Some Monetary and Financial Aspects of the Disinflation Process

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The purpose of this paper is to study some monetary and financial dimensions of the disinflation process, which is taking place in many O. E. C. D. countries. The article tackles four issues: (1) the liquidity of the economy; (2) the evolution of nominal and real interest rates; (3) the process of financial innovation (4). Indebtedness and the evolution of the real burden of the debt under disinflation. The emphasis is placed on the asymmetry between the impact of the acceleration of inflation in the seventies, and the consequences of the present disinflation process.

Disinflation is an ambiguous expression since it represents both a *process* resulting in a progressive and quasi-continuous decrease of the inflation rate, and a *state of the economy* characterized by a more or less durable lower inflation level than at the initial state.

As a process, disinflation raises all the problems associated with the transition towards a lower inflation rate. The distortions are generally the most significant during the transition: because errors in inflationary expectations become substantial, the standard deviation of relative prices increases[1], transfers between agents are extended, etc.

This paper will present some aspects of disinflation in both meanings, particularly highlighting monetary and financial conditions and consequences of the disinflation process. Without really arguing about the intensity and duration of the disinflation process, we will assume that this process, initiated in 1982 in some major O.E.C.D. countries, will continue.

The economic analysis of disinflation has since 1978 concentrated on a few topics:

— the theory of adjustment costs, leading to discounted cost-benefit analysis for different levels of inflation.[2]

[1] *Frochen* and *Maarek's* analysis shows that, in France, the transition from one inflation level to another occurs with an increase in the standard deviation of relative prices, but, once the economy is settled at the new inflation level, the standard deviation returns to its initial value.

[2] The literature on this subject has rapidly grown since the seminal papers of *Modigliani* and *Papademos* (1978), *Modigliani* and *Fischer* (1978), and up until the recent critical appraisal of *Buiter* (1983).

— In relation to the theory of adjustment costs, the choice of an optimal disinflation path which depends on the preference function of public decision-makers the rate of time preference, the shape of short- and long-run Phillips curves, etc.

— The choice of the disinflation pace, which the classical debate between gradualism and "cold turkey" policy, etc.

Monetary and financial variables are not excluded from these analyses. But costs and benefits are generally assessed in terms of production level, rate of unemployment (both variables being associated through Okun's relations being assumed to be more or less stable), seldom in terms of the real burden of the debt, the pace of financial innovations, the controlability of the financial systems by the monetary authorities, the overall financial "fragility", etc.

The purpose of this paper is to tackle some monetary and financial aspects of the disinflation process, focusing on four topics:

— the liquidity of the economy,

— the evolution of real interest rates,

— the financial innovation process,

— the evolution of indebtedness.

1. Disinflation and the Liquidity of the Economy

1.1. The liquidity squeeze

Given the rigidities of fiscal policy and the failure of incomes policy, monetary policy has taken the dominant role in the adjustment process associated with disinflation.

Monetary targeting implemented since the mid-seventies has faced two major uncertainties:

a) Even when monetary policy reaches the targets announced for money or credit aggregates, it can hardly predict the short-run fluctuations of the velocity of money.

b) Even when disregarding uncertainties linked to the velocity of money, it is difficult to split *ex-ante* an increase in nominal G.N.P. between the impact on prices (the price-effect) and the influence on real G.N.P. (the quantity effect). Macro-econometric models have not reduced significantly this uncertainty, which is often used as an argument in favor of gradualism.

Concerning the intermediate-target strategy, the main instrument for monetary regulation, criteria for implementing this strategy must be distinguished from criteria used to select the intermediate target.

The intermediate-target strategy has been justified with three arguments:

1. The search for piecemeal stability, based on the idea that the relations between intermediate and ultimate targets would be more stable than the relations between instruments and ultimate targets.
2. The comparative information lags. In this view, the monetary aggregate chosen as the intermediate target is also an advanced indicator for the evolution of real variables (production, employment, etc.).
3. The announcement effects on social partners and foreign exchange markets.

B. Friedman (1975), (1977) and *R. Bryant* (1983) have underlined the limits of arguments 1 and 2. The main justification for introducing and maintaining intermediate-target strategies, is associated with the creation of announcement effects. Through these effects, Central Banks have, at least partially, offset the failures of incomes policy and contributed to the management of currency floating. Even in countries where announcement effects on social partners have been limited as soon as the procedure was implemented (case of France), or in the ones where monetary targets have been markedly overshot (case of the U.K. in 1980 - 1981, where an extensive phenomenon of financial "re-intermediation" resulted from the phasing-out of the "corset"), the intermediate target strategy has been maintained. One Central Bank cannot decide, aside from the others, to phase-out such a strategy without creating perverse announcement effects and speculative attacks against its currency. This is a classical problem of games theory: either the present situation continues, or there is an agreement and coordination between the Central Banks of major O.E.C.D. countries to phase-out this strategy.

