Brunner versus Friedman : Diverging Aspirations for the Monetarist Project

by

Pierrick Clerc and Michel De Vroey [1]

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[1] Banque de France and Université catholique de Louvain. pierrick.clerc@live.fr; michel.devroey@uclouvain.be

INTRODUCTION

The aim of this paper, written for a conference in homage to Karl Brunner organized by the Swiss National Bank, is to compare Brunner's vision of monetarism with that of Milton Friedman, the most prominent figure of the monetarist school.[2] Over a time span of half a century, Brunner and Meltzer wrote a huge number of articles, books and monographs. They founded the *Journal of Monetary Economics* and the *Journal of Money, Credit & Banking*. They organized the Carnegie-Rochester annual conferences. A venue of civilized confrontation between Keynesian and monetarist economists, these conferences provided young innovative economists, such as Robert Lucas, Thomas Sargent, Finn Kydland and Edward Prescott, the launching pad for ideas that were to transform macroeconomics. Brunner and Meltzer also were at the origin of the so-called Shadow Open-Market Policy committee . Last but not least, they pursued a theoretical ambition predicated on a vision of monetarism different from Friedman's. Our paper aims at substantiating this last aspect.

Its starting point is a little book edited by Robert Gordon entitled *Milton Friedman's Monetary Framework. A Debate with his Critiques* (Gordon 1974) and sometimes coined as the 'Gordon Volume'. It has three parts. The first is a lengthy essay authored by Friedman entitled "A Theoretical Framework for Monetary Analysis". The second consists on comments by Brunner and Meltzer, James Tobin, Paul Davidson and Don Patinkin. The third is Friedman's response. Tobin, Davidson and Patinkin were renown Keynesian economists who had engaged in polemics with Friedman for a long time. By contrast, Brunner and Meltzer were monetarist like Friedman. Hence the reader's expectation that they would largely endorse the views expressed in his essay. However, the contrary is true. Their comments turned out to be as harsh as those of the other participants the debate. What explains?

Our answer evolves at two levels. First, we surmise that Brunner and Meltzer were frustrated by Friedman's view that a common theoretical framework underpinning the Keynesian and the monetarist opposite empirical propositions could be devised. They had set themselves the task of constructing a specifically monetarist theoretical framework meant to stand as an alternative to the IS-LM model. That the common framework proposed by Friedman was the IS-LM model was bound to hurt them.

But there is also a broader explanation. Here, we have the story of two top-notch economists, Brunner and Friedman, who started their career in the post-WWII period. They had much in common: (a) they were pro-Marshall and anti-Walras; (b) they believed in the stability of the market economy, what made them anti-Keynesian from the policymaking viewpoint; (c) they were acutely aware of the risk involved by lax monetary policies and were adept of a strict monetary rule. In short, they both belonged to the monetarist school. However, they strongly differed for what concerned the ambition of monetarism.

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[2] Brunner's name is inseparable of that Allan Meltzer but, since this paper is written for a conference on Brunner, we will often refer to his name alone at the risk of thereby doing injustice to Meltzer Other assessments of Brunner's work are Laidler (1991) and Nelson (2018b).

Brunner held a high ambition for it. He believed that the times were ripe for devising a specifically monetarist general model that could rival the IS-LM model. Friedman was less ambitious. To him, replacing one grant theory with another mattered little. Friedman made seminal theoretical contributions – his permanent income hypothesis, his expectations-augmented Phillips curve model and the idea of a natural level of employment, his paper on the optimal quantity of money – but overall, in his eyes theory was less important than applied work. Expressed positively, his overarching aim was to rehabilitate the quantity theory of money; expressed negatively, it was to debunk Keynesian theory and its policy prescriptions. And he wanted this battle to be waged at the empirical level going as far as writing that "the fundamental difference between [Keynesians and monetarists] is concerned with a question of fact, not of theory" (Friedman 1956: 6).

Our paper is a history of economics contribution. This means that we regard ourselves as outside observers who want to remain out of the fray – to borrow A. Smith's expression, we try to be impartial spectators. Furthermore, we regard history of economics as a 'via negativa'. In spite of our great admiration for the authors we study (otherwise we would not study them to begin with), our distinct approach is to exert a critical eye on their work. We also believe that there is a difference between the ways in which historians of economics and practitioners of a field who happen to write surveys proceed. Historians of economics take a more remote standpoint and use a few tools on their own. In this paper we follow Leijonhufvud's insight that the development of economic theory can be compared to a decision tree, the branches of which originate from choices made about basic methodological nodes. Taking one bifurcation rather than another makes theoretical construction heading for different directions. At the beginning of a given program – say constructing neoclassical economics – theory-builders face very basic methodological choices and bifurcations. Once a given branch has grown sturdier, choices become more specific as second-, third-level, etc., nodes enter the picture.

