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THE COSTS OF A PURELY MONETARY DISINFLATION POLICY:

THE CASE OF LONG-RUN INVOLUNTARY UNEMPLOYMENT

by

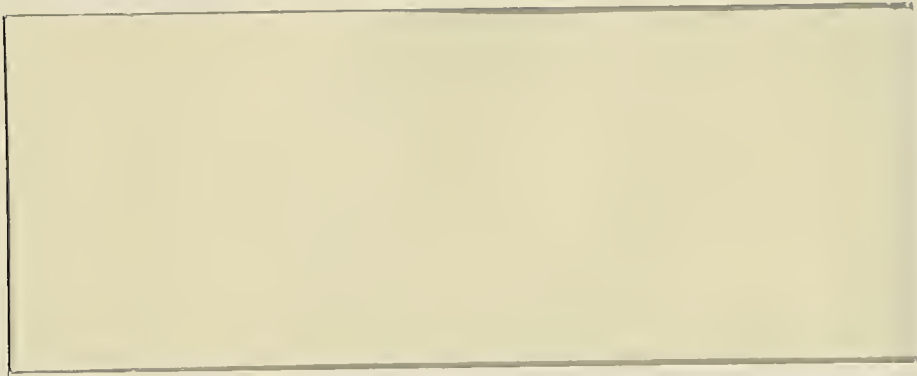Helmut Wagner

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Abstract

There is a common understanding in economics today that there are only transitory effects of monetary policy on employment. Here I develop the theoretical rationale for the possibility of an economy's getting stuck in long-run involuntary unemployment as a consequence of a purely monetary disinflation policy. Involuntary unemployment persists despite flexible wages and prices and despite rational behavior of economic subjects. The underlying mechanism consists first of a governmental insurance policy against re-igniting inflation expectations and second of an information dilemma, or prisoner's dilemma, in which the entrepreneurs are caught. A falling interest rate--caused by an ending of the disinflation policy--is, per se, not a sufficient incentive to expand production for an individual entrepreneur. There is no functional element such as "the economy" reacting in a homogeneous way. It is rational for the single entrepreneurs to wait for the others to invest first. In this case, only demand policy can get the economy out of unemployment.

I am going to show that a purely monetary disinflation policy
in a market economy will - under certain realistic conditions -
lead into the cul-de-sac of an underemployment equilibrium or,
alternatively, increasing unemployment disequilibria. This can be
used as a theoretical basis for the explanation of the empirical
fact of a stop-and-go-policy pattern. By using a monetary dis-
inflation policy, the government or central bank produces an under-
employment situation which may last even beyond the disinflation
period. This underemployment situation can eventually only be put
an end to by a demand policy which tends to produce inflation
again. It is decisive that this process would occur even if the
structural hindrances to the effectiveness of the market mechanism
- like oligopolistic market structures and factor immobilities -
were eliminated.(!) This shall be shown in the following.

The existence of <u>long-run</u> involuntary unemployment with price
flexibility cannot be proved by a purely macro-economic analysis
(up to now). Under certain conditions of "rigidity", macroeconomic
analyses can doubtless prove transitory real effects of monetary
policy. A well-known example is the short-run Phillips curve. In
the long run, where there is no money illusion and price adjust-
ments are completed, however, there are no more quantity effects
(expressed by the vertical graph of the Phillips curve). Only by
including certain microeconomic supplements may such a proof of
long-run unemployment be possible.

If one tries to prove the existence of long-run involuntary un-
employment such as a long-run underemployment-equilibrium, it is
necessary to assume freedom of money illusion as well as wage and
<u>price flexibility</u>. Furthermore it is a precondition for such a
proof to use an <u>equilibrium approach</u> as a methodological point of
departure. Moreover one also has to postulate marginal productivity
payments for labor <u>and</u> capital. Only thus is a steady state

characterizable. Otherwise there would always be an incentive for the economic subjects to improve their positions by adjustments transactions; i.e. a pareto-optimal general (second best-) equilibrium would then not be reached yet. In other words, the proof of an underemployment-equilibrium is only then conclusive when it is carried out under the outlined assumptions.

In the following paper I show first that a transitory monetary disinflation policy only creates transitory quantity effects - as long as one remains at a purely macroeconomic level of analysis. I thereby work with an IS-LM-approach supplemented by a production function and the conditions of marginal productivity payments.

Afterwards I show with the help of a microeconomic argumentation that the economy may tend to get stuck in a recession caused by a disinflation policy and the reasons for this. The foundation herefore is the situation of an information or prisoner's dilemma which the economy may get into.

1. MODEL

The model used in this paper is an extension of the traditional IS-LM-model. It consists of the equilibrium conditions on the money market and the goods market (equations (1) and (2)), the production function (equation (3)) and the conditions of marginal productivity payments for labor and capital (equations (4) and (5)).

The latter two conditions are to be understood as medium- or long-term aims of profit-maximizing firms. They tend to be realized through substitution processes due to production methods. These substitution processes can in part last very long, since they may take place, as substantiated below in section 5., perhaps only in the course of replacement investments.

The model then runs as follows:[1]

(1) $M = P \cdot L \underset{- \quad +}{(i, Y)}$

(2) $S(Y) = I \underset{- \quad + \quad +}{(i-p^e, Y^e)}$

(3) $Y = F \underset{+ \quad +}{(N, K)}$

(4) $\frac{W}{P} = F_N (N, K)$

(5) $i-p^e = F_K (N, K)$

In equation (2), I (investment) can be replaced by $K - K_O$ and accordingly equation (2) can be replaced by

(2') $S(Y) + K_O = K(i-p^e, Y^e)$.[2]

---

1) M: quantity of money

   P: price level

   L: demand for money

   i: rate of interest (nominal)

   Y: national product (national income)

   S: savings

   I :   investment

   p^e: inflation expectation

   $i-p^e$:   real interest rate

   Y^e: expected demand

   K: capital stock

   N: quantity of labor (in hours)

   W: money wage

   $F_N :=$ $\partial F / \partial N$

p^e, Y^e and M are the independent exogenous variables in the model.

2) On the left side of equation (2') we have the supply of capital, on the right side the demand for capital. The interest rate equalizes capital supply and demand.

I should perhaps explain the dependency of the investments upon Y^e instead of Y, as usually assumed. Therewith I suppose that the entrepreneurs have rigid demand expectations when making their investment decisions.

In part 4. of this paper the investment- or capital demand function will be specified.

