

Frisch, Helmut

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# Monetarism and Monetary Economics

## A Delayed Comment

By Helmut Frisch, Vienna

The strong reaction to Professor *Mayer's* paper "The Structure of Monetarism"<sup>1</sup> indicates that he has touched upon a central theme of the contemporary theoretical discussion. Th. Mayer by using 12 propositions which are of varying importance has characterized present-day monetarism. In this note I concentrate on his first proposition: the predominance of the impact of monetary factors on nominal income (the Neo-quantity theory of money). My point in chap. I is that the Neo-quantity theory is completely trivial as a theory of nominal income if a monetary impulse cannot be divided in a real effect (output and employment effect) and in a price effect. This is shown by appeal to the so-called accelerations-theorem, which is formulated by a merging of two *Friedman* models.<sup>2</sup> The few empirical studies which exist make it, however, questionable, whether one can speak of a "dominance" of a monetary impulse on output and production.

In chap. II a neglected aspect of the monetarist transmission process (proposition 2 in Th. Mayer's list): the formation of inflationary expectations is considered. There I claim that the accelerations theorem is compatible with adaptive expectations, but not with the model of rational expectations. According to the latter a monetary impulse would only generate inflationary and no real effects. Newer empirical work conveys the impression that for the USA in the period after the II. World War, the acceleration or deceleration of the rate of monetary expansion has not been anticipated. Therefore the accelerations theorem seems to be more compatible with the empirical evidence than does the model of rational expectations.

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<sup>1</sup> Th. *Mayer*, *The Structure of Monetarism*, *Kredit und Kapital*, Vol. 8 (1975) p. 191 - 215 and p. 293 - 313.

<sup>2</sup> M. *Friedman*, *A Theoretical Framework of Monetary Analysis*, *J. P. E.* 78 (1970) p. 193 - 238.  
*A Monetary Theory of Nominal Income*, *J. P. E.* 79 (1971) p. 323 - 37.

Further it is surprising that Th. Mayer neglects the “crowding-out” effect, which some authors (for example J. Stein<sup>3</sup>) consider as the main difference between Monetarists and Neo-Keynesians. The crowding-out effect claims that government spending not accompanied by monetary expansion, i. e. financed by taxes or borrowing from the public results in a crowding-out of private expenditure with little if any increase in total spending. The neglect of the “crowding-out” is an expression of optimism concerning the stabilization policy of the government, whereas stressing it emphasize the opposite. Chap. III discusses the “crowding-out” effect as a noticeable difference between Monetarists and Neo-Keynesians.

The fundamental difference, however, between monetarism and monetary economics in general is to be found in the ‘stability conjecture’ according to which the private sector of the economy is inherently stable (Chap. IV). This postulate or as Th. Mayer often emphasizes “belief” belongs to the “presuppositions” (A. *Leijonhufvud*) of the monetarists and is always formulated as a contrast to the ‘instability postulate’ of Keynesian economics. After a discussion of a more operational concept of stability it is pointed out that the older monetarists such as K. *Wicksel*, G. *Myrdal* and F. A. *Hayek* used instead of the stability conjecture the concept of the ‘cumulative’ process which rests on the assumption that the monetary sector of the economy (in contrast to the real sector) is unstable, since a discrepancy between the real rate and the market rate of interest moves the system away from equilibrium by a sequence of expenditures and price changes.

### I. The Accelerations Theorem

The recent reformulation of the quantity theory is the accelerations theorem. It implies that only an acceleration or a deceleration of the rate of money growth produces any real effects, i. e. employment and output effects, while a constant rate of growth of the quantity of money determines the rate of inflation. For example Laidler’s formulation is: “The effects of a change in the rate of change of money supply are felt initially on the level of real income and the rate of inflation, but in the long run it is only the rate of inflation that is affected.”<sup>4</sup>

<sup>3</sup> J. L. *Stein*, Inside the Monetarist Blackbox, in J. L. *Stein* ed. “Monetarism”, p. 183 - 232, Amsterdam (1976).

