Forward guidance through interest rate projections: does it work?

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Views expressed here represent those of the authors and not necessarily those of Norges Bank

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Results

- Factor analysis
- Published paths

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Motivation and questions

Forward guidance: guiding expectations

- We define forward guidance as all communication from the CB (direct or indirect) on the likely future path of policy rates, with the aim to influence market expectations of future interest rates
- In this paper we focus on forward guidance in the form of publishing an explicit path of future policy rates
- Distinction between guidance intended and guidance perceived
- Unanticipated part of forward guidance, i.e. forward guidance shocks

Should a CB publish an explicit interest rate path?

- Accountability and transparency regarding reaction pattern (Svensson 2015).
- Potentially efficient way of guiding expectations in intended direction (Bernanke 2013).
- More credible commitment strategy (Woodford 2005; Svensson 2006, 2008).

Should a CB publish an explicit interest rate path?

No, because:

- Interpretation as unconditional commitment instead of conditional forecast (Mishkin 2004, Goodhart 2005);
- Agents may put too much weight on (public) CB information as compared to (private) own information (Morris and Shin 2002, 2005);
- Contribution over other macro forecasts is marginal (Brzoza-Brzezina and Kot 2008);
- CBs might get TOO committed to the path (Gersbach and Hahn 2008).
- The expectations channel might not be so efficient (Nakamura et al 2014, Gabaix 2016)

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Main question

- To what extent can forward guidance surprises on announcement days be traced back to the published interest rate projections?
 - Leverage on expected market rates?
 - Can CB realistically manage expectations?

What we do

- Follow approach of Gürkaynak, Sack and Swanson (GSS, 2005), using high frequency variation in market rates around interest rate announcements, to identify target and 'market path' factor, which can be interpreted as a (conventional) monetary policy shock and forward guidance shock, respectively
- Use these factors to explain changes in various market rates
- Use metrics based on the discrepancy between CB interest rate path and ex ante market expectations as proxies for the unanticipated part of (intended) forward guidance and estimate effects on market rates
- Estimate the correspondence between perceived and intended forward guidance.
- Calculate correlation between CB and ex ante market revisions.

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Related literature

- Literature on event studies identifying policy surprises, Kuttner (2001), Ellingsen and Soderstrom (2003) and Gürkaynak et. al (2005)
- Limited number of papers on the merits of publishing interest rate paths
 - Improved forecasting ability (e.g Kool and Thornton 2014 and Natvik et al., 2017)?
 - Predictability: Ferrero and Secchi (2007), Holmsen et al (2008) and Andersson and Hofmann (2009)
 - Leverage (credibility): Ferrero and Secchi (2007), Moessner and Nelson (2008), Andersson and Hofmann (2009), Svensson (2015)

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Methodology and Data

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GSS 2005 methodology

Interested in disentangling the relative contribution of current rate and forward guidance surprises (perceived). The method proposed by Gürkaynak, Sack and Swanson (GSS, 2005) allows us to do that.

• Matrix of changes in interest rate instruments X can be described by factor model:

$$X = F\Lambda + \varepsilon$$

- F are factors explaining the systematic part in X (if k = 2, change in policy rate and change in forward guidance)
- Λ represent loadings
- Rotate them (multiply by rotation matrix *U*) to give a structural interpretation

$$Z = FU$$

- Identifying assumption: key policy rate rate surprises should be correlated with with the target factor, but uncorrelated with path factor
- After rotation: 1st factor interpreted as MP shock, 2nd factor as FG shock

Forward guidance through interest rate projections

We use two measures (proxies) of unanticipated forward guidance (*intended*):

•
$$R_{m,t+n}^{gap} = R_{m,t+n}^{CB} - R_{m,t+n}^{MKT}$$

•
$$path_{m,t+n}^{SURP} = R_{m,t+n}^{CB} - R_{m-1,t+n}^{CB} - \left(R_{m^+,t+n}^{MKT} - R_{(m-1)^-,t+n}^{MKT} \right)$$

• furthermore, we control for the target factor, i.e. surprises to the current rate.