Graphically we can represent the process induced by a monetary disinflation policy as shown in figure 1:[3]

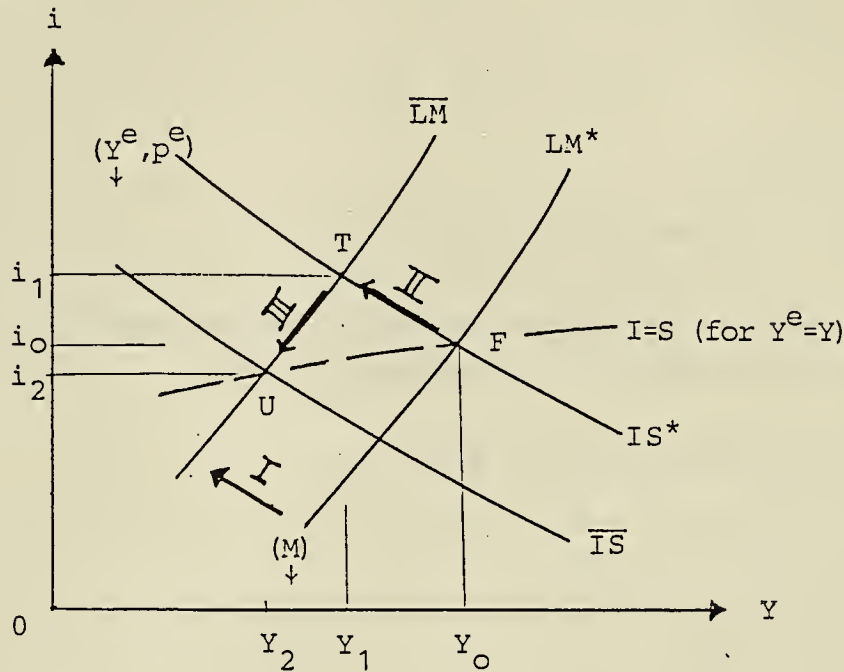FIG. 1

We start from a full employment equilibrium associated with a positive, anticipated rate of inflation $p = p^e$. In figure 1, this starting point is denoted by F, where $Y_o(K_o, N_o)$. Suppose,

---

3) The process described in figure 1 can self-evidently be used for a growing economy too. Suppose linear homogeneity with respect to Y in the savings function and the money demand function. Then one can divide the variables Y, N, K and M by K_o without changing the structure of the model by this transforma- tion. In figure 1, the horizontal axis would then be denoted by Y/K_o instead of Y. N_o, which in a growing economy is inter- preted as supply of labor in efficiency units, increases at the rate of technical progress. At a constant growth, K or K_o, respectively, will grow at the same rate. N_o/K_o remains constant and the full employment equilibrium F reproduces itself from period to period at a corresponding increase in the national product Y.

But that is analogically true for the underemployment equili- brium U, too. Here K and Y grow uniformly at the rate of technical progress, while the rate of unemployment remains constant.

the government or the central bank, respectively, tries to
force down the inflation rate to zero by reducing the supply
of money. This here is denoted as <u>monetary disinflation policy</u>.
The reason may be that the government/central bank assumes a
negative trade-off between the inflation rate and the producti-
vity growth or only a negative trade-off between the inflation
rate and the re-election of the governing party(ies).

What follows from this disinflation policy, depends on the for-
mation of expectations as well as on the structural facts.
I distinguish three cases:

<u>case 1:</u> The disinflation policy is announced or anticipated
with knowledge of the model structure, <u>and</u> the speed of
adjustment of the price level P is at least as high as that
of the quantity of money M.

In this case, the economic system remains at point F. In other
words, monetary policy is perfectly neutral.

<u>case 2:</u> The disinflation process is announced or anticipated
with knowledge of the model structure; <u>however</u> the speed of
adjustment of the price level P is <u>lower</u> than that of the
quantity of money M.

In this case, the economic system goes directly from the full
employment equilibrium F into the underemployment equilibrium U.

<u>case 3:</u> The disinflation policy is not announced and not anti-
cipated either. In other words, it occurs surprisingly. Due to
the time structure of the adjustment speeds of P and M, the same
as in case 2 is assumed.

In this case, the economic system moves to point T first, and
then moves on to point U. Even if the economic agents knew the
model structure and formed rational price expectations, we would

get the same result. (Realistically, one however has to assume, in addition, at least some short-run price rigidity in cases 2 and 3.)

I shall describe case 3 more extensively in the following. In my opinion, case 3 is the empirically most relevant one. However, with case 2 one could just as well substantiate the central argument of the paper that a monetary disinflation policy can have long-run non-neutral effects. The difference lies merely in the detour via the equilibrium T that describes the peculiarity of case 3. I shall discuss the process in case 3 referring to figure 1.

2. THE PROCESS OF RECESSION

Movement I:

The reduction of the nominal supply of money ($\equiv$ monetary disinflation policy) reduces the real quantity of money in case 3, but also in case 2, and thus shifts the LM curve in figure 1 to the left.

This, by increasing the interest rate, initiates a recessive process, which (in case 3) at first leads to a new equilibrium T. [Movement II in figure 1]

Movement II:

The process runs logically as follows:

$i^\dagger$: At first, the entrepreneurs try to maintain Y_o, because they continue to expect the full employment demand $Y^e = Y_o$. Correspondingly, their capital demand continues to be K_o and their money demand continues to be L_o. At the reduced

money supply, this leads to the increase in interest from i_0 to i_1: [4]

$$\frac{M}{P} \downarrow \underset{\substack{\text{equ. (1)} \\ \text{at given } Y}}{\Longrightarrow} i \uparrow$$

$Y \downarrow$: This increase in interest leads to a decrease in the national product, because the capital demand declines when the interest rate rises:

$$i \uparrow \underset{\substack{\text{equ. (2)} \\ \text{at given } p^e, Y^e}}{\Longrightarrow} \quad I \downarrow \equiv K \downarrow \underset{\substack{\text{equ. (3)} \\ \text{at given } N}}{\Longrightarrow} Y \downarrow$$

So eventually the equilibrium point T is reached.

However, T is not a long-run equilibrium, because $Y < Y^e$. Therefore one has to assume that the entrepreneurs will adapt their expected demand to the decreased Y. But this means that the recessive process will itensify in a so-called accelerator process. [4a] This is represented in figure 1 by the movement III. The interest rate and national product decline. The movement ends in a new underemployment equilibrium U which can be a longer-run equilibrium as will be shown.

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4) I shall use some perhaps uncommon symbols in the following: So

       $x \uparrow$ denotes an increase in x
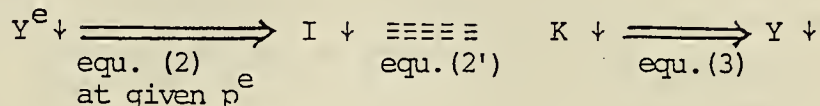
and $x \downarrow$ denotes a decrease in x.