In the first part of the paper we summarize Friedman's Gordon volume essay, Brunner and Meltzer reaction to it and Friedman's response. In Part 2, we study the communalities and differences between Friedman and Brunner. In Part 3, we summarize and assess the Brunner-Meltzer model. More general observations are offered in the conclusion.

THE GORDON VOLUME CONTROVERSY

Friedman's contribution

Friedman's Gordon volume essay brings together two earlier articles both published in the *Journal of Political Economy* and entitled "A Theoretical Framework for Monetary Analysis" (Friedman 1970b) and "A Monetary Theory of Nominal Income" (Friedman 1971), plus a few additions. These two articles differed in status. The 1970 article addressed Friedman's objective of providing a theoretical framework common to the monetarist and Keynesian analyses – that is, a framework supporting both the monetarist and the Keynesian

empirical propositions.[3] It also aimed at coming to grips with what he regarded as the main the bone of contention between the two approaches, the issue of the short-period distribution of increases in nominal income into either a price or a quantity effect. The 1971 article looks to us like an afterthought to the 1970 piece. Herein Friedman introduced a third solution to the problem of a missing equation, the topic at the center of the 1970 paper. It consisted in bypassing the breakdown of nominal income into prices and quantities by limiting the model's result to an explanation of nominal income fluctuations. Friedman's own judgment on this third solution was mixed. On the one hand, he declared superior to the two other solutions, the Keynesian and the monetarist (Friedman 1971: 323; GV: 43 [GV standing for Gordon Volume]). But, on the other hand, he admitted its inability to deal satisfactorily with the saving/ investment relation thereby regarding it as an "unfinished business". In the Gordon volume's essay, the content of the 1971 paper is plugged into what was a single section in the 1970 paper (Section 7, "The missing equation unresolved problems"). As a result, there are now four sections on the issue of the missing equation. We find this piecing together unfortunate because it hides the difference in status between the two initial articles.

Friedman's essay starts with a rich reconstruction of the quantity theory of money in its different acceptations and of John Maynard Keynes's contribution in the *General Theory* (on which he returns in the last part of the paper in his response to his critics). In spite of some biases, this reconstruction is a top-notch history of economics work. To the possible surprise of some readers, it comes across as very laudatory of Keynes' theoretical contribution. He was even more so in his response to the critics in the last part of the volume, which first appeared in a 1972 issue of the *Journal of Political Economy* (Friedman 1972). For all Friedman's praise of *The General Theor*y, his last word about it, however, is scathing:

> I believe that Keynes's theory is the right kind of theory in its simplicity, its concentration on a few key, its potential fruitfulness. I have been led to reject it, not on these grounds, but because I believe that it has been contradicted by evidence: its predictions have not been confirmed by experience. This failure suggests that it has not isolated what are 'really' the key factors in short-run economic change (Friedman 1972: 908; GV: 134).

Friedman's motivation for writing his essay is aptly summarized in his conclusion. It serves the purpose of documenting "his belief that the basic differences among economists are empirical, not theoretical" (Friedman 1970b: 234; GV: 61). The irony is that it took a painstaking theoretical analysis to vindicate his contention. It evolves over several steps, demonstrating that : (a) a theoretical framework common to monetarists and Keynesians can be constructed – "a highly simplified aggregate model of an economy that encompasses both a simplified quantity theory and a simplified income-expenditure theory as special cases" (Friedman 1970b: 217; GV: 29); (b) this model is indeterminate; (c) it can be closed in two alternative ways using either the simplified quantity theory or the simplified income-expenditure theory, an alternative that cannot be settled theoretically; (d) hence the conclusion that the choice between them must be decided on empirical grounds.

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[3] It may be wondered what the 'theoretical framework' appellation exactly means. Our own take is to regard it as synonymous to the 'general equilibrium model of the economy' appellation it being understood that Walrasian theory has no monopoly over the general equilibrium field.

Friedman's common model, which, he asserted, "almost all economists would accept" (1970b: 234; GV: 61) has six equations, directly drawn from the IS-LM model and seven variables. There is thus a 'a missing equation' to be determined by relationships outside the system. According to Friedman, two ways of filling the void are possible – the 'simplified quantity theory' and the 'simplified income-expenditure theory', both deemed to be caricatures of Friedman's own reconstruction of the quantity theory of money and of cutting edge Keynesian macroeconomics. The first assumes that real income is determined outside the system. Overcoming his allergy to Walrasian theory, Friedman suggested that its size could be calculated using the Walrasian system of equations. In this case, what he called the 'simple version of the quantity theory' applies: changes in money supply exert an impact only on nominal magnitudes. The second solution consists of regarding that the price level is determined outside the system. " [It] appends to this system a historical set of prices and an institutional structure that is assumed (...) to keep prices rigid" (1970b: 219-220; GV: 32).

