The Effect of Recessions on Fiscal and Monetary Policy

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In this paper, we extend the results of Ball and Croushore (2003), who show that the output forecasts in the Survey of Professional Forecasters (SPF) are inefficient with respect to changes in monetary policy, as measured by changes in real interest rates. In this paper, we investigate the robustness of this claim of inefficiency, using real-time data across G7 countries and exploring fiscal policy as well as monetary policy. A key finding is that monetary policy and fiscal policy only affect output in recessions, not in normal times. Moreover, monetary policy is much more effective in affecting inflation during recessions than it is during normal times. Finally, forecasters can efficiently forecast the effect of a monetary shock on inflation and a fiscal shock on output growth, but not vice versa. *Keywords: real-time data, output forecasts, yield spread, monetary policy, fiscal policy*

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I. Introduction

Macroeconomists take it as a stylized fact that monetary policy has an effect on real output, although there is much controversy about why this is true and how it can be measured.[1] Given the lack of consensus, the most popular recent view is that coming from New Keynesian models, in which rational expectations hold but there are a variety of market failures.[2] But another possibility is that rational expectations do not hold, in which case the model is much simpler, as Ball and Croushore (2003) suggest. We build upon their research, which had two main ideas: (1) Forecasters underestimate the effects of monetary policy on output growth (though not inflation) in the United States; and (2) A theoretical model shows that biased expectations lead to non-neutrality of monetary policy.

With the Ball-Croushore paper as a starting point, we extend it by considering: (1) a panel of G-7 countries; (2) fiscal policy in addition to monetary policy; and (3) the effects of recessions.

II. Methodology

The idea of Ball and Croushore was not to develop a full model of the economy and attempt to generate a set of shocks that are orthogonal to information in the model that would be known to agents or to the central bank. That is, rather than develop a model that would allow the calculation of "shocks" to monetary and fiscal policy, Ball and Croushore just look at innovations in the monetary and fiscal policy instruments because any attempt to orthogonalize them is fraught with difficulty, as Ramey (2016) noted so clearly.

Instead, because the purpose of the study is not to generate impulse response functions but to focus on how innovations in monetary and fiscal policy affect output, inflation, and the forecasts of those variables, Ball and Croushore employ the following device. First, calculate the difference between the realized values of an economic time

[1]See Ramey (2016) for a detailed analysis.
[2]Richard Clarida and Gertler (1999) and Woodford (2003) are key papers in the New Keynesian literature.

series (output growth or inflation) and forecasts from a time-series model $(y - y^f)$. Second, calculate the difference between survey forecasts of an economic time series (output growth or inflation) and forecasts from a time-series model $(y^e - y^f)$. Third, calculate the difference between the realized values of an economic time series (output growth or inflation) and survey forecasts $(y - y^e)$. Each of these series is then regressed on lagged policy innovations, which are known to the forecasters at the time they make their forecasts.

Most obviously, the regression of survey forecast errors, that is, $y - y^e$, on the policy innovations, is a simple test of forecast efficiency. The forecast error should be orthogonal to any variable known at the time the forecast was made, including a policy innovation. The other two regressions, in a sense, decompose the forecast efficiency test into two pieces: how the variable is affected relative to a time-series forecast of the variable in response to a policy innovation, and how the survey forecast is affected relative to a time-series forecast in response to a policy innovation.

To measure policy innovations, we want to consider deliberate longer-term policy actions, not short-term shocks that might represent nothing but noise. Both Bernanke and Blinder (1992) and Taylor (1993) suggest that changes in the real or nominal interest rate are useful measures of policy innovations. Given our longer-run focus, we consider non-overlapping differences in the real interest rate over four quarters. We define the innovations $M_t^n = R_{t-1-4(n-1)} - R_{t-5-4(n-1)}$, $n = \{1, 2, 3\}$, where time is measured in quarters and the real interest rate is the ex-ante measure $R_{t-1} = i_{t-1} - E_{t-1}(\pi_t)$, where π_t is the inflation rate over the period from t to $t + 4$.