<sup>4</sup> D. *Laidler*, An Elementary Monetarist Model of Simultaneous Fluctuations in Prices and Output, in H. *Frisch* ed., “Inflation in Small Countries”,

In M. Friedman's (1970, 1971), D. Laidler's (1976) and K. Brunner's (1970)<sup>5</sup> model the accelerations theorem appears with a further conjecture, namely that the impact of monetary acceleration (deceleration) has only a temporary effect on output and employment. Both propositions can be found in a particularly simple formulation in Friedman's model. Merging both his theoretical models (1970, 1971) the following theoretical sketch is obtained:

$$(1) \quad \pi = \pi^* + \alpha (y - y^*) + \gamma (\log X - \log X^*)$$

$$(2) \quad x = x^* + (1 - \alpha) (y - y^*) - \gamma (\log X - \log X^*)$$

$$(3) \quad y = y^* + \frac{1}{1 - R\beta} (m - y^*)$$

List of Symbols:

- $\pi$  ... rate of inflation
- $x$  ... rate of growth of real income
- $y$  ... rate of growth of nominal income
- $X$  ... level of real income
- $m$  ... rate of growth of money
- $R$  ... rate of change of the velocity of money
- $\beta$  ... adjustment coefficient for inflationary expectations

This system of three linear differential equations expresses the acceleration theorem very clearly. If in (3) the exogenous rate of growth of the quantity of money increases compared to the expected rate of growth of nominal income ( $m > y^*$ ), a positive difference ( $y - y^*$ ) arises. Equations (1) and (2) show how that deviation of the actual rate from the expected affects the rate of inflation  $\pi$  and the rate of growth of real income  $x$ . The parameters  $\alpha$  and  $(1 - \alpha)$  can be interpreted as price elasticities and production elasticities. The system demonstrates a causal direction. An increase in the growth rate of money supply produces real effects via equations (1) and (2), the magnitude of which is set by the ratio  $\alpha/1 - \alpha$ .

An expectations adjustment process of the type:  $\frac{d}{dt} (y^*) = \beta (y - y^*)$  increases  $y^*$  in the state of disequilibrium until  $y = y^* = m$ . In the new

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Lecture Notes in Economics and Mathematical Systems, Springer-Verlag, Berlin-Heidelberg-New York (1976) p. 76.

<sup>5</sup> K. Brunner, The Monetarist Revolution in Monetary Theory, Weltwirtschaftliches Archiv, 105 (1970).

steady state the effect of an increase of the growth rate of the quantity of money on the real variables have disappeared and all actual rates of growth are equal to the anticipated. If it is intended to produce real effects again the rate of money growth  $m$  has to be raised again. A permanent effect on the real system can only be made possible by a permanent acceleration of the growth of the quantity of money.

The accelerations theorem agrees with the first *Mayer*-proposition concerning the “predominance of the impact of monetary factors on nominal income” and it contains some elements of the monetarist transmission process. Two questions arise immediately:

- (1) The accelerations theorem is an empirical hypothesis and thereby examinable. The only study to my knowledge which has attempted to subject the accelerations theorem to a direct statistical test is from P. Korteweg (1976) and is based on the Dutch economy from 1955 to 1972. In this study the “monetary impulse hypothesis” competes with the “fiscal impulse hypothesis” and the “foreign impulse hypothesis”. P. Korteweg concludes: “Not rejected are the weak foreign and monetary impulse hypothesis. That is: changes in output growth without foreign and monetary impulses are highly unlikely”.<sup>6</sup>

The empirical results do not oppose the accelerations theorem; however they oppose its interpretation in a causal sense, in that an acceleration of the money supply always generates a change in real production.<sup>7</sup> A change in the real rate of growth is always correlated with changes in the rate of growth of money supply; but not every change in the rate of money expansion induces a change in the real rate of growth.

- (2) The duration of the real effects depends on the speed of adjustment of expectations and thereby leads to the question, which concept of expectation formation is compatible with the monetarist theory.

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<sup>6</sup> P. Korteweg, *Inflation, Economic Activity and the Operation of Fiscal, Foreign and Monetary Impulses in the Netherlands — A Preliminary Analysis 1953 - 1973*, *De Economist* (1975) p. 616.

