

What was the message of Friedman's *Presidential Address* to the American
Economic Association?*

James Forder
Balliol College, Oxford
james.forder@balliol.ox.ac.uk

15 December 2016

Abstract

It is widely accepted that the importance of Friedman's Presidential Address to the American Economic Association lies in its criticism of policy based on the Phillips curve. It is argued that a reading of the text does not support such a view, and this and other considerations suggest that any such aim was far from Friedman's mind in 1968. His objective was the quite different one of making a case for policy 'rules' rather than discretion.

Keywords

Milton Friedman; rules and discretion; expectations; Phillips curve

JEL: B22, B31, E58

I. Introduction

There is a widely held and almost completely unquestioned view that the principal objective and most important effect of Friedman's (1968a) Presidential Address to the American Economic Association was to challenge and dismiss the idea of an 'exploitable Phillips curve'. That was the idea that the maintenance of high levels of aggregate demand could hold the labour market permanently out of equilibrium and thereby achieve a low rate of unemployment at the expense of a high rate of inflation. It is said that Friedman undermined this view by presenting an innovative argument to the effect that an attempt to reduce unemployment by inflationary means would result in the adaptation of expectations, and consequently the disappearance of any tradeoff between inflation and unemployment. This would lead to the return of unemployment to its equilibrium level – labelled the 'natural rate' by Friedman. On the basis that these were new ideas and dealt a crushing blow to the prevailing consensus, Friedman's address is often held to have been revolutionary. Sometimes it is said

* I am grateful to participants in the 48th UK History of Economic Thought Conference, at Shanghai in September 2016, for their comments, and to Kardin Somme for research assistance.

even to have been prophetic in actually forecasting the rising inflation of the 1970s. For these reasons, the paper is said to be amongst the most important in macroeconomics, and its insights to be the basis of a substantial part of Friedman's intellectual legacy and reputation.

One observation about this sort of view is that the revolution supposed to have been brought by Friedman cannot have occurred, since the consensus it supposedly destroyed never existed. The Phillips curve was almost never treated as offering a 'menu' of inflation and unemployment combinations to the policymaker, and no certainly no American or British policymaker pursued inflationary policy in the 1960s because of it. The commonly-told story to the contrary emerged in a transformation of the literature in the mid-1970s.¹

That does, though, raise questions about what message Friedman intended his *Address* to convey, and perhaps even of what his understanding of then-current thinking about expectations and the Phillips curve was. On the first question, a plain reading of his paper suggests that its message was that monetary policy would deliver better results if set according to a 'rule' rather than by 'discretion'. For one thing, its title was, after all, was 'The role of monetary policy', not 'The fallacy of the Phillips curve'. And for another, in its final paragraph, in what very much seems to be a summing up of the view he wished to convey, Friedman said,

By setting itself a steady course and keeping to it, the monetary authority could make a major contribution to promoting economic stability. By making that course one of steady but moderate growth in the quantity of money, it would make a major contribution to avoidance of either

¹ The point about the menu arises from a study of every econometric Phillips curve fully published in the academic literature in English before 1968 in chapter 3 of Forder (2014). Chapters 6 and 7 of that book considered the question of policymaking and the emergence of the story. The precision with which the emergence of the story can be dated is one of the most striking facts about it and is confirmed by the findings of Forder (2015) to the effect that it appeared in textbooks more or less exactly in 1978. The general sense of the unimportance of the Phillips curve in the economics of the 1960s is reinforced with further evidence in Beggs (2015) and Forder (2017?).

inflation or deflation of prices. Other forces would still affect the economy, require change and adjustment, and disturb the even tenor of our ways. But steady monetary growth would provide a monetary climate favorable to the effective operation of those basic forces of enterprise, ingenuity, invention, hard work, and thrift that are the true springs of economic growth. That is the most that we can ask from monetary policy at our present stage of knowledge. But that much – and it is a great deal – is clearly within our reach. (p. 17)

Clear as that seems to make Friedman's goal, it is remarkable that later commentary has very often omitted any commentary on his case for rules, and proceeded very much on the basis that the importance of his argument lay in what he said about the Phillips curve.²

It might also be said that it remains an open possibility that Friedman's intention was that his conclusion should be accepted because of his argument about the Phillips curve. The discussion of the Phillips curve would then still be the true core of the paper. A closer look at the argument of the *Address* suggests that is not correct, but more evidence comes from draft versions of it, and from other works of Friedman. Between them, these reveal no evidence that Friedman wished to emphasize any argument about expectations or the Phillips curve, and clearly suggest that at the time of his *Presidential Address* he would not have thought such an argument novel, surprising, or interesting.

² Occasional mentions of Friedman (1968a) in connection with the rules versus discretion debate should not distract attention from the point that it is rarely suggested that this was his area of central concern. Schwarzer (2013) comes close, noting that emphasis on Friedman's discussion of the Phillips curve sometimes obscures his point about rules; Rivot (2015) offers a rare example of Friedman's paper being considered in relation to the debate over rules, with no mention of the Phillips curve. More weighty, though, might be the number of instances of discussions of the question of rules and discretion which make no mention of Friedman (1968a) at all – Fischer (1990) amongst them.

II. A closer reading of the *Address*

The *Address* is in four parts – an introduction followed by three numbered sections with the headings: ‘What monetary policy cannot do’; ‘What monetary policy can do’; and ‘How should monetary policy be conducted?’ The introduction begins with an assertion that there is wide agreement about the goals of policy: high employment, stable prices, and rapid growth, but less agreement about their compatibility or the terms on which they should be traded off against each other, and less still about the role of each instrument of policy. Friedman identified monetary policy as his subject and the questions to be addressed as being what it could contribute and how it should be conducted. Here, there is already a significant point, because Friedman pointed to three layers of analysis – the general goals, the tradeoffs, and the roles of particular instruments. The issue of the exploitability or otherwise of the Phillips curve would clearly fall in the second; but it was the third – actually, just that part of the third concerning monetary policy – that Friedman identified as his subject matter.

Following that setting of his objective, Friedman spent nearly four pages describing the view that monetary policy had been believed powerful in the 1920s, that views had changed after the Depression, but that since the War it gradually come again to be seen as powerful. That was partly a result of theoretical insight and post-War experience, and partly of a reassessment of the Depression, in connection with which Friedman clearly alluded to, although he did not actually cite, Friedman and Schwartz (1963) and their view that the lesson of the Depression was that it was caused by poor monetary policy, not that it showed the inability of monetary policy to restore prosperity. However, the introduction concluded with the warning that there was a danger that, with the renewal of confidence in monetary policy, too much would be expected of it.