Criteria for selecting the intermediate target (or intermediate targets) are:

a) the *(indirect)* controlability of this intermediate target by the monetary authorities.

b) The predictibility of the effects, conditioned by the stability of relations between the intermediate target and the ultimate targets. The monetary authorities must trade-off between these two criteria:

an increased predictibility can only be obtained at the price of a diminution in controllability (and vice versa).[3]

French monetary policy since 1977 has been "quantitative", "pluralist and gradualist".[4]

— "quantitative": not because it strictly referred to the quantity theory of money, but because it has chosen (M_2) ("resident M_2" since the end of 1983) as the intermediate target and has tried to stabilize, even reduce, the liquidity ratio (M_2/G.N.P.).

— "pluralist": besides the announced intermediate target, implicit intermediate targets concerning exchange rates and interest rates are fixed. Since 1982, the very high variability of the external counterpart of (M_2) has led the Bank of France to refer to the domestic credit expansion.[5] "Pluralism" does not necessarily imply monetary "polystrabism": these different intermediate targets, announced or not, are not at the same level in the causality chain, or in the reference scale of policy-makers. Recently, in France, the implicit target concerning domestic credit expansion has been dominant over the announced target for (M_2).

— "gradualist": as shown in table 1, monetary norms and the actual growth of M_2 have been gradually reduced.

In France, the evolution of M_2 is a biased indicator of the adjustment burden shared by monetary policy, since the deceleration in (M_2) growth is also due to: (1) the development of the primary bond market since 1980, mainly explained by modifications in the after-tax real interest rate structure. (2) the success of short-term and mutual investment funds[6].

Up to now, the criterion of capital risks has been advanced to leave short-term SICAV and mutual fund shares out of the largest money aggregate (M_3). This is, at present, a controversial issue.

Here, we find a source of fragility for the French intermediate target strategy. If interest rates were to rise (following American or German interest rates) above a certain threshold, the yield curve would have a negative slope and there would be a quick "deconsolidation" of private saving, leading to an accelerated growth of (M_2).

[3] See *Bryant* (1980).
[4] *La Geniere* (1981).
[5] Domestic credit expansion concerns here the growth of the domestic counterparts of M_2 (claims on Treasury + credits to the economy).
[6] Short-term SICAV ("Sociétés d'investissement à capital variable") and mutual investment funds, specialized in short-term maturity or variable interest rate bonds, have grown rapidly after the modifications of deposit rates in September 1981.

Table 1

	1977	1978	1979	1980	1981	1982	1983	1984
	%							
Normative forecasts for the growth of nominal G. N. P. (at the time of the target choice)	+ 13.2	+ 12.6	+ 13.0	+ 13.0	+ 12.3	+ 17.0	+ 11.2	+ 7.7
Target for M_2	+ 12.5	+ 12.0	+ 11.0	+ 11.0	+ 10.0	12.5 13.5	+ 9.0*	5,5 - 6,5
Actual growth of M_2 (from December to December)	+ 14.0	+ 12.1	+ 14.4	+ 9.8	+ 11.4	+ 11.5	+ 11.1	
Actual growth of M_2 (annual average)	+ 12.3	+ 13.2	+ 13.4	+ 11.6	+ 12.6	+ 12.3	+ 9.6	
Liquidity ratio (M_2 G.N.P.)	48.7	48.5	48.2	46.6	46.8	45.6		

* The March 1983 stabilization Program revised the target from 10 % to 9 %.

1. Since 1983, the target for M_2 has been computed on a quarterly (November, December and January) basis.
2. The target now relates to the subset of M_2 held by residents (resident M_2).

1.2. The velocity of money and the disinflation process

Once again, the evolution of (V) during the transition period towards a lower level of inflation must be distinguished from its behaviour when the new level of inflation is reached. In the main O.E.C.D. countries, the income velocity of monetary aggregates dropped with disinflation (charts page). Nevertheless, in some countries, as in France, the income velocity of the money stock has slightly increased. Different arguments must be presented to explain the empirical diversity.

The drop in (V) during the disinflation process

The attention has recently been focused on the 1982 American experience, characterized by an exceptional drop in the income velocity of (M_1), (M_2) and (M_3). Empirical studies have pointed out two sets of determinants:

— disinflation comes with a significant drop in (V) because it leads to a decline of nominal interest rates and it induces economic agents to restore their cash-balances after a period of high inflation.