<sup>7</sup> According to the weak version of the impulse hypothesis, the phenomenon will not occur without the impulse; according to its strong version, the phenomenon will occur anytime the impulse specified occurs.

## II. Endogenous Expectations

The central question concerning the process of expectation formation is not analysed in Th. Mayer's "Structures", although it is precisely the expectations which play a fundamental role in understanding the accelerations theorem, as well as the monetaristic transmission process. The acceleration theorem is compatible with the adaptive-expectations model, which is explicitly or implicitly accepted by the majority of monetaristic authors (M. Friedman 1970, 1971), (K. Brunner 1970), (D. Laidler 1976). If the economic agents behave according to the model of adaptive expectations, the real variables of the system (output and employment) can be changed through a change in the rate of change of money supply, because of the appearance of an unanticipated inflation.

Let us consider the situation in the labor market, which is usually neglected by the monetarists (E. Claassen<sup>8</sup>). If we start with a steady state situation in which money wages ( $w$ ) grow at the rate of increase of marginal productivity of labor  $g$  and the expected rate of inflation,  $\pi^*$  we have:

$$w = g + \pi^*$$

The rate of growth of the market real wage, however, is  $w - \pi$ , where  $\pi$  is the actual rate of inflation:

$$w - \pi = g + (\pi^* - \pi) .$$

If a non-anticipated inflation develops due to the acceleration of money supply, the market real wage drops below the marginal productivity of labor and (assuming profit maximizing firms) the rate of unemployment is lowered below its "natural" level  $u^*$  (corresponding to the state of affairs in which inflation is fully anticipated  $\pi = \pi^*$ ). This situation could be demonstrated by the following (linearized) adjustment process:

$$\frac{dN}{dt} = N \cdot \gamma (g(N) - (w - \pi))$$

The increase in employment is proportional to the rentability difference  $g - (w - \pi)$ .

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<sup>8</sup> E. Claassen, Short-Period Fluctuations in Nominal and Real Income: A Monetarist Model, in E. Claassen and P. Salin ed. "Stabilization Policies in Interdependent Economies", North-Holland (1972).

However the adaptive expectations adjustment model implies that money wages rise as long as there is a positive difference  $(\pi - \pi^*)$ . When  $(\pi - \pi^*) = 0$  the previous real wage is reached again, the rate of unemployment is equal to  $u^*$  again, but the rate of inflation is permanently higher.

Any further attempt to lower  $u^*$  below  $u$  requires a higher rate of expansion of the money supply. An acceleration of the rate of growth of the money supply induces real effects only when a non-anticipated inflation results, which temporarily lowers the market real wage below the marginal product of labor.

Therefore we have the following lemma:

The accelerations theorem is explained by the existence of a non-anticipated inflation which is a consequence of the change in the rate of money supply.

While authors as M. Friedman (1970, 1971), D. Laidler (1976) or J. Stein (1976) (in his "synthetic" model) have formulated an adaptive expectations process, another group of authors, monetarists "in a broad sense", — such as Th. Sargent<sup>9</sup>, Th. J. Sargent and N. Wallace<sup>10</sup> and R. E. Lucas<sup>11</sup> reject adaptive expectations as a waste of information, preferring rather "rational" expectations. The central idea of the rational expectations hypothesis (REH) is that the expectation of an economic variable "depends in a proper way on the same things that economic theory says actually determine that variable" (Th. J. Sargent and W. Wallace, 1975). More precisely: rational expectations of inflation are unbiased estimators of the actual inflation rate  $\pi_t$ , given all information at the beginning of the period.

From a theoretical point of view "rational expectations" render the accelerations theorem invalid. Since any economic agent knows the model, each change in the rate of growth of money supply leads not only to a change in the actual inflation rate but also in the expected rate of in-

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<sup>9</sup> Th. J. Sargent, Rational Expectations, The Real Rate of Interest, and the Natural Rate of Unemployment, Brookings Paper on Economic Activity, 2 (1973).

<sup>10</sup> Th. J. Sargent and N. Wallace, Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule, J. P. E. 83 (1975), p. 241 - 54.