In itself, that could be consistent with either the main point of the paper being to make a case for rules, or against the Phillips curve. But those introductory

remarks led immediately – in the next section of the paper – to the consideration of what monetary policy cannot do, and Friedman said he would discuss just two things – namely the targeting of a specific nominal interest rate or of a particular rate of employment. In that section, his intentions become clearer.

He argued first that a monetary expansion would lower interest rates only temporarily. Here, interestingly, he discussed three consequences of that monetary expansion and said they would be sufficient to return real interest rates to equilibrium and only then introduced the question of changing expectations, saying ‘when and if’ (p. 6) such a factor became operative, it would have further effects. That was by no means giving emphasis to the matter of expectations since the impossibility of targeting a nominal interest rate was established without reference to it.

Friedman then moved to the question of employment, saying his analysis went ‘more against the grain of current thinking’. (p. 7) In elucidating this, he said there was one level of unemployment that was consistent with equilibrium in the structure of real wages, and labelling it ‘the natural rate’ gave his famous definition of it as ‘the level that would be ground out by the Walrasian system of general equilibrium equations’ (p. 8). He then said there was a resemblance between that statement and the Phillips curve, and continued,

Phillips’ analysis of the relation between unemployment and wage change is deservedly celebrated as an important and original contribution. But, unfortunately, it contains a basic defect – the failure to distinguish between *nominal* wages and *real* wages – just as Wicksell’s analysis failed to distinguish between *nominal* interest rates and *real* interest rates. Implicitly, Phillips wrote his article for a world in which everyone anticipated that nominal prices would be stable and in which that anticipation remained unshaken and immutable whatever happened to actual prices and wages’. (p. 8)

He then described the circumstances of very high inflation in Brazil and commented that nominal wages had to rise quickly to keep real wages unchanged and that an excess supply of labour would be reflected in their rising less quickly than expected inflation, rather than in a fall in nominal wages. He continued saying that the reduction of inflation had, as should be expected, brought a temporary increase in unemployment. To that point, Friedman appended a long footnote saying that the Phillips curve would be well defined for periods where the average rate of change of prices had been stable, with higher curves associated with higher average rates of inflation, but that where there was variability of inflation, the curve would not be well defined, that he believed this accorded with empirical research on the Phillips curve, and that if Phillips' analysis were restated in terms of real wages or anticipated real wages everything fell into place. He said that this was the explanation of the fact that 'students of empirical Phillips Curves have found that it helps to include the rate of change of the price level as an independent variable'. (p. 9n)

That was the end of the discussion of the Phillips curve – it makes no further appearance in the *Address*. It is notable then that Friedman made no suggestion that policy was based on any view about the curve. Its role in his account was exclusively to facilitate the description of outcomes, not intentions, and even then only in Brazil. There was no indication at all that any policymaker believed the Phillips curve contained any message about policy possibilities.

Even more important than that, though, is the point that although the Friedman certainly seems to criticize Phillips, the footnote clearly said that those following him had incorporated price change as an explanatory variable. Here, then, and crucially, Friedman recognized that the post-Phillips literature was not based on any view such as that nominal wages were set without regard to their purchasing power. Whether his criticism of Phillips is fair is one question, but he was absolutely right about the following literature. He was also right to say that what featured was a measure of price change, not of any expectation. But that, of course, is as much a matter of how the coefficient is interpreted as anything. As was later occasionally observed, the same variable could perfectly well be

treated as a measure of expected inflation.³ So there is no doubt that Friedman appreciated that econometrically estimated Phillips curves – or the more successful ones, at least – of the time did *not* share the ‘basic defect’ he attributed to Phillips’ own work.

Having finished discussing the Phillips curve, Friedman turned to policymaking. There, he said, (p. 9)

‘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.’

This, it should be noted, is on its face an hypothetical discussion – it was not being said that policymakers had done such a thing. He considered the effects of a monetary expansion, and argued that its initial effects would be as desired so that employment would rise, but as wages then rose, it would return to its initial level. The argument contains a peculiar and clear mistake, although not one that is fatal to his argument,⁴ and he reached the conclusion that, (p. 10)

‘As in the interest rate case, the “market” rate can be kept below the ‘natural’ rate only by inflation. And, as in the interest rate case, too, only by accelerating inflation. Conversely, let the monetary authority choose a target rate of unemployment that is above the natural rate, and they will be led to produce a deflation, and an accelerating deflation at that.’

³ The overwhelming majority of Phillips curve estimates of the 1960s included a price change variable. The evidence is assessed in Forder (2014, ch 3 part 2), where there is also a fuller argument on the interpretation of the price change variable in terms of expectations. The question of whether Friedman was fair to Phillips depends on what his objectives are taken to have been and that is considered in Forder (2014, ch 1 part 2).

⁴ He said that initially an increase in output took place at ‘former’ (p. 10) nominal wages, but his following discussion only makes sense if wages had in fact risen. The matter is more fully discussed in Forder (2014, ch 1 part 2).

This too is an important passage in interpreting Friedman's argument as a whole because it is evident that the case of an unemployment target below the natural rate was expositional, and of no more importance in Friedman's mind than the case of a target above it. The conclusion he reached at this point was not that a policymaker who attempts to maintain too low a rate of unemployment would produce accelerating inflation, but that *any* target other than the natural rate would ultimately be unachievable.

The character of his argument is even more apparent from the fact that he immediately moved to very brief discussion of what would happen if the policymaker were to target the natural rate itself. Here, Friedman noted that the rate is not in fact known, but said that even if it were, the variability of non-monetary factors would mean that monetary policy would be 'buffeted this way and that by the forces that produce temporary departures of the market rate from the natural rate'. He evidently meant to argue that this too was not a practicable option.

He then said 'To state this conclusion differently', (p. 11) and using the expression 'trade-off' for the first time in the paper said that there was a temporary tradeoff between inflation and unemployment, arising from mistaken anticipations, but no permanent one. That perhaps gives more of an impression of the argument being focussed on policymaker attempts to lower unemployment, but it was not the end of the discussion, since Friedman then said 'To state the general conclusion still differently' (p. 11) and said that monetary policy could target nominal quantities, but,

'It cannot use its control over nominal quantities to peg a real quantity – the real rate of interest, the rate of unemployment, the level of real national income, the real quantity of money, the rate of growth of real national income, or the rate of growth of the real quantity of money'. (p. 11)

That was where the section on what monetary policy cannot do ended, and at that point there is evidently no indication that Friedman's particular objective was to expose a mistake about the Phillips curve, nor to suggest that actual policy was inflationist.