$\underset{\substack{\text{equ. (1)} \\ \text{at given } Y}}{\boxed{\Longrightarrow}}$ is the symbol for "has the following effects on the basis of the functional connection depicted in equation (1) at given Y"

This manner of writing sometimes has certain advantages due to the clarity for the reader as soon as he is familiar with it.

4a) Actually, also adaptations in price expectations will take place. These will strengthen the recessive process as will be shown on pages 11, 17 and 22.
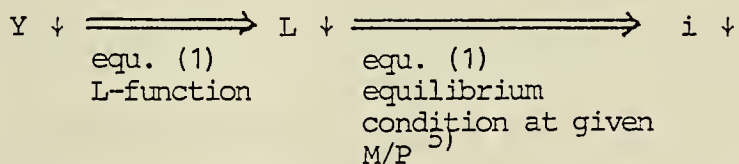
Movement III:

Y ↓: After reaching T, the entrepreneurs reduce Y^e, because they perceive that $Y < Y^e$. The resulting process is represented by the following scheme:

Y^e ↓ $\Longrightarrow$ I ↓ ≡≡≡≡ K ↓ $\Longrightarrow$ Y ↓
$\quad\quad$ equ. (2) $\quad\quad\quad\quad$ equ.(2') $\quad\quad\quad$ equ.(3)
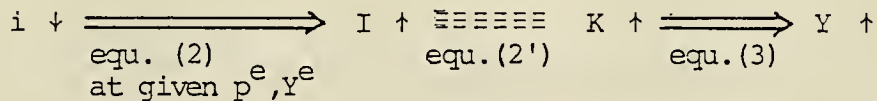$\quad\quad$ at given p^e

Thereby, the IS curve in figure 1 shifts downwards. The process is stopped at U because of the decline in the rate of interest resulting from the decrease in the national product:

i ↓: The decrease in the rate of interest follows from the equilibrium condition (1):

Y ↓ $\Longrightarrow$ L ↓ $\Longrightarrow$ i ↓
$\quad\quad$ equ. (1) $\quad\quad\quad$ equ. (1)
$\quad\quad$ L-function $\quad\quad\quad$ equilibrium
$\quad\quad\quad\quad\quad\quad\quad\quad$ condition at given
$\quad\quad\quad\quad\quad\quad\quad\quad$ M/P [5]

Y ↑: The counter-process that stops the recessive process in U is substantiated as follows:

i ↓ $\Longrightarrow$ I ↑ ≡≡≡≡≡ K ↑ $\Longrightarrow$ Y ↑
$\quad\quad$ equ. (2) $\quad\quad\quad\quad$ equ.(2') $\quad\quad\quad$ equ.(3)
$\quad\quad$ at given p^e, Y^e

So the downward shift of the IS curve gets stopped.

In U there is $Y^e = Y_2$. U denotes an underemployment equilibrium, where $N_2 < N_o$, with a constant real wage and a constant interest rate i_2.

---

5) Strictly speaking, the precondition is that P does not rise at a given M.

3. POSSIBLE STABILIZATION PROCESSES DURING THE DISINFLATION POLICY

The decisive question is whether the situation denoted by
point U really is a long-run equilibrium.

In this section I shall describe some stabilization processes
that could lead the economic system back to the full employment
equilibrium F - despite an enduring disinflation policy. In the
following section 4. I shall then represent the commonly assumed
stabilization process after terminating the disinflation policy.
In section 5., finally, I shall analyze possible destabilization
mechanisms that even aggravate the situation of underemployment.

Suppose, the government or the central bank carries out a strict
disinflation policy. This means that in figure 1 the LM curve
is maintained at $\overline{LM}$ by measures of monetary policy. An economic
system could only escape from an underemployment equilibrium
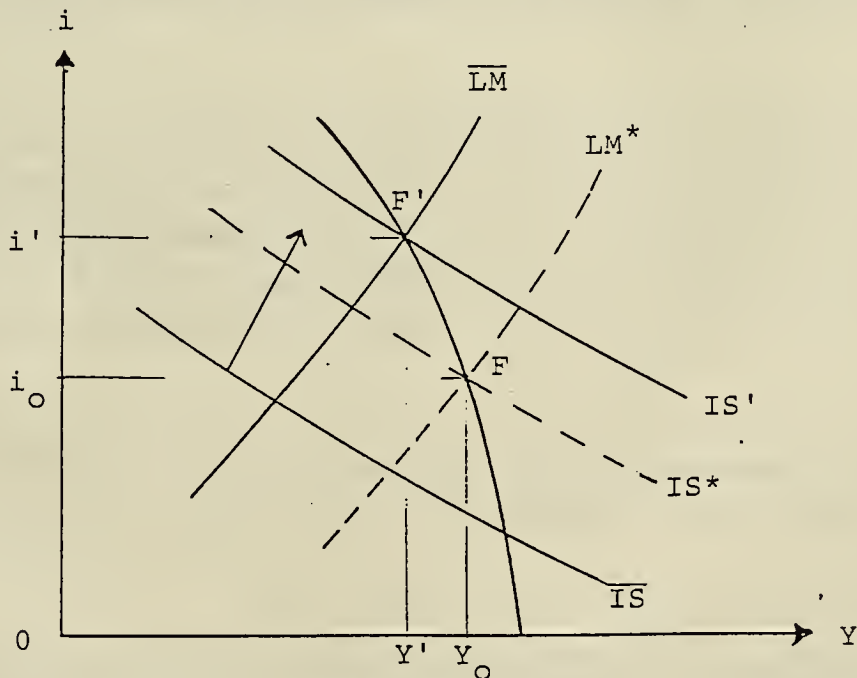if the IS curve shifted to the full employment equilibrium F':

FIG. 2

The backward inclination of the full employment line follows
from equation (5) above: If i rises, the demand for capital
will be reduced. From equation (3) we get:
$Y'(K'(i'), N_o) < Y_o(K_o(i_o), N_o)$ where N_o: full employment
and $K' < K_o$.

Such a shift could possibly be based on

a) <u>wealth effects:</u> That is, the real value of certain assets increases. Suppose, at an underemployment equilibrium the wages decline because of the enduring unemployment $(N_o - N_2)$. This will only lead, at $\overline{LM}$, to proportionate price level decreases because of too low demand expectations $(Y^e = Y_2$ in U). Such price level decreases will raise the real value of nominally fixed assets. This leads, according to the so-called Pigou effect, to a higher consumption demand or, according to the so-called Robertson effect[6], to a higher investment demand. Correspondingly, the IS curve would shift upwards.

However, one principally should have reservation about such stabilization arguments which refer to wealth effects. The reason is that gains in real wealth in the aggregate always face losses in real wealth (at least in the case of inside money). Besides gains for creditors there are losses for debtors, besides Pigou effects there are Fisher effects[7] too.

