The Information Content of Central Bank Interest Rate Projections: Evidence from New Zealand

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The Reserve Bank of New Zealand was the first central bank to publish interest rate projections as a tool for forward guidance of monetary policy. This paper provides new evidence on the information content of interest rate projections for market expectations about future short-term rates before and during the financial crisis. While the information content of interest rate projections decreases with the forecast horizon in both periods, we find that their impact on market expectations has declined significantly since the outbreak of the crisis.

Keywords: Central bank interest rate projections, central bank communication, expectations management of central banks.

JEL classification: E52, E58

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1 Introduction

Central banks take different views on how to manage expectations about future monetary policy. In particular, it is not clear to what extent central banks should reveal information about the policy-intended future interest rate path. In June 1997, the Reserve Bank of New Zealand (RBNZ) was the first central bank to publish interest rate projections within their quarterly Monetary Policy Statements (MPS). Each MPS is a comprehensive analysis of the state of the economy and contains projections for several key economic time series. Yet for the RBNZ's management of expectations about future monetary policy decisions, the publication of the future interest rate track for the 90-day interest rate is of particular importance. This paper provides new evidence on the information content of the RBNZ's interest rate projections for market expectations about future short-term rates before and during the financial crisis.

There is a lively debate on the pros and cons of providing explicit projections of future policy rates. Many central banks remain sceptical against the announcement of an interest rate projection because the public might not appreciate its uncertainty and conditionality, see Archer (2005). Morris and Shin (2002) argue that there is a risk that markets may focus too intently on the public projections and pay too little attention to other private sources of information. As a result, incorrect public forecasts would generate a joint error that will distort the assessment of market participants. Svensson (2006) showed that the public signal must be extremely inaccurate in order to decrease welfare. In the same vein, Rudebusch and Williams (2008) find that providing interest rate projections helps shaping market expectations if the public's understanding of monetary policy implementation is imperfect.

The evidence on the empirical performance of central bank interest rate projections is mixed. Winkelmann (2010) finds that the announcement of the Norges Bank key rate projections has significantly reduced market participants' revisions of the expected future policy path. In contrast, Andersson and Hofmann (2010) show that the publication of interest rate projections is not an important issue for central banks with already a high degree of transparency. For those central banks, announcing the forward interest rate tracks may neither improve the predictability of monetary policy nor the anchoring of long-term inflation expectations. Goodhart and Wen (2011) find that the RBNZ's interest rate projections are even inefficient and useless for horizons of more than two quarters.

The current paper builds on Moessner and Nelson (2008) and Ferrero and Secchi (2009) who investigate the impact of the RBNZ's interest rate projections on market's expectations derived from futures rates for the pre-crisis period. Moessner and Nelson (2008) estimate a statistically significant impact of projections on futures rates at their announcement day. The response of futures rates can only be seen as an indication of an efficient expectations management of the central bank if it is not reversed over the following days. In this case, the effect of newly announced interest rate projections on market expectations would have been only elusive and volatility-increasing. Ferrero and Secchi (2009) show that the impact of the projections is in fact persistent but they only consider forecast horizons up to four quarters ahead.