— disinflation goes with a slowdown in economic activity. Velocity closely follows the economic cycle, this correlation being explained by the dependance of money demand on permanent income or the concept of "expected" velocity recently suggested by *M. Friedman* (1983). Friedman explained almost all of the 1982 drop in the U.S. economy with a combination of these two sets of arguments.[7]

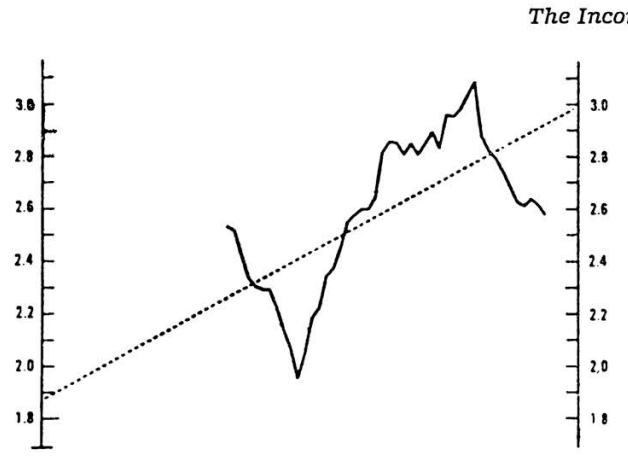
Rising unemployment associated with the disinflation process can also encourage the formation of precautionary cash-balances — thereby the decline of V — by households concerned with increasing unemployment risk. The expected unemployment rate, linked to current and past values (autoregressive formulation) and to other components as suggested by rational expectations models, can have a significant impact on the demand for money. For instance, precautionary cash-balances were growing in France in 1975, after the first oil shock and the sharp increase of the unemployment rate. There is no macro-economic evidence of such a phenomenon in the 1982 American conjuncture (the private saving ratio declined in 1982).

The analysis must be disaggregated: the "secondary" labor force especially exposed to unemployment risks[8], has perhaps constituted precautionary cash-balances when, in August 1982, the unemployment

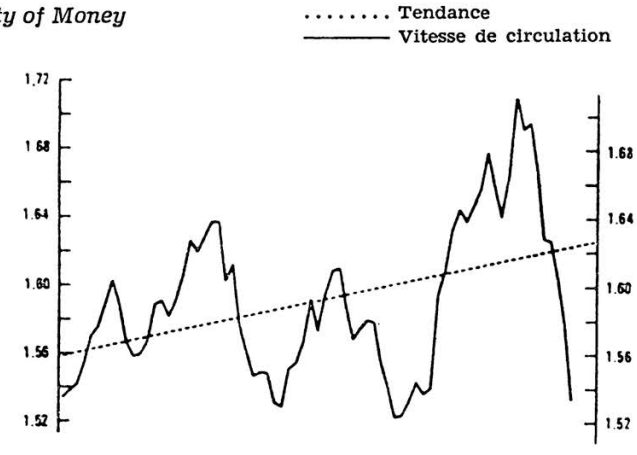
[7] *Friedman* adds to the interest rates drop and to the recession a residual factor, which explains roughly 6 % of the fluctuations in (V).

[8] The "secondary" labor force refers, in the theory of labor market segmentation, to victims of discriminations on the labor market.

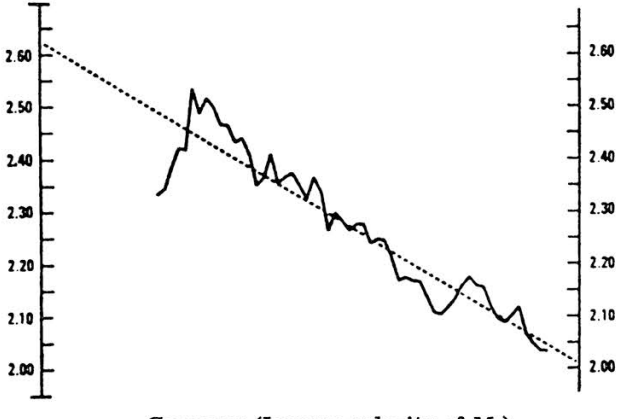
The Income Velocity of Money



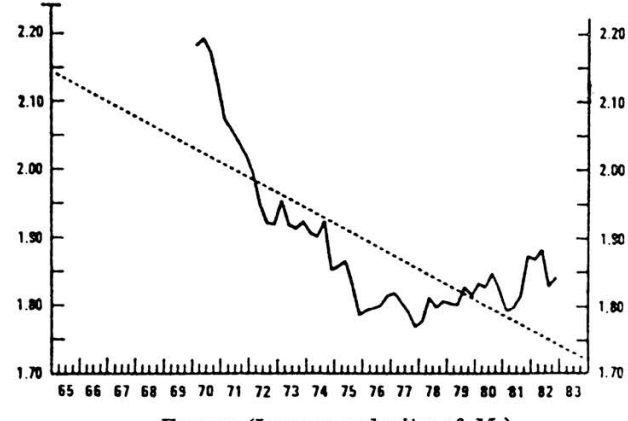
United Kingdom (Income velocity of sterling M_3).