In a similar fashion, we measure fiscal innovations, F_t^n, as changes in the forecasted budget surplus over the coming four quarters. So, if S_t^e is the forecast of the budget deficit made the previous quarter $(t - 1)$, we look at changes in the forecasted surplus from one year to the next, and $F_t^n = S^e_{t-1-4(n-1)} - S^e_{t-5-4(n-1)}$, $n = \{1, 2, 3\}$.

After the variables are defined, the next step is estimating the following equation:

$$\Delta_{jt} = \alpha_j + \Sigma_{v=1}^3 \beta_v \Theta_{jt}^v + \epsilon_{jt}. \quad (1)$$

where $\Delta = \{y - y^f, y^e - y^f, y - y^e; \pi - \pi^f, \pi^e - \pi^f, \pi - \pi^e, \}$ is one of three output growth or inflation differences, and $\Theta = \{M, F\}$ is either a monetary or a fiscal shock.

In this equation, j indexes the countries and α_j is the fixed effect for each country. If the β terms are jointly significant, then the policy innovation is associated with a change in the left-hand side variable. The timing of the significant variables on the right-hand side provides some information about the length of the policy lag. If one or more of the β terms is negative, then, considering output growth y regressions as an example, we infer that:

1) If $y - y^f$ is on the left-hand side, then output falls below a forecast that is based on the "usual" dynamics from the time-series model, so an increase in the policy variable is associated with a decline in output relative to the time-series model. We might expect tighter monetary or fiscal policy to show this effect.

2) If $y^e - y^f$ is on the left-hand side, then the survey forecast of output falls below a forecast that is based on the "usual" dynamics from the time-series model, so an increase in the policy variable is associated with a decline in forecasted output relative to the time-series model. We might expect tighter monetary or fiscal policy to show this effect, if forecasters are rational.

3) If $y - y^e$ is on the left-hand side, then output falls below the survey forecast, so an increase in the policy variable is associated with a decline in output relative to the survey forecast. Under rational expectations, monetary and fiscal policy should show no such effect, so the β coefficients should be jointly zero.

III. Data

Because we are evaluating forecasts made at a particular point in time, it is of crucial importance that only real-time data be used in the analysis, as Croushore (2011) discusses. In this paper, we will use data from G7 countries, using quarterly real-time vintages of quarterly data. Our sample runs from 1991 to 2016.

With real-time data, a crucial decision is what concept of realized values to use as "actual" in calculating forecast errors. In this paper, we use the second release of each variable as measured in the OECD's database for Main Economic Indicators. For data before 1999, we use the Real-Time Historical Database of OECD (RTHD-OECD) data described in Fernandez, Koenig and Nikolsko-Rzhevskyy (2011).[3] For data from 1999 on, the OECD provides the Main Economic Indicators on their own website.[4]

Data on the forecasts of output and inflation come from various issues of "Economic Forecasts: A Worldwide Survey" and "Consensus Forecasts". Both of those publications report forecasts for a wide variety of countries made by a number of private-sector forecasters in each country. The first publication, "Economic Forecasts: A Worldwide Survey" was begun in 1984 by Victor Zarnowitz. However that survey was discontinued in 1999. The publication "Consensus Forecasts – G7 and Western Europe" came into existence in 1989 and continues today with a significatly expanded array of variables and countries. For both survey publications, we take forecasts from the February, May, August, and November issues, which are published near the middle of each quarter. In both cases, we only look at forecasts for one-year ahead. For the univariate time-series forecasts (y^f and π^f), we estimate $ARMA(p, q)$ models, where p is chosen between 0 and 4 (based only on real-time data) to minimize the BIC, and set $q = 0$ for output growth and $q = 1$ for inflation. We simulate a real-time environment, using only data that would have been available to a forecaster in real time, using the RTHD-OECD real-time data set. Note that univariate models, by their nature, ignore changes in policy, so we are using these models as a benchmark, then examining how professional forecasters react differently from a univariate time series to changes in monetary policy.

Recall that as a measure of monetary policy, we use real interest rates, defined as nominal interest rates minus one-year-ahead inflation forecasts. The nominal interest

[3]The data are available at: `http://dallasfed.org/institute/oecd/index.cfm`.
[4]The data can be found at: `http://stats.oecd.org/mei/default.asp?rev=1&lang=e`.