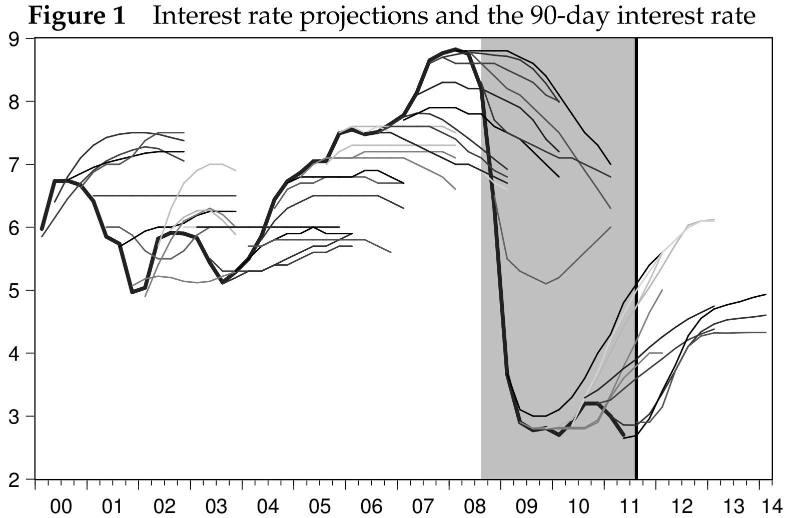
The purpose of this paper is twofold. First, advancing on Ferrero and Secchi (2009), we explore the market response to the RBNZ's longer-term interest rate projections up to six quarters ahead. We find that a persistent impact of projections on futures rates can only be found for forecasting horizons up to two quarters ahead. In contrast, projections for horizons of more than two quarters are apparently seen as less reliable and may only increase interest rate volatility. Second, we investigate whether the information content of interest rate projections has changed during the recent crisis. Our results indicate that the impact of projections on market expectations has significantly decreased since the outbreak of the crisis. Specifically we find a significant breakpoint in the information content of interest rate projections surrounding the Lehman failure while the relationship between interest rate projections and market expectations has been quite stable in the period up to the year 2008.

The remainder of the paper is structured as follows. Section 2 describes the interest rate projections of the RBNZ, while Section 3 derives their unanticipated and anticipated components using futures rates. Section 4 analyzes the response of futures rates to a newly announced interest rate projection before and during the crisis period. Finally, Section 5 provides some concluding remarks.

2 The Interest Rate Projections of the RBNZ

At the RBNZ, the quarterly MPS are the most important tool for communicating both, current and future monetary policy decisions. Each MPS contains projections for several key economic time series. While the public gives considerable attention to the RBNZ's projections for inflation, the exchange rate and output growth, the RBNZ's publication of the future interest rate track for the 90-day interest rate should be crucial for the management of expectations about future interest rate decisions.[1]

Figure 1 Interest rate projections and the 90-day interest rate



Notes: Quarterly projections for the 90-day bank bill rate around its actual monthly level (continuous bold line). The light shaded area refers to the period as of September 2008. The vertical line represents the end of the sample. Data are taken from the Monetary Policy Statements of the RBNZ from March 2000 through September 2011.

[1]Following e.g. Karagedikli and Siklos (2008), speeches and press releases became less important over the recent years. Guender and Rimer (2008) discuss the monetary policy implementation in New Zealand and analyze the effects of the RBNZ's liquidity management on the 90-day bank bill rate.

We collected the interest rate projections published in the 47 MPS from March 15, 2000 until September 15, 2011.[2] Our sample therefore allows to investigate whether the impact of the RBNZ's interest rate projections on market expectations has changed during the crisis. The information about the projected future interest rate path of the 90-day bank bill rate is taken as published in the MPS at 9:00 am on a publication day. In general, the quarterly projections refer to horizons of eight to twelve quarters.[3] Due to the availability of futures data, the empirical analysis shall focus on the impact of interest rate projections up to an horizon of six quarters ahead.

Figure 1 shows the interest rate projections made by the RBNZ for the entire sample period and gives a first impression on its relationship to the actual development of the 90-day interest rate. Apparently, projecting the future interest rate track is not an easy task, particularly during the financial crisis. As a consequence, the projections substantially change from one MPS publication to the next. According to the RBNZ, a significant portion of these changes is associated with changes in its view of the current situation of the economy. In particular, the projections depend on the RBNZ's inflation target and the forecasts of inflation. Note that the shape of most projection paths suggests a mean-reverting behavior of the interest rate in the sense that future interest rates are projected to decrease eventually in times of expected interest rate increases and *vice versa*. This might reflect the central bank's desire to move back to a neutral stance.

