

ONLINE APPENDIX (NOT INTENDED FOR PUBLICATION):
DECOMPOSING THE EFFECTS OF MONETARY POLICY USING AN EXTERNAL
INSTRUMENTS SVAR

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FOMC Meeting	Sched?	FOMC Meeting	Sched?	FOMC Meeting	Sched?	FOMC Meeting	Sched?
1/8/1991	0	7/3/1996	1	11/6/2002	1	3/18/2009	1
2/1/1991	0	8/20/1996	1	12/10/2002	1	4/29/2009	1
2/7/1991	1	9/24/1996	1	1/29/2003	1	6/24/2009	1
3/8/1991	0	11/13/1996	1	3/18/2003	1	8/12/2009	1
3/27/1991	1	12/17/1996	1	5/6/2003	1	9/23/2009	1
4/30/1991	0	2/5/1997	1	6/25/2003	1	11/4/2009	1
5/15/1991	1	3/25/1997	1	8/12/2003	1	12/16/2009	1
7/5/1991	1	5/20/1997	1	9/16/2003	1	1/27/2010	1
8/6/1991	0	7/2/1997	1	10/28/2003	1	3/16/2010	1
8/21/1991	1	8/19/1997	1	12/9/2003	1	4/28/2010	1
9/13/1991	0	9/30/1997	1	1/28/2004	1	6/23/2010	1
10/2/1991	1	11/12/1997	1	3/16/2004	1	8/10/2010	1
10/30/1991	0	12/16/1997	1	5/4/2004	1	9/21/2010	1
11/6/1991	1	2/4/1998	1	6/30/2004	1	11/3/2010	1
12/6/1991	0	3/31/1998	1	8/10/2004	1	12/14/2010	1
12/18/1991	1	5/19/1998	1	9/21/2004	1	1/26/2011	1
12/20/1991	0	7/1/1998	1	11/10/2004	1	3/15/2011	1
2/6/1992	1	8/18/1998	1	12/14/2004	1	4/27/2011	1
4/1/1992	1	9/29/1998	1	2/2/2005	1	6/22/2011	1
4/9/1992	0	10/15/1998	0	3/22/2005	1	8/9/2011	1
5/20/1992	1	11/17/1998	1	5/3/2005	1	9/21/2011	1
7/2/1992	1	12/22/1998	1	6/30/2005	1	11/2/2011	1
8/19/1992	1	2/3/1999	1	8/9/2005	1	12/13/2011	1
9/4/1992	0	3/30/1999	1	9/20/2005	1	1/25/2012	1
10/7/1992	1	5/18/1999	1	11/1/2005	1	3/13/2012	1
11/18/1992	1	6/30/1999	1	12/13/2005	1	4/25/2012	1
12/23/1992	1	8/24/1999	1	1/31/2006	1	6/20/2012	1
2/4/1993	1	10/5/1999	1	3/28/2006	1	8/1/2012	1
3/24/1993	1	11/16/1999	1	5/10/2006	1	9/13/2012	1
5/19/1993	1	12/21/1999	1	6/29/2006	1	10/24/2012	1
7/8/1993	1	2/2/2000	1	8/8/2006	1	12/12/2012	1
8/18/1993	1	3/21/2000	1	9/20/2006	1	1/30/2013	1
9/22/1993	1	5/16/2000	1	10/25/2006	1	3/20/2013	1
11/17/1993	1	6/28/2000	1	12/12/2006	1	5/1/2013	1
12/22/1993	1	8/22/2000	1	1/31/2007	1	6/19/2013	1
2/4/1994	1	10/3/2000	1	3/21/2007	1	7/31/2013	1
3/22/1994	1	11/15/2000	1	5/9/2007	1	9/18/2013	1
4/18/1994	0	12/19/2000	1	6/28/2007	1	10/30/2013	1
5/17/1994	1	1/3/2001	0	8/7/2007	1	12/18/2013	1
7/6/1994	1	1/31/2001	1	8/17/2007	0	1/29/2014	1
8/16/1994	1	3/20/2001	1	9/18/2007	1	3/19/2014	1
9/27/1994	1	4/18/2001	0	10/31/2007	1	4/30/2014	1
11/15/1994	1	5/15/2001	1	12/11/2007	1	6/18/2014	1
12/20/1994	1	6/27/2001	1	1/22/2008	0	7/30/2014	1
2/1/1995	1	8/21/2001	1	1/30/2008	1	9/17/2014	1
3/28/1995	1	9/17/2001	0	3/18/2008	1	10/29/2014	1
5/23/1995	1	10/2/2001	1	4/30/2008	1	12/17/2014	1
7/6/1995	1	11/6/2001	1	6/25/2008	1	1/28/2015	1
8/22/1995	1	12/11/2001	1	8/5/2008	1	3/18/2015	1
9/26/1995	1	1/30/2002	1	9/16/2008	1	4/29/2015	1
11/15/1995	1	3/19/2002	1	10/8/2008	0	6/17/2015	1
12/19/1995	1	5/7/2002	1	10/29/2008	1	7/29/2015	1
1/31/1996	1	6/26/2002	1	11/25/2008	0	9/17/2015	1
3/26/1996	1	8/13/2002	1	12/16/2008	1	10/28/2015	1
5/21/1996	1	9/24/2002	1	1/28/2009	1	12/16/2015	1

Table 1: FOMC meeting dates with a 1 in the “Sched?” column indicating a scheduled meeting and a 0 indicating an unscheduled meeting.