Table 1—Data Summary for G7 Countries over 1991–2016

Variable	Obs	Mean	Std. Dev.	Min	Max
Inflation and growth, average over all horizons					
Inflation $\pi, \%$	707	1.798	1.269	-2.267	8.367
Inflation forecast $\pi^f, \%$	614	1.764	1.016	-2.500	18.000
Inflation expectation $\pi^e, \%$	721	2.289	1.438	-3.594	9.201
Growth $y, \%$	707	1.479	1.945	-8.777	5.920
Growth forecast $y^f, \%$	658	2.015	1.131	-6.900	27.000
Growth expectation $y^e, \%$	721	2.287	1.406	-8.340	9.088
Policy shocks					
Monetary innovation M^1	573	-0.262	1.196	-7.100	5.590
Monetary innovation M^2	545	-0.269	1.222	-7.100	5.590
Monetary innovation M^3	517	-0.284	1.249	-7.100	5.590
Fiscal innovation F^1	567	-0.053	1.517	-6.094	3.941
Fiscal innovation F^2	539	-0.048	1.543	-6.094	3.941
Fiscal innovation F^3	511	-0.044	1.570	-6.094	3.941

rate is the monthly short-term interest rate reported in the International Financial Statistics (IFS) database. The one-year-ahead inflation forecasts come from the surveys, as described above.

For measuring fiscal policy, we use general government primary balances from the OECD Economic Outlook. This is a semi-annual publication containing yearly estimates and forecasts. We convert these to quarterly estimates using quadratic interpolation, which is possible without violating the real-time nature of the experiment because we can use the forecasts to fill in gaps. Implicitly, we assume that no additional data were released between two consecutive semi-annual issues of the OECD Economic Outlook. The summary of our data is available in Table 1. To preserve space, the data there are presented for all G7 countries combined. Moreover, for inflation and growth, the values are the averages over all forecasts horizons.

IV. Results for Monetary Policy

A. *Full 1991–2016 sample*

We begin by analyzing the effects of monetary policy on output growth. We run the regression in Equation (1). Pooling across countries and over time, the regression results are shown in Table 2.

TABLE 2—THE EFFECT OF MONETARY POLICY ON GROWTH AND INFLATION

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
M^1	-0.230	0.168*	-0.398*	-0.268**	-0.219***	-0.049
	(0.210)	(0.077)	(0.183)	(0.080)	(0.050)	(0.075)
M^2	-0.234*	-0.022	-0.213*	-0.161*	-0.043	-0.117
	(0.112)	(0.079)	(0.095)	(0.083)	(0.027)	(0.070)
M^3	-0.216*	-0.048	-0.169	-0.126	-0.010	-0.116
	(0.091)	(0.042)	(0.096)	(0.080)	(0.069)	(0.060)
$\sum M^i$	-0.681	0.099	-0.780	-0.555	-0.273	-0.282
$p(\sum M^i = 0)$	0.06	0.51	0.02	0.00	0.05	0.04
$p(M^i = 0)$	0.02	0.06	0.06	0.00	0.01	0.04
$\overline{R}^2$	0.03	0.03	0.07	0.06	0.06	0.04
Sample size	450	450	450	450	450	450

Notes: Robust standard errors are clustered at the country level.

The negative coefficient in the column for $y - y^f$ means that actual output declines below what the benchmark model forecasts, which suggests that monetary policy affects output. Tighter monetary policy, associated with a higher real interest rate, is associated with a decline in output in two to three years, which, of course, the univariate time-series model cannot forecast. While the coefficient for the first period innovation is not significant, and the following two are only marginally significant, they all are negative, and the cumulative long-run effect of a negative 0.681 percent is significant at 6 percent.

Oddly, however, the column headed $y^e - y^f$ has a positive coefficient on M^1 (albeit significant only at 10 percent), which implies that tighter monetary policy leads to a rise in output growth in the survey forecasts relative to the benchmark model. But the negative coefficient on M^2 and M^3 mean that several years later, tighter monetary policy leads to a decline in forecasted output growth relative to the benchmark model. Moreover, the combined long-term effect is very small and highly insignificant.