U.S.A. (Income velocity of M_2).



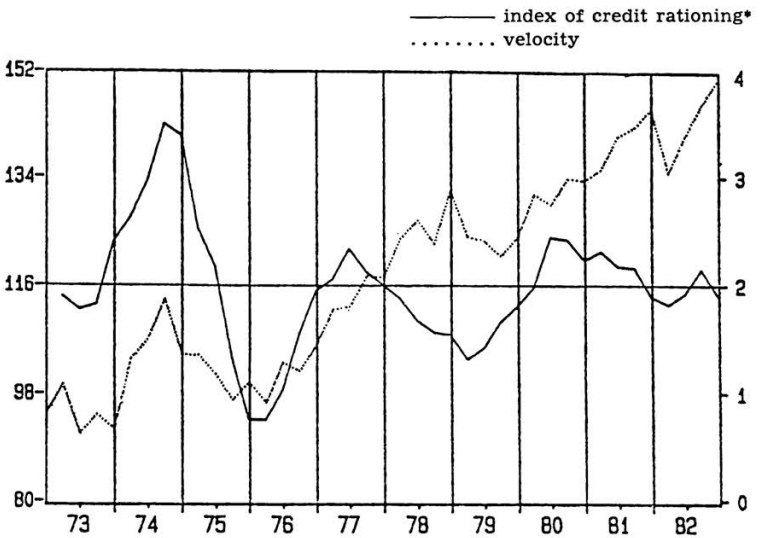
Germany (Income velocity of M_3).



France (Income velocity of M_2).

Source: Economic Outlook, O.E.C.D. July 1983.

Index of credit rationing (for households and firms) and the transaction velocity of (M_1)



* Scale from 0 to 4 (conventionally, the rationing of demand is assumed to take place whenever the index is above 2).

Source: Bank of France.

rate exceeded the psychological threshold of 10 per cent. Knowledge of "sectoral" velocities and of the size of distribution effects is here required.

Stability or slight increase of V during the disinflation process

In France, disinflation was belated and has been more limited than in the U.S., the U.K. or Germany. No significant decline in (V) occurred. On the contrary, the income velocity of (M_2) has remained steady or has slightly increased (about 1 per cent per year since 1980).

Three factors play a dominant role in the relative downward stickiness of V:

a) the stance of monetary policy. In France, there is a high positive correlation between the monthly index of (M_1) transaction velocity and the index of credit rationing due to credit ceilings, both series being computed by the Bank of France. The index of credit rationing, given the computation method[9] and the place of credit ceilings in the French

[9] See the presentation of this index by *Enfrun* and *Pecha* (1983).

monetary policy since 1973, is probably the best indicator of monetary policy in France. As soon as, according to this indicator, credit ceilings create some rationing of the demand on the credit market, transaction velocity and income velocity rise markedly, without any significant lag, as shown in the chart below for the transaction velocity.

The relation between monetary policy and the velocity of money works both ways:

(1) V rises whenever the quantitative constraint on credit is effective. This acceleration of V is due to the strategic behavior of the agents on the "long side" of the credit market (i.e. the public) when credit demand is rationed: implementation of procedures such as "face à face"[10], extension of trade credit, etc., all kinds of institutional changes which can contribute to the increase of (V).

We have formally given to this sequence a game-theoretic interpretation (a game of strategy between at least two players, the monetary authorities and the public) and its graphic counterpart in terms of a "cobweb" model based on the reaction functions of the players[11]. In the short run, the dynamic stability of the reference model is a relevant issue. It seems therefore that the quantitative constraint on credit (due to credit ceilings) is the main determinant of the short-run fluctuations in the velocity of money.

b) The development of the primary bond market, which implies a deceleration in the growth of M_1 and M_2 (households substitute bonds for demand or time deposits with the commercial banks). It also induces a rise in the numerator of the transaction velocity, by increasing the amount of financial transactions. In the very short-run, the promotion of the primary bond market accelerates the transaction velocity of (M_1) (and the transaction velocity of M_2 which, unfortunately, is not known), whereas in the medium and long run, it stimulates the consolidation of private saving and, thereby, the stabilization of (V).

c) The success of new financial products as short term SICAV and mutual investment funds decelerates the growth of (M_2) and ($M_3 - M_2$), since these products are kept outside monetary aggregates.

The incidence of disinflation
on the stability of the money demand function

A distinction must be made between two aspects:

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[10] The "face à face" procedures correspond to an informal commercial paper market. They are financial operations between non-financial agents (in general, between two firms), leading to an activation of cash-balances.

[11] See my first work on this subject *Boissieu* (1975).

(1) The impact of disinflation on the level of the money demand (or equivalently, the level of velocity of money).

(2) Its incidence on the stability of the money demand function.