<sup>11</sup> R. E. Lucas, Jr., Econometric Testing of the Natural Rate Hypothesis, in O. Eckstein, ed. "The Econometrics of Price Determination", Washington, D. C. (1972) p. 50 - 59.

flation, so that an impact on the real variables of the system is excluded.

In contrast, the econometric application of the concept of rational expectations seems to support the accelerations theorem. Especially informative is an econometric attempt by R. J. Barro<sup>12</sup> for the USA (1976). The work can be considered as an econometric test for the accelerations theorem and the concept of rational expectations. The hypothesis that forms the basis of this study is that only unanticipated changes in money have effects on real economic variables like the unemployment rate and the level of output. That hypothesis was quantified by interpreting the “systematic part” (= anticipated money growth) of the money supply as the amount that could have been predicted based on a reduced form equation, where money growth is explained by the “normal federal budget”, the lagged rate of money growth and the lagged rate of unemployment. Unanticipated money growth was measured as actual growth less the amount obtained from this predicted relation ( $m_t - m_t^*$ ). The current and two annual lag values of unanticipated money growth were shown to have considerable explanatory value for unemployment and output according to the accelerations theorem. The results show that from 1961 - 1967 in a period of relatively constant growth the “unanticipated” rate of money expansion was very small; however the acceleration of the money supply 1968 (+ 2.5 %) was not anticipated and this brought the rate of unemployment down to 3.5 % below the estimated “natural level”. An unanticipated monetary contraction 1960 (– 3.9 %) accounted for a sharp rise in the unemployment rate to 6.7 %. The empirical verification speaks for the accelerations theorem and against the REH. R. Barro’s result shows that for the USA for the period 1960 - 1975 an acceleration (deceleration) of the rate of money supply was regularly not (!) anticipated and it thereby led to changes in employment and output.

Why does the empirical evidence speak for the accelerations theorem and not for the REH? There are several reasons:

- (1) Existing price agreements and wage contracts make short-run changes difficult, so that for parts of the price- and wage system adaptive behaviour again appears realistic.<sup>13</sup>

<sup>12</sup> R. J. Barro, Unanticipated Money Growth and Unemployment in the United States, A. E. R. 67 (1977).

<sup>13</sup> See W. Poole, Rational Expectations in the Macro Model, Brookings Papers on Economic Activity 2, (1976) p. 484 f.



- (2) Economic agents might form conditional mathematical expectations using an economic model and information about exogenous variables in  $t$ , but different agents might have different models. People are rational with respect to their model; but the same information might convey different meanings to different economic agents.
- (3) The regular appearance of a significant unanticipated rate of money supply, whenever the rate of money supply changes, shows that economic agents know the pre-determined variables of the model but not all exogenous variables at time  $t$ , when they make their predictions. (For example, the fiscal policy variable in  $t - 1$ , but not the value of that variable in  $t$ ).
- (4) The accelerations theorem can be viewed as a special variant of the hypotheses that only the unanticipated part of changes in the rate of money expansion has effects on the real economic variables.

### III. The Crowding-out Effect

It is interesting to note that Th. Mayer did not discuss the crowding-out effect as a point differentiating monetarism from Keynesian economics. The crowding-out effect deals with the different ways of financing a budget deficit. "Whether deficits produce inflation depends on how they are financed. If, as so often happens, they are financed by creating money, they unquestionably do produce inflationary pressure. If they are financed by borrowing from the public, at whatever interest rates are necessary, they may still exert some minor inflationary pressure. However, their major effect will be to make interest rates higher than they would otherwise be." (M. Friedman, 1972)<sup>14</sup>

The crowding-out effect emphasized by M. Friedman and the econometricians of the St. Louis<sup>15</sup> model stresses the fact that government spending not accompanied by monetary expansion, that is financed by taxes or borrowing from the public results in a crowding-out of private expenditure with little if any net increase in total spending.

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<sup>14</sup> M. Friedman, Comments on the Critics, in R. J. Gordon, ed., "Milton Friedman's Monetary Framework", The University of Chicago Press (1974), p. 140.

<sup>15</sup> L. C. Andersen and K. M. Carlson, A Monetarist Model for Economic Stabilization, Federal Reserve Bank, St. Louis Rev. (1970).