Moving, in the third section of the paper, to what monetary policy can do, he said first that it could avoid introducing disturbances, referring again to the policy mistakes of the inter-war period and saying that every major American contraction, as well as every major inflation had been caused or exacerbated by 'monetary disorder'. (p. 12) In this connection he said that if a monetary rule had been in operation the 'Great Contraction' (i.e. the fall in the money supply between 1929 and 1933) might not have occurred, and would certainly have been much less severe. In that, there is again no suggestion that policy had a tendency towards inflation. Rather, the problems of contraction and inflation appear to be balanced, except that much the biggest single error caused a contraction. But he then went on to comment on recent policy, saying,

'The past few years, to come closer to home, would have been steadier and more productive of economic well-being if the Federal Reserve had avoided drastic and erratic changes of direction, first expanding the money supply at an unduly rapid pace, then, in early 1966, stepping on the brake too hard, then, at the end of 1966, reversing itself and resuming expansion until at least November, 1967, at a more rapid pace than can long be maintained without appreciable inflation.' (p. 12)

In that, there is a suggestion that policy is inflationary, but it is clearly not the main point. Far from suggesting that the failing of policy was that a consistent pursuit of too low a rate of unemployment was leading to inflation, his concern was, on the contrary, that policy was insufficiently steady.

He then listed other things the monetary policymaker could do. One was to suggest institutional improvements and pursue a policy to make the price level predictable. Finally, he said monetary policy could contribute to 'offsetting major

disturbances', such as caused by a excessive fiscal deficit (which he did suggest was a current problem), or, he suggested,

'If the end of a substantial war offers the country an opportunity to shift resources from wartime to peacetime production, monetary policy can ease the transition by a higher rate of monetary growth than would otherwise be desirable'. (p. 14)

That surely reflects an argument which was widely discussed in the 1960s to the effect that inflation could 'lubricate' the labour market by allowing some real wages to fall without requiring nominal wage reductions.⁵ That argument was sometimes framed in the language of 'the Phillips curve'. So here, there is just a hint of Friedman even approving a version of the Phillips curve, even though, he went on immediately to say that great caution was required, and monetary policy should only be used in this way when the need was clear.

Then he moved, in the final part of the paper, to consider the conduct of monetary policy. He said he could not give a full account of the question, but citing Friedman (1959), said he would limit himself to two points that 'follow fairly directly from the preceding discussion'. (p. 14) The first of these was that the target of policy must be a nominal variable and went on to say that the most appealing possibilities were the exchange rate, the price level, or the quantity of money. Of these he said the exchange rate was inappropriate for the United States as it would require the whole economy to adjust to the external sector. The price level, he said, was intrinsically the most important, but was a poor target because uncertainties about the size and timing of effects of policy on it meant that in targeting it, monetary policy would very likely introduce disturbances. Therefore a money supply target was best, with the question of which one being a secondary consideration.

⁵ The extent of discussion of it is established in Forder (2016).

The second point he made was that the authorities should avoid 'sharp swings in policy'. (p. 15) He reprised the discussion of policy error from page 12 (quoted above), also saying that each change of policy had come too late, and been too large, and added four other earlier occasions when he said the same thing had happened. This led him to say that the best approach would be to adopt a target for the rate of growth of the money supply, but failing that, it would be an improvement if the policymaker would simply avoid large swings in policy.

Here again, then, we see his intent with great clarity. Friedman specifically identified these two points as the ones that arose 'fairly directly' from the foregoing discussion. Neither of them was about the natural rate of unemployment, expectations, the Phillips curve, and certainly not any attempt by the policymaker to achieve a presumptively stable, but inflationary point on a Phillips curve. They are, on the other hand, both about the desirability of rule-based policy. The presentation then concluded with one final paragraph, already quoted above from page 17.

A simple reading of the paper therefore gives no reason at all to think either that the discussion of the Phillips curve or expectations was the centrepiece of Friedman's argument. On the contrary, that discussion is short, imprecise, in the middle of the paper, being only part of his argument pointing to a conclusion which is itself only a step on the way to Friedman's final conclusion, and those final conclusions make no specific reference back to the discussion it.

III. Drafts of the Address

Some further insight arises from considering drafts of the paper which are available at the Hoover Institution Archive. The earliest is dated July 1967 and there are numerous hand-written emendations to the typescript, and there are partial copies of a typed version incorporating these changes (also dated July).⁶ There must then have been a much more substantial revision because there is

⁶ Milton Friedman archive, Box 49, folder 10.

another draft, dated September 1967,⁷ which is very similar to the final version. There is then a version marked and dated as the Address itself which is identical to the published version except for what are probably copy-editing changes.⁸ In addition to smaller variations, then, we have one clearly distinct draft in the July version of the paper.

That version was much more focussed on the question of whether monetary policy can target a particular level of unemployment. Even its title – ‘Can full employment be a criterion of monetary policy?’ – reveals that. There, the nearest Friedman came to discussing the impossibility of targeting interest rates was to argue that they provide a poor measure of the stance of monetary policy. (p. 2-3) Neither the discussion of the things that monetary policy can do, nor the discussion of the changes in policy direction in the 1960s and before appears at all; and there is only a very brief treatment of price level targeting. In some important ways, the exposition of the argument about targeting unemployment is also different.

Right at the beginning, Friedman declared it to be ‘an article of faith’ that

‘full employment is not only a major objective of economic policy in general but that it can be and should be a specific criterion of monetary policy – that the monetary authority should be “easy” when unemployment is high and “tight” when unemployment is low. This is so much taken for granted that it will be hard for you to believe that I am serious when I say that in my opinion this belief is wrong – that whatever might be desirable, full employment cannot serve in this way as a criterion of monetary policy.’ (p. 1)

The substance of the argument for this conclusion was very much like that in the final version but there are some differences of exposition to note.

⁷ Milton Friedman archive, Box 49, folder 11.

⁸ Milton Friedman archive, Box 49, folder 9.

Friedman began the argument saying,

'let us suppose that the monetary authority sets a target level of employment, say, the widely used 96 per cent of the labor force (unemployment = 4 per cent)' (p. 4)

That would mean, he said, adopting 'easy' policy when unemployment was above this level, and 'tight' policy when it was below it. After considering perhaps peripheral matters about which monetary tool might be used, and consequential differences in the meaning of 'easy' and 'tight', he stated the crucial question as,

'In principle, will following this policy yield a unique and stable path of monetary growth that will achieve or contribute to the desired objective of keeping employment in the neighborhood of 96 per cent?