Moreover we started by assuming a positive rate of inflation. The disinflation policy was introduced in order to reduce the rate of inflation to zero. That is, as long as the government/ central bank fixes the LM curve at $\overline{LM}$, a positive rate of inflation exists. Thus nominally fixed assets produce a steady though decreasing <u>loss</u> in real value during the disinflation period.

Even greater reserves should be shown against a possible stabilization argument which refers to

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6) Hereto see, for example, Kohn (1981: 876).

7) Fisher effects can be characterized as follows: If the price level falls, the real value of nominally fixed debts and debt services rises. The investments or the demand for capital, respectively, will decrease, also because, among, other things, the interest rate for borrowed capital rises in virtue of an increased real indebtedness (debt-equity ratio) of the firms (→ risk premium in the rate of interest). Correspondingly, the IS curve will rather tend to shift downwards.

b) <u>increasing inflation expectations</u>. In the underemployment equilibrium, the wage and price increases will, as mentioned, decline. This is precisely the purpose of a disinflation policy.

Now one could guess that the economic subjects believe in something like a "normal" inflation rate. If the inflation rate falls under this normal rate, firms are assumed to expect that the inflation rate will rise again sooner or later. The real interest rate, $i - p^e$, would then fall and the investments or the demand for capital, resp., would rise at a given Y^e. Thereby the national income and thus savings would increase, too. The IS curve would shift upwards so that the new full employment equilibrium F' would be realizable. (See figure 2 above.)

However, the assumption of a "normal" rate of inflation appears ultimately unconvincing. A longer-run disinflation policy is carried out precisely because it is assumed that thereby the stubborn inflation expectations can be mollified and eventually eradicated.

Thus one has rather to assume that a disinflation policy leads to <u>expectations of deflation</u>. Deflation expectations do not necessarily mean expectations of a falling price level but are to be understood more generally as expectations of falling increases in the price level.

The argumentation in section 5. is partly based on this latter expectation process. Here I shall substantiate the possibility of long-term involuntary unemployment through the effect of deflation expectations.

4. <u>STABILIZATION PROCESS AFTER TERMINATING THE DISINFLATION POLICY</u>

Suppose first that in the underemployment equilibrium U, produced by the disinflation policy, the money wage increases are reduced

because of the underemployment ($N_2 < N_o$). In section 5., this
supposition will be relativized, since reducing the money wage
is not by all means the best alternative for the entrepreneurs,
even though assuming rational expectations.)

Because of the constant interest rate and the constant demand
expectation this, however, does not affect more investments,
but only a proportionate decrease in the inflation rate. The
real wage thus remains constant. A constant interest rate as
well as a constant real wage are formal minimum conditions for
the existence of an underemployment equilibrium in the sense of
a long-run constant underemployment level. The constancy of
the interest rate is here not explained by a "reservation rate
of interest" as by Keynes[8], but by the disinflation policy
of the government/central bank. As long as the central bank
succeeds in compensating the falls in inflation by reducing
the growth of the money quantity - which presupposes that the
adjustment speed of M is at least as high as that of P -, the
real money stock will not increase by more than is planned.
The central bank fixes the LM curve at $\overline{LM}$. Neither interest
effects nor investment effects can arise. The economic system
remains stuck in an underemployment equilibrium because of the
disinflation policy aimed at the reduction in inflation
(expectations). The more stubborn the inflation expectations
are, the longer will the disinflation policy last and the longer
the underemployment equilibrium will therefore persist.

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8) For a modern interpretation of the Keynesian concept of a
"reservation rate of interest" (→ liquidity trap) see Wagner
(1986 a). There I restrained from the concept of a reservation
rate of interest as a concept to substantiate an underemployment
equilibrium. The reason is that, when considering the deflation
expectations emerging in an underemployment equilibrium, the
reservation rate of interest does not remain constant. There-
with an important formal condition for the existence of an
underemployment equilibrium is violated.

But what happens, if the government/central bank eventually
ends the disinflation policy - because it has reached its goal
or it believes no longer to be able to sustain the disinflation
policy because of political reasons due to re-election?[9] One
will tend to assume that the price mechanism will then lead
the economy back again to the full employment equilibrium -
provided (as done above) that it will not be hindered by
structural or legal, institutional rulings.

Yet some fundamental doubts can be raised and also substantiated
about this traditional "belief".

At first, however, I shall represent the traditional understanding
of the stabilization process in the case of an ending of the
disinflation policy: Starting point is the underemployment equi-
librium U. (The argumentation can be followed with the aid of
figure 3 below.)

The underemployment situation will continue to put pressure on
the money wages or their increases, respectively. The increase
in money wages will be reduced and therewith the increase in
the price level. However, the money quantity growth is now no
longer reduced to an equal extent. But this means that the real
money stock M/P increases. In figure 3, this affects a right-
ward shift of the LM curve. This induces a decrease in the
interest rate according to our model structure shown above.
This on the other hand leads to an increased demand for capital
and therewith to increases in production. The latter affects
an upward shift of the IS curve in figure 3. So eventually one
reaches the full employment equilibrium F again.