According to a hypothesis by J. Stein<sup>16</sup> the acceptance or rejection of the crowding-out effect is the point of difference between the two schools, the “Monetarists” and the “Neo-Keynesians”. Stein considers the following ‘Gedankenexperiment’. The government reduces taxes and finances the deficit through the sale of bonds, thereby increasing  $\theta$ , the bonds/money ratio. Since the budget deficit raises the bonds/money ratio the bond market can only be in equilibrium if the nominal rate of interest rises. On the commodity market the results are two opposite effects: a positive wealth effect on the expenditure function  $\frac{\partial E}{\partial \theta} > 0$ , and a negative crowding-out effect  $\frac{\partial E}{\partial r} \cdot \frac{\partial r}{\partial \theta} < 0$ , ( $\frac{\partial r}{\partial \theta}$  is the effect of a change of the bonds/money ratio upon the market rate of interest). Three possible developments can come from these effects: the “crowding-out” effect can be stronger, can be weaker or can exactly compensate the positive wealth effect.

These two opposite effects signify the difference between Monetarists and Neo-Keynesians:

$$\frac{\partial \pi}{\partial \theta} \leq 0 : \text{ Monetarists}$$

$\pi = \text{rate of inflation}$

$$\frac{\partial \pi}{\partial \theta} > 0 : \text{ Neo-Keynesians}$$

If the effect of a government deficit financed by borrowing from the public on the rate of inflation is non-positive the model is Monetarist, if it is positive the model is Neo-Keynesian.

The “crowding-out” effect is an empirically testable hypothesis. F. Modigliani and A. Ando<sup>17</sup> have recently attempted to conduct, by means of a simulation study, an assessment of the role of the crowding-out effect. They point out that as a consequence of a “monetary impulse” the crowding-out effect is only one of several effects. Financing an increase in government expenditure ( $\Delta G$ ) by issuing debt will produce the following effects:

<sup>16</sup> Jerome L. Stein, Inside the Monetarist Black Box, in “Monetarism”, J. Stein ed., Studies in Monetary Economics, Vol. 1 (1976) North-Holland-Publ.-Comp., Amsterdam-New York-Oxford, p. 193 f.

<sup>17</sup> F. Modigliani and A. Ando, Impacts of Fiscal Actions on Aggregate Income and the Monetarist Controversy: Theory and Evidence, in J. Stein ed. “Monetarism”. Studies in Monetary Economics, Vol. 1 (1976) North-Holland, p. 25 f.

(1) an impact effect (direct effect  $\Delta G \rightarrow$  real income), (2) an induced consumption effect, (3) an accelerator effect, (4) price effects, (5) wealth effects, (6) crowding-out effect and (7) a real balance effect (*Pigou-Patinkin*). According to *Modigliani* and *Ando* we can assume that the effects (3), (5), (7) are empirically negligible and (6) is contractive. Empirical evidence suggests that the contractive mechanisms tend to work more slowly than the major expansive one.

Hence one would expect that first real income will increase (the peak response in the *Modigliani-Ando* simulation is reached in about 5 quarters) but because of the crowding-out effect in the intermediate run (2 - 3 years) the system moves back to the initial situation. The Neo-Keynesian model's neglect of the crowding-out effect expresses an optimism about a government stabilization policy, whereas the Monetarists express exactly the opposite by emphasizing the crowding-out effect. This is undoubtedly an important point of difference between the two schools and of more importance than the following points discussed by Th. Mayer: (4) "Irrelevance of allocative detail for the explanation of short run changes in money income, (6) Reliance on small rather than large econometric models, (7) Use of the reserve base or similar measure as the indicator of monetary policy, (8) Use of the money stock as the proper target of monetary policy." Perhaps, however, it belongs to Th. Mayer's point (9): "Dislike of government intervention".