[2]Although the RBNZ already started publishing forward interest rate tracks in 1997, the early years up to the introduction of the official cash rate in March 1999 are characterized by the RBNZ's 'open mouth operations', see Guthrie and Wright (2000). Due to the availability of some control variables the estimation period starts in 2000.

[3]In the period from March 2000 until August 2001, projections were only made for the first and second semesters over the projection horizon. A linear interpolation has been applied in order to get data that corresponds to the quarters. In 2002, the projections were only made up to an horizon of five to eight quarters ahead.

3 The Impact of Interest Rate Projections on Market Expectations: The Empirical Setup

3.1 Market Expectations about Future 90-day Interest Rates

Following e.g. Hamilton (2009), the effect of a newly announced interest rate projection on market expectations should be reflected in the response of the corresponding futures rates. In particular, we consider the futures rate for the 90-day bank bill rate as a market-based proxy for prevailing market expectations about future 90-day interest rates.[4] Specifically, let $f^j(t)$ be the futures rate at the end of day t corresponding to the contract which expires j quarters ahead. The immediate impact of interest rate projections on the expected 90-day rate j quarters ahead should be reflected in $\Delta f^j(t) = f^j(t) - f^j(t-1)$, i.e. the daily change of futures rates observed at the announcement day. [5]

The release of projections can only be viewed as stabilizing if their impact on market expectations persists over time. In contrast, if the response of futures rates is reversed over the following days, then the effect of the monetary policy announcement is only short-lived and volatility increasing. In order to analyze the persistence of the projections' effect on market expectations, we also consider their impact on the futures rates up to n business days ahead, i.e. $f^j(t+n) - f^j(t-1)$.

3.2 Expected and Unexpected Changes of Interest Rate Projections

Market expectations about future interest rates should mainly react to the unanticipated part of a monetary policy announcement. For evaluating the response of market

[4] 90 Day Bank Bill Futures are traded at the Sydney Futures Exchange since December 1986. Futures rates are calculated by 100 minus the contract price as given by Bloomberg L.P. These typically contain risk premia and thus may not perfectly reflect the expected future 90-day interest rate, compare Ferrero and Secchi (2009). In this paper, we follow Moessner and Nelson (2008) who argue that term premia are sufficiently small at horizons up to six quarters.

[5] While daily data may suffer from endogenous responses of asset prices to other news and developments during the day, it is less affected by market overreactions and non-synchronies than intraday data. Since we are particularly interested in the persistent part of the market's response, our analysis will employ daily data.

interest rates, it is therefore crucial to identify the anticipated and unanticipated parts of a newly released interest rate projection. To that aim, let $p^j(t) - p^{j+1}(t-1)$ denote the actual change in the interest rate projection for the 90-day interest rate j quarters ahead observed at an announcement day. Note that the projection available at $t-1$ has already been released one quarter before. Therefore, the relevant projection in $t-1$ refers to $j+1$ quarters ahead. In line with the literature, we assume that the expected value $E_{t-1}p^j(t)$ of the upcoming projection is reflected in the corresponding futures rates.

The futures contracts expire not exactly at the end of a quarter but about two weeks before, i.e. on the first Wednesday after the 9th day of the months March, June, September, and December. As a result, $E_{t-1}p^j(t)$ may depend on both, the futures rates expiring in j and $j-1$ quarters ahead. In the following, we account for the (bi-weekly) overlap of futures contracts and the quarterly (i.e. 12-weekly) projections by defining $E_{t-1}p^j(t) = \frac{10}{12} \cdot f^{j-1}(t-1) + \frac{2}{12} \cdot f^j(t-1)$, but our main results are not affected by this particular weighting scheme. After these preliminaries, the actual change in the interest rate projection can be decomposed as

$$p^j(t) - p^{j+1}(t-1) = \left[p^j(t) - E_{t-1}p^j(t)\right] + \left[E_{t-1}p^j(t) - p^{j+1}(t-1)\right] \quad (1)$$

$$= \Delta p^{j,unexp}(t) + \Delta p^{j,exp}(t) \quad (2)$$

where $\Delta p^{j,unexp}(t)$ and $\Delta p^{j,exp}(t)$ denote the unexpected and expected part of the change of the interest rate projection, respectively.

