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Nominal rigidities, skewness and inflation regimes

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Abstract

The menu-costs model developed by Ball and Mankiw (BM) [Ball, L., Mankiw, N.G., 1994. Asymmetric price adjustment and economic fluctuations. Economic Journal 104 (423), 247–261; Ball, L., Mankiw, N.G., 1995. Relative-Price Changes as Aggregate supply shocks. Quarterly Journal of Economics 110 (1), 161–193] predicts that inflation is positively related to the skewness of price changes distribution. We test this prediction in different inflationary contexts: Spain (1975–2002) and Argentina (1960–1989). We find a positive inflation–skewness relationship in both countries at low inflation, even though the mean annual inflation rates were very different: 2.2% for Spain and 23% for Argentina. Therefore, the threshold of low inflation under which the menu-costs model is suitable is determined endogenously, and it depends on the inflationary experience of each economy. In the higher inflation periods skewness is not significant. Finally, our results suggest that the menu-costs model is not suitable beyond certain threshold of inflation.

Keywords: Nominal rigidities; Inflation regimes; Relative price variability; Skewness

1. Introduction

In a flexible price framework changes in relative prices should not affect average inflation and, therefore, the prediction is that there is no relationship between inflation and the higher moments of the relative price changes distribution. But empirical evidence does not support this result. On the contrary, inflation and the second and third moments of the relative price changes distribution appear to be positively correlated. However, there is no consensus about the causal mechanism underlying that relationship. On the one hand, there is a vast empirical literature studying the relation between inflation and the second moment, the relative price variability (RPV), finding that causation runs from inflation to RPV. This strand of work dates back to Mills (1927), and since the contributions of Vining and Elwertowski (1976) and specially Parks (1978), a lot of empirical work has been done.

On the other hand, a second line of research proposed by Ball and Mankiw (henceforth BM) (1994, 1995) shows that inflation is influenced by the skewness.[1] They argue that, in the presence of nominal rigidities, due to the fact

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[1] Usually a menu-costs model has been used to explain nominal price rigidity, which implies that demand policies may be effective. BM move away from the traditional approach: they propose a theory of supply shocks. As they argue, supply shocks are changes in certain relative prices and they assert that menu-costs model is a plausible framework to explain why those changes affect the price level.

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that firms face menu costs, changes in the price level and skewness are positively correlated. This paper is focused on this approach, and tries to check if the skewness–inflation relationship holds for different inflationary contexts. More precisely, our goal is to show that there is a threshold of the inflation rate under which the BM approach is suitable, and furthermore that such threshold is determined endogenously in each economy. The hypothesis is that this threshold depends on the inflationary experience of each country.

We test out such statement in two economies with very different inflationary history: Spain, from 1975 to 2002, and Argentina, from 1960 to 1989. The first economy has been historically stable in the last fifty years in comparison with Argentina: along the period studied in this paper the monthly inflation rate moved in a range between −1% and 4%. On the contrary, Argentina shows a very rich inflationary history: in the last forty years its monthly inflation rate fluctuated from −1.7% to 54%.

Our results show that the predictions of menu-costs model hold for the lower inflation period in both countries, even though the mean inflation rate in each period differs strongly across them. In fact, the mean annual inflation rate in Argentina along the low inflation period was around 20%, higher than the inflation rate of Spain in the high inflation period. Nonetheless, in neither of them is such an approach suitable at high inflation.

The paper is organized as follows. Section 2 summarises the theoretical framework and the main empirical evidence. Section 3 presents the price data, variables and equations used in the empirical analysis. Section 4 shows the empirical results concerning the inflation–RPV–skewness relationship. Finally, Section 5 concludes.

2. Theoretical framework and empirical literature

BM (1994, 1995) use a menu-costs model to explain how the economy responds to shifts in relative prices that, in a flexible price setting, would leave the price level unchanged. Within a menu-costs framework, price adjustments are costly. Hence, when firms experience a shock to their desired relative prices, they only change their prices if the profit from the adjustment is larger than the menu cost. These menu costs give rise to a band of inaction in response to relative prices shocks. In that framework, a relationship between the inflation rate and the higher moments of the distribution of the desired price changes arises. The features of that relationship depend on the inflationary context.

On the one hand, BM (1995) state that in an economy with no trend inflation, the average inflation rate is positively related to the skewness of the distribution of relative price changes. The intuition behind this result is illustrated in Fig. A.1(a) to (c),[2] presented in Appendix A. Those figures show how the skewness of the distribution of desired price changes influences the price level. As was aforementioned, the presence of menu costs implies that firms have a range of inaction in response to shocks to their desired prices. If there is no trend inflation, such range is assumed to be symmetric around zero and it is between the upper (U) and the lower (L) cut-off prices. In Fig. A.1(a) the distribution of desired price changes is symmetric. In this case, if the desired changes are in the upper tail of the distribution — i.e., above U — firms will raise their prices, and if the desired changes are in the lower tail — i.e., under L, firms will lower their prices. As the distribution is symmetric, both tails are equal and the net effect of the shock on the average inflation is zero. In Fig. A.1(b) the distribution of desired changes is skewed to the right (but still has mean zero); thus, the upper tail is larger than the lower tail. In this case, more prices rise than fall, so that the overall price level increases. In Fig. A.1(c) the distribution of shocks is skewed to the left, so the lower tail is bigger than the upper tail, which implies that more firms are lowering prices than raising them and the price level falls.

Moreover, a larger RPV will magnify the effects of skewness: if the distribution of shocks is symmetric, an increase in the variance of shocks increases the size of both tails by the same amount, so the price level remains unchanged. However, if the distribution is skewed to the right (left), a larger variance increases both tails, but the absolute increase in the upper (lower) tail is larger. Therefore the price level increases (decreases) by a larger amount. In short, RPV has no independent effect on inflation, but it interacts positively with skewness: a larger RPV is inflationary when the distribution is skewed to the right and deflationary when it is skewed to the left.

On the other hand, BM (1994) examine the effects of changes in relative prices in the presence of a positive trend inflation, given a symmetric distribution of the desired price changes, concluding that price adjustments become asymmetric. In this context, when firms face a negative shock, they can either pay the menu cost and lower their prices or let inflation erodes their relative prices until the desired level. The higher the inflation, the faster the erosion process

[2] These figures are based on BM (1995).