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9) One could also ask what would happen, if in the course of time
   the adjustment speed of P increases and exceeds that of M.
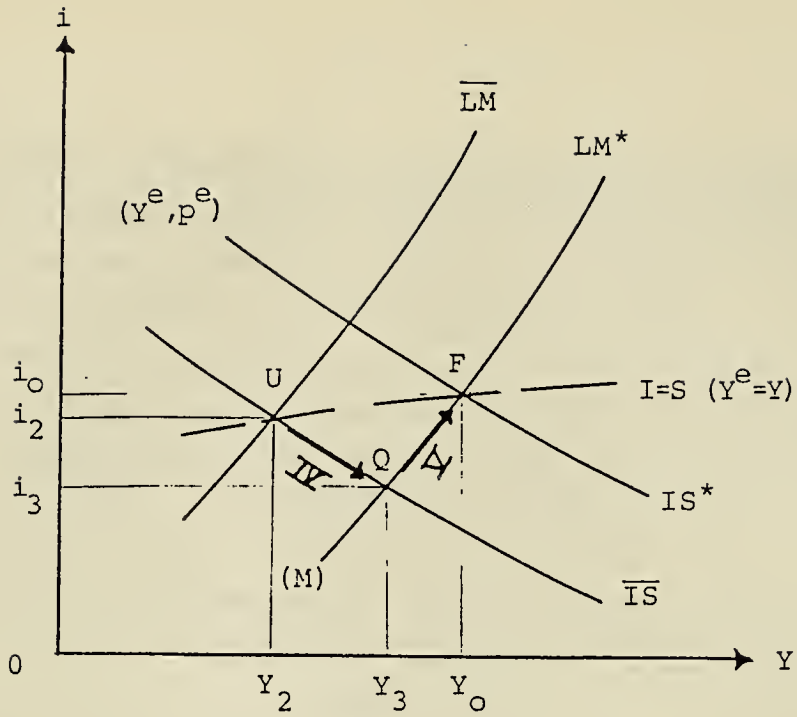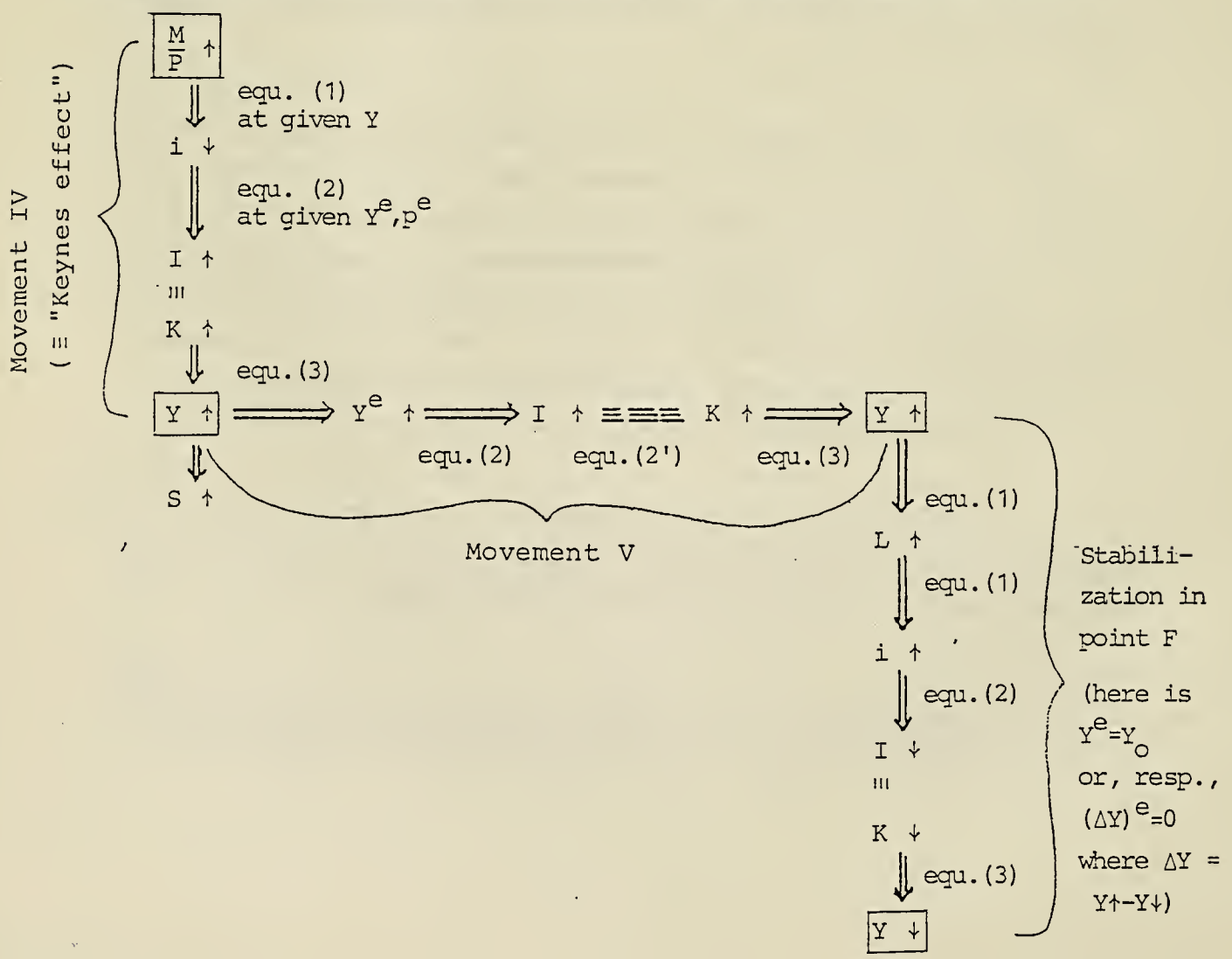   The following conclusions would then be just as true.

FIG. 3

I shall depict in the following the process of operation in
more detail with the aid of the arrow scheme explained above:

Movement IV
(≡ "Keynes effect")

$\boxed{\dfrac{M}{P} \uparrow}$

⇓ equ. (1)
at given Y

$i \downarrow$

⇓ equ. (2)
at given Y^e, p^e

$I \uparrow$

≡≡≡

$K \uparrow$

⇓ equ.(3)

$\boxed{Y \uparrow} \Longrightarrow Y^e \uparrow \Longrightarrow I \uparrow \equiv\equiv\equiv K \uparrow \Longrightarrow \boxed{Y \uparrow}$

⇓   equ.(2)   equ.(2')   equ.(3)

$S \uparrow$

Movement V

⇓ equ.(1)

$L \uparrow$

⇓ equ.(1)

$i \uparrow$

⇓ equ.(2)

$I \downarrow$

≡≡≡

$K \downarrow$

⇓ equ.(3)

$\boxed{Y \downarrow}$

Stabili-
zation in
point F

(here is
$Y^e = Y_o$
or, resp.,
$(\Delta Y)^e = 0$
where $\Delta Y = Y\uparrow - Y\downarrow$)

This stabilization process can, in principal, be explained only macroeconomically.

For the individual entrepreneur, who is the economic actor in the investment process, a falling interest rate is not in any case a sufficient incentive to producing more and therefore demanding more labor. For the individual entrepreneur, an increase in production is only profitable if he can suppose that he can also sell this increase in production. However, his sales possibilities only improve if additional demand for his products arises in the economy. The individual entrepreneur does not sell his products only to his own workers. In other words, the individual firm is not a closed system.

Nevertheless the sales possibilities of the individual entrepreneurs are assumed to be raised through the substitution process resulting from the decrease in the interest rate: In consequence of the decrease in the interest rate, the real factor price relation $\frac{i-p^e}{W/P}$ declines. This induces a substitution process such that the factor price relation K/N increases. When the interest rate declines, it becomes more profitable for the firms to produce at a higher capital intensity. The capital demand therefore increases. (This is the substantiation of the interest dependency of the capital demand as assumed in (2').) The positive demand effects of this substitution process can be illustrated by the following example:

Firm A orders x_A (additional) machines from firm B with the intention to carry through the substitution process, i.e. to dismiss z_A workers <u>after</u> receiving the machines.

Firm B hence produces x_A machines in addition and herefore must employ y_B additional workers. These y_B workers demand additional consumption goods with their wage incomes.