The empirical analysis on the impact of interest rate projections on market expectations about the future course of the 90-day interest rate is based on the following regressions:

$$f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j \cdot X(t+n) + \varepsilon^j(t+n) \quad (3)$$

where n denotes the number of business days after the publication of an interest rate projection and $j = 1, \ldots 6$ is the horizon of the futures rate in quarters. $f^j(t-1)$ and

$f^j(t+n)$ indicate the futures rates before and n days after the announced projection. Following Karagedikli and Siklos (2008), the equations are augmented by a vector of control variables $X(t+n)$, including the change of the effective exchange rate, government bond yields for Australia and the US as well as the Citigroup Economic Surprise Index for New Zealand as provided by Bloomberg L.P.

4 The Response of Futures Rates to Interest Rate Projections: Empirical Results

4.1 Results from the Pre-Crisis Period

Let us first explore how the RBNZs interest rate projections for the 90-day interest rate have affected the corresponding futures rates before the outbreak of the crisis. We assume that the financial crisis starts with the Lehman breakdown implying that the MPS publication of September 11, 2008 is the last observation in the pre-crisis sample. Table 1 summarizes the main results of the regressions for the pre-crisis period for $j = 1, \cdots, 6$. In addition to the estimates for the immediate effect ($n = 0$), long-run effects of projections are exemplarily presented for $n = 20$, but our main findings will not depend on this choice. The complete set of results of Table 1 in terms of the control variables is provided in the appendix.[6] The upper panel shows the immediate effect ($n = 0$) of the interest rate projections on market expectations. In accordance with Moessner and Nelson (2008) and Goodhart and Wen (2011), both components of the interest rate projection have a significant and plausibly signed effect on market expectations for all forecasting horizons under consideration. In line with Kuttner (2001), the coefficients of the unexpected change, β^{unexp}, tend to be larger than the coefficient of the expected change, β^{exp}. [7]

[6]While the influence of exchange rates, i.e. the trade-weighted index, is particularly striking for the immediate change of futures rates, the long-run response is also driven by foreign exchange rates.

[7]The significant influence of expected changes in the central banks projection might indicate that the 90-day Bank Bill Future is only an imperfect proxy for market expectations about changes in the RBNZs projections. Moessner and Nelson (2008) also find that expected changes of projections have a significant impact on the change of futures rates. Ferrero and Secchi (2009) use a proxy for the unexpected change in the interest rate projections that as well contains its expected component.

Table 1 The response of futures rates to interest rate projections in the pre-crisis period

$$f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j X(t+n) + \varepsilon^j(t+n)$$

		1 quarter ahead	2 quarters ahead	3 quarters ahead	4 quarters ahead	5 quarters ahead	6 quarters ahead
$n = 0$ immediate effect	β^{exp}	0.20***	0.16***	0.12***	0.08***	0.08***	0.08**
		(0.04)	(0.04)	(0.03)	(0.02)	(0.03)	(0.04)
	β^{unexp}	0.43***	0.28***	0.16**	0.11**	0.09**	0.10*
		(0.10)	(0.10)	(0.07)	(0.05)	(0.04)	(0.05)
	R^2	0.63	0.60	0.50	0.49	0.45	0.42
$n = 20$ long-run effect	β^{exp}	0.25**	0.18**	0.10	0.08	−0.07	−0.11
		(0.09)	(0.09)	(0.07)	(0.07)	(0.07)	(0.09)
	β^{unexp}	0.39*	0.23	0.14	0.06	−0.05	−0.12
		(0.19)	(0.17)	(0.14)	(0.10)	(0.08)	(0.10)
	R^2	0.62	0.69	0.69	0.68	0.72	0.71

Notes: The sample covers MPS publication days from March 15, 2000 until September 11, 2008. For the long-run effect, the MPS from June 5, 2008 is the last observation in the pre-crisis period. White standard errors in parentheses; *** (**) [*] denotes significance at the 1 % (5 %) [10 %] level. $X(t+n)$ denotes a vector of control variables (effective exchange rate, foreign long-term yields) as described in the text. The full table of results is provided in Tables 5 and A4 in the appendix.