The answer, I shall argue is No. If the unemployment target happens to be wrong, in a sense I shall specify, the policy will produce either an explosive inflation or an explosive deflation. If the employment target happens to be correct, the policy will produce the equivalent of a random walk in the quantity of money'. (p. 6)

He then assumed – just as in the final version – there had been a period of price stability, with unemployment above target, and the policymaker then sought to address this with a monetary expansion. The argument followed what can for current purposes be treated as much the same lines as in the final version, although it was taken rather more slowly. In due course it also reached a rather more developed conclusion specifically making the point that in successive rounds of expansion, anticipations would be likely to adjust more quickly than they did in previous ones so that,

'Clearly, the final outcome of strict adherence to the rule would be accelerated and ultimately explosive inflation. The public will sooner or later start to anticipate not only the first derivative but also higher

derivatives of the price movement ... There is no stable and bounded path of monetary growth that is yielded by adherence to the rule outlined'. (p. 11-12)

He then introduced the natural rate of unemployment in substantially the same way as it appeared in the final version and also made his remarks about the Phillips curve. In this version, though, the whole of the discussion was in the main text, rather than most of it being in a footnote.

Having done that, he then explicitly noted that the example worked out in detail had presumed that the policy target was a rate of employment above the natural rate. But, he said, partly in a hand-written change, the analysis would apply equally to an employment target that was too low, and that would result in an accelerating deflation. (p. 15) After that he considered the case of targeting the natural rate itself, giving it rather more careful attention than in the final version and again making it clear that his concern was that such an approach to policy would be destabilizing. (p. 15-16)

There was then some discussion of possible objections to his argument, in the course of which he said that the adjustment of expectations might be slow. He considered the period starting in 1960-1 when he said expected inflation was low and said of the following period, (p. 21)

'For about 4 years rapid though somewhat erratic monetary growth was reflected primarily in output. Not until 1965 did prices start to rise at an appreciably accelerated rate, and many would attribute this result to the reinforcement of monetary growth by the escalation of war expenditures.'
(p. 21)

He drew the conclusion that the 'time scale of explosion at the moment in the U.S. may well be measured in quinquennia, not years or months' (p. 21), but went on to say that it would be foolish to attempt to dismiss the ultimate effects for that

reason, and that he did not in any case think that the United States would adopt such a policy.

He briefly noted that the slow adjustment also made it difficult to determine what was an effect of a price rise on employment and what was the effect of an accelerating price rise. To this, he said, 'To distinguish between these, one must look at a broader range of experience. The difference is then patent', (p. 22) but gave no indication of what experience he had in mind. He then very briefly concluded in favour of rules-based policy.

In the July version, then, the crucial theoretical argument *was* about the impossibility of targeting a specific rate of unemployment. That brings it rather closer than the final version to being about the inflationary consequences of seeking too high a level of employment. But when he introduced the 96% target, there was no indication that Friedman had any view as to whether it was above or below the natural rate, and the way he introduced it made it clear that did not matter, since any target for unemployment would lead to poor policy. Then, in the theoretical treatment of that issue, Friedman was precise and explicit in saying that his consideration of too high a target was merely a way of presenting the argument, which applied equally to too high a target, or in a slightly different form, to a target of the natural rate itself. The objective was, in other words, as he stated it: To argue that employment *cannot* be a 'criterion' of policy. It was not to argue that some target levels would have inflationary effects.

So, whilst none of these points suggests that the July version was drafted to be an attack on attempts to exploit the Phillips curve, all these changes between July and September moved the story further away from that position – the title, and the emphasis of the paper were moved towards the advocacy of rules, and a monetary rule in particular, and away from the consideration of employment targets, and the discussion of the Phillips curve, although retained, was downgraded, with much of it moved into a footnote. Concerning the discussion of expectations, the point about the public forming expectations of the higher derivatives was removed, and that surely would not have happened if Friedman

had felt that developing a novel argument about expectations was a principal goal of the paper. The same point can be made about the way Friedman put the point that the evidence on the 1960s was hard to interpret, but wider experience made the point 'patent', without elucidation – that would be a ridiculous way to proceed if the point about expectations were unfamiliar.

A final point of this kind concerns the hypothetical policy that Friedman used as his example. In the July version, it was framed around the idea of pursuing a target of '96 per cent' employment, whereas the final version makes it '3 per cent' unemployment. This is interesting because the target set in the Council of Economic Advisers (1962) was to reduce unemployment to 4%, regarding this as a level that could be achieved without adverse inflationary consequences. That would make it, in Friedman's terminology, equivalent to their estimate of the 'natural rate'. So in the September version Friedman – surely consciously – moved his example *away* from being a realistic one, and put the argument in terms that were therefore much more clearly hypothetical. Had he wished to criticise *actual* policy for pursuing too low a target, he would hardly have made that change.

That leaves his observations about the rise of prices in 1965 being a slow response to the expansion begun in 1960-1. That just might suggest that the July version was offering a criticism of actual policy, but with so many other considerations arguing against that view, it would be hard to build up one paragraph, with content which is nowhere referred to anywhere else in the draft, as determining the main point of the paper. In any case, that paragraph was removed in the September version. Furthermore, when it was removed, Friedman included the criticism of policy for making too many sharp changes. So again, he clearly moved away from suggesting either that policy was pursuing excessive employment, or that the underlying mistake being made was anything to do with failure to appreciate the point about expectations, and towards the desirability of steady policy, and hence of rules.

Clearly, then, this consideration of the earlier drafts of the Address suggests anything but the view that the final version was supposed to present a striking new insight about the Phillips curve or expectations, or to suggest that the systematic pursuit of too a high a level of employment was the great failing of American policy of the 1960s or any other period. Slight as are the indications that those ideas were ever in Friedman's mind, he moved decisively away from them between July and September.

IV. Friedman on expectations

Contrary to what is so often said about Friedman (1968a) – or Friedman (1966a), which is sometimes cited in preference – it certainly did not offer an original presentation of the expectations argument. In Forder (2010) I presented plenty of earlier statements of it by well-known economists, and in chapter 4 part 1 of Forder (2014), plenty more, along with other evidence that it was a familiar argument well before 1968.⁹ That is not quite the same as to say that Friedman did not intend that argument to be the main point of his Address, but there are yet more earlier statements of the point which do suggest that. These statements, which have gone all-but completely unnoticed, are those by Friedman himself.

