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Indexation, staggering and disinflation*

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Since high inflation makes very frequent price adjustments desirable, costs of taking optimal price decisions may become high, and indexation may emerge as an economical rule of thumb to update prices between optimal adjustments. We introduce indexation in a model of staggered price setting, where individual prices, when not adjusted by inflation, are set optimally. We show that it is more difficult to disinflate in a model with indexation than in a standard fixed price staggering model: the costs associated with a given path of money disinflation are higher and the time necessary to stabilize an inflationary economy while keeping output at its natural level is about three times longer. As a consequence, the paper explains why disinflation may be more difficult in high inflation economies.

Key words: Indexation; Staggering; Disinflation
JEL classification: E31; E52; E63

1. Introduction

Indexation, either formal or informal, is widespread in high inflation economies. It is also a current view among economic policy makers that indexation makes disinflation more difficult. This paper provides theoretical foundations for this view by introducing indexation in a continuous time model of staggered price setting, where price changes alternate between adjustments by realized inflation and optimal adjustments. We show that it is more difficult to disinflate in a model with indexation than in a standard

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fixed price staggering model.[1] As a consequence, the paper offers an explanation of why disinflation may be more difficult in high inflation economies. To incorporate indexation in the pricing rule of firms, we choose a rule whereby individual prices are adjusted by the accumulated inflation since the last adjustment, at some points in the interval between optimal price adjustments. This rule, which entails individual price rigidity, is more realistic than the indexation rules used in the well-known indexation papers by Gray (1976, 1978) and Fischer (1977), where a nominal price or wage is immediately adjusted whenever there is a price level change.

Although the optimality of a pricing rule which includes both fixed price and indexation was not demonstrated up to now, it is possible to give a rationale for the emergence of this kind of rule when inflation is high.[2] With a fixed nominal price, a firm incurs a loss for not adjusting its price while the optimal price moves. This loss has to be weighted against the cost of adjusting the price. With high inflation, individual price adjustments have to occur very often to prevent the current price from drifting away from the optimal price. However, optimal price decisions or price negotiations may be too costly to implement so frequently. In contrast, price adjustments by realized inflation use free and widely available information.[3] Thus, indexation by past inflation may emerge, either as a rule of thumb or as an institutional arrangement, to update prices at some points in the time interval between optimal price adjustments.

To capture those features in the simplest setup, we assume that individual price adjustments alternate between optimal price setting and indexation by past inflation. Each firm, when deciding about its optimal price, takes into account that its price will be automatically adjusted by past inflation at the midpoint of the time interval between two optimal price adjustments. There is also uniform staggering of the optimal price setting among firms. It is therefore not surprising that the dynamics generated by this model is complex. Linear disinflation causes a boom, followed by a recession. For relatively fast disinflations the relative size and length of the recession tend to be large when compared to the boom.

Indexation does help to explain the costs of disinflation. In a model without indexation, disinflation can be achieved very quickly without a

[1]By combining staggering with some other features, costs of disinflation can be made higher than in the standard fixed price staggering model. One possibility is to relax the assumption of full credibility, as in Ball (1992). Another is to assume limited rationality by a fraction of agents, as mentioned in Ball (1991).

[2]Gray (1978) derives the optimal degree of indexation and the contract length in an economy subject to both real and monetary shocks. However, because menu costs are absent in her model, prices are free to vary.

[3]A similar argument can be found in Blanchard (1979). He derives a rule which indexes the nominal wage to the price level when it is costly to apply the most efficient rule. In that context it is in general optimal to index by a fraction of the price level. In our case, since we assume high inflation and fixed prices between adjustments, this fraction tends to be very close to one.