#### IV. The Stability of the Private Sector

A central theorem of the present-day Monetarism is the stability conjecture of the private sector. *Mayer* states: "Monetarism generally believes that the private sector is inherently stable if left to its own devices and not disturbed by an erratic monetary growth". (*Th. Mayer*, op. cit. p. 204) The hypothesis about the stability of the private sector is a fact accepted by all monetarists. (*M. Friedman*<sup>18</sup>), (*K. Brunner* and *A. Meltzer*<sup>19</sup>), (*D. Laidler* [op. cit. 1976]) Here we have reached the core of the contemporary monetarism discussion. The monetarist model differs from the Keynesian economics by the 'belief' that the economic system exhibits a strong tendency to converge to the equilibrium of its real variables. This difference is usually noticeable at the 'cosmological'

<sup>18</sup> *M. Friedman*, *The Role of Monetary Policy*, A. E. R. vol. 58 (1968) p. 1 - 17.

<sup>19</sup> *K. Brunner and A. Meltzer*, *An aggregative theory for a closed economy*, in *J. L. Stein* ed. "Monetarism" op. cit. p. 69 - 103.

level — to use A. *Leijonhufvud's* term — and not explicitly represented by the formal model. The 'vision' — how the economy basically works distinguishes Monetarism and 'Keynesian economics'. Even when one bears in mind Th. *Mayer's* warning against claiming "that monetarism is basically an 'ideological' doctrine" and his advice to resist firmly the "temptation to play amateur psychoanalyst", (Th. *Mayer*, op. cit. p. 307) the stability conjecture is not included with the propositions which constitute the model but rather with the 'pre-suppositions' (A. *Leijonhufvud*)<sup>20</sup>, i. e. propositions underlying the assumptions on which the model is based.

On the level of economic model building the stability problem can be reduced to two questions:

- (1) Does the private economy exhibit a tendency to converge to equilibrium?
- (2) Does this occur in a monotonic or in an oscillatory way?

The stability concept which has been taken from physics is useable only with important limitations in the social science. Even if a system converges to equilibrium the models differ according to the speed of reduction of a disturbance. G. *Tintner*<sup>21</sup> has recently suggested to introduce the concept of 'half-life' as an operational measure for examinations of stability. If halving a disturbance requires ten years for example the system is economically unstable, if it requires 10 months it might be called stable. This of course concerns only a one-shot impulse. However, every non-anticipated change in the exogenous variables generates a new impulse with resultant fluctuations so that at every point of time a system of overlapping — strengthening or compensating — fluctuations results. So far the system is in the average away from the equilibrium and the usual concept of stability would appear to be devoid of meaning.

The second question is concerned with the stability of the adjustment process. The *Hicks-Samuelson* trade cycle model explains the type of the adjustment process through the lag structure of the variables of the system, which generates as solution a difference (differential) equation

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<sup>20</sup> A. *Leijonhufvud*, Schools, "revolutions" and research programmes in economic theory, in S. J. *Latsis* ed., "Methods and Appraisal" in Economics, Cambridge Univ. Press, London (1976) p. 65 - 99.

<sup>21</sup> G. *Tintner*, B. *Böhm*, R. *Rieder*, Is the Austrian Economy Stable?, unpubl. Manuscript, University of Technology (1976) Vienna.

of second order. In accordance with the values of the parameters this equation yields a monotonous adjustment process or cyclical fluctuations, which can be dampened or explosive. If a monotonous adjustment process or dampened fluctuations exist the system is stable. The current monetaristic literature hardly shows experiments with lag-structures. The simplest strict monetarist model which has a lag-structure was formulated by D. *Laidler* (op. cit., 1976). It is formed by 3 equations: a money market equation, an 'expectations augmented' *Phillips* curve and an adaptive inflations-expectation process of the type discussed. The solution of the model yields a differential equation of second order for excess demand. The message of the model is that a change in the rate of monetary expansion or in the anticipated 'full employment' rate of growth of the real GNP will generate cyclical fluctuations. When a simple monetarist model generates cyclical fluctuations by a change in its exogenous variables, it is difficult to understand why stabilisation policy should not be possible and desirable. However, Th. *Mayer's* conclusions, "In any case, if the private sector is inherently stable no counter-cyclical policy may be needed or be desirable" (*Mayer*, op. cit. p. 306), belong more to the monetarist "cosmology" than to the propositions which are relevant for the model.

