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Tracking U.S. inflation expectations with domestic and global indicators

Efrem Castelnuovo*

Department of Economics, University of Padua, Via del Santo 33, I-35123 Padova (PD), Italy

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A B S T R A C T

Are foreign variables important for tracking U.S. inflation expectations? This paper estimates a reduced-form model that takes both *domestic* and *global* indicators of economic slack and inflationary pressures into account. Our main findings point towards the instability of the estimated parameters over the last four decades. In particular, global indicators appear to have played a statistically significant role in shaping forecasters' expectations until the mid-1980s. By contrast, the U.S. monetary policy stance turns out to be relevant in the 1980s and 1990s. We relate this finding to the more aggressive monetary policy conduct implemented by the Fed since the end of the Volcker experiment.

1. Introduction

"The challenge that lies before the Committee is to manage policy in a way that permits the economy to realize its productive potential while simultaneously maintaining firm control of inflation and *inflation expectations*." (Ben S. Bernanke, Remarks on the Economic Outlook and Monetary Policy, Annual Meeting of the Bond Market Association, New York, April 22, 2004, emphasis added)
"[…] to make effective policy, the Federal Reserve must have a full an understanding as possible of the factors determining economic growth, employment, and inflation in the U.S. economy, *whether those influences originate at home or abroad*." (Ben S. Bernanke, Remarks on Globalization

* Tel.: +39 049 8274257; fax: +39 049 8274211.
E-mail address: efrem.castelnuovo@unipd.it.

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and Monetary Policy, Fourth Economic Summit at the Stanford Institute for Economic Policy Research, Stanford, March 2, 2007, emphasis added)

Inflation expectations are an element of key importance for monetary policy makers.[1] When thinking of a simple model for inflation expectations in a given country, it is natural to relate such expectations to *domestic* factors (i.e. factors specific to that country). However, some recent contributions (Rogoff, 2003; Ciccarelli and Mojon, in press; Mumtaz and Surico, 2008; Borio and Filardo, 2007) have stressed the role potentially played by *global* factors (i.e. factors regarding country-aggregates such as the G7 or the OECD) in affecting U.S. inflation. If one country's inflation is mainly driven by global forces, central bankers might have the incentive to coordinate at an international level in order to offer a global response to global shocks. Of course, given the role played by inflation expectations in influencing inflation (e.g. Woodford, 2003), it is crucial to understand to what extent global factors have actually influenced *expected* inflation.[2]

This paper aims at assessing the link existing between U.S. inflation expectations and international (i.e. global) forces at an empirical level. To do so, we estimate a battery of simple reduced-form models for U.S. inflation expectations. As regressors, we consider both standard domestic indicators such as U.S. inflation, the U.S. output gap, different measures of inflationary pressures, and the U.S. monetary policy conduct on the one hand, and global measures of inflation and the business cycle on the other. We conduct our empirical analysis by proceeding in two steps. First, we assume absence of breaks in the estimated relationships, and we estimate fixed-coefficient models. Then, we investigate the issue of parameter stability by running rolling-window regressions as well as sub-sample regressions.

Several results arise. We find full sample evidence for the global output gap and global inflation to be drivers of U.S. inflation expectations. Further checks show that these global variables add information with respect to a large variety of standard measures of internal and external pressures (e.g. unit labor costs, trade openness, global liquidity, financial pressures). Interestingly enough, this full sample empirical evidence turns out *not* to be robust across different subsamples. In fact, rolling-window regressions reveal that the relevance of our global indicators is not stable over time, i.e. it tends to disappear when crossing the mid-1980s. We argue that this break might be due to the aggressive monetary policy conduct implemented by the Fed at the end of the Volcker experiment. A subsample analysis confirms the significance of a measure of monetary policy stance in the last two decades, so corroborating our conjecture on the 'substitution' between global and domestic forces that might have occurred in the mid 1980s.

The structure of the paper is the following. Section 2 presents the time-series of interest and the empirical model we employ for tracking inflation expectations, and it discusses our full sample results. Section 3 analyzes the parameter instability issue, and it interprets the findings stemming from our subsample estimates. Section 4 proposes some further empirical investigations corroborating the results presented in Section 3. Section 5 concludes.

2. Tracking the U.S. inflation expectations: model and evidence

We aim at tracking the short-term U.S. inflation expectations with a simple reduced-form model. Following Erceg and Levin (2003), we concentrate on inflation expectations as reported by the Survey

[1] In this paper, we concentrate on U.S. short-term inflation expectations. For contributions dealing with long-term inflation expectations in various countries, see Castelnuovo et al. (2003) and Gürkaynak et al. (2005, 2006).

[2] In the standard new-Keynesian model à la Clarida et al. (1999), realized inflation is the sufficient statistic for expected inflation, i.e. $E_t\pi_{t+1} = \rho\pi_t$, where ρ is the autoregressive parameter of the AR(1) process for the cost-push shock. However, such a model does not capture the well-known evidence in favor of the existence of lags in the monetary policy transmission mechanism. Consider a model more suited for capturing the mentioned lags, i.e. a simplified version of the AD/AS model proposed by Rudebusch and Svensson (1999): $\pi_t = \alpha\pi_{t-1} + \beta y_{t-1} + \epsilon_t$, $y_t = \gamma y_{t-1} - \varphi(i_{t-1} - \pi_{t-1}) + \eta_t$, where π is the inflation rate, y is the output gap, i is the nominal interest rate, and ϵ, η are white noise shocks. Then, by imposing the rational expectations assumption, one obtains $E_t\pi_{t+1} = \varphi_1\pi_{t-1} + \varphi_2 y_{t-1} + \varphi_3(i_{t-1} - \pi_{t-1}) + \xi_{t+1}$, where $\varphi_1 \equiv \alpha^2$, $\varphi_2 \equiv (\alpha+\gamma)\beta$, $\varphi_3 \equiv -\beta\varphi$, and $\xi_{t+1} \equiv \alpha\epsilon_t + \beta\eta_t$. In general, the link between expected inflation and a variety of macro-variables may be interpreted as a perceived law of motion followed by the private sector under some form of learning (see e.g. Milani, 2007).