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Eliciting GDP forecasts from the FOMC's minutes around the financial crisis

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ABSTRACT

Stekler and Symington (2016) construct indexes that quantify the Federal Open Market Committee's views about the US economy, as expressed in the minutes of the FOMC's meetings. These indexes provide insights into the FOMC's deliberations, especially at the onset of the Great Recession. The current paper complements Stekler and Symington's analysis by showing that their indexes reveal relatively minor bias in the FOMC's views when the indexes are reinterpreted as forecasts. Additionally, these indexes provide a proximate mechanism for inferring the Fed staff's Greenbook forecasts of the US real GDP growth rate, years before the Greenbook's public release.

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1. Introduction

Monetary policy decisions by the Fed's Federal Open Market Committee (FOMC) have attracted considerable attention in recent years, especially with quantitative easing through large-scale asset purchases and with the introduction of forward guidance; see Bernanke (2012) and Yellen (2012) *inter alia*. The FOMC's decisions are based in part on the Greenbook forecasts, which are economic forecasts produced by the Fed's staff. Ericsson, Hood, Joutz, Sinclair, and Stekler (2013), Nunes (2013), Romer and Romer (2008), and Sinclair, Joutz, and Stekler (2010) *inter alia* have extensively analyzed the Greenbook forecasts; and Banternghansa and McCracken (2009) and Sheng (2015) have examined the FOMC participants' own forecasts.

Stekler and Symington (2016) propose a creative and insightful innovation on such existing studies of US monetary policy. Stekler and Symington employ a textual analysis of the minutes of the FOMC meetings for 2006–2010, developing quantitative indexes that reflect the extent of optimism or pessimism expressed in the FOMC minutes themselves on the current and future outlook for the US economy. Through these indexes and accompanying research, Stekler and Symington provide key insights on the views of the FOMC, especially those held at the onset of the recent financial crisis and Great Recession. Specifically, Stekler and Symington find temporary inaccurate assessments by the FOMC of the economy at that time—in part due to inaccurate advance estimates of GDP growth.

The current paper shows that Stekler and Symington's indexes reveal even more. With few exceptions, Stekler and Symington's indexes imply relatively minor bias in the FOMC's views when the indexes are reinterpreted as forecasts. Furthermore, these indexes very closely track the Greenbook forecasts of the current-quarter and one-quarter-ahead US real GDP growth rates. Stekler and Symington's indexes thus provide a proximate mechanism for inferring these Greenbook forecasts, years in advance

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of the public release of the Greenbook. The minutes of an FOMC meeting are published *three weeks* after the meeting itself, whereas the Greenbook is not released to the public until at least *five years* after it is presented to the FOMC.

This paper is organized as follows. Section 2 describes Stekler and Symington's indexes, the Greenbook forecasts, and the data being forecast. Section 3 discusses different approaches to testing for forecast bias, and it proposes impulse indicator saturation as a generic test of potentially time-varying forecast bias. Section 4 presents evidence on forecast bias; and it constructs "post-casts" of the 2010 Greenbook forecasts, conditional on Stekler and Symington's indexes. Section 5 concludes.

Before proceeding, it is important to note that the presence of forecast bias (or lack thereof) is consequential, both economically and statistically. That said, the particular sense in which forecast bias is consequential depends in part on whether the Greenbook forecast and Stekler and Symington's indexes are interpreted as "forecasts" or as "projections", where "projections" are in the sense of being policy simulations conditional upon a certain set of assumptions. If they are interpreted *qua* forecasts, then forecast bias implies potential room for improvement in terms of standard performance measures, although forecast improvement may be feasible for unbiased forecasts as well. If the forecasts are interpreted *qua* projections, then forecast bias implies limited usefulness of the forecasts as representing interesting hypothetical paths for economic policy. With that in mind, the Greenbook forecasts and Stekler and Symington's indexes are always referred to as "forecasts" below, while recognizing that sometimes they may be more usefully viewed as projections. This broader usage of the term "forecast" is also in line with Clements and Hendry (2002, p. 2): "A forecast is any statement about the future".

