008 conference on the "great inflation", Blinder and Rudd (2013, 121) criticised this terminological transformation considering that "the Great Inflation was really the Great *Stagflation*" and that "any coherent explanation must also explain the contemporaneous deep recessions". It remains that Blinder and Rudd's article, which defended the "supply-shock explanation" (121), belonged to

34. I have also built a network of the stagflation documents where the links between documents depend on the proximity of their vocabulary (See the Online Appendix, Figure 14, for further details on this method). The network is polarised between the recent documents that focus on monetary policy, and those that focus mainly on oil shocks and supply shocks (old documents, but also the more recent contribution on oil shocks, gathered in community 3 in Figure 5). In other words, the structure of this vocabulary network is not determined by the changes of concepts and vocabulary of economists over time, but rather by the changes of focus—from supply shocks related issues to monetary policy related issues.

35. This is confirmed by the high use of "time-consistency", as "Kydland-Prescott model" and "Barro-Gordon model" in the 1990s and early 2000s (Online Appendix, Figure 18).

36. If we look at the most identifying words for each period, "energy", "wage", "capital", "productivity" and "labor" arrive in the first ranks for the 1975-1986 period, whereas "oil", "rule", "burns", "fomc", "natural rate" and "policymakers" are dominant for the more recent period (see the Online Appendix, Figure 16, for methodology and results).

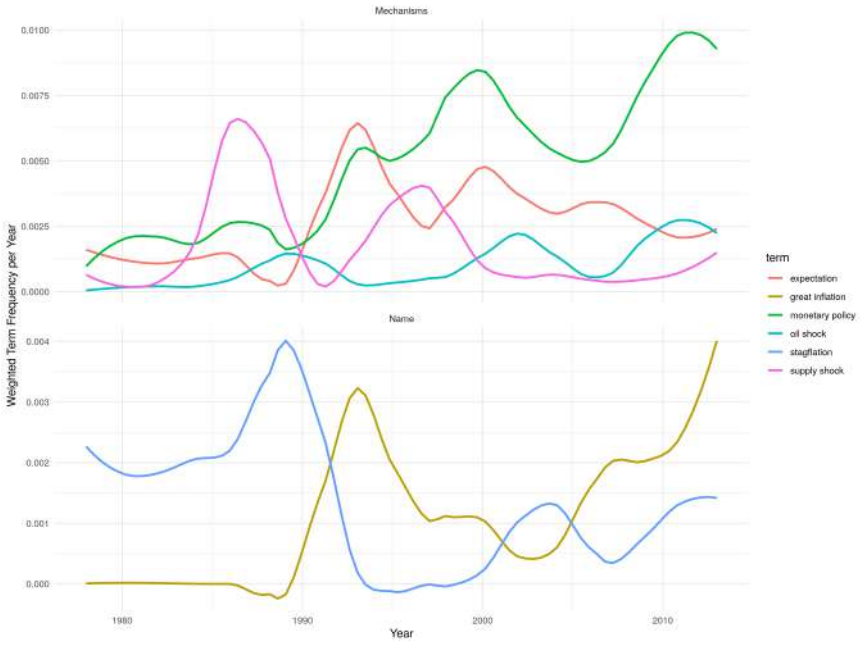

Figure 6 – Evolution of the normalised frequency of words used by stagflation documents.

the first part of the conference labelled "Early Explanations", whereas what would represent more modern explanations were gathered under the label "New Monetary Explanations".

Conclusion

While a common narrative about the history of macroeconomics describes the 1970s as a period of revolutions and vociferous battles of ideas, the 1990s is referred as the period of the "new neoclassical synthesis" (Goodfriend and King, 1997), a period of convergences and compromises between the Real Business Cycles and the New Keynesian programs of research.[37] This article has demonstrated that the methodological battles of the 1970s made marginal apparitions in the contributions explaining the US stagflation in the 1970s and early 1980s. Supply-shocks and inflation inertia were seen as the major mechanisms underlying the stagflation and the minority which proposed alternative explanations was forced to deal also with the supply-shocks explanation. Such an explanation was at odds with Friedman's and Lucas's views.[38] However, it did not seem highly controversial at the time

37. Duarte (2012) discusses the building of such a narrative.

38. Consistently with his opposition to the existence of cost-push inflation, Friedman declared in *The Guardian* in September 1974 that it was "a complete fallacy to suppose that the rise in

and it appeared sufficiently satisfying for the topic to progressively disappear after the mid-1980s.