The first solution is weird. The IS-LM and the Walrasian model are two alternative ways of capturing the outcome of an economy. They are based on different premises. Their variables are hardly interchangeable. For example, there is no direct equivalent to real income in Walrasian theory. Furthermore, Walrasian categories were not meant to be have empirical counterparts. At first sight, the second solution looks odd as well. Stating that price rigidity is the hallmark of Keynesian theory was rather uncommon at the time. Friedman's justification for it is to be found in the historical part of his essay. He regarded Keynes as a Marshallian economist who departed from Alfred Marshall on one point, the relative speed of adjustment of prices and quantities. Marshall was of the opinion that prices adjusted faster than quantities as illustrated in his fish market example (Marshalll 1920: 307). Following Leijonhufvud, Friedman took it that *The General Theory* was based on a reversal of Marshall's speed of adjustment order, having output reacting to shocks faster than prices. As long as the economy is below full unemployment, the argument runs, demand activation increases output without causing changes in prices. To Friedman, this is price rigidity. [4]

Keynes's assumption about the relative speed of adjustment of price and quantity is still the key to the difference in approach and analysis between those economists who regard themselves as Keynesians and those who do not. Whatever the first group may say in their asides and in their qualifications, they treat the price level as an institutional datum in their formal theoretical analysis" (1970b: 210-211; GV: 20).

Friedman reasoning did not stop at the above confrontation. He gave the problem another shot in a section on the adjustment process. The following two equations summarize his analysis of the short-run division of a change in nominal income between prices and output.

$$\frac{d\log P}{dt} = \left(\frac{d\log P}{dt}\right)^{*} + \alpha\left[\frac{d\log Y}{dt} - \left(\frac{d\log Y}{dt}\right)^{*}\right] + \gamma\left[\log y - (\log y)^{*}\right]$$

[4] Friedman's semantics is misleading. In the Keynesian story, the reason why prices do not change is that any pressure for their change is absent rather than their lack flexibility.

$$\frac{d\log y}{dt} = \left(\frac{d\log y}{dt}\right)^{*} + (1-\alpha)\left[\frac{d\log Y}{dt} - \left(\frac{d\log Y}{dt}\right)^{*}\right] - \gamma\left[\log y - (\log y)^{*}\right]$$

where *P* is the price level, *y* output, α and γ parameters, and the asterisk indicates equilibrium values. According to the 'simple quantity theory', increases in the rate of money creation are absorbed in price changes while output keeps growing at its equilibrium rate. This result is obtained by setting $\alpha = 1$ and $\gamma = \infty$, the latter assuring that $y = y^*$. By contrast, in Keynesian theory the impact of increases in the rate of money creation fully falls on output as long as the economy is below full employment. This is obtained by setting $[(d \log P)/(dt)]^* = 0$, and $\alpha = \gamma = 0$ as long as $y < y^*$.

The above formulation is of course correct but hardly helpful in solving the dispute between monetarist and Keynesians. It all hinges on the value given to *a* and theory has nothing to say about this. The earlier conclusion still holds: there is no theoretical way of resolving whether the Keynesian or the quantity solution is the best one. This result may look gloomy yet not to Friedman since it confirms his claim that the dispute must be solved empirically rather than theoretically.

Brunner and Meltzer's comments

Brunner and Meltzer did not want to join the crowd of "almost all economists" who Friedman presumed could accept his framework. Above all, they disapproved of Friedman's very project of devising a common theoretical framework between monetarism and Keynesianism. Indeed, it run counter to their own project of building a specifically monetarist theoretical framework that could act as an alternative to the IS-LM model. Hence the ring of bitterness hovering in their paper.

Their main regret concerned Friedman's lack of attention to the transmission mechanism – the channels through which changes in the quantity of money exert an impact on the real economy**.** Monetarists narrow this broad characterization down to the issue of monetary shocks affecting an economy experiencing equilibrium – that is, departures from the money constant rate of growth rule that in their view must guide the behavior of central banks. Although this is stated only implicitly, the usual suspect is a government which, under the inspiration of Keynesian advisers, pushes the central bank to engage in monetary activation for the sake of decreasing unemployment. Brunner and Meltzer strongly disagreed with the view that the IS-LM model can be used for such a purpose. To them, it was crucial that the transmission mechanism operates through changes in relative prices, thereby achieving a synthesis between micro and macro analysis. This, they claimed, is beyond the ability of the IS-LM model because it comprises only one relative price, the interest rate.

> We believe that more than one equation is missing. Relative prices, real rates of return, the outstanding stock of government debt, and the government budget are additional 'missing' variables. Without better evidence for the model than has been provided, we do not accept the framework as a useful statement of short-run macro theory. Too many familiar features of cycles are omitted or ignored" (Brunner and Meltzer 1972a: 818; GV: 74-75).

At a minimum, a second relative price, is needed. Brunner and Meltzer had come to see it as their mission to device an alternative model achieving this requirement. Friedman could not be indicted for having totally neglected the multi-channel transmission mechanism

idea of a. He evoked it in several of his earlier papers (Friedman 1961, 1963, 1970a) but only in a casual way. The writing of a theoretical framework essay could have been the ideal opportunity for devising a specifically monetarist general equilibrium model – or, if this was too much to ask, at the least, their own freshly minted alternative model. To their disarray, nothing like this was to be found in Friedman's essay. On the contrary, he took the view that the IS-LM could serve as a general framework underpinning both the monetarist and the Keynesian empirical propositions.