For many O.E.C.D. countries, empirical evidence shows a "break" in 1973 - 1974 in the demand for money functions. Controversies about the existence and the explanation of the phenomenon are still lively. A favorite argument relates to the acceleration of the financial innovation process, resulting from high inflation and nominal interest rates.[12] R. Porter and Th. Simpson[13] have modelized the process, underlying the importance of thresholds for inflation rates and nominal interest rates. We cannot assume *a priori* that the acceleration of inflation and the disinflation process have a symmetrical influence. Nevertheless, it is likely that the transition towards a lower inflation induces changes in money demand behaviour, as did the acceleration of inflation after the first oil shock.

2. Disinflation and Real Interest Rates

Having many difficulties in modelizing inflationary expectations, the economists use to compute real interest rates by deflating nominal rates with the actual inflation rate, instead of the expected inflation rate.

In the late seventies, in several O.E.C.D. countries, the monetary authorities implemented a positive real interest rate policy to promote private savings. In France, the administration of capital markets by the policy-makers has been used, since 1978 - 1979, to enforce this policy. It is empirically difficult to split the increment in real interest rates since 1980 to an "active" component (expression of domestic policy-makers' interventions) and a "passive" component due to the external constraint on domestic interest rates, etc. In spite of the external influence on French interest rates, the "active" component does not seem negligible in France, due to the administration of interest rates by the monetary authorities (Bank of France, Treasury Department . . .).

The present disinflation process reveals a *downward stickiness* of nominal interest rates which, in several economies, is more pronounced than the downward stickiness of nominal wages. This stickiness in interest rates does not result, as in simplified keynesianism, from expectations of higher interest rates and from an infinite interest-elasticity

[12] See the survey presented by *Judd* and *Scadding* (1982).
[13] *Porter* and *Simpson* (1980).

of the money demand (the "liquidity trap"). It comes from the combination of at least five factors:

a) Actual and expected budget deficits, which create financial "crowding-out" effects.

b) The inertia of inflationary exceptations. Creditors, not convinced by the scope of the disinflation process, would not accept a drop in inflation risk premia. Here, the credibility of disinflation policies is the crucial issue. If the credibility is not reinforced, inflationary exceptations are sticky downwards.

c) Increased volatility of interest rates, mainly due to the implementation of a new monetary policy by the *Fed* in October 1979. Increased volatility means extension of interest rate risk and leads some agents, who have no access to financial futures markets, to add to basic interest rates some lump-sum premia. Higher volability also increases the demand for money and thereby, *ceteris paribus,* interest rates, since it creates incentives for a reallocation of portfolios in favor of cash-balances. Whether the impact must be on the entire yield curve,[14] or concerns mainly long-term interest rates[15] remains a controversial issue. As long as interest rates variability does not decrease, this will slow down the decline of nominal interest rates. The argument confirms that the general level of interest rates is necessarily conditioned by their volatility.

d) Disinflation increases rather than decreases the borrowers' default risk. Due to disinflation, the real burden of the debt is higher than the level *expected* by the borrowers in the perspective of a steady or even accelerated inflation. Since disinflation extends the default risk of firms and indebted countries, it goes with higher default risk premia, and this influence can be stronger than the impact of lower inflationary expectations.

e) Inflation in the seventies came, as has already been noted, with an acceleration of the financial innovation process. The new products offered by the banks and other financial institutions have in general worsened the average cost of resourced mobilization for these institutions. In the U.S.A., the impressive success of the "money market deposit account" (M.M.D.A.) offered by banks and savings institutions since December 1982, suggests a higher average cost of financial institutions' liabilities. To know the impact of interest rates deregulation and the financial innovation process on banks' costs we must assess the extent of portfolio reallocation. In France, banks loosen credit ceilings

[14] *Mascaro* and *Meltzer* (1983).
[15] *Clarida* and *Friedman* (1983).

by issuing bonds.[16] Since September 1981, they have extensively used this "loophole" through short-term SICAV and mutual investment funds. The banks have issued nearly two thirds of their new bonds with variable interest rates, so that they would benefit, at least partially, from disinflation.

Whatever the causes of financial innovation, the issues are the same: is the rise in the cost of resources mobilization (rise estimated by taking as the reference situation a world where a "Q regulation" type applies and demand deposits represent a significant proportion of banks' liabilities) a transitory or a permanent phenomenon? Are there, at the micro-economic level or for the overall banking system, offsetting forces due to economies of scale associated to an extended mobilization of re-sourced by financial institutions? Will the higher average cost of banks' liabilities be translated into lending rates, and contribute to the downward stickiness of these rates?

The answers to these crucial issues remain today very loose. One of the reasons is that the theory of financial innovation is still partial, despite W. Silber's attempts at a global interpretation.[17] The theory of financial innovation has not really been associated with the theory of the banking firm. The impact of financial innovation on banks' profit and lending rates can be studied only if micro-economic theories of the banking firm and analyses of the financial innovation process are linked.