An important new insight from Table 1 is that the long-run impact ($n = 20$) of interest rate projections depends on the forecasting horizon. In contrast to Ferrero and Secchi (2009), we only find a persistent and thus, expectations-stabilizing impact of projections on futures rates up to two quarters ahead. For futures contracts maturing more than two quarters ahead, the significant response estimated at the announcement day is reversed only a few days later. Therefore, there is no persistent impact of longer-term interest rate projections on the corresponding futures rates. In contrast to Ferrero and Secchi (2009), this result suggests that market participants perceive the RBNZs longer-term interest rate projections as less reliable.

4.2 Market Expectations and Interest Rate Projections during the Crisis

In order to analyze whether the role of interest rate projections on market expectations has changed during the financial crisis, we re-estimated Equation 3 for the whole sample period until September 15, 2011. For all forecast horizons ($j = 1, \ldots, 6$), Table 2 shows the estimates for the immediate effect ($n = 0$) and the long-run effects of projections which are exemplarily presented for $n = 20$.

The results clearly indicate that the impact of interest rate projections for market expectations has strongly decreased since the outbreak of the crisis. Compared with earlier results obtained by Moessner and Nelson (2008) and Ferrero and Secchi (2009), virtually all coefficients related to interest rate projections are smaller and less significant than their counterparts of the pre-crisis period. This suggests that the empirical relationship between interest rate projections and futures rates has changed over time. In order to investigate the timing and the significance of a structural break, we performed Quandt-Andrews endogenous breakpoint tests for $n = 0$, see Andrews (1993). Table 2 shows that the corresponding maximum F-statistics typically indicate a break in the coefficients of interest rate projections at the first MPS publication during the post-Lehman era, i.e. December 4, 2008.

The results shown in Table 2 suggest a declining role of interest rate projections for

Table 2 The response of futures rates to interest rate projections before and during the crisis

$$f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j \cdot X(t+n) + \varepsilon^j(t+n)$$

		1 quarter ahead	2 quarters ahead	3 quarters ahead	4 quarters ahead	5 quarters ahead	6 quarters ahead
$n = 0$ immediate effect	β^{exp}	0.08**	0.07**	0.05*	0.04**	0.03	0.03
		(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)
	β^{unexp}	0.23**	0.14*	0.07	0.04	0.02	0.02
		(0.11)	(0.07)	(0.05)	(0.03)	(0.03)	(0.04)
	R^2	0.42	0.37	0.36	0.38	0.41	0.39
	Quandt-Andrews	**04.12.2008**	**04.12.2008**	04.12.2008	04.12.2008	08.03.2007	08.03.2007
		(27.35)***	(13.62)**	(8.77)	(6.97)	(6.45)	(6.50)
$n = 20$ long-run effect	β^{exp}	0.11*	0.09*	0.08	0.05	−0.03	−0.07
		(0.06)	(0.05)	(0.06)	(0.07)	(0.08)	(0.11)
	β^{unexp}	0.17	0.08	0.06	0.01	−0.05	−0.10
		(0.16)	(0.12)	(0.10)	(0.08)	(0.08)	(0.10)
	R^2	0.52	0.61	0.61	0.58	0.56	0.54

Notes: The sample covers MPS publication days from March 15, 2000 until September 15, 2011. White standard errors in parentheses; *** (**) [*] denotes significance at the 1 % (5 %) [10 %] level. Quandt-Andrews indicates the policy day with the most likely breakpoint location together with the Max Wald F-statistic. A standard trimming value of 15 % allowed us to compare breakpoints between March 20, 2002 and December 10, 2009. $X(t+n)$ denotes a vector of control variables (effective exchange rate, foreign long-term yields, economic surprise variable).