The hypothesis of stability is a speciality of present-day monetarism. The older monetaristic school of K. *Wicksell*, G. *Myrdal*, F. *Hayek* and others was in this respect somewhat more cautious. Instead of the stability conjecture this school used the concept of the "cumulative" process. In *Wicksell's* model any discrepancy between the market rate of interest and the natural rate will set in motion a dynamic sequence of spending and inflation which will continue as long as the gap persists.

*Wicksell's* cumulative process can be "stable" in the sense that it contains a self-correcting mechanism, or it may be not self-limiting but of indefinite duration, in the pure credit system. (Th. M. *Humphrey*<sup>22</sup>) In the monetarist business cycle model of F. A. *Hayek*<sup>23</sup> the cumulative process is clearly unstable and, in contrast to *Wicksell*, inflationary changes and changes in the real sector of the economy develop. In the *Hayek* model, the increase in money supply by the banking system lowers the market rate of interest below the natural rate which would equilibrate real investment and voluntary savings. The creation of money

<sup>22</sup> Th. M. *Humphrey*, Interest Rates, Expectations, and the Wicksellian Policy Rule, *Atlantic Economic Journal* vol. IV (1976) p.9 - 20.

<sup>23</sup> F. A. *Hayek*, Prices and Production, London (1932) Lecture III.

leads to a “first round effect”: the additional money funds are spent for the purchase of investment goods. This induces an inflationary effect and a restructuring process in the economy. The relative price of investment goods (compared with consumer goods) rises and workers and “non specific” means of production will be removed from their current use to the investment goods sector. During this process, excess demand for labor arises. Rising money wages and the (relative) decrease in the production of consumer goods lead to an increase in the price of consumer-goods. A critical point exists in this expansion process, a point at which the market rate of interest will increase. If voluntary savings do not rise — as *Hayek* assumes — an additional creation of money, i. e. an acceleration of the supply of money would become necessary.<sup>24</sup>

In *Hayek's* model the cumulative process ends in a “crisis”, but the upper turning point remains, however, somewhat in darkness.

The private sector in *Hayek's* model is inherently unstable, since a deviation from the equilibrium of the system leads away from equilibrium. The cumulative process is maintained by continuously creating money, the rate of which must accelerate. In contrast to the present-day monetarists, the leading monetarists of the 1920's and 1930's considered the monetary system as immanently unstable, whereby disturbances of the system (= deviation of the market rate from the real rate of interest) induce a cumulative process. If the *Hayek* model would be augmented by a modern expectation-adjustment process, the result could offer a fruitful alternative to present-day monetaristic literature.

## Zusammenfassung

### Monetarismus und monetäre ökonomische Theorie

Prof. Mayer hat in seinem Essay „The Structure of Monetarism“ den gegenwärtigen „Monetarismus“ durch 12 Propositionen charakterisiert. Der vorliegende Beitrag befaßt sich im wesentlichen mit der Neuformulierung der Quantitätstheorie (Proposition I in Prof. Mayers Darstellung), sowie mit

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<sup>24</sup> It is interesting to note that *Hayek* used the accelerations theorem: “All this must mean a return to shorter or less roundabout methods of production if the increase in the demand for consumers' goods is not compensated by a further proportional injection of money by new bank loans granted to producers . . . And as long as the banks are going on progressively increasing their loans it will, therefore, be possible to continue the prolonged methods of production or perhaps even to extend them still further” (F. A. *Hayek*, op. cit. p. 80).

dem „Stabilitätspostulat“ der Monetaristen. Die Neo-Quantitätstheorie kommt in dem Akzelerationstheorem zum Ausdruck, wonach eine Beschleunigung im Wachstum der Geldmenge reale Effekte erzeugt, während im steady state die Rate des Geldmengenwachstums nur die Inflationsrate bestimmt. Es wird gezeigt, daß das Akzelerationstheorem adaptive Erwartungen impliziert; rationale Erwartungen würden reale Effekte bei einer Änderung des Geldangebots von vornherein ausschalten. Empirische Untersuchungen in den USA zeigen, daß nach dem II. Weltkrieg die Akzeleration oder Dezeleration der Geldmenge regelmäßig *nicht* antizipiert wurde, so daß das Akzelerationstheorem eher mit der empirischen Evidenz kompatibel erscheint als rationale Erwartungen.