In France, the extension of banks' medium-term liabilities (through the issuing of bonds) might influence the level and the downward rigidity of lending rates in the late eighties for three reasons:

1. For about one third of the bonds issued by the banks, the real burden of the debt will increase if disinflation continues, because they bear fixed rates of interest.

2. For variable interest rate bonds, the repercussicion of disinflation on nominal interest rates might be partial and delayed.[18]

3. Even in a world with only variable interest rate bonds and where the Fisher effect would work perfectly, changes in the inflation path would modify the time profile of borrowers' repayments.

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[16] Under the present regulation, when a bank issues for 100 of bonds, it is allowed to lend for 80 over the credit ceiling.

[17] *Silber* (1975), (1983).

[18] When the monetary authorities regulate capital markets, they have the opportunity to choose the intensity and the time schedule of the impact of the Fisher effect (influence of inflationary expectations on nominal rates).

We have mentioned five factors which can contribute to the downward stickiness of nominal interest rates. Our analysis cannot pretend to be a theory. It is imperative today to give the same attention to the downward rigidity of interest rates as that given to the downward rigidity of nominal wages in keynesian analyses and controversies. R. Mundell's analysis[19] highlights a negative relationship between real interest rates and expected inflation, which is based on wealth effects. This analysis can partly explain the downward stickiness of nominal interest rates during the disinflation process, but must be complemented with the other factors mentioned above.

3. Disinflation and Financial Innovation

The acceleration of inflation has had a significant impact on the *pace* and *nature* of financial innovation in O.E.C.D. countries. What are the likely consequences of disinflation on the financial innovation process?

3.1. Disinflation and the pace of financial innovation

Only product innovations will be studies here.[20] Higher rates of inflation played a major but not exclusive role in the development of new financial products since 1972 - 1973, in the U.S.A., Canada, etc. Other determinants were also influential: regulations imposed by the monetary authorities, competition among financial institutions, increased interest rate volatility, etc. Higher inflation rates, more or less integrated in nominal interest rates, raised the opportunity cost of holding cash-balances, and encouraged economic agents to invest in new cash-management techniques.

R. Porter and *Th. Simpson*'s analysis is particularly enlightening in that it shows that investment in new financial techniques takes place when nominal interest rates reach certain critical thresholds.

There is probably some kind of irreversibility in the process of financial innovation, an asymmetry between the genesis and the disappearance of financial products: the new products are retained within the system even when the reasons for their development fade away or disappear. Because this asymmetry is not complete, disinflation should slow down the demand for new financial products by the public (households and firms).

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[19] *Mundell* (1963).

[20] The distinction between product and process innovations is as delicate in finance as it is in the industrial area. See our articles *Boissieu* (1983).

Conversely, disinflation can continue only if it relies on tight quantitative constraints (credit ceilings or other restrictions on the credit market). In the perspective of W. Silber's interpretation[21], the tightening of constraints required by disinflation will have a higher "shadow price", and this evolution will create incentives for the public to circumvent or offset the quantitative constraints with financial innovations. Should this influence be dominant, disinflation would accelerate, rather than hamper, the financial innovation process.

3.2. Disinflation and the nature of financial innovation

There are at present two sets of product innovations[22]:

— *Private* financial innovations are initiated by the public and financial institutions, in order to circumvent regulations, to increase market shares, etc.

— *Public* financial innovations are generally introduced by the Treasury Department, offering attractive financial products on capital markets in order to finance, without money creation, a significant proportion of increasing public deficits.

Unlike the U.S.A., Canada or the U.K., public financial innovations are dominant in France. In this country, the financial innovation process is very centralized and strictly regulated by the "Direction du Trésor" of the Ministry of Economy and the Bank of France. Since 1981, the monetary authorities have accepted financial innovations which were favouring the promotion of the primary bond market (example already mentioned of short-term SICAV and mutual funds investing in short-term maturity bonds or variable interest rate assets). They have also taken some initiatives in this area (example of the new products introduced by the "Delors law" of January 1983). In France, policy-makers authorize *ex-ante* the supply of new financial products, whereas, in the U.S.A., they are confronted with this supply as a "fait accompli" and decide *ex-post* whether monetary regulations (reserve requirements, etc.) will be imposed on the new products, whether these products must be included in monetary aggregates, etc.

Since 1981, financial innovations by the French Treasury have aimed at:

— reducing budget deficits. A good example is given by the "titres participatifs" which increase quasi-equity capital of nationalized firms and thereby reduce governmental subsidies to these firms.

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[21] *Silber* (1975).

[22] I have presented this differentiation in *Boissieu* (1983 a).