Firm B, for its part, orders x_B additional machines from firm C in order to also carry through the substitution process <u>after</u> receiving the machines.

Firm C hence produces x_B machines in addition and herefore must employ y_C additional workers. These y_C workers as well demand additional consumption goods with their wage incomes. And so on.

So the well-known multiplicator-accelerator-process is set in motion and the economy again approaches the full employment situation. Hence U cannot be regarded as a long-run equilibrium. As soon as the disinflation policy is put an end to, the described substitution processes start to work and lead the economy back to the full employment equilibrium.

5. DESTABILIZATION MECHANISMS

There could be long-run involuntary unemployment only if at least one of the two following possibilities emerged:

a) The government/central bank keeps on its restrictive monetary course even after successful disinflation. Thus it tries to maintain the $\overline{LM}$ curve.

b) The substitution processes do not take place in the manner described.

To a): This possibility can certainly be assessed as realistic. The more "inflation-averse" a government/central bank is, the more will it be inclined to keep the money supply tight in order to suppress still guessed inflation mentalities. That is, this policy functions as an insurance against otherwise supposedly re-emerging inflation expectations.[10] The present policy in West Germany can partly be interpreted in this way. However,
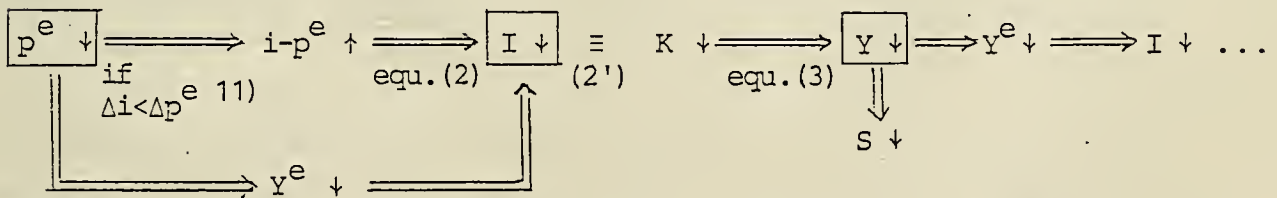
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10) Besides, such a policy could be based on guessed positive side-effects of unemployment so produced - as, for instance, is emphasized in the efficiency wage literature. (See, for example, Shapiro and Stiglitz 1984.)

could this substantiate an underemployment <u>equilibrium?</u>
Actually one would then expect the maintenance of the economy
in an underemployment situation to lead to deflation processes
which, for their part, have recession-intensifying effects:
Attempts of the unemployed to find employment by demanding
lower than current wages would - in a competitive economy -
only affect general decreases in the wage level and consequent-
ly decreases in the price level too. This would naturally result
in deflation expectations, i.e. a declining p^e, too.

A fall in p^e means that the alternative costs of an investment
into real capital increase. The investment demand in equation (2)
above is not dependent on the nominal interest rate, i, but on
the <u>real</u> interest rate, $i - p^e$. When the real interest rate
rises, the investment- or capital demand and with it the pro-
duction decreases, ceteris paribus. The decrease in investments
will even be intensified by the negative effects of deflation
expectations on the demand expectations, Y^e, of the entrepreneurs.
If the entrepreneurs have deflation expectations in the sense
of expected absolute reductions in prices, they have to assume
that planned purchases of consumption- and of investment goods
will be delayed. This is expressed by the following arrow scheme:

$$\boxed{p^e\ \downarrow} \underset{\substack{\text{if}\\ \Delta i<\Delta p^e\ 11)}}{\Longrightarrow} i-p^e\ \uparrow \underset{\text{equ.(2)}}{\Longrightarrow} \boxed{I\ \downarrow} \underset{(2')}{\equiv} K\ \downarrow \underset{\text{equ.(3)}}{\Longrightarrow} \boxed{Y\ \downarrow} \Longrightarrow Y^e\ \downarrow \Longrightarrow I\ \downarrow\ \dots$$

$$\Longrightarrow Y^e\ \downarrow \qquad\qquad S\ \downarrow$$

The IS curve shifts downwards as a consequence of deflation
expectations.

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11) Now the nominal rate of interest will adapt itself to the
changed inflation- or deflation expectation in the course of
time. Yet, as the empirical evidence shows and as can also be
proved by theoretical analysis (see, for example, Mundell (1963)
or Wagner (1985)), the nominal rate of interest will only
partially adapt itself to the inflation- or deflation ex-
pectations, respectively.

Hence the production and herewith the employment will contineous-
ly decline. This, however, cannot be in the interest of profit-
maximizing firms. Consequently, firms acting rationally may
eventually jointly turn down wage-decrease offers from unemployed
workers - for fear of such cumulative recession processes resulting
from cumulative deflation processes. Hence, the price level may not
fall and there may be no deflation expectations either. [11a] With
a non-accelerating money supply (i.e., at the supposed monetary-
political maintenance of the LM curve), the real money stock would
therefore not rise either. So the underemployment equilibrium U
would persist.

To b): This possibility can be regarded as quite realistic, too.
This does not mean that there would be no substitution process
at all. This would not be compatible with the assumed profit-
maximizing behavior. However, the substitution processes could
be realized only very hesitatingly - because of expectations
uncertainty and substitution costs. In principal, one can imagine
that the substitution processes do not succeed in getting the
economy stabilized. The unemployment may even increase - although
the government/central bank ended the disinflation policy. This,
for instance, is the case if the substitution is only carried
through in the course of the usual replacement investments
(labor-saving technical progress). The employment level would
then even continue to decrease. The economy would still further
depart from the full employment situation.

If the substitution processes do not take place as smoothly as
described in section 4., the economy could remain in an under-
employment equilibrium. For, a falling rate of interest (caused
by an ending of the disinflation policy, i.e. - graphicly ex-
pressed - by a rightward shift of the LM curve) is, per se, not
yet a sufficient incentive to expand production for an individual
entrepreneur, as already explained above. He will expand his
production only if he is sure that sufficiently many other
entrepreneurs will also increase their production. If only a
single entrepreneur carries through a capital widening in

11a) This can only be seen as the result of a successful social
learning process. Hereto see in section 6.

consequence of a decrease in the interest rate, he will be worse off - since he then cannot fully utilize his additional capacities. In other words: An enlargement in capacities is profitable for the individual entrepreneurs only if they can expect the aggregate demand to rise sufficiently. The aggregate demand, however, will increase sufficiently only if the individual entrepreneurs in the aggregate enlarge their capacities.

We here apparently face the dilemma of a vicious circle. This vicious circle can only be broken if the individual entrepreneurs give the market mechanism an advance of trust. That is, they must - relying on the functioning of the above macroeconomic model connection - enlarge their capacity, i.e. increase their demand for capital and labor.