This was Brunner and Meltzer's main bone of contention with Friedman's essay. But their bill of indictments was larger. Let us just mention three other criticisms. First, they regret his failing to discuss the money multiplier mechanism. Although we will not integrate it in our subsequent presentation of their model, it plays an important role in those versions of their model comprising a banking sector. Brunner and Meltzer also lamented Friedman's lack of consideration for the endogenous component of the money base which they regarded as a key factor enabling the system to return to equilibrium. Finally, they complained about Friedman's neglect of consideration of fiscal policy.

> One of the more striking features of Friedman's analysis is that in fifty-five pages of text, much of it devoted to short-run or short-term adjustments, the fiscal role of government is mentioned only once and only to be dismissed. Changes in government expenditure and taxes, apparently, have so little effect that they can be ignored entirely. We know of no evidence to support this conclusion (Brunner and Meltzer 1972a: 842; GV: 68).

According to Brunner and Meltzer, fiscal must be part of the model for at least two reasons. First, the interaction between fiscal and monetary policy plays an important role in the explanation of inflation. The second reason relates to the long-run impact of the budget process on the level of normal output: increases in real government expenditures imply increases in taxes. As a result, the stock of real capital, the available labor supply and ultimately normal output are reduced.[5]

Friedman's response

Friedman's response to Brunner and Meltzer was one of amazement: "Granted... I really am puzzled that Brunner and Meltzer could have inflated the role of the common model as much as they did" (Friedman 1972: 911; GV: 136).

> My aim was much less ambitious. It was to outline a general approach that could suggest what empirical issues required study, an approach that could then be elaborated in further detail in connection with such empirical studies (Friedman 1972: 909; GV: 134-5).

His framework, he wrote, was "only a beginning" (1972: 912; GV: 137) which does not "profess to be a complete, fully worked out, analysis of short-term fluctuations in aggregate economic magnitudes" (Friedman 1971: 332; GV: 43). However, he never bothered to undertake such analysis in his subsequent writings.

Friedman responses to the other criticisms were in the same vein. In earlier writings,

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[5] All this led Monti (1974) to label their particular brand of Monetarism "fiscal Monetarism". On the importance of the money supply process and fiscal policy issues in the work of Brunner and Meltzer see also Laidler (1995: 3-10).

[5]See Nelson (2018a, Chapters 4 and 8).

he recognized the endogenous character of the money multiplier and the money base. "A two-way relation between monetary change and business conditions is, indeed, one reason why the lag in the effect of monetary action might be expected to be long and variable" (Friedman 1961: 449). However, he did not deem it worthwhile to provide a formal treatment of this in his essay, arguing that "no purpose for which we shall use the model would be affected in any way by treating money supply as simply an exogenous variable" (Friedman 1970b: 219; GV: 31).[6] As far as fiscal policy is concerned, Friedman initially (e.g. in his 1948 paper) took for granted that fiscal policy could have significant effects but he gradually changed his mind latter on. Small wonder then that fiscal variables are absent from his essay. In his words, "We can neglect (...) the fiscal role of government, by assuming that there are neither government expenditures nor government receipts" (Friedman 1970b: 217; GV: 29).

COMMUNALITIES AND DIFFERENCES

Table 1. Communalities and differences [7]

			Keynesian macro	**Friedman's monetarism**	**Brunner's monetarism**
1. **Vision of economics**: Marshallian (pragmatic vision)			✓	✓	✓
2. **Equilibrium**:	concept: state of rest equilibrium		✓	✓	✓
	disequilibrium:	with rationing	✓ (H)		
		with market clearing	✓ (M)	✓	✓
	multiple equilibria:		✓ (M)		
3. **Microfoundations**: implicit			✓	✓	✓
4. **Theory/measurement**: theory and measurement			✓	✓	✓
5. **Prior on the working of the market system**:	prone to malfunctioning		✓		
	inherent stability			✓	✓
6. **Mission of monetarism**:	reasserting the central role of the quantity of money in nominal income variations			✓	
	constructing a specifically monetarist framework				✓
7. **Focus:**	a simplified model of the economy		✓		✓
	a few empirical relations			✓	
8. **Readiness to use the IS-LM model**:	yes		✓	✓	
	no				✓
9. **Attention to transmission**:	little		✓	✓	
	huge				✓
10. **Characterization of demand activation**:	correcting a sub-optimal occurrence		✓		
	generating a disequilibrium			✓	✓
11. **Principle guiding the functioning of central banks**:	discretion		✓		
	monetary rule			✓	✓
12. **Explanation of inflation:**	Phillips curve (demand pull + cost push)		✓		
	excess of money creation			✓	✓

Brunner and Friedman have much in common. The aim of this section is to sort out the basic methodological choices about which Brunner and Friedman were eye in eye and those for which they choose different bifurcations. We also take the opportunity for comparing their views with those of Keynesian macroeconomists. Table 1 illustrates.

