



Stock market conditions and monetary policy in a DSGE model for the U.S.

Efrem Castelnuovo^{a,*}, Salvatore Nisticò^b

^a *Università di Padova and Bank of Finland, Via del Santo 33, 35123 Padua (PD), Italy*

^b *Università di Roma "Tor Vergata" and LUISS "Guido Carli", Viale Romania 32, 00197 Rome, Italy*

ARTICLE INFO

Available online 26 June 2010

JEL classification:

E12

E44

E52

Keywords:

Stock prices

Monetary policy

Bayesian estimation

Wealth effects

ABSTRACT

This paper investigates the interactions between stock market fluctuations and monetary policy within a DSGE model for the U.S. economy. First, we design a framework in which fluctuations in households financial wealth are allowed—but not necessarily required—to exert an impact on current consumption. This is due to the interaction, in the financial markets, of long-time traders holding wealth accumulated over time with newcomers holding no wealth at all. Importantly, we introduce nominal wage stickiness to induce pro-cyclicality in real dividends. Additional nominal and real frictions are modeled to capture the pervasive macroeconomic persistence of the observables employed to estimate our model. We fit our model to post-WWII U.S. data, and report three main results. First, the data strongly support a significant role of stock prices in affecting real activity and the business cycle. Second, our estimates also identify a significant and counteractive response of the Fed to stock-price fluctuations. Third, we derive from our model a microfounded measure of financial slack, the “stock-price gap”, which we then contrast to alternative ones, currently used in empirical studies, to assess the properties of the latter to capture the dynamic and cyclical implications of our DSGE model. The behavior of our “stock-price gap” is consistent with the episodes of stock-market booms and busts occurred in the post-WWII, as reported by independent analyses, and closely correlates with the current financial meltdown. Typically employed proxies of financial slack such as detrended log-indexes or growth rates show limited capabilities of capturing the implications of our model-consistent index of financial stress. Cyclical properties of the model as well as counterfactuals regarding shocks to our measure of financial slackness and monetary policy shocks are also proposed.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

“Financial and economic conditions can change quickly. Consequently, the Committee must remain exceptionally alert and flexible, prepared to act in a decisive and timely manner and, in particular, to counter any adverse dynamics that might threaten economic or financial stability”.

Chairman Ben S. Bernanke, Financial Markets, the Economic Outlook, and Monetary Policy, speech held at the Women in Housing and Finance and Exchequer Club Joint Luncheon, Washington, DC, January 10, 2008 (Bernanke, 2008).

Policymakers closely monitor financial market's behavior. This is due to the strict interconnections between financial and real sectors in the economy. Swings in asset prices affect real activity through several channels (households wealth,

* Corresponding author. Tel.: +39 049 827 4257; fax: +39 049 827 4211.

E-mail addresses: efrem.castelnuovo@unipd.it (E. Castelnuovo), snistico@luiss.it (S. Nisticò).

firms' market value of collateral, Tobin's Q), and, consequently, inflation and the term structure. On the other hand, stock market fluctuations are driven by expectations on future returns, which are tightly linked to expectations on the predicted evolution of the business cycle, inflation, and monetary policy decisions.¹ Of course, policy-makers need to gauge financial markets' conditions and identify their drivers to appropriately implement monetary policy actions.²

While the supply-side interplay between stock prices and the real economy has been given some attention in the analysis of large scale, quantitative models with financial frictions, considerably less (if not zero) attention has been paid in analyzing the role of the demand-side interplay, working through wealth effects on households' consumption, in the standard small scale Dynamic New Keynesian (DNK) model. On the other hand, such workhorse model, despite its parsimony, has been shown to have meaningful implications for the pricing of equity markets and the response of the stock market to real and monetary shocks.³

The standard new-Keynesian model of the business cycle, however, as much widely adopted in central banks as well as academic circles to perform monetary policy analysis, typically considers stock prices as redundant for the computation of the equilibrium values of inflation, output, and the policy rate.⁴ This is so because financial wealth fluctuations are fully smoothed out by infinitely lived agents, both at the individual and aggregate levels. This feature of the standard new-Keynesian framework effectively shuts down the demand-side channel of transmission of financial shocks and makes it ill-suited to investigate the role of stock prices in the macroeconomic environment.