Der fundamentale Unterschied zwischen Monetarismus und monetärer Ökonomie liegt in der Annahme oder Ablehnung des „Stabilitätspostulates“, wonach die Marktwirtschaft inhärent stabil sei. Monetarismus wird definiert als monetäre ökonomische Theorie mit der zusätzlichen Annahme des „Stabilitätspostulates“. Dieses Konzept hat keinen operationalen Charakter und gehört eher zur „Weltanschauung“ der monetaristischen Richtung. Ältere „Monetaristen“ wie K. *Wicksell* und F. A. *Hayek* verwendeten anstatt des Stabilitätspostulates das Konzept des Kumulativen Prozesses, welcher impliziert, daß der monetäre Sektor inhärent instabil sei.

## Summary

### Monetarism and Monetary Economics

In his essay “The Structure of Monetarism” Prof. Mayer has characterized present-day monetarism by using 12 propositions. In this note I concentrate on his first proposition (the Neo-quantity theory of money) and on the “stability”-postulate. The Neo-quantity theory is discussed by appeal to the so called accelerations-theorem, according to which an acceleration (or deceleration) of the rate of growth of money supply generates real effects, while in a steady state the rate of growth of money supply determines only the rate of inflation. The few empirical studies make it questionable, whether one can speak of a “predominance” of a monetary impulse on output and production. It is contended that the accelerations theorem is compatible with adaptive expectations but not with the model of rational expectations. According to the latter a monetary impulse would only generate inflationary and no real effects. Recent empirical investigations convey the impression that for the USA in the period after the II. World War the acceleration or deceleration of the rate of money expansion has not been anticipated. Therefore the accelerations theorem seems to be more compatible with the empirical evidence than does the model of rational expectations.

The fundamental difference between monetarism and monetary economics in general is to be found in the “stability conjecture” according to which the private sector of the economy is inherently stable. “Monetarism” is defined as monetary economics with the additional assumption of the

“stability conjecture”. This conjecture is not an operational concept and belongs to the “Weltanschauung” of the monetarist school of thought. After a discussion of a more operational concept of stability it is pointed out that older monetarists such as *Wicksell* and *Hayek* used instead of the stability conjecture the concept of the “cumulative” process, which implies that the monetary sector of the economy is inherently unstable.

## Résumé

### Monétarisme et théorie économique monétaire

Dans son essai « The structure of monétarism », le Professeur *Mayer* a caractérisé l'actuel « monétarisme » par 12 propositions. La présente étude s'intéresse principalement à la nouvelle formulation de la théorie de la quantité (Première proposition dans l'essai de *Mayer*) ainsi qu'au « postulat de la stabilité » des monétaristes. La théorie néo-quantitative s'exprime dans le théorème de l'accélération, selon lequel l'activation de l'expansion de la masse monétaire engendre des effets réels, alors qu'en modèle statique (steady state), le taux d'expansion de cette masse n'influence que le taux d'inflation. L'auteur démontre que le théorème de l'accélération implique des expectatives adaptables; des expectatives rationnelles écarteraient anticipativement les effets réels d'une modification de l'offre de monnaie. Aux Etats-Unis, des recherches empiriques ont établi qu'après la seconde guerre mondiale l'accélération ou la décélération de la masse monétaire n'était régulièrement pas anticipée, de sorte que le théorème de l'accélération semble plus compatible avec l'évidence empirique qu'avec des expectatives rationnelles.

La différence fondamentale entre le monétarisme et l'économie monétaire consiste en l'acceptation ou le rejet du « postulat de la stabilité » qui veut que l'économie de marché soit stable en elle-même. L'on définit le monétarisme comme étant la théorie économique monétaire complétée du « postulat de la stabilité ». Ce concept n'a aucun caractère opérationnel, mais participe plutôt de la philosophie de l'orientation monétariste. D'anciens « monétaristes » tels *K. Wicksell* et *F. A. Hayek* exploitent non pas le postulat de la stabilité mais le concept du processus cumulatif qui implique l'instabilité inhérente du domaine monétaire.