[7] The slots in grey refer to nodes which the three approaches agree on. The nodes in blue are those about which Brunner and Friedman choose different bifurcations. 'H' refers to Hicks's IS-LM model (Hicks 1937) and 'M' to Modigliani's (Modigliani 1944).

As far as communities are concerned, the table displays that the three approaches take the same bifurcations on four nodes. First of all, with respect to the Marshall-Walras divide, they are definitely on the side of the Cambridge economist sharing with him a pragmatic vision of the mission of economics (node 1). Second, they share the same equilibrium concept, the state of rest concept (node 2). Equilibrium is defined as a state of affairs where agents have no incentives to change their behavior. Rather than existing effectively, it acts as a center of gravity. Hence, more often than not, the market or the economy experiences disequilibrium. Taking the 'implicit micro-foundations' bifurcation is a third communality between the three approaches (node 3). All neoclassical economists agree on the view that aggregates are grounded in individual agents' optimizing decision-making. The 'implicit micro-foundations' bifurcation means that it is deemed acceptable to skip the formal derivation of households' market demand and supply functions from their individual decisional process. The fourth similarity is that in all three approaches theory and measurement (empirical work) are deemed to go hand in hand (node 4). All these bifurcations relate basic methodological nodes about which Marshall and Walras parted company.[8]

Turning now to the differences, we proceed in two steps. First we identify the methodological nodes where Friedman and Brunner agree between them while departing from the Keynesian standpoint. They amount to four.

1) The most importance difference between monetarists and Keynesian relates to node 5 (their priors about the working of market economies). Both Friedman and Brunner take it for granted that the market economy is stable to the effect that any governmental interventions in the economy will do more harm than good. For their part, Keynesian economists question the view that market forces always bring the economy toward a single optimal equilibrium outcome. They rather regard the market economy as being prone to market failures – especially aggregate demand deficiencies – requiring autonomous demand activation initiated by governments as their remedy. Hence they cannot agree with any modeling strategy starting from the premise that shocks must be conceived of as acting upon an economy experiencing equilibrium. A return to the first generation of IS-LM models is useful to bring the point home.[9] They comprised two variants, the classical and the Keynesian ones (each determinate). In the former, nominal wags are assumedly flexible, in the latter rigid. Keynesians considered the Keynesian variant as the right depiction of reality, the classical model acting as a foil.

2) The second difference between monetarists and Keynesians relates to the equilibrium concept sub-node of node 2. To monetarists, disequilibrium refers, like in Marshall, to situations in which the market-period allocation displays a matching between supply and demand (market clearing) yet at prices and quantities different from their equilibrium magnitudes It is also assumed that these situations trigger a re-equilibrating process. Keynesian macroeconomics takes a different bifurcation, actually two bifurcations if one believes, as we do that IS-LM *à la* John Hicks and *à la* Franco Modigliani tread different routes. Hicks assumed that labor markets displayed rigidity as a fact of life, the result of

[8] See De Vroey (2012, 2018).
[9] See for example Allen (1967, Chapter 7).

which a rationing of labor supply. Modigliani, for his part was of the view that the supply of labor had a an infinitely-elastic section and could display market clearing at a sub-optimal level of employment. The real-balance effect can be invoked for dismissing the view that rigidity and standstill go hand in hand. Patinkin admitted this point yet suggested to replace rigidity with sluggishness**.** [10]

3) The above differences generate an additional difference captured in node 10 (characterization of demand activation). Monetarists regard monetary activation as a shock on an equilibrium position, the result of which is to generate a temporary disequilibrium. By contrast, to Keynesians such activation makes sense only when the economy is stuck in a sub-optimal position. The rationale for demand activation is either to bring markets to an otherwise non-attained equilibrium position (Modigliani) or to speed up a long-drawn equilibration process (Patinkin). In other words, what monetarists regard as an unfortunate shock, the result of the lack of existence of a monetary policy rule, is deemed to be a welfare-improving action by Keynesians.

4) The fourth difference, pertaining to node 11 (monetary policy), ensues from the above choices. It requires no special comment. What monetarists regard as a shock that could have been avoided where it not for the wrong Keynesian ideas is deemed to be a welfare-improving action by Keynesians.

5) The fifth differences bears on the explanation of inflation (node 12). Keynesians study inflation using the supposedly stable Phillips curve with its cost-push underpinning while monetarist link inflation to departures from the monetary rule.

Finally, we need to identify the methodological nodes where Friedman and Brunner depart from each other. They amount to four. First, they differ on their ambitions about the monetarist enterprise (node 6). This translates into node 7 (their respective focus). They also diverge on the readiness of using the IS-LM model as a common theoretical framework for Keynesian and monetarist empirical propositions (node 8) and on the usefulness of putting the transmission mechanism center and front in the monetarist approach (node 9). Put together, these difference in chosen bifurcations generate important differences in research program.