— reducing the monetization of budget deficits by adjusting Treasury securities to the new market conditions: shortened maturities, variable interest rates or a combination of fixed and variable interest rates, etc.

— adapting the monetary ways of financing the deficit (since June 1982, the French Treasury has offered to the banks Treasury bills with variable interest rates).

The importance of public innovations in the financial innovation process in France explains their large fiscal dimension. Financial innovations by the Treasury often include a tax benefit. They increase the amount of "fiscal expenditures".

What will be the impact of disinflation on the respective weights of private and public financial innovations?

We have already mentioned some effects of disinflation on private financial innovations. The effect on public financial innovations will be conditioned by the evolution of public deficits. The quantity-effect and the price-effect may play opposite roles.

— The quantity-effect refers to the built-in increase of public deficits due to the economic recession associated with disinflation. The intensity of built-in stabilizers varies between countries, as is suggested by the diversity of tax systems and public expenditure structures, and confirmed by O.E.C.D. empirical analysis.

— The price-effect reflects the positive elasticity of public deficits with regards to inflation rates. On this issue, J. C. Chouraqui and R. Price[23] adopt a moderate but clear position when they consider O.E.C.D. countries' experience since 1971. They claim that one of the reasons for structural budget deficits is the fact that, under the present circumstances, public expenditures have a higher elasticity to inflation than tax receipts, even though "it is difficult to present a general rule in this area in view of the diversity of fiscal regulations". The difference in inflation — elasticities results from two factors:

(1) Certain public expenditures increase faster than inflation ("over-indexation" of certain transfers, etc.).

(2) On the whole, tax receipts rise slower than inflation, because, if the indexation of progressive taxes is almost perfect (perfect indexation of the income-tax bracket), other taxes are only partially indexed on inflation (the case of specific excises on goods and services).

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[23] *Chouraqui* and *Price* (1983), 18.

The symmetrical reasoning is also difficult to admit here. We cannot assume that public deficits elasticity to inflation will be the same during the desinflation process as after the two oil shocks. The outlook for public deficits and therefore for public financial innovations will depend on the new combination of the quantity-effect and the price-effect due to disinflation.

4. Disinflation and Indebtedness

There is, at present, a need for a theory of the impact of disinflation on the real burden of the debt and the transfers between creditors and debtors. A few analytical elements can be suggested, and must be completed by piecemeal empirical evidence.

4.1. Disinflation and financial crises

The influence of indebtedness on the genesis and development of financial crises has been particularly studied by I. Fisher[24] and H. Minsky[25].

Fisher's analysis deals with the consequences of a deflation process on the real burden of the debt and on the dynamics of the price level: confronted with the increased burden of their indebtedness (supposed to be at fixed interest rates), firms will accept "distress sales" in order to meet their repayment obligations, and this will in turn aggravate the deflation process and the real burden of the debt. . .

When trying to adapt Fisher's analysis to the case of disinflation, we must not look at the absolute burden of the debt, but at the gap between the *expected* and the *actual* burden, taking into account inflationary expectations.

Many borrowers, many firms for example, became indebted in the seventies with fixed interest rate loans, because they were expecting higher inflation rates to reimburse a significant proportion of their debts. Present disinflation belies their expectations. The relevant concept is thus the *expected burden of the debt,* and we can assume that it will, for instance, be assessed through a learning process à "la Cagan": expectations are revised at each period depending on the gap between the actual and the expected debt service (this gap is linked to errors in inflationary expectations). The adaptation of Fisher's argument to the case of disinflation means that firms try to increase their sales, whenever the actual debt service is higher than the expected debt service.

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[24] *Fisher* (1933).
[25] *Minsky* (1982).

Minsky's theory emphasizes the influence of rising interest rates on profitability and firm's value:

a) The increase of interest rates aggravates interest payments and losses of speculative units.

b) It reduces the value of the firm (due to the rise of rates of time preference applied to future cash-flows).

The combination of these two arguments leads to "distress sales" of real and financial assets and, then a further increase of interest rates...

This theory can be fruitfully applied to the present situation characterized by a downward stickiness of interest rates (see above).

4.2. The sensitivity of the debt burden to the inflation path

The sensitivity of the debt burden to the temporal path of inflation depends on the indexation of financial contracts. To explain the extent of indexation of financial contracts, we can refer to:

— the speed of adjustment of the nominal yield curve to the inflationary expectation changes,

— the sensitivity of inflationary expectations to the actual inflation path,

— the average maturity and the term structure of the debt. Shortening debt maturity has the same effect as variable interest rates in extending the indexation of the economy,

— the proportion of financial contracts (loans, bonds etc.) with variable interest rates,

— the choice of the reference rate in the indexation formula, which is important because the adjustment speed of nominal interest rates varies according to interest rate maturity,

— the proportion of subsidized credits. In France, we find two categories of credits with subsidized interest rates:

(1) Credits for which conditions are fixed independently of market interest rates and for which, by definition, the value of the subsidy rises with market rates. These are non-indexed contracts.