2. The FOMC minutes index, forecasts, and data

This section describes the indexes constructed by Stekler and Symington (2016) from the minutes of the FOMC, some related forecasts, and the data on the US real GDP growth rates being forecast. The construction of these indexes may involve truncation and nonlinearities, so this section also discusses those issues.

2.1. FOMC minutes index

Stekler and Symington (2016) (hereafter, S&S) employ a focused textual analysis of the minutes for the 40 FOMC meetings during 2006–2010. From their textual analysis, S&S construct quantitative indexes that gauge the FOMC's views on the current and future strength of the US economy, as expressed in the FOMC minutes themselves; see S&S (Sections 3.1.1, 3.1.2, and 4.1) in particular. S&S regard these indexes as "measuring the FOMC's views about the state of the economy" (Section 3.1.1); and the indexes are scaled such that they correspond to GDP growth rates. To design their indexes, S&S examine certain sections of the minutes that discuss:

(i) *the current economic outlook*, typically in a paragraph or paragraphs beginning "The information reviewed at the … meeting suggested that …"; and

(ii) *the future economic outlook*, typically in a paragraph or paragraphs beginning "In their discussion of the economic situation and outlook, meeting participants …".

In these sets of paragraphs, Stekler and Symington search for select keywords that characterize views on the outlook. Keywords range from "strong", "robust", "considerable", "upbeat", "brisk", and "surge" for a very optimistic outlook to "recession", "contraction", and "sharp and widespread decline" for a very pessimistic one. S&S (Table 2) provide details. From the frequencies of occurrence of the keywords, Stekler and Symington create two indexes, one for the current outlook and one for the future outlook. These indexes are called FOMC Minutes Indexes (or FMIs) below. S&S then document properties of their indexes, including through comparisons with the Greenbook forecasts and with the forecasts from the Survey of Professional Forecasters (SPF). Section 4 below analyzes additional properties of S&S's indexes.

The empirical results in S&S and those below are subject to an important caveat. Specifically, the *context* of the paragraphs for (i) and (ii) in the FOMC minutes affects the interpretation of the FMIs. Starting with the January 2009 minutes, the paragraphs for (i) and (ii) respectively appear under separate sections titled:

> "*Staff Review* of the Economic Situation", and
> "*Participants' Views* on Current Conditions and the Economic Outlook",

or similar (italics added). Thus, the "current-outlook FMI" draws on text about the Fed staff's views, whereas the "future-outlook FMI" ostensibly reflects the views of the FOMC participants on both current conditions and future outlook. These nuances are germane to the interpretation of the FMIs when compared with (e.g.) the Fed staff's Greenbook forecasts, as in S&S (Section 4.1 and Fig. 2). Section 4.3 discusses these subtleties further. See Danker and Luecke (2005) for a valuable perspective on the evolution of the FOMC's minutes.

Table 1 presents a schematic for the generation of the FMIs, formalizing the creation of the FOMC minutes and the derivation of the FMI therefrom, as follows.

(a) *Writing of the FOMC minutes*. The FOMC draws on the Greenbook forecast (g_t), certain qualitative and quantitative information (x_{0t}), and possibly additional information (e_{0t}) in writing the text of the FOMC minutes (x_{1t}). That transformation is denoted $\phi_0(g_t, x_{0t}, e_{0t})$. The subscript t is the time index that dates the FOMC meetings.

The variable x_{0t} includes information on the housing and financial markets; and the Greenbook forecast itself draws on that information as well. This presence of x_{0t} motivates in part S&S's interest in ascertaining x_{0t}'s roles in influencing the minutes x_{1t}. The text of the minutes also provides the basis for S&S's assessment of the FOMC's views on risk and uncertainty to the economy.

(b) *Quantification of the FOMC minutes as a score*. S&S (Table 2) then analyze the text in the minutes of the FOMC meetings to create a score index (x_{2t}), as given in S&S (Table 3). That quantification of the text may involve additional information (e_{1t}). The implied transformation is $\phi_1(x_{1t}, e_{1t})$.