Node 6 is the decisive one. Brunner's project is more ambitious as it aims at making monetarism a full-fledged theoretical model. Jointly with Meltzer, Brunner strived at making monetarism evolve at the same theoretical level as Keynesian macroeconomics. They wanted to be theory builders. Not so for Friedman. He was focused on policy, and in his eyes the dismissal of Keynesian theory did not require the building of an alternative theory.

A priori a highly ambitious program, like Brunner and Meltzer's, looks more appealing than a modest one, like Friedman's. However, what matters is achievement. Did Brunner and Meltzer succeed in their project of building a new general model able to replace the IS-LM model? Answering this question is the task undertaken in the last section of the paper.

[10] We are far from thinking that Keynesian claims were rigorously vindicated; the contrary is true. But what is under discussion here are differences in motivation and premises.

THE BRUNNER-MELTZER MODEL

A prototype Brunner and Meltzer model

Time and again, Brunner and Meltzer argued that the IS-LM model could not be the appropriate framework to develop monetarist ideas.[11] What was needed was to construct a monetarist framework for aggregative analysis, the very task they assigned themselves in the 1960s and 1970s. This said, there is no single Brunner and Meltzer model.[12] The first implementation of their project is to be found in a 1972 *Journal of Political Economy* article, entitled "Money, Debt, and Economic Activity" (Brunner and Meltzer 1972b). Over the years, they developed a few variants of this initial mode, some emphasizing financial intermediation, others providing a more detailed analysis of the fiscal policy dimension.

In all of their successive models, two insights prevailed. The first is a desire to reconcile the micro and macro dimensions. Later in the unfolding of macroeconomics this contention carried the meaning that macroeconomics needs to be based on explicit micro-foundations. But Brunner and Meltzer had something different in mind, namely that, as already stated, a good simplified model of the economy needs to incorporate relative prices. Their model has two of them, the interest rate and the P/p ratio (more on this below). Their second insight is that time had come to give more attention to adjustment processes, the study of how the economy returns to equilibrium after a shock. Above, we mentioned the idea of differences in speed of adjustment. It is also present in Brunner and Meltzer's reasoning: a difference in speed of adjustment of the two relative prices considered is a central ingredient of their model. Their point was not to make the analysis richer for its own sake. Brunner and Meltzer also stress that their model generates policy conclusions different from those of the IS-LM model.

Our reconstructed B&M model comprises three assets markets and one output market, plus a government pursuing a fiscal and a monetary policy. The first two are standard ones: the money and the bonds markets. In the latter government bonds, yielding a nominal return i, are exchanged. The third market is what Brunner and Meltzer call the market for existing real assets. When describing what lies behind this expression, they mention housing, durable goods and existing equipment.[13] Actually, in their model, only the latter item matters, a second-hand market for existing productive equipment (as opposed to newly produced equipment). They assumed that it consists of single good the price of which is P. Brunner and Meltzer decided to reason only in terms of the two first markets. For vindicating this choice they invoke the 'balance-sheet equation' (Brunner and Meltzer 1993: 83, fn.2).[14] Their demand for money function has several arguments, including i and P. They picked P for acting as the money market adjustment variable, i playing this role for the bonds market. After a shock, the two assets markets are assumed to adjust instantaneously. That is, it is implicitly assumed that they function as auction markets wherein agents are price-takers and wherefrom

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[11] See for instance Brunner and Meltzer (1972b, 1993).
[12] Henceforth, we will use the B&M model terminology.
[13] Their real assets market it is not a stock exchange wherein private companies' shares are traded.
[14] By 'balance-sheet equation', they mean a no-arbitrage condition between financial assets as present in portfolio choice models .

information problems are absent.

The output market consist of a composite commodity, *y*, acting both as a consumption and an investment good, with price *p*. So, the same physical good is exchanged in the output market and in the so-called 'real capital' market. The difference is just that in the former the good is new while it is not so in the second. Thus, as far as theory is concerned, they are two different commodities. The *P/p* ratio is the second relative price in their model, on top of *i*. In equilibrium "existing capital sells at reproduction cost" (Brunner and Meltzer 1976: 74), i.e. *P/p* = 1. An increase in *P/p* means that the price of existing real assets rises relatively to that of new real assets. This will induce producers (here acting as demanders of *y* in its quality of equipment good) to substitute new for existing real assets. The demand for the output good is the sum of the real demand of the private sector and of the government. On the supply side, it is assumed that producers are price makers. They set *p* according to a price-setting function. Here Brunner and Meltzer assume that the price set by producers increases with aggregate real output (*y*) and with producers' expectations of future prices. Importantly, there is some price 'stickiness' in the output market because "acquiring information is costly" (Brunner and Meltzer 1972: 38). [15] This implies, they claim, that producers adjust the price of output in a sluggish manner. For the same reason, it is also assumed that producers and purchasers revise their expectations only gradually.