The earliest published evidence of his personal recognition of the argument seems to be nearly twenty years before his Presidential Address. In Friedman (1948), discussing the consequences of downward wage rigidity, he considered the effect of a wage rise in one sector, and said that if other wages did not fall, employment could be maintained only if nominal income increased, and that required inflation. There, he simply concluded that effective policy required

⁹ It is sometimes suggested that the 'invention' of the idea of the natural rate of unemployment was the great innovation. When that is suggested, it tends to be left ambiguous whether the point is that the existence of the natural rate is an immediate consequence of adaptation of expectations, in which case it is the expectations argument which is crucial, or whether the idea of a unique equilibrium rate of unemployment is itself suggested as the crucial innovation, in which case the suggestion would seem to be incorrect since that view, even if not put in those words, was the norm before 1936.

price flexibility, but Neff (1949), commenting on the paper, seemed to suggest that in this situation, inflation should be accepted. Friedman (1949, p. 952), in his response, said that if the question were asked whether inflation were a solution to a problem of unemployment, one should go further and ask 'whether even inflation would be a permanent "solution." Would it not have to become cumulative to remain a solution?'

That was very brief, and perhaps not precise, but the sense of the point is clear enough. The brevity with which he put the point then suggests Friedman expected his readers to recognize it – even nearly 20 years before the Presidential Address.

He put the same sort of point much more clearly in Friedman (1958a, p.252). Considering again the matter of sticky prices he said,

'In a market economy, the reallocation of resources necessitated by economic growth and development requires changes in relative prices and relative wages. It is much easier, it is argued, for these to come about without friction and resistance if they can occur through rises in some prices and wages without declines in others.'

One of the responses he offered (p. 252) was to say,

'it is argued that once it becomes widely recognized that prices are rising, the advantages cited in the preceding paragraph will disappear: escalator clauses or their economic equivalent will eliminate the stickiness of prices and wages and the greater stickiness of wages than of prices; strong unions will increase still further their wage demands to allow for price increases; and interest rates will rise to allow for the price rise. If the advantages are to be obtained, the rate of price rise will have to be accelerated and there is no stopping place short of runaway inflation.'

In the same year, in Friedman (1958b, p. 5) he framed the argument differently, but reached the same conclusion, saying, 'any steady rise in prices under present conditions would be clearly recognized as being produced by explicit action. Initial stimulating effects, if any, would wear off as it was widely anticipated, and there would be steady pressure to increase the rate of rise of prices'.

The intent was also clear in Friedman (1962, p. 284) when he published problems which had been set to his students. One said 'Considerations derived from price theory give no reason to expect any systematic long-term relation between the percentage of the labor force unemployed and the rate at which money wages rise. Explain why not.' No answers were published, but it is apparent that even his students were expected to understand the point.

In Friedman (1963/1968) the argument appeared in the role of rejecting the view that inflation could stimulate growth. He referred to books by Earl Hamilton, presumably with Hamilton (1934) in mind, and opined, following that author, that rapid growth in 15th and 16th century Spain was the result of inflation which shifted income from labourers to those with a greater tendency to invest. This, he said, made no case for inflation since the benefit had arisen from the inflation being unexpected. He continued,

'I am exceedingly sceptical that any similar result can be obtained by a deliberate process of expanding the money supply without its degenerating into hyperinflation. If it is done deliberately, many people will know about it and will act so as to prevent the redistribution from taking place. If you announce to the public that you are going to adopt the deliberate policy of increasing prices at the rate of 3 per cent a year everybody will adjust to that announcement. In order to have the redistributive effects favorable to development, you will have to increase prices at the rate of, say, 6 per cent a year. Once people adjust to that rate, you would have to go to a still higher rate and there is no stopping place.'

(p. 35)

In Friedman (1966b), a *Newsweek* column, he gave a rather clearer account of the idea that was to appear in the July draft the following year. He said that from 1961 to 1965 increases in the money supply increased output because stable prices were anticipated; then in 1965 because inflation was faster than anticipated, but that,

‘The only way to make an expansion of this kind last is to continue to accelerate monetary growth. However, that would produce still more rapid inflation. To avoid this consequence, the Federal Reserve has already sharply reduced monetary growth—indeed, too sharply—to a rate of about 3 per cent a year since April’.

In Friedman (1967a) he actually mentioned the Phillips curve, before saying that since wage bargains were ultimately bargains for a real wage, inflation could not change the level of employment. Then there is Friedman and Schwartz (1967), who reported statistical work estimating the relationship between capacity utilization and various other variables, including wage change, and insisted on the importance of controlling for anticipated inflation.

None of these is a terribly sophisticated statement. Some are firmly put, but none gave an indication that Friedman believed the point original – just the same is true of the version in the Presidential Address of course. For current purposes, though, the important point is that it is really not to be argued, or contemplated, that Friedman believed the expectations argument was novel at the time of his *Presidential Address*.

V. Friedman on rules and discretion

Before 1968, in addition to numerous scattered remarks, Friedman made three major statements of the case for preferring policy rules to discretion. In Friedman (1948) he proposed a nearly-fully automatic system for macroeconomic policy with 100% reserve banking, an end to government-issued interest-bearing securities, and fixed tax schedules and expenditure rules

designed to achieve a balanced budget at a high level of employment. A decline in private demand tending to cause unemployment would then result in a fiscal deficit, and this would be financed entirely by money creation so that the money supply would automatically expand. He argued that the fiscal transfers, price change, and the change in the money supply would all operate to reverse the downturn without the necessity of any discretionary action. Similarly, in the event of a boom, there would be a contraction of the money supply, again combining with other factors to promote stabilization.

In Friedman (1959) he continued to express support for 100% reserve banking, although he did not press the case, and he abandoned the idea that there should be no government bonds, on the contrary saying that monetary policy should be conducted entirely through open market operations. That should be done, he suggested, with the objective of stabilizing the rate of growth of the money supply.

The reason he gave for proposing the simpler rule was that his research since the earlier paper had convinced him that it would in practice work well. Although he did not say so, it is apparent that the work he had in mind was that leading to Friedman and Schwartz (1963), which had begun when he joined the NBER in 1946. What he did say was that his simple rule would have improved on the policy actually followed at the time of the excessive expansion of 1919-20, and sharp contraction thereafter, the collapse of the money supply between 1929 and 1933, and its sharp decline again in the recession of 1937-38. He also considered each of the War and post-War years, finding that the hypothetical rule would have brought smaller, but still – so he argued – detectable improvements in policy in that period. So, as of 1959, it could be seen that the rule would have improved policy substantially in the pre-War period, and even if lessons had been learned since then, it would still have brought detectable improvements in the post-War period.