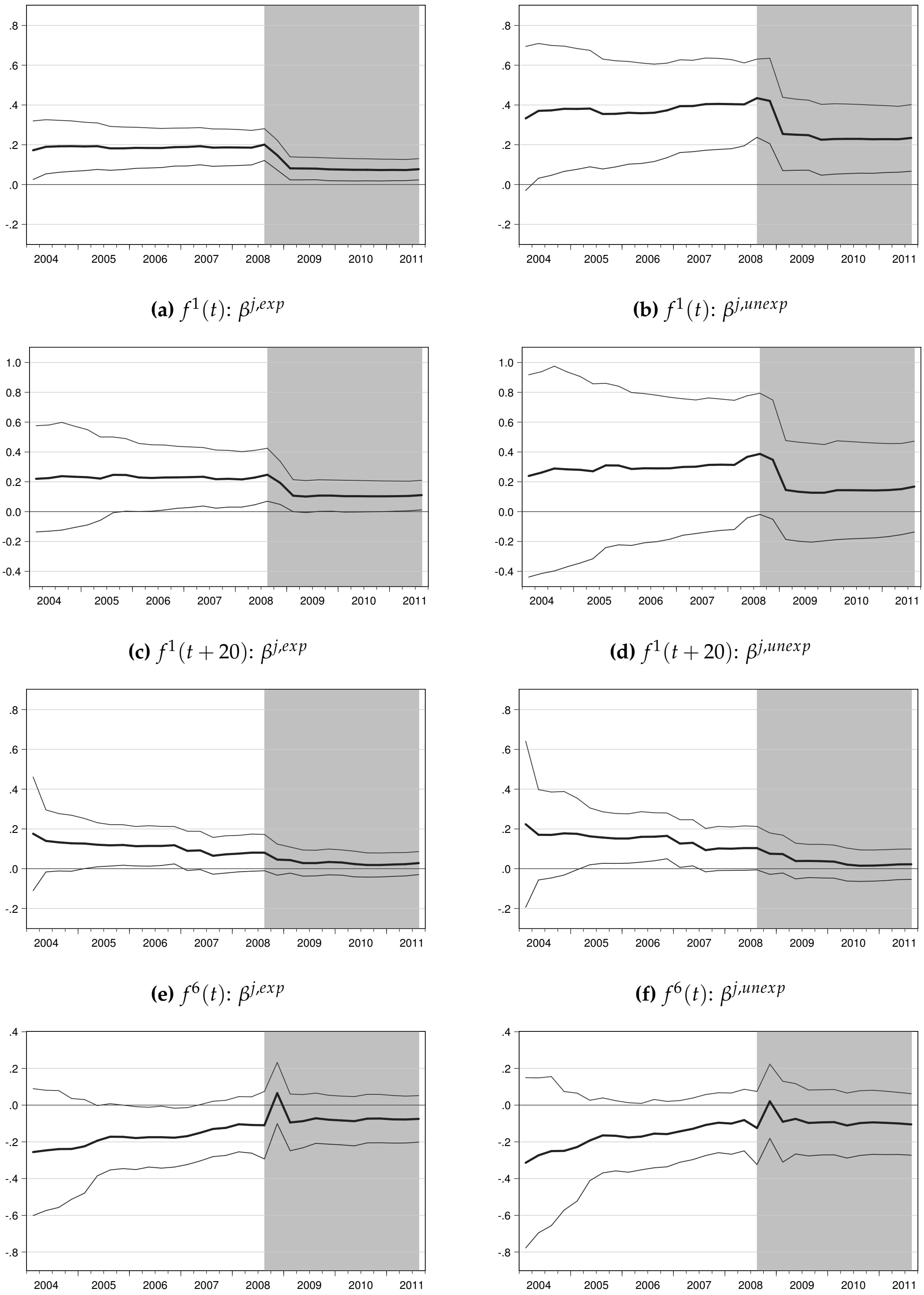
market expectations for the crisis period. In order to shed more light on the role of the financial crisis for the significance of interest rate projections, we performed recursive estimations of Equation 3. Figure 2 depicts recursive estimates of the coefficients of expected and unexpected changes in projections, i.e. $\beta^{j,exp}$ and $\beta^{j,unexp}$. We exemplarily present the results for futures rates with one and six quarter horizons. Apparently, the relationship between interest rate projections and market expectations has been rather stable before September 2008. After the Lehman breakdown, there is a rapid decline in the size and significance of all coefficients related to interest rate projections.