Finally, there is the government. It levies taxes in order to finance its expenditures. Taxes increases with *p* and *y*. Budget deficits can be financed through the issuance of bonds and through the creation of base money by the central bank. Changes in base money can also stem from 'pure' open-market operations, which are independent from the budget deficit. Such operations generate simultaneous and opposite changes in the stocks of base money and government bonds.

The equilibrium of the economy is defined as a state where output is at its normal level ($y = y^*$), real existing assets sell at reproduction cost (*P/p* = 1), and the government budget is balanced. It can be depicted graphically in a *i-y* plan as the intersection of two curves called the *M* and *OM* curves. The *AM* relation indicates the locus of points for which bonds and money markets clear.[16] This relation is positively sloped in the *i, y* plane. An increase in the money base, or a drop in the issuance of government bonds, generates a fall in *i* for a given level of *y*. As a result, the *AM* curve shifts rightward. The *OM* relation represents the locus of points for which the output market clears. This relation is negatively sloped in the *i, y* plane. Importantly, the position of the *OM* curve depends on the ratio of the existing equipment/new equipment ratio. In equilibrium, *P/p =1*. Assume that, for some reason, *P/p >1*. This situation exerts opposite effects. Brunner and Meltzer consider two factors susceptible to cause the OM curve to move to the right. First, producers prefer to purchase new equipment rather than existing one. Hence the demand for new output increases. Second, the real value of non-

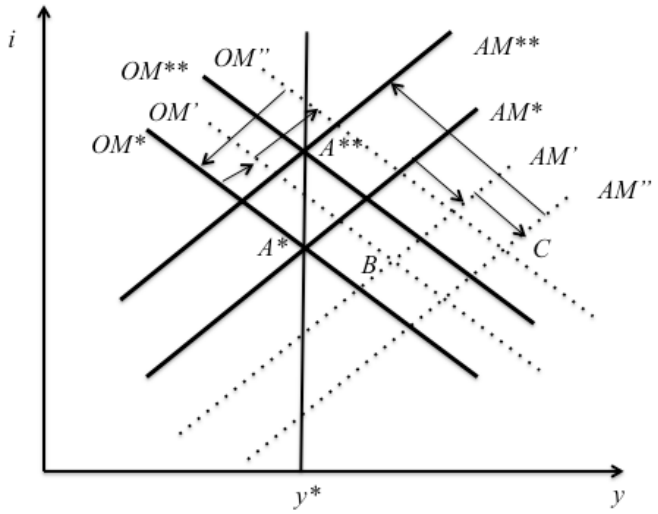
[15] In the 1980s, Brunner and Meltzer (especially in their work with Alex Cukierman) provided a more detailed account of what they meant by "costs of acquiring information"..

[16] On several occasions occasions, Friedman and Brunner presented non-market clearing as a fact of life. However, they did not introduce it within their theoretical constructions (the only notable exception being Brunner, Cukierman and Meltzer 1983).

human wealth appreciates. This positive wealth effect entails an increase in consumption expenditures. On the other hand, they make an assumption that causes it to move to the left, namely that expectations about the future price of output exert an effect in the same direction on its present price. This implies a fall in demand, *i* being given.

Figure 1depicts the model's equilibrium output (*y**) as a function of the equilibrium *AM* and *OM* curves (*AM** and *OM**). They intersect at point *A**. Like Friedman, Brunner and Meltzer are interested in a situation where the government decides to engage in a positive monetary expansion in spite of the fact that the economy is in equilibrium. Their inquiry bears on the mechanism by which, after this monetary shock, the economy returns to its equilibrium allocation – in terms of the graph, how it goes from *A ** to *A***. At both points output is in equilibrium yet with different nominal interest rates.

Figure 1. The AM/OM model



Let us assume that it takes the open-market purchase route. The open-market operation simultaneously increases the money base and decreases the issuance of government bonds, pushing the *AM* curve to the right (from *AM** to *AM'*). The expansion in base money instantaneously raises the price of existing real assets *P*. Given price stickiness on the output market, *P/p* increases, shifting the *OM* curve to the right (from OM* to *OM'*). Point *B*, at the intersection of *AM'* and *OM'*), is definitely not an equilibrium position. At this point, *p* and *y* are higher than they were initially. This movement may continue, for example pushing output to the level corresponding to the intersection of *AM''* and *OM''* at *C*. But counter-acting forces will set in. On the one hand, the higher output price leads producers to adjust their price-level expectations upward, this time shifting the *OM* curve to the left. Second, higher *p* and *y* raise tax collections, producing budget surpluses. This entails an endogenous fall in both the money base and the issuance of government bonds. The larger the proportion of the budget financed by base money, the stronger the leftward shift of the *AM* curve. Gradually, the system converges towards point *A***, where output is back at its equilibrium level. All monetary prices (*p*, *i* and *P*) as well as expectations, have risen in the same proportion as base money.