	(a)	(b)	(c)	(d)
VARIABLES	FFR residual	1 year residual	FFR residual	1 year residual
Target Factor	0.662*** (0.134)	0.763*** (0.140)	0.852*** (0.195)	1.032*** (0.235)
Path Factor	-0.168 (0.131)	0.324** (0.161)	-0.217 (0.221)	0.177 (0.330)
Constant	-0.005 (0.010)	0.000 (0.012)	-0.006 (0.010)	-0.000 (0.013)
Observations	252	252	252	252
R-squared	0.106	0.108	0.090	0.082
Adjusted R-squared	0.0991	0.101	0.0830	0.0749
Robust F-statistic	12.49	17.37	10.23	9.777

Table 2: First stage regression of residuals from the reduced form VAR on the target and path factors. Columns (a) and (b) show the results using a 2 day window, while columns (c) and (d) show the results using a 30 minute window. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)
VARIABLES	FFR residual	1 year residual
Target Factor	0.809*** (0.128)	0.893*** (0.167)
Path Factor	-0.150 (0.168)	0.310 (0.219)
Constant	-0.006 (0.008)	0.000 (0.011)
Observations	299	299
R-squared	0.115	0.099
Adjusted R-squared	0.109	0.0930
Robust F-statistic	20.75	14.59

Table 3: **Sample: July 1979 to November 2015** : First stage regression of residuals from the reduced form VAR on the target and path factors, from the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

VARIABLES	(1) FFR residual	(2) 1 year residual
Target Factor	0.780*** (0.140)	0.951*** (0.175)
Path Factor	-0.207 (0.188)	0.350 (0.252)
Constant	-0.004 (0.011)	-0.002 (0.014)
Observations	216	216
R-squared	0.121	0.111
Adjusted R-squared	0.113	0.102
Robust F-statistic	16.32	14.95

Table 4: **Sample: July 1979 to December 2008.** : First stage regression of residuals from the reduced form VAR on the target and path factors, from the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

VARIABLES	FFR residual	1 year residual
Target Factor	0.819*** (0.110)	0.724*** (0.172)
Path Factor	-0.033 (0.131)	0.301 (0.191)
Constant	-0.010 (0.007)	-0.002 (0.011)
Observations	252	252
R-squared	0.229	0.093
Adjusted R-squared	0.223	0.0862
Robust F-statistic	27.76	9.422

Table 5: **Sample: July 1984 to December 2011.** : First stage regression of residuals from the reduced form VAR on the target and path factors, from the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)
VARIABLES	FFR residual	1 year residual
Target Factor	0.678*** (0.150)	0.816*** (0.158)
Path Factor	-0.110 (0.164)	0.203 (0.220)
Constant	-0.002 (0.010)	-0.005 (0.013)
Observations	241	241
R-squared	0.086	0.084
Adjusted R-squared	0.0787	0.0766
Robust F-statistic	10.42	13.31

Table 6: First stage regression of residuals from the reduced form VAR on the target and path factors, from the model with the excess bond premium added to the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)
VARIABLES	FFR residual	1 year residual
Target Factor	0.799*** (0.147)	0.835*** (0.170)
Path Factor	-0.135 (0.186)	0.294 (0.232)
Constant	-0.005 (0.011)	0.004 (0.013)
Observations	241	241
R-squared	0.105	0.083
Adjusted R-squared	0.0974	0.0752
Robust F-statistic	15.15	12.04

Table 7: First stage regression of residuals from the reduced form VAR on the target and path factors, from the model with commodity prices added to the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)
VARIABLES	FFR residual	1 year residual
Target Factor	0.678*** (0.150)	0.841*** (0.187)
Path Factor	-0.110 (0.164)	0.352 (0.236)
Constant	-0.002 (0.010)	0.004 (0.013)
Observations	241	241
R-squared	0.086	0.093
Adjusted R-squared	0.0787	0.0853
Robust F-statistic	10.42	10.85

Table 8: First stage regression of residuals from the reduced form VAR on the target and path factors, from the model with the unemployment rate added to the baseline specification. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)
VARIABLES	FFR residual	1 year residual
Target Factor	0.878*** (0.290)	0.843** (0.338)
Path Factor (Pvt Res)	-0.181 (0.211)	0.239 (0.293)
Constant	-0.006 (0.011)	-0.001 (0.014)
Observations	241	241
R-squared	0.044	0.027
Adjusted R-squared	0.0365	0.0192
Robust F-statistic	4.731	3.678

Table 9: First stage regression of residuals from the reduced form VAR on the target and path factors after controlling for private information. This results here also exclude the unscheduled FOMC meeting dates. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

VARIABLES	(1) FFR residual	(2) 1 year residual
Target Factor	0.783*** (0.157)	0.836*** (0.193)
Path Factor	-0.205 (0.192)	0.245 (0.276)
Constant	0.004 (0.010)	0.014 (0.014)
Observations	216	216
R-squared	0.105	0.073
Adjusted R-squared	0.0966	0.0642
Robust F-statistic	13.03	9.382

Table 10: **Futures Data Sample: February 1994 to December 2011.** First stage regression of residuals from the reduced form VAR on the target and path factors. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

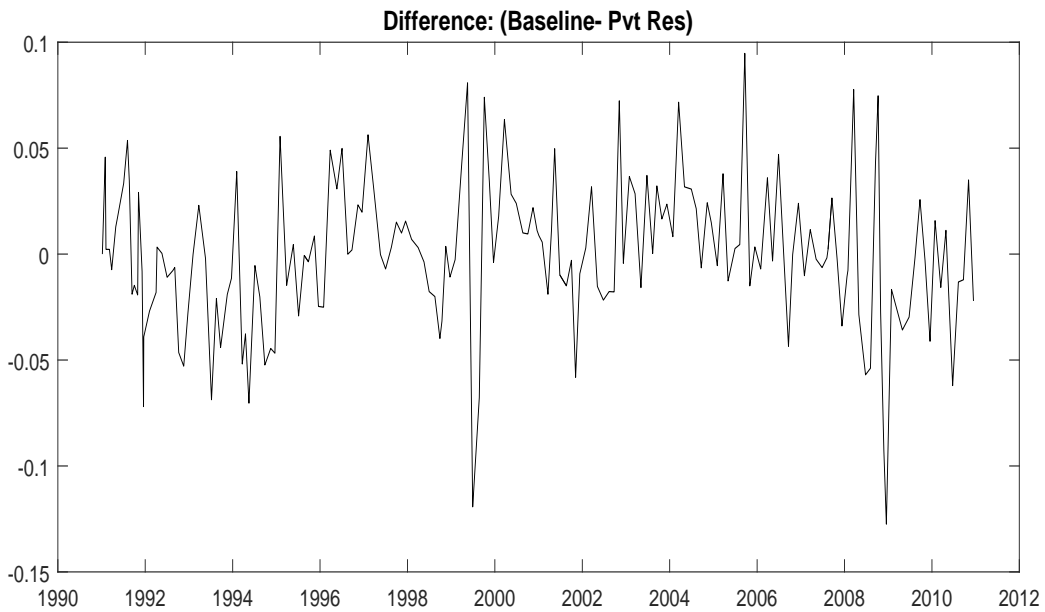
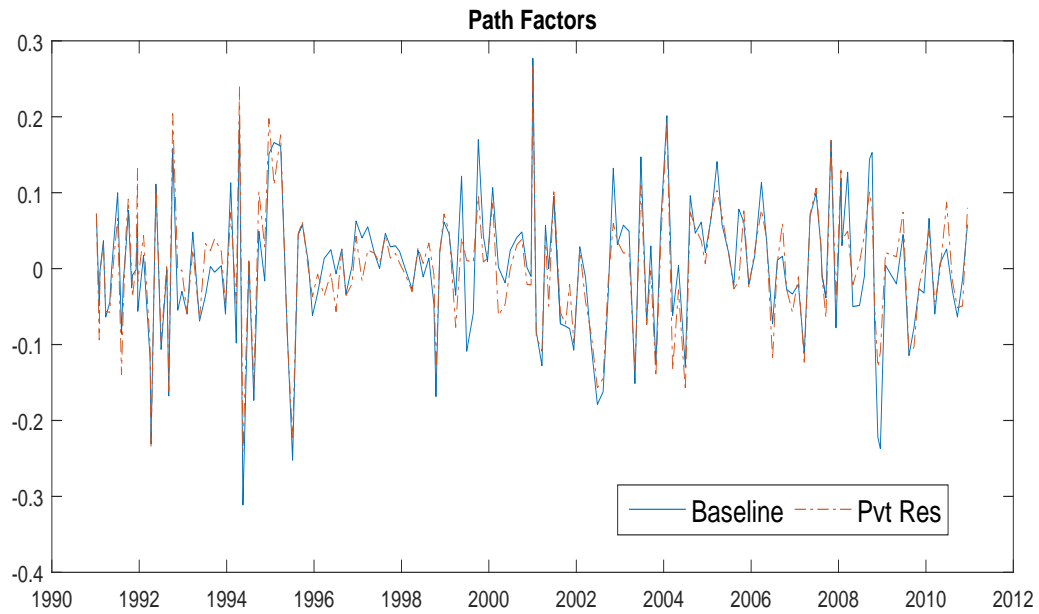


Figure 1: The top panel shows the path factors from the baseline specification (solid blue line) and the residual after controlling for Fed private info (dashed red line). The bottom panel shows the difference between the two series.

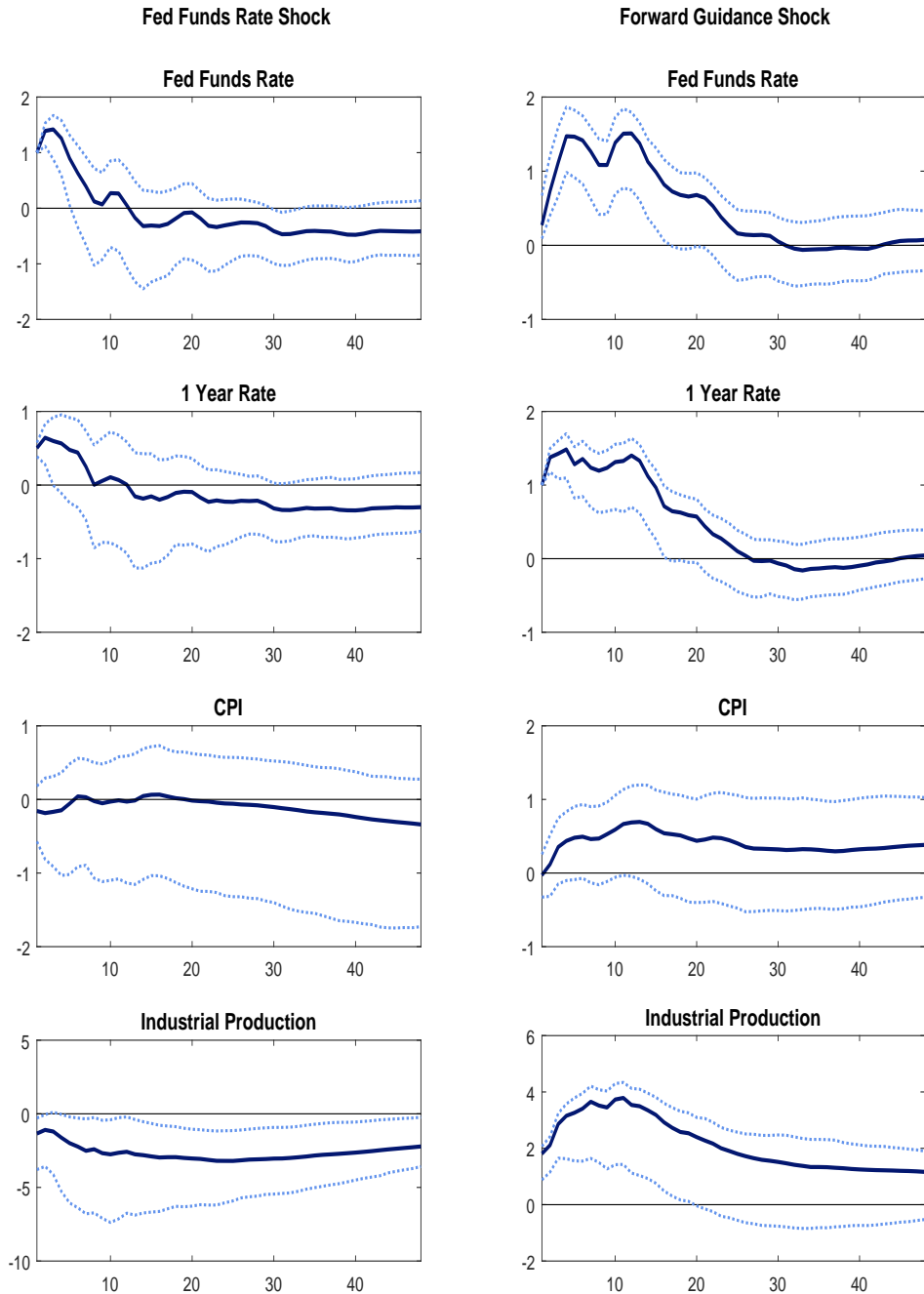


Figure 2: **Tight 30 minute window.** The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The monetary surprises are constructed using a 30 minute window around FOMC announcements. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

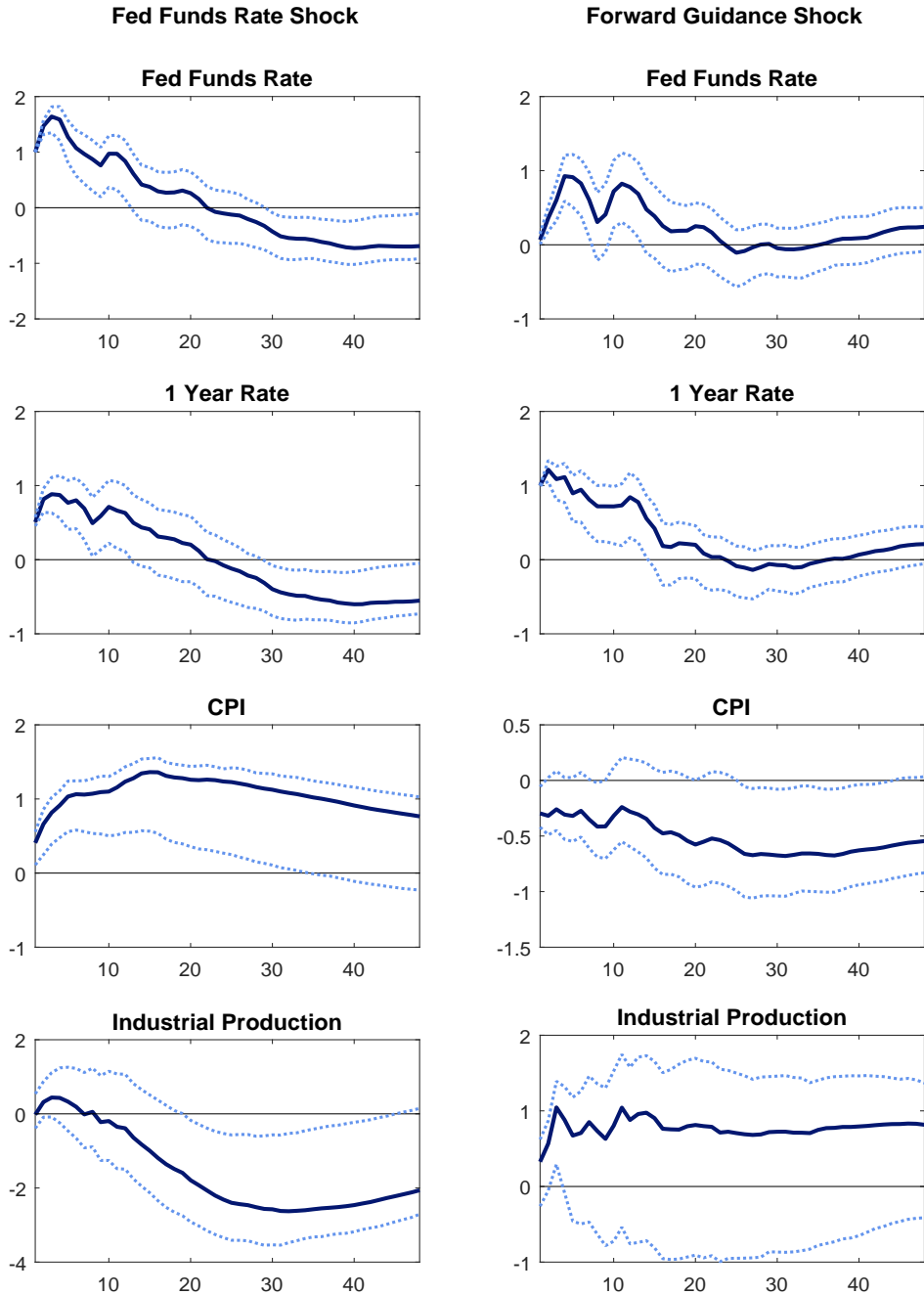


Figure 3: **Two day window**. The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The monetary surprises are constructed using a two day window around FOMC announcements. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

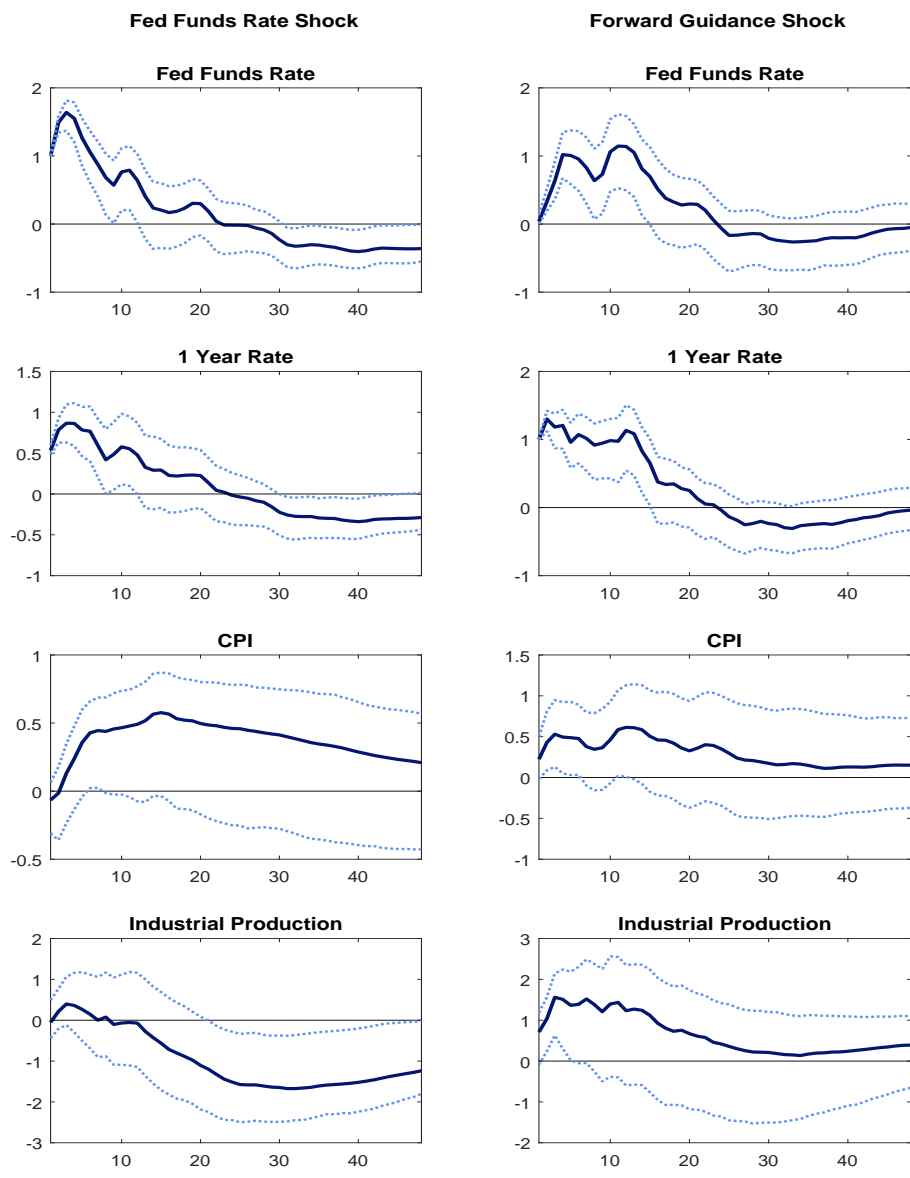


Figure 4: **Sample: July 1979 to November 2015** The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The first column shows the response to a conventional monetary policy shock (i.e. shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

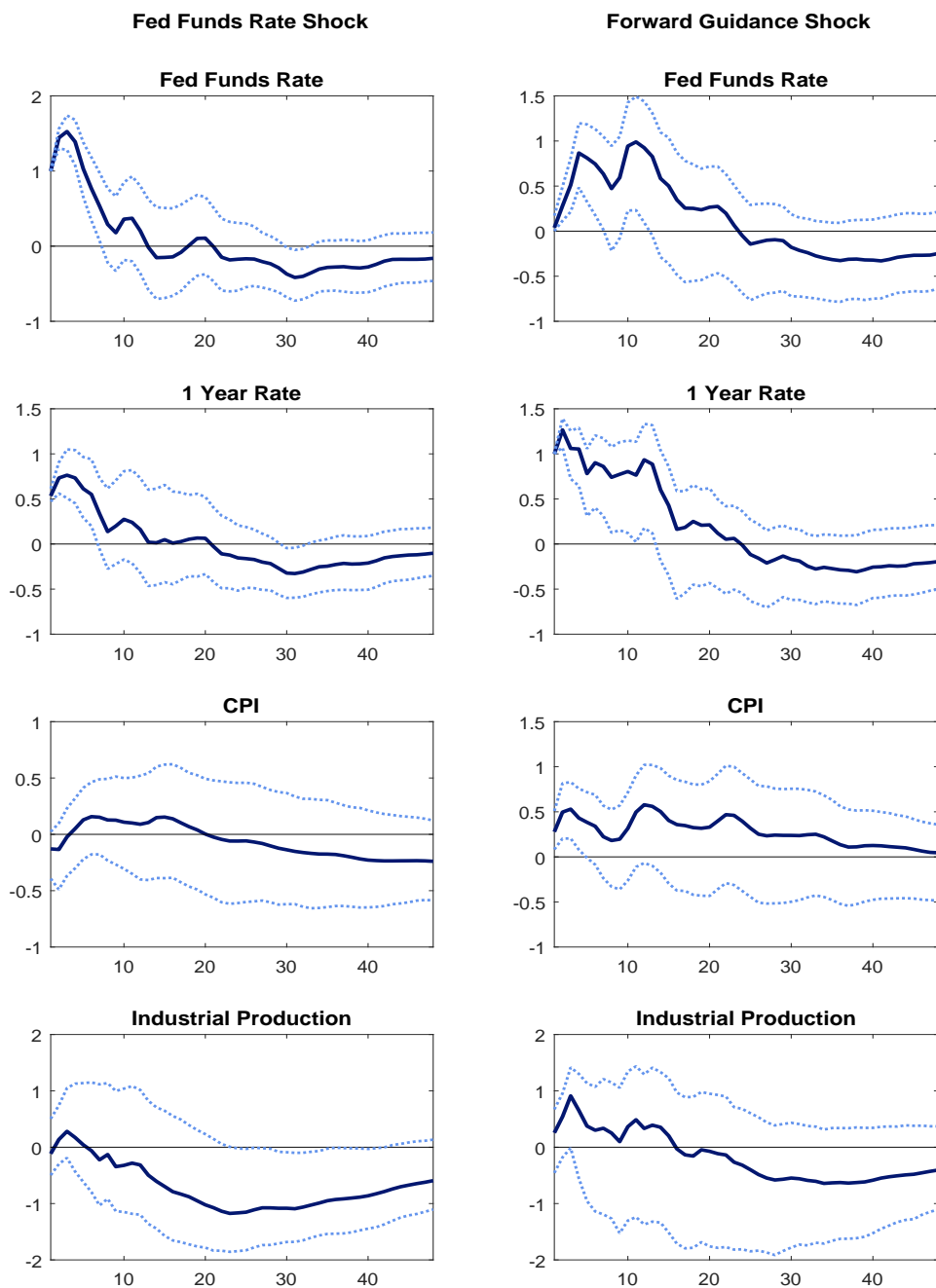


Figure 5: **Sample: July 1979 to December 2008.** The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

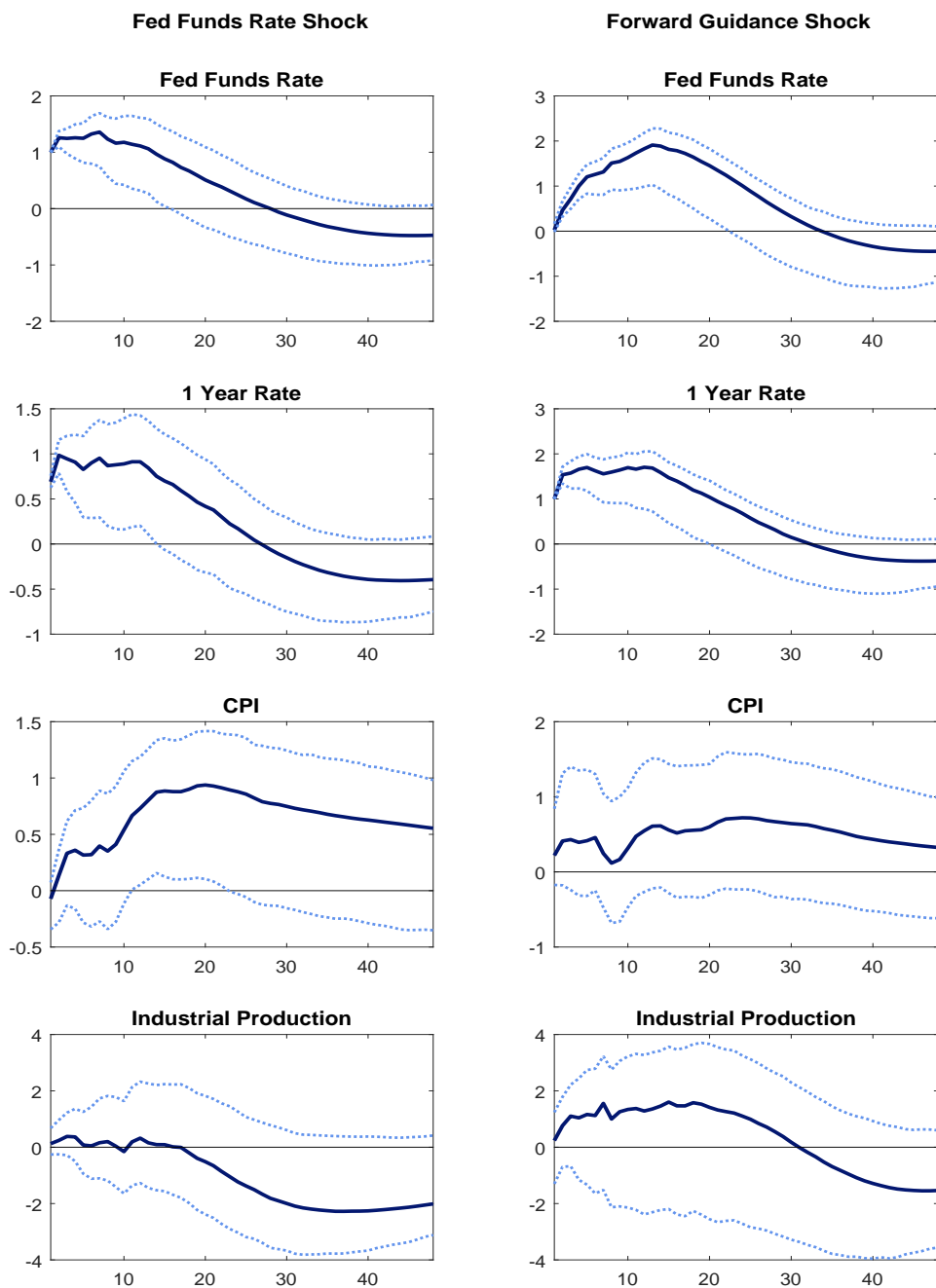


Figure 6: **Sample: July 1984 to December 2011.** The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

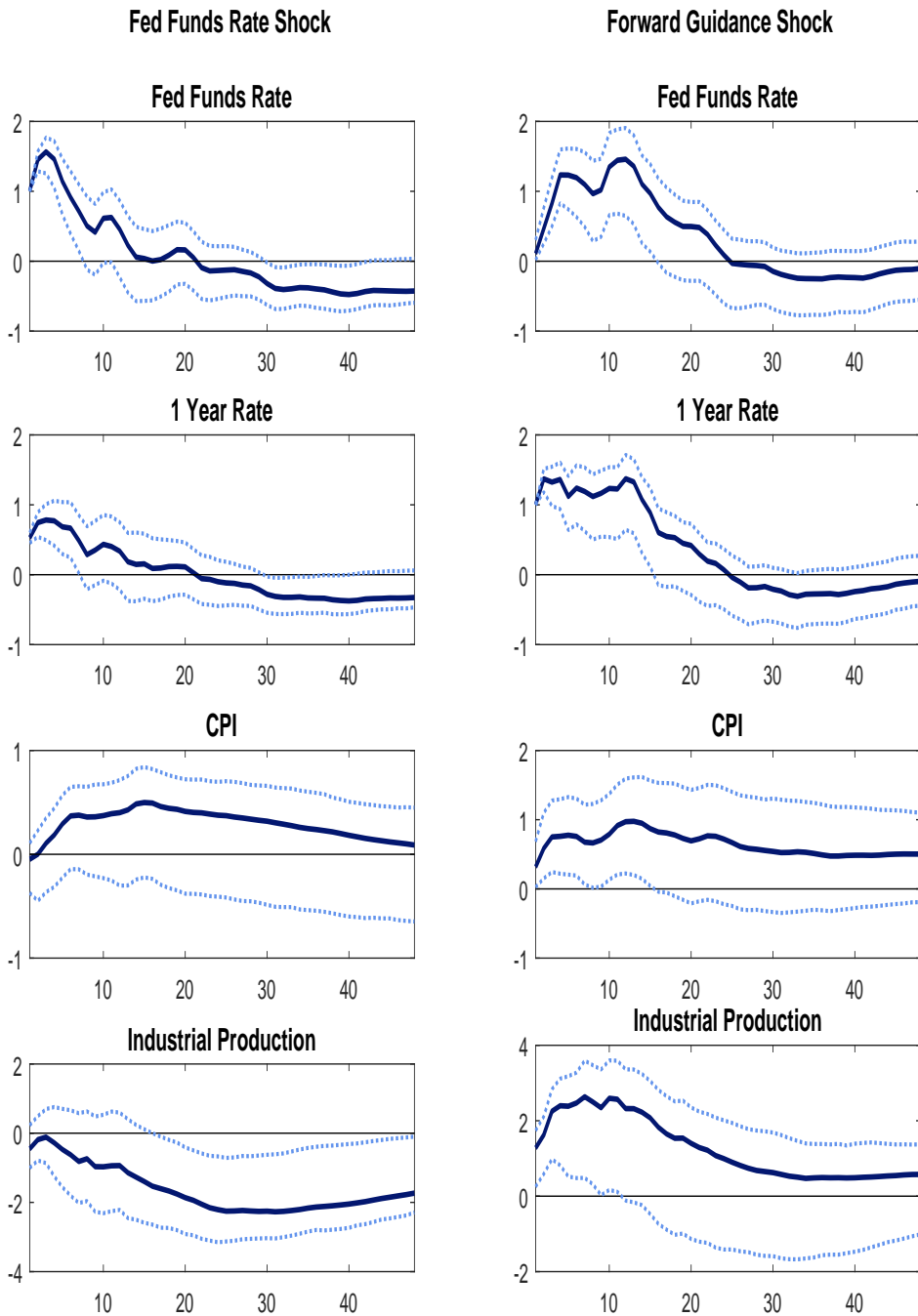


Figure 7: **Futures Data Sample: February 1994 to December 2011.** The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation)

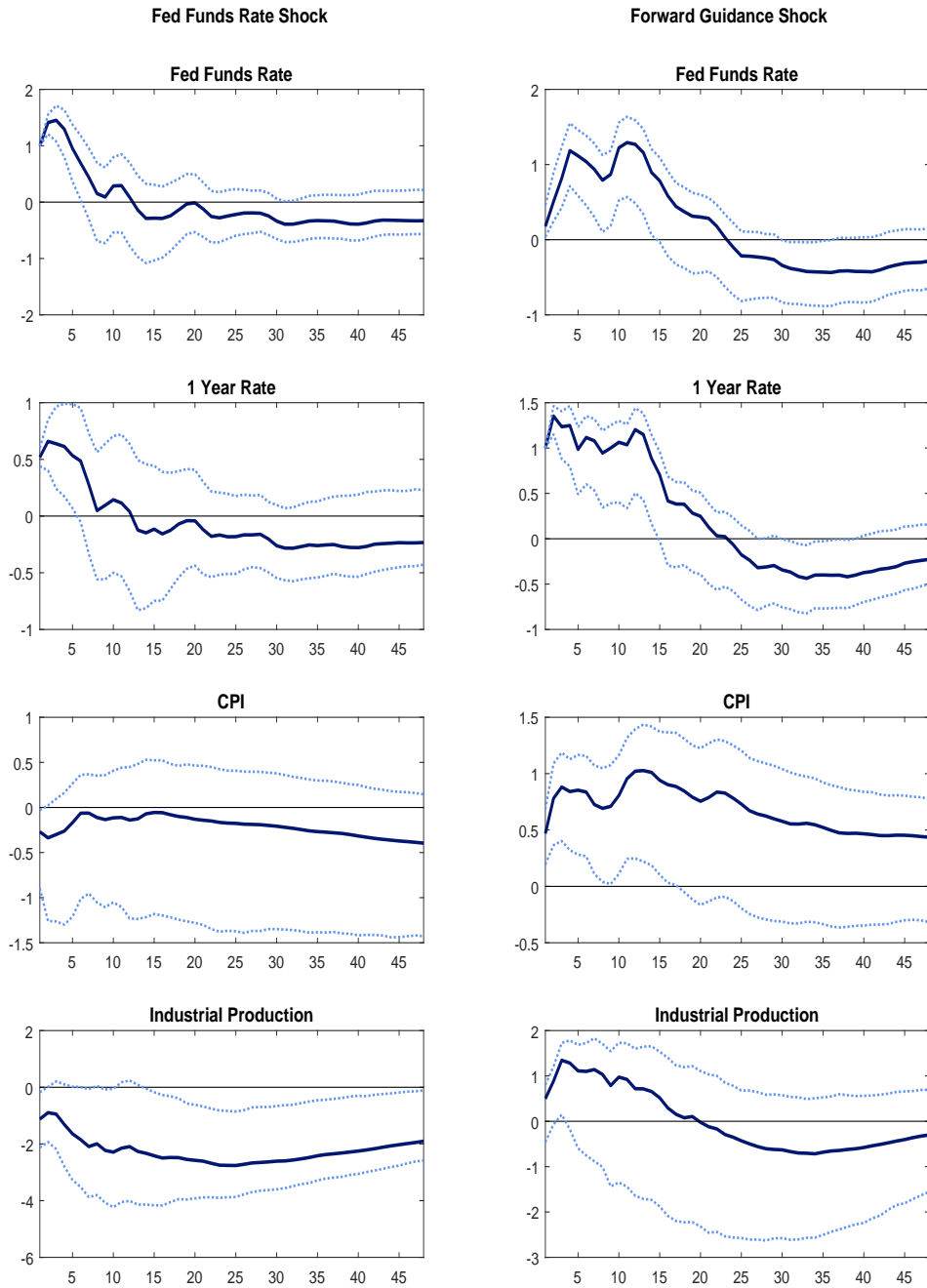


Figure 8: The impulse responses to a unit monetary policy shock identified using the external instruments identification strategy I outlined in the text, with 90% confidence intervals. The first column shows the response to a conventional monetary policy shock (i.e shock to the federal funds rate equation), while the second column shows the response to a forward guidance shock (i.e. shock to the 1 year rate equation). The daily futures shock series is aggregated to a monthly series by weighing it based on which day of the month the FOMC meeting occurred. If the FOMC meeting occurs in the final 5 days of the month, then the shock is assigned to the next month.

VARIABLES	(1) FFR residual	(2) 1 year residual
Target Factor	0.907*** (0.230)	1.071*** (0.237)
Path Factor	0.005 (0.186)	0.412* (0.247)
Constant	-0.005 (0.010)	0.000 (0.013)
Observations	252	252
R-squared	0.078	0.089
Adjusted R-squared	0.0710	0.0819
Robust F-statistic	7.888	12.43

Table 11: First stage regression of residuals from the reduced form VAR on the target and path factors. The daily futures shock series is aggregated to a monthly series by weighing it based on which day of the month the FOMC meeting occurred. If the FOMC meeting occurs in the final 5 days of the month, then the shock is assigned to the next month. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(a)	(b)		(c)	(d)
VARIABLES	Target Factor	Path Factor	VARIABLES	Target Factor	Path Factor
GDPt1	0.006 (0.010)	0.020 (0.015)	All	0.5714	0.0026
GDPt2	0.001 (0.013)	-0.013 (0.013)	GDP	0.2613	0.0022
GDPt3	-0.018 (0.014)	0.005 (0.013)	CPI	0.5099	0.1589
GDPt4	0.007 (0.015)	0.030* (0.017)	Current	0.6962	0.0483
CPIt1	0.002 (0.007)	0.007 (0.007)	Lagged	0.6277	0.0057
CPIt2	-0.017 (0.015)	-0.052*** (0.019)			
CPIt3	0.071* (0.036)	0.006 (0.032)			
CPIt4	-0.036 (0.043)	0.059 (0.051)			
GDPt1lag	0.007 (0.008)	0.010 (0.010)			
GDPt2lag	-0.001 (0.010)	-0.011 (0.013)			
GDPt3lag	0.020 (0.015)	0.025* (0.014)			
GDPt4lag	-0.006 (0.015)	-0.049*** (0.019)			
CPIt1lag	0.000 (0.004)	-0.002 (0.007)			
CPIt2lag	0.016 (0.016)	-0.014 (0.020)			
CPIt3lag	-0.050 (0.039)	0.078* (0.042)			
CPIt4lag	0.011 (0.037)	-0.085 (0.061)			
Constant	-0.003 (0.007)	0.006 (0.009)			
Observations	158	158			
R-squared	0.111	0.188			
Adjusted R-squared	0.00987	0.0963			

Table 12: Regression results of target and path factor on measure of Federal Reserve private information excluding the unscheduled FOMC meetings. Columns (a) and (b) show the regression coefficients with robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, Columns (c) and (d) show the p-values from Wald tests. See the main text for more details.