Data for Norway and Sweden, sample period: 2001Q1 to 2016Q4

- I-month implied rate
- FRA's 1, 2, 3, 4 quarters ahead (3m ir)
- swap rates for longer maturities
- Quarterly 3-month money market rate forecasts from CB, and implied market rates based on swap curve

Factors - Norway



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Factors - Sweden



(a) Sweden - Target Factor

(b) Sweden - Path Factor

Results

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Perceived forward guidance - Norway

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \varepsilon_t$$

Norway

	Const	TarFact	adj. R2	Const	TarFact	PathFact	adj. R2
FRA 1	-0.0078	0.4538***	0.47	-0.0078***	0.4538***	0.2269***	0.90
	[0.0065]	[0.0710]		[0.0026]	[0.0473]	[0.0217]	
FRA 2	-0.009	0.4715***	0.39	-0.0090***	0.4715***	0.2929***	0.96
	[0.0082]	[0.0886]		[0.0022]	[0.0262]	[0.0141]	
FRA 3	-0.0117	0.3867***	0.27	-0.0117***	0.3867***	0.3254***	0.98
	[0.0089]	[0.0830]		[0.0016]	[0.0188]	[0.0095]	
FRA 4	-0.0153	0.3271***	0.20	-0.0153***	0.3271***	0.3271***	0.95
	[0.0093]	[0.0766]		[0.0022]	[0.0236]	[0.0170]	

Table: Factor Diagnostics - Norway

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Perceived forward guidance - Sweden

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \varepsilon_t$$

Sweden

	Const	TarFact	adj. R2	Const	TarFact	PathFact	adj. R2
FRA 1	-0.0198**	0.8136***	0.59	-0.0198***	0.8136***	0.1665***	0.75
	[0.0077]	[0.2006]		[0.0052]	[0.1643]	[0.0237]	
FRA 2	-0.0119	0.5528***	0.34	-0.0119***	0.5528***	0.2901***	0.97
	[0.0082]	[0.1165]		[0.0013]	[0.0283]	[0.0139]	
FRA 3	-0.0134	0.3850***	0.16	-0.0134***	0.3850***	0.3230***	0.97
	[0.0085]	[0.0955]		[0.0014]	[0.0461]	[0.0061]	
FRA 4	-0.0127	0.3184***	0.12	-0.0127***	0.3184***	0.3184***	0.95
	[0.0079]	[0.0951]		[0.0018]	[0.0423]	[0.0113]	

Table: Factor Diagnostics - Sweden

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Perceived forward guidance - Norway

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \varepsilon_t$$

Norway

	Const	TarFact	adj. R2	Const	TarFact	PathFact	adj. R2
2y Swap	-0.0136*	0.2498***	0.16	-0.0136***	0.2498***	0.2936***	0.95
	[0.0074]	[0.0555]		[0.0020]	[0.0180]	[0.0087]	
5y Swap	-0.0121**	0.1732***	0.13	-0.0121***	0.1732***	0.2206***	0.88
	[0.0056]	[0.0463]		[0.0020]	[0.0148]	[0.0102]	
10y Swap	-0.0116**	0.1278***	0.10	-0.0116***	0.1278***	0.1573***	0.66
	[0.0046]	[0.0431]		[0.0028]	[0.0218]	[0.0117]	
5y5y Swap	-0.0112**	0.0823*	0.04	-0.0112***	0.0823**	0.0936***	0.24
	[0.0046]	[0.0491]		[0.0042]	[0.0400]	[0.0187]	

Table: Monetary policy surprises and forward guidance - Norway

Perceived forward guidance - Sweden

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \varepsilon_t$$

Sweden

	Const	TarFact	adj. R2	Const	TarFact	PathFact	adj. R2
2y Swap	-0.0147**	0.4403***	0.30	-0.0147***	0.4403***	0.2358***	0.88
	[0.0071]	[0.1023]		[0.0026]	[0.0324]	[0.0306]	
5y Swap	-0.0119*	0.2245***	0.10	-0.0119**	0.2245***	0.1762***	0.57
	[0.0069]	[0.0690]		[0.0047]	[0.0371]	[0.0268]	
10y Swap	-0.0054	0.1204**	0.03	-0.0054	0.1204***	0.1372***	0.38
	[0.0064]	[0.0501]		[0.0047]	[0.0422]	[0.0228]	
5y5y Swap	0,0012	0.0154	-0.01	0.0012	0.0154	0.0978***	0.15
	[0.0065]	[0.0505]		[0.0056]	[0.0584]	[0.0218]	

Table: Monetary policy surprises and forward guidance - Sweden

Correspondence of ex ante rate revisions

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Norway	0.72	0.86	0.88	0.89	0.88	0.86	0.83	0.80
Sweden	0.82	0.81	0.73	0.67	0.60	0.56	0.54	0.52

Table: Correlation table of market and CB rate revisions

• corr
$$\left(R_{m,t+n}^{CB} - R_{m-1,t+n}^{CB}, R_{m^+,t+n}^{MKT} - R_{(m-1)^-,t+n}^{MKT} \right)$$

Effect of intended forward guidance - Norway

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 R_{m,t+n}^{gap} + \beta_3 path_{m,t+n}^{SURP} + \varepsilon_t$$