(2) Credits for which the value of the privilege stays constant (the interest rate is equal to market rates minus (x) points). These are indexed contracts.

Table 2

Ratio of bond issues with variable interest rate over the total amount issued (France)

	1982	1983	1984 (first two months)
	%		
— total issues	22	14	47
— issues by banks and other financial institutions	73	43	56

Let us assume a situation of perfect indexation of credits and loans on the inflation path. The real burden of the debt is not, under this condition, sensitive to the temporal path of inflation. But disinflation will influence the inter-temporal allocation of the debt service and thereby, depending on their respective rates of time preference, the situation of debtors and creditors.

Let us now consider a model based on three assumptions:

(1) Disinflation will lead, in the long run through the Fisher effect, to a drop in nominal interest rates (short and long term rates).

(2) Economic agents form rational expectations about the time profile of nominal interest rates, and know that disinflation will provoke a decline in nominal rates.

(3) The buyers of financial assets (lenders) on capital markets can impose their conditions on the borrowers.

With these three assumptions, at each period, the proportion of financial operations with fixed interest rates in the total amount of financial operations is indicative of the credibility of disinflation policy. This indicator has no absolute meaning but must be used in a dynamic perspective since it shows the evolution, rather than the level, of credibility. If disinflation is credible and if lenders have rational expectations, they are induced to buy fixed interest rate securities. The converse proposition would hold true if we were assuming that borrowers were able to impose their conditions. In the latter case, the proportion of variable rate operations would be an indicator of the credibility of disinflation, at least from the borrowers' point of view.

In France, the proportion of bonds with variable interest rates has, since 1982, been very sensitive to interest rate expectations, themselves conditioned by the nature of disinflation policy and its credibility.

The drop of variable rate issues, from 1982 to 1983, is more pronounced for financial institutions than for other borrowers. It must be related to lower interest rate expectations due to the implementation of the Delors stabilization program in March 1983.

It is *a priori* surprising to observe a marked increase in the proportion of variable rate issues in early 1984, at the moment when the government set for the 1984 inflation a target of 5 per cent (growth from December to December).

This could mean that the market does not believe in the possibility of reaching such a remote target (the actual inflation rate for 1983 was almost 9,5 per cent). The increased proportion of variable rate bonds would suggest a lack of credibility for the disinflation policy. It means also that lenders consider that downward flexibility of long-term rates is limited because the interest rate differential (between long-term and short-term rates) dwindles and because the external constraint creates a downward rigidity for short-term rates.

4.3. Transfers between creditors and debtors

Transfers between agents come from the non-indexation, or partial indexation of financial contracts. During the preparation of the VIIIth plan, G. Maarek[26] presented an evaluation of these transfers. From his study, it appears that, in the French economic situation of 1978, an inflation rate of 10 percent per year would induce a net gain for firms (net debtors) of about 54 billion French francs, a net loss for households of 62 billion francs, etc.

It would be enlightening to associate systematically to each inflation path the matrix of transfers between net creditors and net debtors. Disinflation, unlike deflation, does not reverse the direction of transfers. It reduces the debt alleviation due to inflation, which was expected by the borrowers. Given the likely resistance from the debtors to the slow down, a fortiori to the inversion of transfers in their favor that will occur with disinflation in a non-indexed (or partially indexed) economy, the structures of indebtedness contribute to the downward rigidity of inflation, and to the determination of a high level for the "core inflation". Past inflation conditions future inflation, more through the influence of past indebtedness than by the channel of inflationary expectations.

The main hindrance to disinflation comes from the distribution effects it will generate, and from the resistance to these effects. The

[26] *Maarek* (1980).

limits to the indexation of financial contracts might make the acceleration of inflation the only economically and politically acceptable solution to the national and international debt problem.

Summary

In contrast to the development in other countries no significant decline of the income velocity of money occured in France. Nominal interest rates showed also a downward stickiness which resulted from a combination of several factors. An asymmetry between the impact of inflation and disinflation is also demonstrated by the development of financial innovations and the real burden of indebtedness.

Zusammenfassung

Im Gegensatz zur Entwicklung in anderen Ländern trat in Frankreich kein deutlicher Rückgang der Einkommensgeschwindigkeit des Geldes ein. Die nominellen Zinssätze weisen ebenfalls eine Starrheit nach unten auf, die aus einer Kombination verschiedener Faktoren resultiert. Eine Asymmetrie zwischen dem Einfluß der Inflation und dem der Disinflation zeigt sich auch in der Entwicklung finanzieller Innovationen und in der realen Belastung aus der Verschuldung.

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