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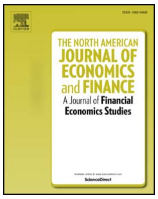

On credit and output: Is the supply of credit relevant?[☆]

Joshua Wojnilower

Independent Evaluation Office of the International Monetary Fund, 1900 Pennsylvania Ave NW, Washington, D.C. 20431, United States

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ABSTRACT

The consensus that changes in the supply of credit were irrelevant to making monetary policy decisions existed among macroeconomists during the second half of the twentieth century. Transmission of shocks to the real economy through changes in the supply of credit, however, played an important role in the recent U.S. financial crisis. This paper explores the extent to which policymakers should consider changes in the supply of credit when making forecasts and monetary policy decisions. More specifically, it considers whether a measure of real credit balances offers consistent and stable information, beyond that of a real interest rate and real money balances, about future output gaps during the U.S. post-war era. Results yield evidence that changes in real credit balances are the only variable, among those considered, to provide consistent and stable information about future output gaps over the entire sample period. Each information variable, however, provides relatively little value added for forecasting future output gaps, beyond a simple autoregressive model. To improve upon forecasts and monetary policy decisions, policymakers therefore should consider a broader range of information variables and occasionally reassess the relative weightings assigned to each.

1. Introduction

New Keynesian models, in their most basic form, focus solely on the ability of a short-term real interest rate to explain future movements of real output. Despite evidence that monetary aggregates yield information about future changes in output (Estrella & Mishkin, 1997; Hafer, Haslag, & Jones, 2007; Hafer & Jones, 2008; Meltzer, 2001; Nelson, 2002; Nelson, 2003), beyond that of real interest rates, little impetus to revise monetary theory, or policy, existed during the Great Moderation. Failure of short-term real interest rates to forecast the recent U.S. financial crisis or subsequent weak recovery highlights potential value of expanding the set of indicators policymakers use to forecast macroeconomic outcomes. Expanding the set of indicators solely to include monetary aggregates, however, may be insufficient given similar forecasting failures in the past decade. One new indicator worth considering is aggregate credit given a growing literature examining the relationship between the supply of credit and the real economy, both theoretically (see, e.g. Adrian, Moench, & Shin, 2010b; Borio & Zhu, 2012; Gertler & Kiyotaki 2010; Shleifer & Vishny, 2010; Woodford, 2010) and empirically (see, e.g. Borio and Lowe, 2002, 2004; Goodhart, 2003; Adrian, Moench, & Shin, 2010a; Adrian et al., 2010b; Adrian & Shin, 2010; Jordà, Schularick, & Taylor, 2011; Schularick & Taylor, 2012). The time is therefore ripe to reconsider which macroeconomic variables offer useful information to economists and monetary policymakers regarding the future state of their primary targets, i.e. output, inflation, and unemployment.

Ongoing debates about monetary policy are broad and complex, ranging from questions about optimal policy targets and

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E-mail address: jwojnilower@imf.org.

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instruments to how and when different transmission mechanisms work, both in theory and in practice. To shed some light on these questions, this paper answers a simpler question: given a specific target variable, which macroeconomic variables should policymakers consider when making forecasts and monetary policy decisions? The simplistic nature of this question, however, does not imply that the results are of lesser importance to policymakers. On the contrary, a consistent and stable relationship between information and target variables is critical to employing monetary theory successfully in actual policy decisions (Hafer et al., 2007), especially in a monetary regime where policymakers are targeting a forecast (Rudebusch & Svensson, 1999).[1]