In Friedman (1967b) he again made the case for rules, this time citing Friedman and Schwartz (1963), and again argued that research and experience since the

1930s had shown it would bring good results. Here, the emphasis on the outcome of new research is apparent from the fact the main line of his argument was intended to show that Henry Simons would have supported a money growth rule had he been aware of the facts Friedman was presenting.

The comparison of these arguments about rules and his remarks about expectations is most instructive. In the case of expectations, Friedman asserted the point, but never really argued it. Of all his discussions, only the mention of the Brazilian case even offered an instance of the expectations effect – in none of the earlier statements did he seem to have felt that any such thing was required to make the point. If it was backed by anything, it was backed by commonsense. He clearly did not expect it to be a point that would be seriously disputed. In the case of rules, he very much argues the point. The making of that argument forms the whole substance of Friedman (1948); it is the crucial consideration in his interpretation of Simons' thought in Friedman (1967b); and in Friedman (1959), which is a book, it is one of two or three principal themes. Furthermore, his view of the matter in detail develops. First he modified his position as a result of his research and incorporated detailed commentary on the 1950s in his presentation, and then in Friedman (1968a) itself, he updated the argument by including a discussion of policy mistakes of the 1960s. So, the point about expectations, he clearly thought routine. The argument for rules, in the 1960s – the high tide of fine tuning – was very much *Friedman's* argument. Clearly that makes the discussion of rules the attractive choice for a Presidential Address.

VI. The *Address* in relation to Friedman's later work.

Finally, Friedman's intentions and his understanding of the significance of his *Address* can be considered in the light of his later remarks about it. Most strikingly, in the few years following it, he hardly mentioned it, and said nothing at all that suggests he thought it a significant contribution.

As close as he came to suggesting he thought Friedman (1968a) an important or innovative paper in this period was a single reference in Friedman (1969b). That

was the lead paper in a volume otherwise consisting of reprints of Friedman's earlier work, which is something of a sequel to Friedman (1953), containing a mixture of well-known and little-known papers from 1952 and after. The lead paper argued for a steadily falling price level on the basis that this could make the cost of holding money measured by the real interest rate equal to the (zero or negligible) cost of producing it, thereby achieving the socially optimal degree of liquidity. The optimality of such an arrangement clearly depends on agents anticipating falling prices, and Friedman said so. He also said there had been recent discussions of tradeoffs between inflation and employment or growth and distinguished his paper from those by saying, 'the earlier discussion was almost entirely about *unanticipated* inflations or deflations, while this paper is mostly about *anticipated* inflations or deflations.' (p. 45) He then cited Friedman (1968a) for a 'fuller discussion' of the point that there is no tradeoff between anticipated inflation and employment.

Here, then, there is no intimation that the earlier discussion had been misguided – it is merely said that it was about something else, and there is no indication Friedman thought it inherently foolish to analyse the terms of temporary tradeoffs; and there is no real suggestion that the earlier paper was innovative – it is merely a source for a fuller discussion. As it happens, the 1969 paper is also cited in Friedman (1968a), so he was evidently writing the two at the same time, and the Address was reprinted in the same volume. Those things may explain why he chose to cite that particular source. In any case, in his introduction to the volume, all Friedman had to say about the Presidential Address was that it dealt with matters of policy – not theory, then – and that it reported his feeling that the pendulum may have swung too far towards viewing monetary policy as important. So there was no hint at all that he felt he had challenged fundamental beliefs. Furthermore, the Address appeared in that volume as chapter 5 (of 13) and that hardly suggests Friedman thought it particularly important.

In Friedman (1972a), he addressed the question 'Have monetary policies failed?' He revised his estimate of the typical time lag between policy change and its effect, but otherwise stuck to previous views, again stressing that policy had

been too variable, saying that in 1967 and 1968 monetary growth had been too fast; it had slowed in the first half of 1969, but since that brought no quick effects, there had been a sharper contraction then; this had brought an unnecessarily sharp recession in 1970, and that had led to an excessive expansion of the money supply in the first half of 1971, and excessive contraction in the second. The content and form of presentation were exactly of the kind in Friedman (1959) and Friedman (1968a), although the implication is that the errors were more severe. So again, the problem with policy was that it introduced volatility. Neither expectations nor the Phillips curve came into the discussion in any way.

Friedman (1972b) was, like the Presidential Address, a lecture, this time to the American Philosophical Society. It too was concerned with making the case for rules, although it too discussed expectations and the Phillips curve, in both cases making similar points to those in the *Presidential Address*. By the time it was written (November 1971), though, the breakdown of the American Phillips curve was evident in the data, and had been remarked on, for example, by Gordon (1970) and Perry (1970). Yet when Friedman came to discuss it, he referred to the existence of debate over the matter, stating his view, but made no motion towards suggesting that he had forecast this breakdown four years earlier, and indeed, he cited the *Presidential Address* only once – and that for a fuller exposition of the view that an attempt to target *any* level of unemployment would produce instability.

The Phillips curve appeared again in Friedman (1974), which was an amalgam with some changes of Friedman (1970a), and Friedman (1971a), and it was put in the role of describing Keynesian thinking. But expectations were not mentioned in connection with it, and there was no suggestion that the Keynesians (or anyone) had been under a misapprehension about them, nor that anyone had thought it wise to pursue inflationary policy. Friedman (1968a) was not cited.

Friedman (1970b) was entitled 'The counter-revolution in monetary theory' and told Friedman's story of the Keynesian view of the unimportance of money, the reinterpretation of the events of the Depression, along with an account of the American debate over the importance of fiscal, as against monetary policy. Some of this followed the line of argument in the introduction to Friedman (1968a) fairly closely. He remarked in passing (p. 19) that in the last 50 years the Federal Reserve had usually acted too late, and then too aggressively, and said that they did so again in 1966 and 1967. He moved to state 11 'Key propositions of monetarism' (p. 22-26) and to conclude that steady growth in the money supply was the best practical policy, and it was dangerous to expect too much of monetary policy. The *message* was very much like that of the *Presidential Address* – if the Address is understood as making a case for rules. But again in Friedman (1970b), neither the Phillips curve, nor the matter of expectations made any appearance, and the Presidential Address was mentioned only on the last page, for the purpose of emphasizing the benefits of rules over fine tuning

Those things are all unmentioned in Friedman (1971b) and Friedman (1972c). The first concerned the conditions for the maximization of government revenue from inflation, so there was an opportunity to discuss the change in money demand resulting from a temporary change in output, had he wished to take it. The second was a foretaste of Friedman and Schwartz (1982) which was to express monetarist conclusions in relation to the United States and the United Kingdom (and where there was discussion of the Phillips curve – but that was much later).