	Const	TarFact	RevDiff	Gap	adj. R2
FRA 1	-0.0077	0.5646***	0.1550**	-0.0108	0.77
	[0.0121]	[0.0891]	[0.0635]	[0.0952]	
FRA 2	-0.0075	0.4450***	0.0722*	0.0999*	0.62
	[0.0107]	[0.1172]	[0.0398]	[0.0553]	
FRA 3	-0.0058	0.2924**	0.1003***	0.1214**	0.55
	[0.0115]	[0.1207]	[0.0323]	[0.0556]	
FRA 4	-0.0073	0.1795	0.1244***	0.1348***	0.61
	[0.0098]	[0.1079]	[0.0356]	[0.0406]	

Table: Forward guidance and market rates - Norway

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Effect of intended forward guidance - Sweden

•
$$\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 R_{m,t+n}^{gap} + \beta_3 path_{m,t+n}^{SURP} + \varepsilon_t$$

	Const	TarFact	RevDiff	Gap	adj. R2
FRA 1	-0.0265***	0.7689***	0.1601**	-0.0314	0.82
	[0.0069]	[0.0823]	[0.0705]	[0.0279]	
FRA 2	-0.0243**	0.7624***	0.1260**	0.0288	0.7
	[0.0107]	[0.1272]	[0.0601]	[0.0537]	
FRA 3	-0.0263**	0.6741***	0.1002**	0.0452	0.64
	[0.0105]	[0.1423]	[0.0425]	[0.0376]	
FRA 4	-0.0218**	0.5401***	0.0882**	0.045	0.54
	[0.0106]	[0.1604]	[0.0391]	[0.0320]	

Table: Forward guidance and market rates - Sweden

Effect of intended forward guidance - Norway

• $\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 R_{m,t+n}^{gap} + \beta_3 path_{m,t+n}^{SURP} + \varepsilon_t$

	Const	TarFact	RevDiff	Gap	adj.R2
2y Swap	-0.0077	0.3499*	0.0677	0.0797**	0.5
	[0.0082]	[0.1731]	[0.0447]	[0.0358]	
5y Swap	-0.0121**	0.2157**	0.0538*	0.0499**	0.48
	[0.0052]	[0.0989]	[0.0305]	[0.0224]	
10y Swap	-0.0113**	0.1525*	0.0344	0.0206	0.32
	[0.0046]	[0.0805]	[0.0232]	[0.0182]	
5y Swap 5y ahead	-0.0103**	0.0887	0.0149	-0.009	0.03
	[0.0047]	[0.0709]	[0.0223]	[0.0186]	

Table: Forward guidance and yields - Norway

Effect of intended forward guidance - Sweden

• $\Delta y_{i,t} = \alpha + \beta_1 Z_{1,t} + \beta_2 R_{m,t+n}^{gap} + \beta_3 path_{m,t+n}^{SURP} + \varepsilon_t$

	Const	TarFact	RevDiff	Gap	adj.R2
2y Swap	-0.0145*	0.4974***	0.0505	0.0283*	0.41
	[0.0080]	[0.1111]	[0.0381]	[0.0154]	
5y Swap	-0.0105*	0.3045***	0.0302	0.0212*	0.31
	[0.0059]	[0.0687]	[0.0237]	[0.0113]	
10y Swap	-0.0049	0.1593***	0.0065	0.0225**	0.23
	[0.0041]	[0.0475]	[0.0107]	[0.0089]	
5y Swap 5y ahead	0.0007	0.0127	-0.0175	0.0239**	0.03
	[0.0039]	[0.0445]	[0.0155]	[0.0109]	

Table: Forward guidance and yields - Sweden

Market and CB paths

$$Z_{2,t} = \alpha + \beta_2 R_{m,a}^{gap} + \beta_3 path_{m,a}^{SURP} + \varepsilon_t$$

	Const	RevDiff	Gap	adj.R2
Norway	0.0134	0.3028***	0.4401**	0.47
	[0.0286]	[0.1072]	[0.1131]	
Sweden	-0.0148	0.2276**	0.1776**	0.19
	[0.0267]	[0.1129]	[0.0709]	

Table: Perceived versus intended forward guidance

Conclusion

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Conclusion

We identify two factors that measure monetary policy surprises and forward guidance surprises. We find that:

- The relative importance of the monetary policy surprises are limited to the very short end of the yield curve
- In line with GSS, we find that most of the variation in market rates is driven by the forward guidance shock

Conclusion

To find out to what extent the market path factor corresponds to actual policy intentions, we use data on the published interest rate path of Norges Bank and Sveriges Riksbank:

- We find that these rate projections generally move market expectations in the direction of the published path.
- Measures based on the difference between the market's (ex ante) and central bank's path explain 47% of variation in market rate path surprises in Norway and 19% in Sweden.
- Correlations between central bank and ex ante market revisions of interest rate expectations suggesting that market participants understand the reaction pattern of the central bank to some extent. This is more visible for Norway than for Sweden.

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