Assuming that the Federal Reserve currently seeks to minimize a loss function containing the output gap and inflation (Rudebusch & Svensson, 1999), this exploration begins by re-examining the relationship between a short-term real interest rate and the output gap, adding eighteen years (seventy-two quarters) of new data to earlier studies (Hafer & Jones, 2008; Hafer et al., 2007). Building on empirical literature by Rudebusch and Svensson (1999, 2002) that found no role for monetary aggregates, this paper's baseline specification for simple OLS regressions is a dynamic IS equation that only includes lags of the output gap and a short-term real interest rate. Next, the baseline specification is augmented by including lagged values for two measures of real money balances. These specifications serve to determine whether predictive content of monetary aggregates, found in subsequent literature (Estrella & Mishkin, 1997; Hafer & Jones, 2008; Hafer et al., 2007; Meltzer, 2001; Nelson, 2002; Nelson, 2003), also withstands the test of time. Subsequently, specifications with and without real money balances are augmented by independently adding a measure of real credit balances. These specifications serve to assess if a relationship exists between aggregate credit and the real economy. To the extent this relationship exists, it's consistent with the view that transmission of monetary policy to its target variables occurs, at least partially, through changes in the supply of credit. Moreover, to the extent this relationship is a recent phenomenon, it's consistent with the view that an increasing share of U.S. credit supplied by market-based financial intermediaries, e.g. shadow banks, increased the relevance of credit constraints (Adrian et al., 2010b; Woodford, 2010). Finally, a Bai and Perron (1998) test for unknown breakpoints is employed to determine whether any of the models are temporally stable.

Results reveal that only a measure of real credit balances, among those considered, has a relatively consistent and stable relationship with the output gap over the full sample period. Further, subsample testing demonstrates that previously observed relationships between a short-term real interest rate, broad real money balances, and the output gap are not statistically significant in the post-1980 sub-period. Each information variable, however, provides relatively little value added for forecasting future output gaps beyond a simple autoregressive (AR) model. Overall, findings undermine the effectiveness of using simple backward-looking models to run policy experiments given the unstable nature and limited value added of relationships between information and target variables. Policymakers therefore would benefit from expanding their set of information variables, to include at least an aggregate credit variable, and from occasionally reassessing the relative weightings assigned to each one.

Section 2 briefly discusses relevant theories for expecting real interest rates, monetary aggregates, and credit aggregates to contain informational value about future real output. Section 3 describes the methodology and data employed. Section 4 displays and discusses results. Section 5 addresses robustness checks. Section 6 offers extensions of this research as well as implications for policymakers. Section 7 concludes.

2. Background

An ongoing debate regarding the significance of different monetary policy transmission mechanisms exists throughout macroeconomic history. Within this debate, consensus formed around two distinct views: the "money view" and the "new credit view." Although the predictions and policy implications differ substantially, these disparities largely stem from varying views about the substitutability between types of money and credit. While describing all the varying implications of different assumptions is beyond the scope of this paper, highlighting several assumptions of these specific views demonstrates the emphasis of alternative measures in forecasting real activity.[2]

Economists often refer to the current dominant consensus in monetary theory as the new credit view. Theories and models within this view assume that imperfect substitutability exists between bank loans and open market credit, yet nearly perfect substitutability exists between different forms of money (Bernanke & Blinder, 1992; Bernanke & Gertler, 1995; Kiyotaki & Moore, 1997).[3] Hence, the supply of both credit and money is assumed to be highly elastic. Demand for loans, primarily to fund investment, therefore determines aggregate demand. Consequently, the primary transmission mechanism of monetary policy is real interest rates, which determine the demand for loans.

These assumptions of the new credit view are apparent in the three essential equations (Eqs. (1)–(3)) of the standard New Keynesian model:

$$y_t = E_t y_{t+1} - \alpha r_t + \varepsilon_{1t} \tag{1}$$

$$\pi_t = \beta E_t(\pi_{t+1}) + \delta(y_t - y_t^*) + \varepsilon_{2t} \tag{2}$$

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[1] Within an inflation-forecast-targeting regime, the measure of success is the central bank's ability to maintain their forecasts of employment and inflation a couple years ahead at their target levels or growth rates (Rudebusch & Svensson, 1999).

[2] See Trautwein (2000) for an overview of the different views. Discussion of the "old credit view" is omitted since it is not directly relevant to the question this paper seeks to answer.

[3] Imperfect substitutability between bank loans and open market credit refers solely to the demand for such assets/liabilities. Perfect substitutability between different forms of money, however, refers to both the demand for and supply of these assets/liabilities.

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