As a synonym for this advance of trust, the term of rational expectations formation is introduced in the New Classical Macroeconomics. It implies that the entrepreneurs know the above model structure, accept it as true and rely on its empirical functional automatism. More simply speaking, the individual entrepreneurs include the circular flow effects of their actions, i.e. here: of possible capital widenings, into their investment decisions. However, it is decisive that all entrepreneurs (or at least a large part of them) must do this in order to get the stabilization mechanism function. The individual entrepreneurs, however, when knowing that connection, will carry through capacity-enlarging investments only if they can rely on many other entrepreneurs doing the same. This again presupposes that each individual entrepreneur can assume that all the other entrepreneurs (or at least the majority of them) also know the - same - model structure, accept it as true and rely on its empirical functional automatism. However, as long as the individual entrepreneur is not sure that the other entrepreneurs have the same information, react just as he does and therefore increase investment relying in return on his own equal behavior, he will abstain from capacity-enlarging investments. A decreasing interest rate alone then will not induce

him hereto either. It is safer for him to await the aggregate
deveplopment, i.e. to wait and see what the other entrepreneurs,
whose intentions he is unsure about, do. The decisive indicator
which shows him the intentions of the others is the demand de-
velopment (the general order intakes etc.) but not the interest
rate.

The notion that the individual entrepreneur only observes the
interest indicator and has no knowledge about the social com-
plexity and interrelation of the process of expectations and
trust in investment decisions is, in my opinion, too ignorant
of the world. In other words, it is understandable only as the
result of a (too) abstract macro-modelling, but not microecono-
mically in a significant way. [12]

Considering the outline above, it is (more) suggestive to
start - instead from (2) and (2') - directly from a function
for a <u>widening</u> of investments or of capital demand, resp., i.e.
for an enlargement of capacity, as represented in the equations
(6) and (6'):

(6) $I = I(i_r, \cdot)$ where $I_{i_r} < 0$ only for $0 < r_r \geq i_r$

$$\text{where } r_r: = \text{expected real return on } I$$

$$r_r = r - p^e; \quad i_r = i - p^e$$

(6') $K = K(i_r, \cdot)$ where $K_{i_r} < 0$ only for $0 < r'_r \geq i_r$

$$\text{where } r'_r: = \text{expected real return on } K \ (= I + K_o)$$

$$r'_r = r' - p^e.$$

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12) Here I conciously deviate from the common, however unrealistic
characterization of economic actors as being "blind", i.e. indi-
vidualistic (here) in the sense of not being capable of learning
and understanding social processes. I therefore also see the
differences between polypolistic and oligopolistic market behavior
more in the different chance to influence prices (and to collect
information). (Hereto see Wagner (1983).) However, both types,
polypolies as well as oligopolies, include the behavior of the
rest of society into their decision process and decide under
uncertainty.

Otherwise there is $\quad I_{i_r} = 0$

and $\quad K_{i_r} = 0.$

One can write these investment- and capital demand functions just as well as follows:

(7) $I = I(r-i)$ where $I'(\Delta) > 0$ for $\Delta \geq 0$ and $r > 0$

and $\quad I'(\Delta) = 0$ for $\Delta < 0$ or $r \leq 0$

(7') $K = K(r'-i)$ where $K'(\Delta) > 0$ for $\Delta \geq 0$ and $r' > 0$

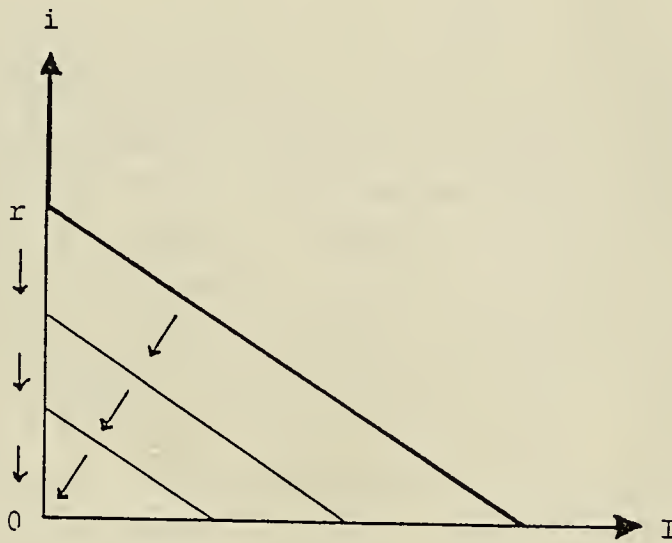and $\quad K'(\Delta) = 0$ for $\Delta < 0$ or $r \leq 0.$

FIG. 4

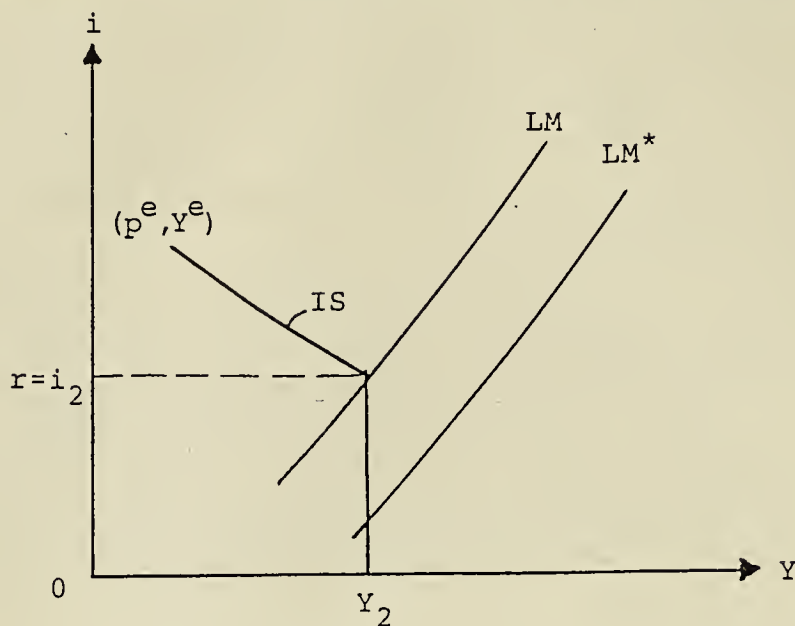Correspondingly the IS curve then runs as depicted in figure 5.