The coefficients remain again stable during the financial crisis. This applies for all forecast horizons and for both, short- and long-run effects of interest rate projections. In most cases, however, they are very close to zero and rarely significant. One interpretation of this decline in significance would be that interest rate projections failed to gauge market expectations when the economic outlook is extremely uncertain. In this situation, the information content of longer-term interest rate projections is not clear and market participants may thus ignore central bank projections to a large degree. However, futures-based proxies for market's expectations of the RBNZ projections become less reliable in times of financial turbulence when risk premia are high and unstable. Therefore, in particular during the crisis, the behavior of futures rates might be only loosely connected to the credibility of the RBNZ's interest rate projections.

5 Concluding Remarks

For monetary policy to be effective, it is crucial to shape the market expectations about the future path of short-term rates. To that aim, the Reserve Bank of New Zealand has adopted a quantitative forward guidance strategy including the disclosure of long-term interest rate projections. This paper provides new evidence on the information content of the RBNZ's interest rate projections for market expectations before and during the financial crisis.

Figure 2 The changing information content of interest rate projections



(a) $f^1(t)$: $\beta^{j,exp}$

(b) $f^1(t)$: $\beta^{j,unexp}$

(c) $f^1(t+20)$: $\beta^{j,exp}$

(d) $f^1(t+20)$: $\beta^{j,unexp}$

(e) $f^6(t)$: $\beta^{j,exp}$

(f) $f^6(t)$: $\beta^{j,unexp}$

(g) $f^6(t+20)$: $\beta^{j,exp}$

(h) $f^6(t+20)$: $\beta^{j,unexp}$

Notes: Recursive estimates and ± 2 standard error bands for $\beta^{j,exp}$ and $\beta^{j,unexp}$ from $f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j X(t+n) + \varepsilon^j(t+n)$ at the one and six quarter horizon. The light shaded area refers to the period as of September 2008.

For the pre-crisis period, our results confirm that the RBNZ's interest rate projections were an efficient tool for guiding market expectations - at least for short-term horizons. For longer-term horizons, however, their effect on market expectations is only short-lived and thus, volatility increasing. According to Dale et al. (2011), this may suggest that the release of longer-term projections may even be detrimental because of the private sector's limited ability to assess the quality of that information. Since the outbreak of the financial crisis, the role of interest rate projections for futures rates has decreased significantly. Recursive estimations reveal that there is a sharp decline in the size and significance of all coefficients related to interest rate projections. This result may be partly explained by unstable risk premia that impede the appropriateness of futures rates as proxy measures for market expectations in times of turbulence. Yet an element of risk remains that markets tend to ignore central bank projections that are perceived as less reliable. Following Moessner and Nelson (2008), in this situation the release of interest rate projections may even damage the central bank's credibility.

The current study showed that the information content of interest rate projections depends on the forecast horizon and on the degree of uncertainty about the economic outlook. From this perspective, the RBNZ's interest rate projections are probably not implemented in an optimal way. For example, the choice of the maximum forecast horizon could depend on the prevailing uncertainty. Therefore, the forward guidance of the central bank might be improved by using the instrument of interest rate projections in a more flexible way.