The third column of the table shows that the survey forecasts are inefficient, and the bias arises immediately following a policy shock. The negative and significant coefficients on two out of three lags on monetary policy suggest that actual output falls more in response to a tightening of monetary policy than the forecasters expect. In fact, over the course of three years, they underpredict the effect by almost 0.8 percent. So, even though the forecasters move their forecasts in the right direction, they do not do so by enough. This is similar to the result found by Ball and Croushore (2003).

If we do the same exercise for inflation, we find the results to be comparable to those for growth, as the right panel of Table 2 shows. For inflation, again as expected, tighter monetary policy leads to lower inflation than the univariate time-series benchmark model implies, so monetary policy is effective in controlling inflation, as can be seen in the column headed $\pi - \pi^f$, where there are negative coefficients on the measures of monetary policy.

In the column headed $\pi^e - \pi^f$, the coefficient on M^1 is negative, suggesting that the survey forecasts decline relative to the time-series benchmark in response to a tightening of monetary policy. This both means that forecasters expect monetary policy to have an immediate effect on the economy, and it does look that its effect is especially pronounced during the first year.

Finally, in the column headed $\pi - \pi^e$, no coefficients are significant, suggesting that the survey might be efficient with respect to monetary policy. However, all of them are negative that suggest a possible bias, and a t-test says that the cumulative long-term effect is in fact negative, though very small in magnitude: only about a quarter of a percent over three years.

B. *Pre-crisis 1991–2008 sample*

One issue in these results is that includes the period of the financial crisis, when monetary policy in many countries was constrained by the so-called zero lower bound on nominal interest rates. Some countries began to use alternative monetary policies, but clearly measuring monetary policy with interest rates could be problematic in this period. So, we now examine the same regressions but ending the sample in 2008 to see if that makes a difference in the results.

The results of ending the sample in 2008 are shown in Table 3.

Table 3—The Effect of Monetary Policy on Growth and Inflation, Sample Ending in 2008

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
M^1	-0.270	-0.025	-0.245	-0.063	-0.137**	0.074
	(0.231)	(0.046)	(0.208)	(0.098)	(0.037)	(0.094)
M^2	-0.405*	-0.024	-0.381*	-0.040	-0.005	-0.034
	(0.184)	(0.067)	(0.179)	(0.171)	(0.075)	(0.100)
M^3	-0.743***	-0.177*	-0.566***	-0.346**	-0.185**	-0.161
	(0.069)	(0.091)	(0.110)	(0.094)	(0.053)	(0.090)
$\sum M^i$	-1.418	-0.227	-1.191	-0.449	-0.327	-0.122
$p(\sum M^i = 0)$	0.01	0.06	0.02	0.01	0.00	0.10
$p(M^i = 0)$	0.00	0.15	0.01	0.00	0.00	0.07
$\overline{R}^2$	0.17	0.04	0.13	0.07	0.06	0.05
Sample size	275	275	275	275	275	275

As before, actual output drops in response to a tightening of monetary policy. In fact, the impact is even stronger than it was in the longer sample, suggesting that including the period of the financial crisis weakened the apparent impact of monetary policy on output growth.

In this sample that ends before the financial crisis, the impact on survey forecasts of output growth makes more sense than in the full sample. Now survey forecasts of output growth decline relative to the benchmark forecast (all three coefficients in the second column labeled $y^e - y^f$ are negative), unlike the odd situation in the full sample.

However, the overall result is that actual output declines more than the survey forecasts think it will, especially in the middle-run, consistent with inefficiency in the forecasts. Survey forecasters appear to underpredict the effect of a policy shock by more than one percent over three years.

For inflation, similar results occur whether the sample ends in 2008 or later. Again, inflation falls relative to the benchmark model when there is a monetary tightening, as expected. The forecasters recognize that and reduce their forecasts of inflation in response to a monetary tightening. And the survey inflation forecasts are efficient with respect to monetary policy: the individual coefficients and well as the long-term cumulative effect are all insignificant. One notable difference, however, is the effect of M^3 on inflation and growth. Indeed, in Table 2 monetary policy shocks are typically significantly in the short to medium run. Here, on the other hand, long-run monetary shocks M^3 are significant in all but one specification, with point estimates reaching a negative 0.743.