FIG. 5

This means that - in the case b) described above - an increase
in the real money stock (by declines in wage and price levels),
even if it lowers the interest rate, will not simultaneously
increase the investment or capital demand. Correspondingly,
also the production may remain at the level Y_2, and the employ-
ment at the underemployment level N_2. Even if the interest rate
becomes negative, this would not affect expansive investments
(in the sense of creating more production and employment). As
long as the individual entrepreneur is not convinced of an
increase in aggregate demand, his expected return on a capital
widening, r_r, will be negative. At a negative return r_r, however,
he will carry through no capital widening, even if
$i_r \leqq r_r$.[13] Wage decreases would only result in price level
decreases. The result would be deflation expectations which
would still aggravate the underemployment situation. For deflation
expectations decrease not only r but also r_r due to wealth trans-
fers and to purchase delays and because they raise the uncertainty
in investment planning ($r = r_r + p^e$; r_r: = the real return on
an investment into physical assets). Hence, at point U it may be
rational for profit-maximizing firms - as I explained elsewhere

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13) In a long-run competitive equilibrium model, clearly the extra
profits will equal zero and therefore $r_r = i_r = F_K$. Yet r_r will
be ≤ 0 for the individual entrepreneur because of the perceived
prisoner's dilemma. (See again footnote 12 above.)

(see Wagner 1986 a) - to resist unemployed's supplies of wage decreases, when expecting such deflation processes and recession processes resulting therefrom. In this case, the prices level will not decrease either. At a non-accelerating quantity of money, the real money stock will not rise, that is: not only the real wage, but also the interest rate remain constant. So the underemployment equilibrium is maintained. At an accelerating quantity of money, however, the interest rate falls indeed, nevertheless this does not lead to capital widenings.

The only and empirically more likely alternative to an underemployment equilibrium is a permanent worsening of the recession (i.e., increasing unemployment-disequilibria). For qualifications see in section 6.

Could, on the other side, a strong inflation(ary) policy of the central bank, which produces new inflation expectations, lead the economic system out of this cul-de-sac? This cannot be answered decidedly. Inflation expectations doubtless increase the nominal rate of return, r. However, two different things have to be considered: Firstly, inflation expectations increase the money interest, i, too (even though less than proportionally, so that r - i tends to rise). Secondly and more importantly, there is some reason to believe that inflation expectations have a negative effect on the <u>real</u> rate of return r_r by (further) raising the uncertainty in investment planning, so in particular by fanning anxieties about a new disinflation policy.[14] (Hereto see, e.g., Wagner (1986 b)). Insofar i_r eventually could indeed rise by more than r_r in consequence of an inflation(ary) policy.

A way out of the long-run unemployment impasse thus only seems to be possible by increasing the <u>aggregate</u> demand <u>exogenously.</u> Hereby one apparently cannot renounce governmental demand policy, unless one hopes for the chance of exogenous demand shocks like for example from exchange rate changes[15] or

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14) This can partly be expressed as that the demand expectations, Y^e, decline.

15) Such demand-increasing exchange rate changes occur, for instance, if a country is more sucessful in combating inflation than the other countries. (See, in this context, Wagner (1985).)

from preference changes abroad in favor of domestic products. But, as soon as the demand policy has inflationary effects, a renewed change in the politico-economic course, i.e. a new disinflation policy, is to be expected sooner or later, as experience shows.

So the roundabout of a stop-and-go-policy keeps on rotating. Only a sucessful incomes policy seems to be able to put an end to this. By such an incomes policy, the negative feedbacks from inflation- as well as from deflation expectations on the real rate of return r_r could be avoided. Moreover, in the ideal case, monetary disinflation policies producing long-run negative quantity effects would even become unnecessary.[16]

An additional stabilization possibility follows from (unevenly distributed) product innovations. Such innovations can induce single creative firms to carry through capital widening, even at a given aggregate demand expectation, in the expectation of being able to take away customers from other firms by their new products. Thereby expansive circular flow processes would be launched. This is also an argument for supplementing traditional demand-orientated stabilization policies by supply-political measures like promotion of technological progress and innovation policy.

I have in this paper only shown the basic possibilities of a purely monetary disinflation policy in getting stuck in a situation of long-run involuntary unemployment.
Nonetheless, the theoretical approach used is a promising one that should induce further research.

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16) For the conventional objections against incomes policy see, for example, Mayer (1981). For a defense of incomes policy see, for instance, in Colander (ed., 1986).

6. SUMMARY

Disinflation managed by purely monetary policy empirically requires
a long time period of economic recession because of contract commit-
ments and prior expectations. During such a long-term recession
negative accelerator processes - based on declining demand expecta-
tions as well as on deflation expectations - lead to increasing un-
employment-disequilibria (or, alternatively, short-run underemploy-
ment equilibria). After wages and prices become more flexible, how-
ever, the market forces are supposed to bring the economy back to
the full-employment equilibrium with no inflation. This is the
dominant belief in today's economics profession.

In this paper I have argued that after a long recessionary period
the economy - or more particularly the single entrepreneurs - will
tend to get into an information dilemma or prisoner's dilemma. Even
with declining wages and prices, and therefore declining nominal
interest rates after the termination of the disinflation policy,
capital demand will not rise because of the coordination problem
described above. As long as wages and prices decline the recession
will worsen, i.e., the unemployment disequilibrium will increase.
There is no reliable endogenous mechanism that takes the economy
out of the recession.

The only likely alternative to a persistent increase in unemploy-
ment disequilibria is an underemployment equilibrium. This could
be achieved if entrepreneurs agreed to jointly resist any wage cut
offers from unemployed Workers. They as a class have an incentive
to do this because a continously worsening recession is not in their
interest. But there will always be an incentive for single entre-
preneurs to break such an agreement.

In a competitive economy with a great number of firms single entre-
preneurs will always have a strong incentive to cheat in the hope
that others will not notice, or not react to their cheating. If
only a single entrepreneur accepts the wage cut offer of unemployed
workers, he or she can thus raise his or her profit. As long as

other entrepreneurs comply with the agreement not to accept wage cut offers, the recession will not worsen. If, however, all entrepreneurs simultaneously try to act in this way and cheat, the recession will worsen and involuntary unemployment will rise.

In an oligopolist economy, however, entrepreneurial behavior may be different. Oligopolist entrepreneurs cannot hide their cheating and cannot expect their competitors not to react. There everyone knows for sure that his cheating will always produce a worsening of the recession. After experiencing such a worsening, accompanied by lowering profits, entrepreneurs should be inclined to comply with the agreement to resist wage cut offers. In addition, and perhaps even more important, these entrepreneurs have to consider in their decision making the likely negative effects of an enduring recession on the stability of the capitalist order.

The main point of this paper, however, is not the question of whether there will be an underemployment equilibrium instead of a persistent increase in unemployment disequilibrium. The main point is the proof that, after a purely monetary disinflation policy, there will be no reliable possibility that the economy will get out of the cul-de-sac of long-run involuntary unemployment by endogenous forces. Thus expansionary governmental demand policy is inevitable in this case.

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