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Appendix

Table A3 The immediate response of futures rates to interest rate projections in the pre-crisis period ($n = 0$)

$$f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j X(t+n) + \varepsilon^j(t+n)$$

	1 quarter ahead	2 quarters ahead	3 quarters ahead	4 quarters ahead	5 quarters ahead	6 quarters ahead
α	−0.03	−0.01	0.00	−0.01	−0.01	−0.01
	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
β^{exp}	0.20***	0.16***	0.12***	0.08***	0.08***	0.08**
	(0.04)	(0.04)	(0.03)	(0.02)	(0.03)	(0.04)
β^{unexp}	0.43***	0.28***	0.16**	0.11**	0.09**	0.10*
	(0.10)	(0.10)	(0.07)	(0.05)	(0.04)	(0.05)
γ^{twi}	5.21*	7.67***	8.02***	8.27***	7.72***	8.29***
	(2.56)	(2.64)	(2.73)	(2.60)	(2.57)	(2.97)
γ^{AUS}	0.11	0.05	−0.02	0.12	0.09	0.19
	(0.22)	(0.28)	(0.30)	(0.31)	(0.31)	(0.32)
γ^{US}	−0.23	−0.05	0.18	0.25	0.33	0.49
	(0.23)	(0.24)	(0.25)	(0.26)	(0.30)	(0.37)
γ^{ecosur}	0.00	0.00	0.001*	0.001**	0.001**	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.001)
R^2	0.63	0.60	0.50	0.49	0.45	0.42

Notes: The sample covers MPS publication days from March 15, 2000 until September 11, 2008. For the long-run effect, the MPS from June 5, 2008 is the last observation in the pre-crisis period. White standard errors in parentheses; *** (**) [*] denotes significance at the 1 % (5 %) [10 %] level. $X(t+n)$ denotes a vector of control variables (effective exchange rate, foreign long-term yields) as described in the text.

Table A4 The long-run response of futures rates to interest rate projections in the pre-crisis period ($n = 20$)

$$f^j(t+n) - f^j(t-1) = \alpha^j + \beta^{j,exp} \cdot \Delta p^{j,exp}(t) + \beta^{j,unexp} \cdot \Delta p^{j,unexp}(t) + \gamma^j X(t+n) + \varepsilon^j(t+n)$$

	1 quarter ahead	2 quarters ahead	3 quarters ahead	4 quarters ahead	5 quarters ahead	6 quarters ahead
α	-0.05^{*}	-0.02	0.00	0.04	0.03	0.04
	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
β^{exp}	0.25^{**}	0.18^{**}	0.10	0.08	-0.07	-0.11
	(0.09)	(0.09)	(0.07)	(0.07)	(0.07)	(0.09)
β^{unexp}	0.39^{*}	0.23	0.14	0.06	-0.05	-0.12
	(0.19)	(0.17)	(0.14)	(0.10)	(0.08)	(0.10)
γ^{twi}	0.39	0.52	1.08	1.12	2.17^{*}	2.46^{*}
	(1.01)	(1.01)	(1.13)	(1.28)	(1.18)	(1.25)
γ^{AUS}	0.32^{**}	0.42^{***}	0.43^{***}	0.35^{**}	0.30^{*}	0.17
	(0.13)	(0.11)	(0.11)	(0.13)	(0.16)	(0.19)
γ^{US}	0.11	0.23	0.30^{*}	0.39^{**}	0.41^{**}	0.51^{**}
	(0.14)	(0.15)	(0.16)	(0.17)	(0.17)	(0.19)
γ^{ecosur}	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.62	0.69	0.69	0.68	0.72	0.71

Notes: The sample covers MPS publication days from March 15, 2000 until September 11, 2008. For the long-run effect, the MPS from June 5, 2008 is the last observation in the pre-crisis period. White standard errors in parentheses; *** (**) [*] denotes significance at the 1 % (5 %) [10 %] level. $X(t+n)$ denotes a vector of control variables (effective exchange rate, foreign long-term yields) as described in the text.