Nevertheless, it seems that the measure of monetary policy is affected by the financial crisis, but the overall conclusions about forecast efficiency do not change.

V. Results for Fiscal Policy

We begin by analyzing the effects of fiscal policy on output growth. We again estimate Equation (1). Pooling across countries and over time, the regression results are shown in Table 4. Interestingly, the insignificant coefficients in the column for $y - y^f$ mean that actual output declines but does not change relative to the benchmark model forecasts, which suggests that fiscal policy does not have much impact on output. Forecasters appear to realize that, and their predictions are statistically the same as those from a univariate model based on past data. Moreover, their forecasts appear to be efficient – only the first out of three coefficients is marginally significant, and there is no inefficiency in the long run.

Table 4—The Effect of Fiscal Policy on Growth and Inflation

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
F^1	-0.138	0.023	-0.161*	-0.126**	-0.011	-0.116***
	(0.073)	(0.029)	(0.067)	(0.037)	(0.033)	(0.028)
F^2	-0.069	-0.048	-0.021	-0.155**	0.039	-0.195**
	(0.094)	(0.056)	(0.050)	(0.056)	(0.029)	(0.061)
F^3	0.104	0.024	0.080	0.097**	0.161**	-0.065
	(0.056)	(0.035)	(0.058)	(0.037)	(0.051)	(0.045)
$\sum F^i$	-0.104	-0.002	-0.102	-0.185	0.190	-0.375
$p(\sum F^i = 0)$	0.46	0.98	0.41	0.08	0.06	0.02
$p(F^i = 0)$	0.17	0.01	0.03	0.03	0.02	0.00
$\overline{R}^2$	0.02	0.01	0.02	0.06	0.06	0.12
Sample size	439	439	439	439	439	439

If we do the same exercise for inflation, however, we find a very different result, as the right panel of Table 4 shows. Tighter fiscal policy reduces inflation in the short and medium run but not in the long run, while the overall effect is still negative and marginally significant.

In the column headed $\pi^e - \pi^f$, only one of the coefficients is significant, suggesting that fiscal policy does not affect the survey forecasts relative to the time-series benchmark except for the three-year horizon.

Finally, in the column headed $\pi - \pi^e$, both the coefficients on F^1 and F^2 are negative and significant, implying that the survey forecasts are inefficient with respect to fiscal policy.

Overall, the results for fiscal policy are a mirror image of those for monetary policy. Forecasters appear to know well the effect of a monetary shock on inflation and a fiscal shock on growth (and are able to estimate them efficiently), but they fail to foresee the effects of monetary policy on growth and fiscal policy – on inflation, as those channels are traditionally less studied.[5]

[5] While it is expected for the zero lower bound to alter the effect of monetary policy on the economy, one may argue that fiscal policy got affected by it as well. For that reason we also estimated Equation (1) for the

VI. Results for Recessions and Normal Times

A. Monetary policy

Our conclusions about the efficiency of the forecasts of output and inflation as well as about the effectiveness of monetary and fiscal policies could be affected by the business cycle. It could be that both monetary policy and fiscal policy have a significant impact on output in recessions, but not in expansions when output could have reached potential.[6] And perhaps tighter policy affects inflation more in normal times than it does in recessions. To examine these differences, we run the same regressions as before but restrict the sample period to those considered to be recessions, compared with other periods. Then we repeat the exercise for a sample consisting of more normal times.

Our definition of "recession" is that determined by the Economic Cycle Research Institute for all the countries except the United States, for which we use the National Bureau of Economic Research methodology. Because there may be some dispute about when recessions begin and end, we consider "normal times" to be periods that are at least one year away from recession periods. In that way, we'll avoid having the results overly influenced by the transitions into or out of recessions.

We begin by analyzing the effects of the monetary policy on growth and inflation. We run the regression in Equation (1). Pooling across countries and over time, the regression results are shown in Table 5.