Meanwhile, policy matters and the behaviour of the Federal Reserve were mentioned in Friedman's *Newsweek* articles. In Friedman (1969a) he pointed to policymakers' tendency to over-react to current events, in Friedman (1972d) he explained the case for rules, and in Friedman (1972e) praised the Federal Reserve for adopting one. In none of them is there a suggestion that misunderstandings about expectations had caused policy errors. Similarly, in other popular presentations, such as Friedman (1971c), and Friedman (1973) there is no indication of a special insight coming from Friedman (1968a).

In all of these works, then, the Presidential Address is mentioned in three footnotes, both times as a source for a fuller discussion of a point being skated over. If Friedman had revolutionised the debate over macroeconomic policy in 1968, and prophesied the inflation which then developed in the first half of the 1970s, it could hardly be explained why would he *never* give an indication of that point in his academic writing in those years; nor why would he would never mention it in published interviews in that period. Plainly, Friedman himself did not see any such special insight in his Presidential Address.

Friedman's later works give rather a different picture. In Friedman (1975) he cited Friedman (1968a) saying, 'seven years ago, I argued that the long-run Phillips curve was vertical' (p. 23). In Friedman (1977) he said, 'Some of us were sceptical from the outset about the validity of a stable Phillips curve, primarily on theoretical rather than empirical grounds'. Here he cited four of his own works, giving dates between 1966 and 1968. An example of a rather different sort comes from a comparison between two of Friedman's encyclopaedia entries on the subject of the Quantity Theory – Friedman (1968b) and Friedman (1987). In the second of these, although not in the first, Friedman introduced a discussion of the Phillips curve, quoted his Presidential Address for its definition of the natural rate of unemployment, described the view that only the short run Phillips curve would have a negative slope and said 'The emergence of stagflation in the 1970s quickly confirmed this analysis'. So, late on, Friedman's views on the Phillips curve even came to be part of his account of the Quantity Theory – they had been no such thing around the time of the Presidential Address. Then, much later, in his memoirs, Friedman and Friedman (1998, p. 230) said that the Presidential Address 'questioned the validity of the Phillips curve – the notion that there was a permanent trade-off between inflation and unemployment'.

So, until 1975 Friedman showed no sign of thinking his *Address* had contained any great innovation or special insight, or that it forecast of the breakdown of the Phillips curve. That could hardly be clearer since there are so many occasions

when he could have made some such point in pieces he was in any case writing, and there is simply nothing to be found. It is unlikely to be argued that the reason was he was excessively modest, or afraid of publicity, and if it were, it would have to be explained why those characteristics disappeared from his personality in 1975. Clearly, the reason he did not seek to present Friedman (1968a) as an innovative paper, or one making a significant point about expectations or the Phillips curve is that he did not see it in those ways. Certainly, therefore, he had not intended, when he wrote it, to make those its major points. The idea that they were central to it appeared in Friedman's own writings only when, in the mid-1970s, it started to be more widely asserted that policy in the 1960s policy had been based on foolish ideas about the exploitability of an inflation-unemployment tradeoff.

VII. Conclusion

So the point about expectations and the Phillips curve is a part of Friedman's argument, but it is a small part, and there is no basis for saying either that it was, or that Friedman believed it to be, an original, novel, or distinctive part. The distinctive aspect of his *Address*, and the main point of the argument, was to advance the case for rules rather than discretion.

The weight of the argument seems clear on a simple reading of the paper. But in any case, in considering whether the emphasis was on rules or the Phillips curve, there is plenty of other evidence. The comparison of drafts of the paper, a consideration of Friedman's earlier writings, and of his later writings all point in the same direction. In each case, the evidence favours the interpretation that Friedman was seeking to put the case for rules, and that the argument about expectations and the Phillips curve was in no way intended to be the paper's significant contribution.

Concerning the early drafts, it is clear that Friedman moved his presentation away from an emphasis on the Phillips curve. With his earlier work in mind, we can ask whether it is more likely that he chose to use the opportunity of giving

the Presidential Address to make his eighth or ninth presentation of the well-known expectations argument, which he had never before treated as surprising, and to which he had nothing to add except perhaps some terminology; or whether, on the other hand, he used that platform to re-present and update an argument peculiar to him, the development of which had been a notable theme of his career up to that time. The answer should be apparent.

Then considering his later work, the complete absence – for seven years – of any indication that he thought the Presidential Address important is in itself conclusive. Neither the Address nor the expectations argument made an appearance when he raised the matter of the role of the Phillips curve in Keynesian economics in Friedman (1974). Interviewed by *Playboy* he had nothing to say about the argument – supposedly a revolutionary one – he had presented five years earlier. In other discussions of the failures of monetary policy, like Friedman (1972b) he continued to emphasize the tendency for too many sharp changes, even though, according to later stories, he should have been able to point to the unfolding of his predictions about what would happen when an inflationary point on the Phillips curve was made a policy target. There is *no* substantive comment on the importance of the Address be found in any of Friedman's works for seven years after it was published. Clearly, he did not imagine it had launched a fundamental challenge to orthodoxy.

In this case, then, the plain reading of the paper – if it is unencumbered by presuppositions about the Phillips curve – is completely adequate to understanding Friedman's intentions. He was advancing the view that attempts at fine tuning did more harm than good. That was argued theoretically, and as a lesson of experience. The conclusion was that policy outcome would be better if policy were set by a rule.

It is a consequence that one is forced to the conclusion that the intellectual contribution of Friedman (1968a) is rather slight. Indeed, that is why it was chapter 5 of a book Friedman published the following year, with an abstruse argument about making the price level fall as its lead paper. But that should really be no surprise. Few Presidential Addresses present revolutionary findings.

It is quite to be expected that they should offer updated restatements of their authors' position. It is another consequence that its contribution to Friedman's legacy is rather slight since his case for rules did not take hold. On the contrary, the movement towards central bank independence is very much associated with a re-establishment of the case for discretion. Nevertheless, the vicissitudes of these things are such that it certainly contributed enormously to his reputation.