In the following years, some rare contributions were published, notably Ball (1991, 1995) and Parkin (1993), which regarded Kydland and Prescott (1977) and Barro and Gordon (1983a,b) as credible models to explain the 1970s US inflation. A major renewal in the literature appears after 1997, with DeLong (1997) and Sargent (1999). After 1997, stagflation explanations largely differed from the 1970s and 1980s, and focused on the role played by the monetary policy of the Fed, questioning the role of distorting political pressure, bad economic ideas, bad policies and inappropriate institutional settings. The path-breaking contributions that stimulated methodological debates in macroeconomics in the 1970s (like Friedman 1968; Lucas 1976 or Kydland and Prescott's article), and which were mostly ignored in the stagflation literature at the time, were now central references. A contemporaneous reader of the recent contributions on the 'great inflation' could be easily tempted to think that New Classical references were also the main sources of inspiration to explain the stagflation during the 1970s and early 1980s. As this article demonstrates, that was obviously not the case.

The contributions of the late 1990s and 2000s proposed a diverse sample of explanations, turning around the role played by monetary policy. This diversity seemingly relies on a relatively unified background, with common references. Expectations generally played a key role, and the New Keynesian Phillips curve as the Taylor rule were frequently used. Nonetheless, a main dividing line remains in this recent literature on the "Great Inflation", depending on the answers to the question "have economists (and policymakers) drawn the lessons from the 1970s experience?"

A first group (composed by DeLong and Taylor in a certain extent, but above all by Christina and David Romer) answers positively and delivers a narrative about the progress of economics and the development of new solid foundations for monetary policy since the 1970s. In this narrative, the Phillips curve "myth" as described by Forder (2014) played a crucial role: the belief in the long term trade-off, stimulated by Samuelson and Solow's 1960 article, was the main culprit for the inflation of the 1970s, and Friedman (1968) and the development of the natural rate hypothesis has progressively contributed to changing the beliefs of policymakers.

Sargent, although he supported the importance of policymakers' beliefs in the long-run trade-off, belonged to the second group. In his discussion of Romer and Romer (2002a), he seemed to reject this narrative of the progress of economists'

the price of oil, or of other commodities, has had any significant effect on inflation" (Nelson, 2007, 159)—See also Forder (2019, 287). Lucas did not address, at the time, the impact of the oil shocks on the US economy, but later declared that "the direct effect of the OPEC shocks was minor" (Snowdon and Vane, 1999, 152).

and policymakers' thought. Summarising the conclusion of his 1999 book, he argued that it was likely that the "Fed did the right thing for the wrong reason" (Sargent, 2002, 92): the model of the Fed was reestimated with new data and adopted the natural rate view of the Phillips Curve because it was vindicated by these new estimations. They did not do it for theoretical reasons, by taking into account the Lucas critique. In Sargent's words, if policymakers have not "learned a correct rational expectations version of the natural rate hypothesis", "the mean dynamics governing adaptation threaten eventually to rekindle inflation" (Sargent, 1999, 134).

Orphanides also developed (quite different) arguments against the optimistic narrative. Following one of Friedman's (1968, 10) argument, he opposed any activist Taylor rule, considering that strong reliance on imperfect data (like estimations of the natural rate of unemployment and of the output gap) could lead to worse results than following a non-activist policy rule.[39] A third argument of this group of 'pessimists' came from the economists developing models in the time-consistency spirit. Chari (1998, 488), Ireland (1999, 290) or Christiano and Gust (2000, 22-23) all argued that, as the mandates of the Fed and the general institutional settings governing monetary policy have not changed since the 1970s, nothing prevents a coming back of a new high inflation period.

Whether inspired by Friedman, the Lucas Critique, or the time-consistency literature, many authors of the 1990s and early 2000s contributions about stagflation denied that the lessons of the 1970s have been properly drawn. They considered that monetary policy would not be able to prevent a new period of high inflation, in a context similar to the 1970s. A history of stagflation explanations sheds light on the remaining divisions in macroeconomics at the time of the 'new neoclassical synthesis'. It is thus a supplementary motivation for historians to scrutinise the concrete foundations of this supposed period of convergence.

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39. Drawing conclusions from his *AER* article on the 1970s, Orphanides argued:

> [A] more fundamental flaw can be readily identified: concentrating policy efforts toward targeting the economy's elusive full employment potential. Paradoxically, had policymakers concentrated their efforts on safe-guarding price stability alone, better outcomes for both employment and price stability would have been likely. As long as "we have as yet devised no method to estimate accurately and readily the natural rate" (Friedman, 1968 p. 10), it would appear wise to simply accept that the scope for stabilization policy remains limited. (Orphanides, 2002, 116).

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