There are striking differences between the effects of monetary policy on the economy during recessions and normal times. It appears that during recessions (Panel A), monetary policy is very effective both on the real side of the economy (growth) as well as its nominal side (inflation): the coefficients in the columns for $y - y^f$ and $\pi - \pi^f$ are significant and all negative, meaning that actual output and inflation decline relative to the benchmark model forecasts, as we might expect in recessions.

shorter 1991-2008 sample, with the results presented in Table A1 in the Appendix. Unlike Table 4, none of the coefficients appears to be statistically significant, perhaps due to a smaller sample size.

[6] For example, see Parker (2011) and Tenreyro and Thwaites (2016).

Table 5—The Effects of Monetary Policy in Recessions and Normal Times

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
Panel A: The Effects of Monetary Policy in Recessions						
M^1	-0.992**	0.212	-1.204***	-0.571**	-0.391**	-0.180
	(0.313)	(0.134)	(0.219)	(0.169)	(0.128)	(0.116)
M^2	-0.674**	0.082	-0.756***	-0.655	-0.344	-0.310**
	(0.270)	(0.109)	(0.197)	(0.346)	(0.340)	(0.119)
M^3	-0.409	-0.025	-0.384	-0.533*	-0.244	-0.289**
	(0.393)	(0.216)	(0.234)	(0.218)	(0.163)	(0.111)
$\sum M^i$	-2.075	0.269	-2.343	-1.758	-0.979	-0.779
$p(\sum M^i = 0)$	0.00	0.18	0.00	0.02	0.05	0.01
$p(M^i = 0)$	0.03	0.44	0.00	0.01	0.05	0.01
$\overline{R}^2$	0.17	0.04	0.27	0.27	0.18	0.18
Sample size	105	105	105	105	105	105
Panel B: The Effects of Monetary Policy in Normal Times						
M^1	-0.185	-0.031	-0.154	-0.281***	-0.192*	-0.089
	(0.203)	(0.059)	(0.241)	(0.048)	(0.083)	(0.095)
M^2	0.050	-0.084	0.135	0.077	0.094**	-0.018
	(0.101)	(0.072)	(0.089)	(0.080)	(0.034)	(0.062)
M^3	0.052	-0.056	0.109	-0.063	0.064	-0.127
	(0.137)	(0.047)	(0.169)	(0.069)	(0.106)	(0.087)
$\sum M^i$	-0.082	-0.171	0.089	-0.267	-0.033	-0.234
$p(\sum M^i = 0)$	0.74	0.18	0.71	0.00	0.86	0.16
$p(M^i = 0)$	0.41	0.54	0.24	0.00	0.03	0.39
$\overline{R}^2$	0.02	0.02	0.04	0.06	0.06	0.04
Sample size	234	234	234	234	234	234

The cumulative effects on growth and inflation are 2.1 and 1.8 percent, respectively.

Additionally, in the columns headed $y - y^e$ and $\pi - \pi^e$, we see that during recessions, both output and inflation respond to monetary policy changes more than the forecasters think it will. This does not necessarily imply that the forecasts are inefficient because forecasters may not know if the economy is in a recession when they make their forecasts. But the results do suggest that monetary policy may work by causing output and inflation to change differently than forecasters think it will.

If we do the same exercise for normal times, however, we find much less evidence of any impact of the policy, as Panel B in Table 5 shows. Now it appears that monetary policy has no effect on growth and an economically small effect on inflation during normal times. The magnitude of the effects over three years is only 1/7 of that for the recession times (-0.267 versus -1.758). Also, as suggested by the $y - y^e$ and $\pi - \pi^e$ columns, both the output and inflation forecasts are efficient at all conventional levels of significance.

B. Fiscal policy

The results for fiscal policy are presented in Table 6 and largely mimic those for monetary policy.

First, we see that fiscal policy is much more effective during recessions than during normal times. Indeed, during recessions (Panel A), the coefficients in columns $y - y^f$ and $\pi - \pi^f$ are all negative and most are statistically significant. Moreover, the policy has an immediate effect and starts working during the first year after being implemented. During normal times (Panel B), however, some of the coefficients switch signs and the long-term effects are much smaller in magnitude and never significant regardless of whether we look at growth or inflation.