References

- Beggs, M. (2015) *Inflation and the making of macroeconomic policy in Australia, 1945-85*. Basingstoke: Palgrave.
- Council of Economic Advisers (1962) *Economic Report of the President*. Washington DC: US Government Printing Office.
- Fischer, S. (1990) 'Rules versus discretion in monetary policy', in *Handbook of Monetary Economics* volume II, eds. B. M. Friedman and F. H. Hahn. Amsterdam: North Holland. pp. 1155-1184.
- Forder, J. (2010) 'The historical place of the 'Friedman-Phelps' expectations critique'. *European Journal of the History of Economic Thought* 17(3) pp. 493-511.
- Forder, J. (2014) *Macroeconomics and the Phillips curve myth*. Oxford: OUP.
- Forder, J. (2015) 'Textbooks on the Phillips curve'. *History of Political Economy* 47(2) pp. 207-240.
- Forder, J. (2016) 'A neglected inconsistency in Milton Friedman's AEA Presidential Address'. *Journal of the History of Economic Thought* 38(1) pp. 105-112.
- Forder, J. (2017?) *Harry Johnson on the Phillips curve*. Unpublished draft, Balliol College Oxford. Forthcoming in the *Journal of the History of Economic Thought*.
- Friedman, M. (1948) 'A monetary and fiscal framework for economic stability'. *American Economic Review* 38(3) pp. 245-264.
- Friedman, M. (1949) 'Professor Friedman's proposal: Rejoinder'. *The American Economic Review* 39(5) pp. 949-955.
- Friedman, M. (1953) *Essays in positive economics*. Chicago: Chicago University Press.
- Friedman, M. (1958a) 'The supply of money and changes in prices and output', in *The relationship of prices to economic stability and growth. Compendium of papers submitted by panelists appearing before the JEC 85th Congress, 2d Sess, March 31 1958* Washington DC: US Government Printing Office. pp. 241-256.
- Friedman, M. (1958b) *Inflation* Lecture to the Mont Pèlerin Society, Princeton New Jersey, 3 to 8 September 1958. Hoover Institution Milton Friedman Archive, Box 44 folder 12.

- Friedman, M. (1959) *A program for monetary stability*. New York: Fordham University Press.
- Friedman, M. (1962) *Price theory: A provisional text*. Chicago: Aldine.
- Friedman, M. (1963/1968) *Inflation: Causes and consequences*. Bombay: Asia Publishing House.
- Friedman, M. (1966a) 'Comments', in *Guidelines, informal controls, and the market place* eds. G. P. Schultz and R. Z. Aliber. Chicago: Chicago University Press. pp. 55-61.
- Friedman, M. (1966b) 'An inflationary recession'. *Newsweek*, October 17, p. 92.
- Friedman, M. (1967a) 'Must we choose between inflation and unemployment'. *Stanford Graduate School of Business Bulletin* (35) pp. 10-13, 40, 42.
- Friedman, M. (1967b) 'The monetary theory and policy of Henry Simons'. *Journal of Law and Economics* 10 pp. 1-13.
- Friedman, M. (1968a) 'The role of monetary policy'. *American Economic Review* LVIII(1) pp. 1-17.
- Friedman, M. (1968b) 'Money: Quantity theory', in *International encyclopedia of the social sciences* ed., D. Sills. New York: Macmillan.
- Friedman, M. (1969a) 'Money and inflation'. *Newsweek*, 26 May, p. 105.
- Friedman, M. (1969b) 'The optimum quantity of money', in *The optimum quantity of money and other essays* ed., M. Friedman. London: Macmillan. pp. 1-50.
- Friedman, M. (1970a) 'A theoretical framework for monetary analysis'. *Journal of Political Economy* 78(2) pp. 193-238.
- Friedman, M. (1970b) *The counter-revolution in monetary theory*. London: Institute of Economic Affairs.
- Friedman, M. (1971a) *A theoretical framework for monetary analysis*. New York: NBER.
- Friedman, M. (1971b) 'Government revenue from Inflation'. *The Journal of Political Economy* 79(4) pp. 846-856.
- Friedman, M. (1971c) 'The American economist Milton Friedman, in conversation with Robert McKenzie, gives his view of how our economic problems could be solved'. *The Listener*, vol 85, 11 February, pp. 169-171.
- Friedman, M. (1972a) 'Have monetary policies failed?'. *American Economic Review* 62(2) pp. 11-18.
- Friedman, M. (1972b) 'Monetary policy'. *Proceedings of the American philosophical society* 116(3) pp. 183-196.
- Friedman, M. (1972c) 'Monetary trends in the United States and the United Kingdom'. *American Economist* 16(1) pp. 4-17.
- Friedman, M. (1972d) 'The case for a monetary rule'. *Newsweek*, 7 Feb, p. 67.
- Friedman, M. (1972e) 'The Fed on the spot'. *Newsweek*, 16 October, p. 98.
- Friedman, M. (1973) 'The Playboy Interview: Milton Friedman'. *Playboy*, pp. 51-56, 58-60, 62, 64, 66, 68, 74.
- Friedman, M. (1974) 'A theoretical framework for monetary analysis', in *Milton Friedman's monetary framework* ed., R. J. Gordon. Chicago: Chicago University Press. pp. 1-62.
- Friedman, M. (1975) *Unemployment versus inflation?* London: Institute of Economic Affairs.
- Friedman, M. (1977) 'Nobel Lecture: Inflation and unemployment'. *Journal of Political Economy* 85 pp. 451-472.

- Friedman, M. (1987) 'Quantity theory of money', in *The New Palgrave - A dictionary of economics* eds. J. Eatwell, M. Milgate, and P. Newman. London: Macmillan.
- Friedman, M. and R. D. Friedman (1998) *Two lucky people*. Chicago: University of Chicago Press.
- Friedman, M. and A. J. Schwartz (1963) *A monetary history of the United States 1867-1960*. Princeton: Princeton University Press.
- Friedman, M. and A. J. Schwartz (1967) 'Staff reports on research under way', in *Contributions to economic knowledge through research* pp. 36-40.
- Friedman, M. and A. J. Schwartz (1982) *Monetary trends in the United States and the United Kingdom: Their relation to income, prices, and interest rates, 1867-1975*. Chicago: Chicago University Press.
- Gordon, R. J. (1970) 'The recent acceleration of inflation and its lessons for the future'. *Brookings Papers on Economic Activity* 1 pp. 8-41.
- Hamilton, E. J. (1934) *American treasure and the price revolution in Spain*. Cambridge MA: Harvard University Press.
- Neff, P. (1949) 'Professor Friedman's proposal: A Comment'. *The American Economic Review* 39(5) pp. 946-949.
- Perry, G. L. (1970) 'Changing labor markets and inflation'. *Brookings Papers on Economic Activity* 3 pp. 411-448.
- Rivot, S. (2015) 'Rule-based frameworks in historical perspective: Keynes' and Friedman's monetary policies versus contemporary policy-rules'. *European Journal of the History of Economic Thought* 22(4) pp. 601-633.
- Schwarzer, J. A. (2013) Friedman's Presidential Address: Its German Translations. <http://tinyurl.com/JASF1968trans>