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The role of media for consumers' inflation expectation formation

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ABSTRACT

The full-information rational expectations model is clearly rejected by the data. The expectation formation process has therefore important implications for macroeconomic outcomes. We examine how consumers react to information provided by the media, by taking into account that this information is imperfect. We show that information rigidities play a role empirically. Intensive news reporting improves the accuracy of consumers' inflation expectations, because they receive more information. However, this effect depends on the tone of the news. If news are badly toned, the effect reverts.

1. Introduction

Well-anchored inflation expectations are essential not only for securing price stability but also for facilitating overall economic stability over time. Monetary policy-makers often emphasize that managing consumers' inflation expectations has become one of their most important tasks. It is thus essential to understand the process of inflation expectation formation.

Models with full-information rational expectations are clearly rejected by the data (see, for example, Mankiw et al., 2003; Döpke et al., 2008a,b; Coibion and Gorodnichenko, 2010, 2012; Pfajfar and Zakelj, 2009). One explanation for this finding is that peoples' abilities to process information are constrained (Sims, 2003). In recent years, there has been considerable effort in developing theoretical models of expectation formation featuring imperfect information. In these models, the way agents form their expectations has macroeconomic implications (see, for example, Ball et al., 2005; Paciello and Wiederholt, 2011). However, empirical evidence on how expectations are formed is still scarce. This paper sheds light on the formation of consumers' inflation expectation by investigating the role of news media as transmitters and filters of news.

In theoretical models, there are two approaches to model imperfect information: sticky information and partial information (see Mankiw and Reis, 2011). In sticky information models, agents update information only infrequently, because acquiring information continuously is too costly (Mankiw and Reis, 2002). However, once agents update their information sets, they gain full information. In contrast, in partial information models, agents update their information sets

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continuously, but they observe only a noisy signal on the underlying economic variables (Woodford, 2001). Arguably, both sources of imperfection should play a role in reality.

The Media is relevant for the expectation formation process, because most people obtain their information from news reports. For example, Blinder and Krueger (2004) show that consumers obtain their economic information largely from TV and newspapers. Thus, the media may affect the way consumers update their inflation expectations, just as it influences, for example, peoples' voting behavior (see, for example, DellaVigna and Kaplan, 2007; Hetherington, 1996; Doms and Morin, 2004). Indeed, using news reports as the source of economic information is a rational choice by consumers, because these reports provide a low-cost way of obtaining information. Sims (2003) argues that the treatment that media give to economic news affects the way people react to it, creating a common component to the idiosyncratic error generated by information processing. Therefore, media reporting plays an important role in the expectation formation process.

We examine how consumers react to information provided by the media. We build upon Carroll (2003), who models sticky information by assuming that news media provide information, which is received and processed only by a share of the population. This information is then spread from period to period through the population, similar to the way diseases spread. In this model, consumers' inflation forecasts are more accurate, the more the media report. Our paper extends his model by allowing for the news transmitted by the media being noisy. When consumers receive this information, they have to distinguish news from noise, which is illustrated in a Bayesian learning framework. In this framework, media coverage has two effects. First, as in Carroll (2003), the intensity of news reports plays a role. The more media report, the higher the likelihood that consumers will absorb new information. Second, the content of news is important, because it determines what signal consumers receive. In particular, the content plays a role if media slant information (see, for example, Groseclose and Milyo, 2005; Gentzkow and Shapiro, 2010; Chiang and Knight, 2011; Larcinese et al., 2011; Puglisi and Snyder, 2011).[1] In such a setting, more reporting has an ambiguous effect on consumers' forecast accuracy.

Our findings suggest that both effects play a role empirically. Based on a rich media data set for Germany over 10 years, covering up to 26 media outlets containing close to 4000 statements dealing with inflation, we can provide evidence that the reaction of inflation expectations to news delivered by media reports depends on both the quantity and the content of news. In general, intensive media reporting informs consumers and thus prompts them to update their information sets more frequently. This, however, is only the case if media reports are neutrally toned. Unfavorably toned media reports tend to impair consumers' expectations. Given the detailed information we have on each news item, we can disentangle news that report rising inflation which are not framed in a negative way from news that cover rising inflation more neutrally and can show that the effect runs in the opposite direction, i.e., badly toned news on rising inflation impair the forecast accuracy while news on rising inflation that are more neutrally phrased improve the forecast accuracy.

Consequently, we can confirm results reported in the previous literature with some qualifications. For the accuracy of expectations, the amount of news matters as much as the tone of news reports. One possible explanation for this finding is biased media reporting, if, for example, media exaggerate certain developments or report more on bad than on good news. Another possible explanation is that people overreact to bad relative to good news due to an asymmetric loss function or loss aversion (Soroka, 2006).[2] Arguably, both play a role empirically.

The effect on consumers' inflation expectations is also quantitatively important. As proposed by Carroll (2003), we use the gap between consumers' inflation expectations and expectations of professional forecasters to quantify the accuracy of consumers' expectations. On average, the gap amounts to 56 basis points. According to our estimates, it declines by about 14% with eight (one standard deviation) additional neutrally toned media reports. On the contrary, eight unfavorably toned media reports would raise the gap by more than 60%.

The remainder of the paper is organized as follows. Section 2 derives a simple Bayesian learning framework to motivate our hypotheses. Section 3 introduces the data and explains the methodology. In Section 4, the results are presented and robustness checks are conducted. Section 5 concludes.

2. Model and hypotheses

This section outlines a Bayesian learning framework that allows us to describe the influence of media coverage on consumers' inflation expectation formation. Because the contribution of this paper is mostly empirical, we keep this section as simple as possible. We want to show that a higher volume of media reporting does not necessarily make consumers' inflation forecasts more accurate, which would be the case in Carroll's (2003) epidemiological model, where biased media reporting is not considered. In the setting described here, the effect depends on the content of the media signal. If the media (i) report infrequently and (ii) the signal consumers receive from the media is noisy and may be biased, a higher intensity of reporting has an ambiguous effect on forecast accuracy.

We assume that the media send a noisy signal about the true underlying state, which is the rational inflation forecast. Consumers face a signal extraction problem and they learn about the rational inflation forecast from the signals they receive.

[1] Both effects are also related to the agenda-setting theory that was established in communication science by McCombs and Shaw (1972). According to the theory, the media have the ability to influence the salience of topics on the public agenda. Hence certain topics are reported in a specific way while others are crowded out.

[2] For an empirical study on loss aversion with respect to inflation perceptions see Dräger et al. (2011).