Similarly, in recessions, we see much more evidence of forecasts being inefficient than we do during normal times. Indeed, in Panel A the coefficients in columns $y - y^e$ and $\pi - \pi^e$ are all negative and some are significant at the five percent level, while in Panel B the significance is only marginal with the cumulative effects always

Table 6—The Effects of Fiscal Policy in Recessions and Normal Times

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
Panel A: The Effects of Fiscal Policy in Recessions						
F^1	-0.556**	0.007	-0.563**	-0.486**	-0.212	-0.275***
	(0.198)	(0.084)	(0.202)	(0.137)	(0.112)	(0.042)
F^2	-0.046	0.059	-0.105	-0.376**	-0.109	-0.267
	(0.157)	(0.109)	(0.156)	(0.114)	(0.078)	(0.141)
F^3	-0.051	0.119**	-0.171	-0.193**	-0.032	-0.161**
	(0.225)	(0.037)	(0.247)	(0.073)	(0.098)	(0.051)
$\sum F^i$	-0.653	0.186	-0.839	-1.056	-0.353	-0.703
$p(\sum F^i = 0)$	0.25	0.41	0.19	0.00	0.19	0.01
$p(F^i = 0)$	0.00	0.02	0.00	0.01	0.31	0.00
$\overline{R}^2$	0.08	0.02	0.08	0.16	0.06	0.20
Sample size	103	103	103	103	103	103
Panel B: The Effects of Fiscal Policy in Normal Times						
F^1	-0.038	0.046	-0.084	-0.058**	0.013	-0.071
	(0.140)	(0.065)	(0.118)	(0.021)	(0.043)	(0.059)
F^2	-0.002	-0.032	0.030	-0.060	0.108*	-0.168*
	(0.061)	(0.078)	(0.046)	(0.051)	(0.047)	(0.072)
F^3	0.167**	0.015	0.152*	0.076*	0.178**	-0.102
	(0.049)	(0.048)	(0.065)	(0.034)	(0.062)	(0.080)
$\sum F^i$	0.127	0.029	0.098	-0.042	0.299	-0.341
$p(\sum F^i = 0)$	0.51	0.86	0.45	0.58	0.07	0.10
$p(F^i = 0)$	0.02	0.20	0.01	0.04	0.08	0.12
$\overline{R}^2$	0.06	0.01	0.06	0.03	0.13	0.13
Sample size	224	224	224	224	224	224

being insignificant.

VII. Summary and Conclusions

Our results suggest that forecasters generally underestimate the impact of monetary policy on output growth but not on inflation. During recessions, monetary and fiscal policy are both effective and forecasters tend to underestimate their effects. During normal times, neither monetary policy nor fiscal policy have a significant effect on output, and monetary policy has a small but significant effect on inflation.

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VIII. Appendix

Table A1—The Effect of Fiscal Policy on Growth and Inflation, Sample Ending in 2008

	Growth, y			Inflation, π		
	$y - y^f$	$y^e - y^f$	$y - y^e$	$\pi - \pi^f$	$\pi^e - \pi^f$	$\pi - \pi^e$
F^1	-0.194	0.016	-0.210	0.046	0.020	0.026
	(0.107)	(0.034)	(0.117)	(0.079)	(0.067)	(0.025)
F^2	-0.199	0.021	-0.220	-0.076	0.018	-0.094
	(0.199)	(0.064)	(0.181)	(0.153)	(0.074)	(0.100)
F^3	-0.037	0.101	-0.138	0.080	0.046	0.034
	(0.147)	(0.055)	(0.136)	(0.042)	(0.057)	(0.038)
$\sum F^i$	-0.430	0.138	-0.568	0.050	0.084	-0.034
$p(\sum F^i = 0)$	0.21	0.35	0.14	0.81	0.53	0.81
$p(F^i = 0)$	0.15	0.10	0.32	0.07	0.28	0.31
$\overline{R}^2$	0.03	0.03	0.04	0.01	0.01	0.02
Sample size	264	264	264	264	264	264