This paper proposes a small-scale new-Keynesian model in which stock prices are allowed to play an active role in determining the dynamics of the business cycle, through the demand side. Building on previous contributions by Nisticò (2005) and Airaudo et al. (2007), we consider a framework in which households face a constant probability of exiting the financial markets in each period and interact with a fraction of agents who enter the financial markets holding no wealth at all.⁵ Consequently, aggregate consumption cannot be perfectly smoothed out in reaction to swings in financial wealth, and stock-price fluctuations thereby affect aggregate demand.

In order to take it to the data, we add several features to the setup in Nisticò (2005). First, we assume nominal-wage stickiness. Carlstrom and Fuerst (2007) show that this assumption makes real dividends pro-cyclical. Indeed, following a monetary policy tightening that induces a fall in firms' labor demand, if wages were fully flexible, firms' marginal costs would fall as well, and firms' dividends would counter-cyclically increase. By contrast, the presence of nominal wage stickiness makes revenues fall more than marginal costs, thus delivering pro-cyclical real dividends. Second, we add price and wage indexation to past inflation and productivity growth, and external habits in consumption. These additional features enable our framework to capture the endogenous persistence in the U.S. macroeconomic data. Finally, we allow for a stochastic trend in total factor productivity, which allows us to estimate our model without pre-filtering our observables.

An appealing feature of our theoretical framework is that it implies a microfounded, endogenous measure of financial slack at business cycle frequencies, that we label "stock-price gap". In analogy with the output gap, we define the "stock-price gap" as the percentage deviation of the real stock-price index from its frictionless level—consistent with an equilibrium with no dynamic distortions—and is therefore the relevant benchmark for monetary-policy makers. Such measure of financial conditions endogenously interacts with the output gap via the IS curve and the pricing equation, and may enter the Taylor rule that describes the systematic behavior of the U.S. monetary policy authority. The microfoundation of the model enables us to identify the effect that macroeconomic shocks exert on our measure of financial stress.

We fit our new-Keynesian model to U.S. data over the post WWII sample with Bayesian techniques and perform several exercises. Our main results can be summarized as follows. First. The data give strong support to our new-Keynesian model with stock prices. In particular, our estimates suggest that a significant ratio of traders in the financial markets are periodically replaced by newcomers holding zero financial assets. This makes the economy significantly non-Ricardian, and implies a finite average planning horizon for households' financial investments. Second. The evidence shows a significant systematic response of the Fed to stock-price dynamics. Specifically, the estimated interest-rate rule displays an additional component, responding to non-zero stock-price gaps. Third. Our estimated stock-price gap is consistent with the phases of booms and busts occurred in the sample, as dated by Bordo et al. (2008).⁶ Moreover, our estimated stock-price gap allows us to evaluate the ability of alternative proxies, currently used in the empirical literature, to capture the dynamic and

¹ Examples of empirical contributions pointing towards the stock price-monetary policy interconnections are Lee (1992), Patelis (1997), Thorbecke (1997), Rigobon and Sack (2003, 2004), Neri (2004), Bernanke and Kuttner (2005), D'Agostino et al. (2005), Furlanetto (2008), and Bjørnland and Leitemo (2009).

² For a thorough analysis on the conduct of monetary policy in presence of stock prices within a new-Keynesian model similar to the one employed in this paper, see Nisticò (2005).

³ See, among the others, Sangiorgi and Santoro (2006) and Challe and Giannitsarou (2008).

⁴ For an exhaustive analysis of the new-Keynesian framework, see Woodford (2003).

⁵ Nisticò (2005) analyzes monetary policy for price stability within a calibrated, purely forward-looking version of the model we employ in our investigation. Airaudo et al. (2007) deal with the issue of equilibrium uniqueness and stability under learning with the set up proposed by Nisticò (2005).

⁶ Bordo et al. (2008) propose a classification of the U.S. financial market swings in the post WWII sample based on a two-step strategy. First, they classify as financial booms all periods of at least 36 months from trough to peak with an average annual rate of increase in the real S&P500 index of at least 10% or at least 24 months with an annual rate of increase of at least 20%, and as financial busts all periods of at least 12 months from a market peak to a market trough in which the index declined at an average rate of at least 20% per year, plus the years 1966 and 1987. Then, they exploit the so identified booms/busts as starting values for a statistical analysis conducted by jointly estimating a hybrid Qual-VAR and a dynamic factor model, and check if a latent variable—their measure of financial conditions—assumes values above or below certain estimated thresholds. Their statistical investigation supports the dating established in the first step of their analysis. Bordo et al. (2007) extend this analysis to Germany and the United Kingdom.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات