



How Effective is Central Bank Forward Guidance?

Clemens Kool, Utrecht University
Dan Thornton, Federal Reserve Bank St. Louis

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Overview

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- Countries with FG
- Existing evidence
- Step 1: testing CB forecasting ability
- Step 2: testing for improvements in interest rate predictability after FG
- Conclusions



Motivation

- Increased concern for CB transparency since early 1980s
 - Initially counterpart for increased independence through accountability
 - Additionally, increase of credibility with positive effects on efficacy of monetary policy (anchoring long-term inflation expectations, reducing economic and financial uncertainty, making financial markets do the job)
 - See Bernanke (2007), Svensson (2006, 2008), Woodford (2003, 2005)
- No consensus though
 - More transparency could be counterproductive
 - a.o. Morris and Shin (2002), Walsh (2007, 2008), Gosselin et al. (2006), Kool et al. (2011), Mishkin (2004), Goodhart (2005)
- New: (Quantitative) Forward Guidance
 - CB interest rate projections: inertia (Woodford 1999)
 - Little empirical evidence so far
 - This paper aims at providing evidence on increased predictability of interest rates after the introduction of FG



Countries with FG

- New Zealand
 - Quarterly since December 1997 (for 3m bill rate)
- Norway
 - 3 times a year since October 2005 (for sight deposit rate=policy rate)
- Sweden
 - 3 times a year since February 2007 (for repo rate = policy rate)
- United States
 - Implicit (language) August 2003-December 2005 and December 2008-August 2011
 - Explicit since August 2011 (not in our sample)
- All CBs predict average daily rate in calendar quarters
- PM Czech Republic



Existing empirical evidence

- Most evidence is for NZ only and uses event type analysis round announcement days
 - Moessner and Nelson (2008), Ferrero and Secchi (2007), Drew and Karagedikli (2008)
 - Overall, small impact at short horizons at best
 - Potential drawback: joint test with appropriate surprise measures and overestimation of interest rate response (Thornton 2009)
 - Anderson and Hofmann (2010) compare NZ, NW and SW
- Forecasting evidence
 - McCaw and Ranchhod (2002): RBNZ forecasts do not outperform RW
 - Turner (2006): RBNZ forecasts outperform survey forecasts at 12m horizon (but not at 3m)
 - Goodhart and Lim (2011): RBNZ forecasts have some predictive power for 3m and 6m ahead market rates



Step 1: testing CB forecasting ability

➤ Hypothesis:

- If central bank interest rate forecasts do not outperform the no-predictability alternative (RW), it is hard to see how forward guidance can improve the CB's ability to influence longer-term yields through market expectations

➤ Use Modified Diebold-Mariano test statistic to test for difference in forecast performance between central bank and a naïve random walk forecast

- Negative difference implies CB outperforms RW

➤ Two measures (loss functions)

- Absolute errors
- Squared errors
- RW benchmark = average daily rate in last five working days of previous month
- PM no evidence available for US (implicit guidance does not give exact forecasts and forecast errors)



Table 1

Difference between central bank and RW forecasts: New Zealand

Quarters ahead	MAE			MSE		
	Mean	SE	MDM	Mean	SE	MDM
1	-0.045	0.025	-1.79	-0.053	0.061	-0.85
2	-0.107	0.044	-2.37*	-0.316	0.167	-1.84
3	-0.107	0.072	-1.43	-0.514	0.300	-1.63
4	-0.096	0.102	-0.88	-0.679	0.471	-1.34
5	-0.044	0.132	-0.30	-0.711	0.605	-1.07
6	-0.012	0.130	-0.08	-0.789	0.651	-1.08
7	-0.004	0.135	-0.02	-0.812	0.687	-1.03
8	-0.058	0.142	-0.34	-1.009	0.782	-1.09

Note: *Significant at 5 percent level. Significant coefficients are printed in bold.



Table 2

Difference between central bank and RW forecasts: Norway

Quarters ahead	MAE			MSE		
	Mean	SE	MDM	Mean	SE	MDM
1	-0.332	0.095	-3.40**	-0.488	0.344	-1.38
2	-0.505	0.124	-3.73**	-0.959	0.581	-1.50
3	-0.528	0.196	-2.24*	-1.346	0.776	-1.44
4	-0.517	0.254	-1.56	-1.440	0.856	-1.29
5	-0.660	0.293	-1.53	-1.838	0.981	-1.27
6	-0.697	0.286	-1.40	-2.340	1.088	-1.24
7	-0.663	0.358	-0.85	-2.415	1.550	-0.71
8	-0.492	0.446	-0.41	-1.716	2.191	-0.29

Note: *Significant at 5 percent level; **significant at 1 percent level. Significant coefficients are printed in bold.



Table 3

Difference between central bank and RW forecasts: Sweden

Quarters ahead	MAE			MSE		
	Mean	SE	MDM	Mean	SE	MDM
1	-0.378	0.124	-2.92**	-0.696	0.510	-1.31
2	-0.529	0.148	-3.15**	-0.961	0.687	-1.24
3	-0.559	0.192	-2.31*	-1.183	0.828	-1.13
4	-0.449	0.248	-1.23	-1.163	1.016	-0.78
5	-0.281	0.300	-0.51	-0.699	1.320	-0.29
6	-0.380	0.364	-0.47	-0.442	1.580	-0.13
7	-0.307	0.376	-0.22	0.150	1.788	0.02
8	-0.031	0.374	0.00	0.956	1.906	0.00

Note: *Significant at 5 percent level; **significant at 1 percent level. Significant coefficients are printed in bold.



Step 1: testing CB forecasting ability

➤ Conclusion:

- In most cases CB forecasts are better than RW forecasts
- For NZ, the differences are typically very small and insignificant
- For NW and SW, differences are larger (30-50 bp), but significantly so only at short horizons and for MAE (not for MSE)

➤ Caveat:

- Extremely small sample for NW and SW
- Strong overlap with global financial crisis (starting 2007-2008) and the start of FG in NW and SW



Step 2: testing for improvements in interest rate predictability after FG

➤ Hypothesis:

- If central bank interest rate forecasts add value, private market participants should be able to improve their own interest rate forecasts after the start of FG

➤ Private forecasts are mean survey forecasts from Consensus Economics (CE) for

- 3m and 12 m ahead (end of period)
- 3m bill rates and 10yr bond rates
- again both for MAE and MSE

➤ Use double differencing regression:

$$d_t = \alpha + \beta Dum + \varepsilon_t,$$

➤ where d_t equals the difference in survey (CE) forecast performance and a naïve random walk forecast

- Negative β implies CE performance increased (relative to RW) after the start of FG



Table 4

Changes in survey (CE) forecast performance (β): New Zealand

	MAE		MSE	
	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Random walk benchmark				
Bill				
3-mo-ahead	-0.104	0.114	-0.367	0.313
12 mo-ahead	0.226	0.322	-0.493	1.09
Bond				
3-mo-ahead	0	0.056	-0.079	0.077
12-mo-ahead	-0.071	0.141	-0.194	0.318

Note: *Significant at 5 percent level; **significant at 1 percent level.

Significant coefficients are printed in bold.



Table 5
Changes in survey (CE) forecast performance (β): Norway

	MAE		MSE	
	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Random walk benchmark				
Bill				
3-mo-ahead	-0.161	0.096	-0.39	0.371
12-mo-ahead	-0.600**	0.210	-2.479*	0.974
Bond				
3-mo-ahead	0	0.051	0.02	0.053
12-mo-ahead	0.01	0.129	-0.059	0.21

Note: *Significant at 5 percent level; **significant at 1 percent level.

Significant coefficients are printed in bold.



Table 6
Changes in survey (CE) forecast performance (β): Sweden

	MAE		MSE	
	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Random walk benchmark				
Bill				
3-mo-ahead	-0.107	0.095	-0.384	0.362
12-mo-ahead	-0.837**	0.168	-2.684**	0.846
Bond				
3-mo-ahead	0.08	0.061	0.157	0.107
12-mo-ahead	0.236	0.129	0.285	0.260

Note: **Significant at 1 percent level. Significant coefficients are printed in bold.



Step 2: testing for improvements in interest rate predictability after FG

➤ **Conclusions**

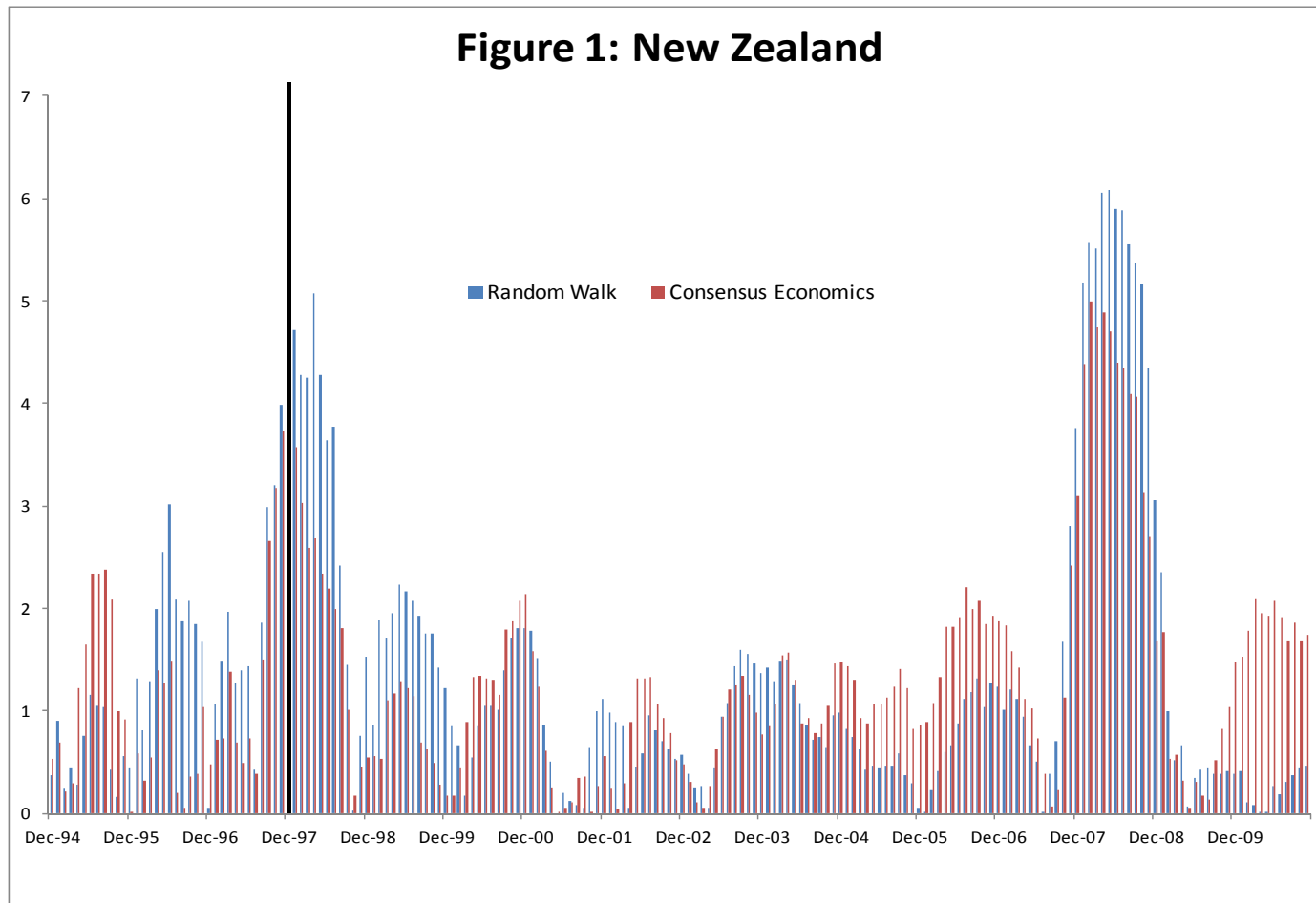
- evidence is weak and varies by country and loss measure (MAE, MSE)
- Strongest (least weak) evidence of effect is for 3-month rate at 12-month horizon for NW and SW (60-80 bp)
- No significant evidence at all for bond rates
- No significant evidence at all NZ (with by far the longest FG period)

➤ **Alternative benchmark**

- CE survey performance in non-FG country with qualitatively the same evidence (instead of RW)
 - NZ vs Australia
 - NW vs Canada
 - SW vs UK
- Qualitatively similar results but more idiosyncratic sensitivity to events in these other countries

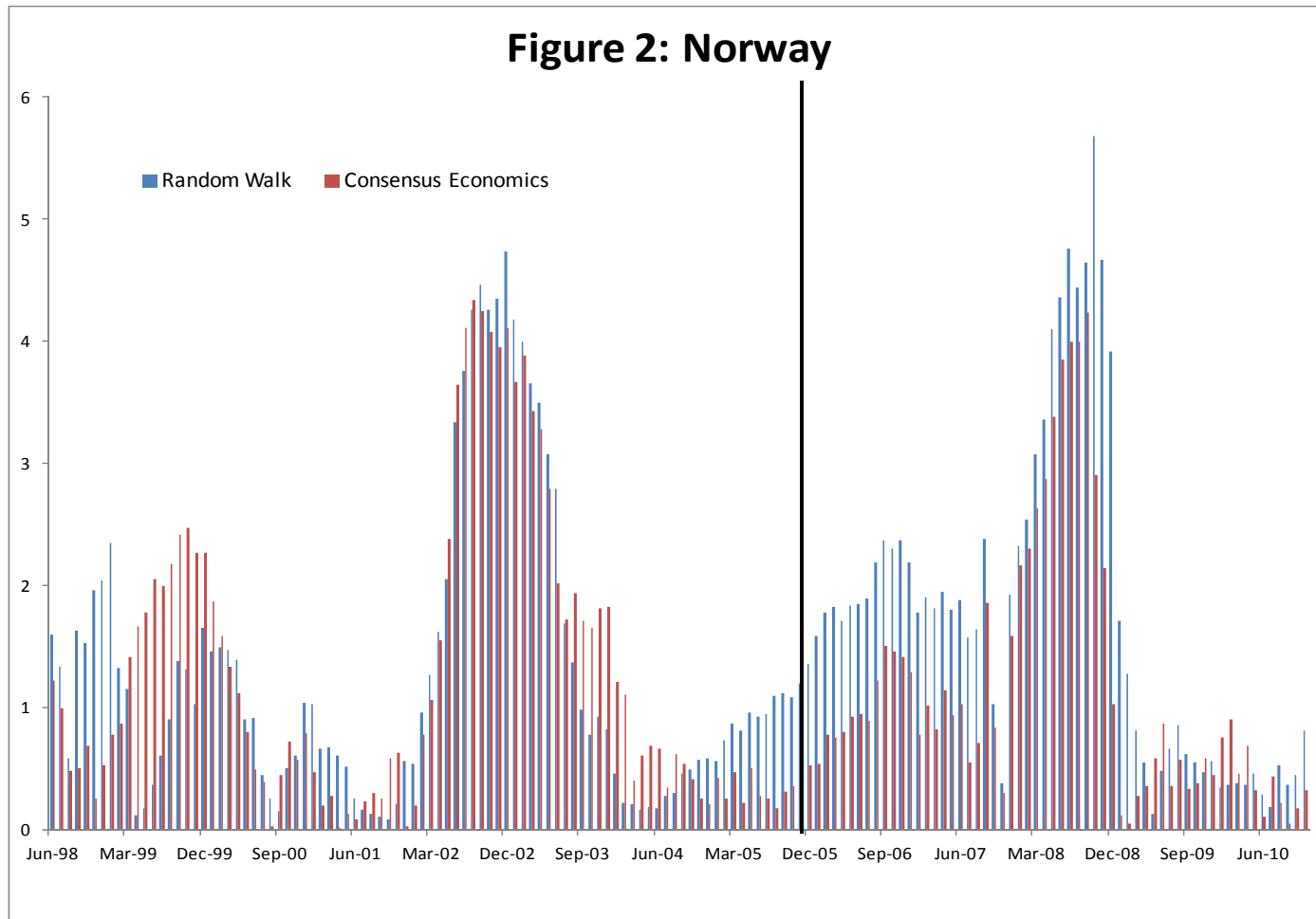


12m Ahead Absolute Forecast Errors of the 3m Bill Rate





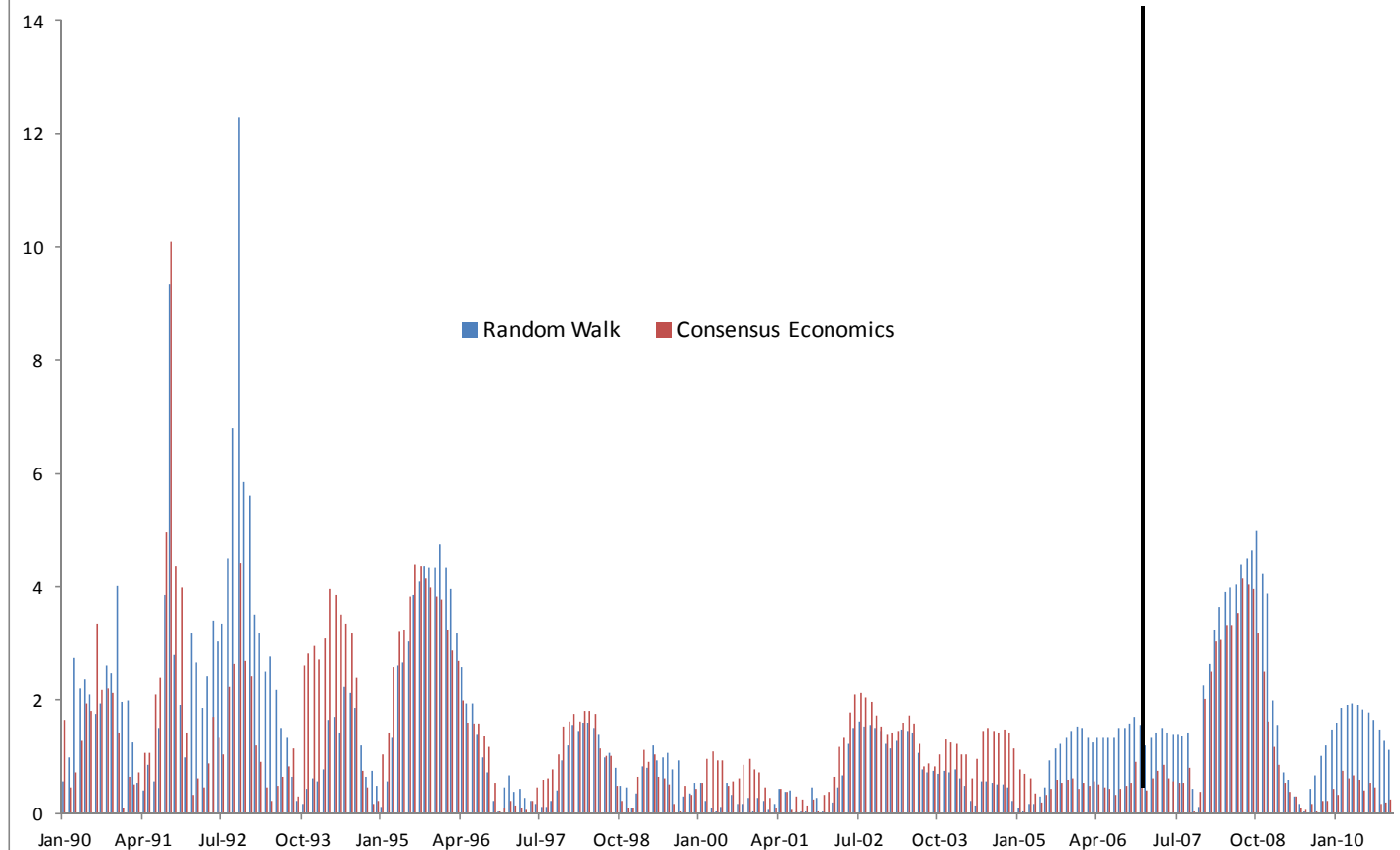
12m Ahead Absolute Forecast Errors of the 3m Bill Rate





12m Ahead Absolute Forecast Errors of the 3m Bill Rate

Figure 3: Sweden





Graphical Evidence

- NZ experience show that outperformance has strong persistence (cycles)
 - Implies caution in drawing conclusions from short samples

- NW and SW already show CE forecasts start to outperform RW before the start of FG
 - For Norway, the improvement roughly corresponds to the CBs change of communication strategy, focusing on interest rate conditions
 - For Sweden, we have no explanation as yet



Table 8
Changes in survey (CE) forecast performance: United States

	MAE				MSE			
	$\hat{\beta}_1$	SE	$\hat{\beta}_2$	SE	$\hat{\beta}_1$	SE	$\hat{\beta}_2$	SE
Random walk benchmark								
Bill								
3-mo	-0.297**	0.086	0.081**	0.027	-0.221**	0.076	0.070*	0.034
12-mo	-1.268**	0.134	0.426**	0.124	-3.014**	0.470	0.224	0.270
Bond								
3-mo	0.019	0.074	0.032	0.059	0.015	0.055	0.090	0.098
12-mo	0.131	0.187	0.422	0.226	0.095	0.243	0.759*	0.372

Note: *Significant at 5 percent level; **significant at 1 percent level; Significant coefficients are printed in bold.



Step 2: testing for improvements in interest rate predictability in the US

➤ **Conclusions**

- significant improvement for 3m bill rate at both 3m and 12m horizon (120bp) in first period (2003-05)
- significant deterioration for 3m bill rate at both 3m and 12m horizon (40bp) in second period (2008-11)
- No significant evidence at all for bond rates

➤ **Alternative benchmark**

- Blue Chip surveys (for quarterly average of daily rates) lead to virtually identical results as CE



In Summary

We find no compelling evidence that FG actually improves markets' ability to better forecast future rates. The weak support we do find is at the short end of the yield curve, at relatively short horizons, and only for Sweden and Norway (where caution is necessary as the time series under the FG regime are relatively short and roughly coinciding with the global financial crisis period). There is no evidence that FG improves the efficacy of monetary policy for NZ, the country that has been practicing FG since 1997.