Brunner and Meltzer are adamant that their model is superior to the IS-LM model. First, it provides a richer account of the transmission mechanism because it comprises two relative prices rather than one. In their eyes, taking stock of the *P/p* ratio brings in new insights. For example, Brunner writes:

> According to this analysis real capital inherited from the past is frozen into the portfolios of individual agents' wealth positions. It exists and decays beyond any portfolio adjustments proceeding on the market. No asset price *P* can emerge under the circumstances and relative variations of *P* and *p* cannot guide investment or consumption (Brunner 1974: 32).

A second reason is that their analysis questions the policy conclusions of the IS-LM model. In the latter, the interest-rate elasticities of investment and money demand play a crucial role in the study of the real effects of monetary shocks. If the economy is stuck in the so-called 'liquidity trap' (for which the interest-rate elasticity of money demand is infinite), monetary policy is impotent. The same conclusion ensues if investment is insensitive to interest-rate movements. By contrast in their model, even in the liquidity-trap case (and if investment is interest-insensitive as well) variations in *P/p* allow monetary impulses to have prominent real effects – a revenge of the 'classics' over Hicks !

Critical remarks

Unfortunately, the B&M model does not stand up to close scrutiny. First of all, in their model everything hinges on the difference in speed of adjustment between *P* and *p*. If *P* is as sticky as *p*, there are no variations in *P/p* and the transmission process is restricted to the interest-rate channel like in the IS-LM model. It is true that market for financial assets (stock exchanges) adjust instantaneously. But the market of which *P* is the price of a market for second-hand equipment. There is no reason for extending the instantaneousness of price adjustment proper to the other types of assets markets to the second-hand equipment market. In the output market, stickiness is justified on the grounds that they are beset with information problems. But since George Akerlof's lemon market paper, we all know that information problems are especially big in second-hand markets. Hence the rise in *P/p* ends up to be unjustified.[17]

A second critical remark concerns the labor market. The latter is absent from the B&M model. There seem to be neither wage-earners nor firms in it. These are terms that they are keen to avoid, writing about purchasers and producers. Does it mean that their economy is composed of self-employed workers? They certainly do not write this explicitly. Were it the case, another problem would arise: why would the self-employed workers need to buy a good that they can produce themselves?

A third criticism is that many assumptions made by Brunner and Meltzer look *ad hoc*. The central role given to the second-hand equipment market and the substitution between old and new equipment is far-fetched. The factors picked up for explaining the return of the *AM* and *OM* curves to their equilibrium positions also seem *ad hoc*. In the same vein, the price-setting function is not justified. Likewise, the link between the cost of acquiring information and stickiness is hardly established.

[17] Laidler (1978, 1990) makes the same point.

Finally, the B&M model pales in comparison with Lucas's signal-extracting contemporary model. The latter is simpler and more rigorous. It has relative prices and microfoundations. It supports monetarist policy conclusion. And it did succeed in achieving what Brunner and Meltzer strived at, dethroning the IS-LM model.

CONCLUDING REMARKS

In this paper we have compared Friedman's and Brunner's aspirations about the development of monetarism. Brunner, jointly with Meltzer, cherished to hope that monetarism would dethrone Keynesian macroeconomics and replace it as the mainstream approach in macroeconomics. They wanted to change theory. Friedman's overarching aim was to persuade politicians and the large public that it was time to abandon the Keynesian vision of the working of the market economy and return to the laissez faire vision. This aim also pervaded his academic activities but these were hardly geared toward make a theoretical revolution the outcome of which would be the rise of a theoretical monetarist framework. Friedman believed that it was possible to defeat Keynesian theory through historical and empirical work.

Economic theory can be compared to a machine. A scientific revolution – in macroeconomics the transition from Keynesian to DSGE macroeconomics – can then be regarded as a change of machine, marking the obsolescence of the old one. Brunner and Meltzer engaged in a battle for replacing the Keynesian machine, to no avail. Friedman was not interested in the whole machine but in one of its pieces, a spare part that had an autonomous usage but that also happened to fit the Keynesian machine. The advantage of regarding monetarism as a spare piece that can be part of different machines is that its fate ceases to be linked to that of the machine of which it was a part once. More or less at the same period when Brunner and Meltzer and Friedman had the dispute we have documented, it happened that both the IS-LM and monetarism were the joint victims of the Lucasian revolution. As noticed by Sargent, this revolution, was "impartial in the rough treatment it handed out to participants on both sides of the monetarist-Keynesian controversies" (Sargent 1996: 5). Now decades later, the Lucas model has evolved into RBC modeling and the latter into DSGE modeling, the same machine in different models. But when watching the novelties in the latest version of the machine, we see that the monetarist spare part has become a central piece of the new model of the machine. Monetarism *à la* Friedman is back in fashion! Like cats, monetarism, narrowly understood, seems to have several lives, the very result of its modest ambition.

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