# Narratives in Finance

Master's Thesis

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Author
Corinne Knöpfel
Wiesen 2488, Herisau
11-613-676
corinne.knoepfel@student.unisg.ch

Supervisor
Dr. Peter Gruber
Institute of Finance
Università della Svizzera Italiana

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# Abstract

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Chapter 1

# Introduction

# Chapter 2

# Monetary Policy and Interest Rates

However little understood, the relationship between monetary policy and market interest rates is undeniable. Interest rates of all maturities react to changes in monetary policy, creating opportunities and risks for traders, challenges for policy makers, and puzzling effects for academics to study (Ellingsen & Söderström, 2001, p. 1594).

Target rate changes in particular have an impact on the bond market and on interest rates (Cook & Hahn, 1989, p. 332). Yet, the understanding of yield curve movements is incomplete at best. On average, the relationship between monetary policy and interest rates appears to be positive: An increase in the central bank's target rate leads to an increase in the interest rates of all maturities. However, there are many instances where this simple rule has proven false and interest rates of long maturities fell in response to an increase in the central bank's rate (Ellingsen & Söderström, 2001, p. 1594).

Chapter 2.1 gives an account of the puzzle posed by the inconsistent response of long-term rates, Chapter 2.2 touches on previous research and possible explanations, and Chapter 2.3 outlines how an investigation of narratives might be able to shed light on this puzzle.

## 2.1 Excess Sensitivity Puzzle

Cook and Hahn (1989) analyzed financial data from the late 70s and found that the U.S. Federal Reserve (Fed), by setting the target for the federal funds rate, had a strong influence on interest rate movements. While short-term rates reacted particularly strongly, changes in the target rate also caused small but significant movements in long-term rates.

It is not surprising that short-term rates follow the target rate closely, after all the Fed keeps the overnight rate close to the target and thus directly influences the one-month rate (Ellingsen, Söderström, & Masseng, 2003, p. 1). The movements of the long-term rates are more ambiguous. Cook and Hahn (1989, p. 343–346) interpret the fact that, on average, 10-year and 30-year bonds co-move with the short-term rates as evidence for the expectation theory of the term structure of interest rates. According to the expectation theory, long-term rates are equal to short-term rates over the same period of time plus a term premium. Thus, an increase in the short-term rates is expected to drive up long-term rates as well, but to a lesser extent (Ellingsen & Söderström, 2001, p. 1594).

To Romer and Romer (2000), on the other hand, the response of long-term rates presents a puzzle. They argue that standard theory predicts a drop in inflation as short-term rates rise, which ought to lead to a reduction in long-term rates. The opposite can be observed, however: Interest rates for all maturities typically rise following an increase in the target rate. Romer and Romer (2000) explain this anomaly with information-asymmetry between the Fed and the general public. They find evidence that the Fed is in possession of private information, which it reveals to other market participants through its monetary policy. In response, market participants adjust their inflation expectations upwards, causing long-term rates to rise.

Dissecting the interest rate response in more detail led Skinner and Zettelmeyer (1995) to paint an even complexer picture. While the yield curve shifts upwards on average, they found a number of occasions where an adjustment to the target rate caused the yield curve to tilt: Long and short rates responded by moving in opposite directions (as cited in Ellingsen et al., 2003, p. 1). Skinner and Zettelmeyer came to the conclusion that these were not singular occurrences, but that such tilts made up a considerable portion of the yield curve responses and could be observed in all four of the big economies they studied, that is in France, Germany, the United Kingdom, and the United States (as cited in Ellingsen & Söderström, 2001, p. 1594). An example is the yield curve movement in 1994, where interest rates of long maturities fell after the Fed announced an increase in its target rate (Ellingsen & Söderström, 2001, p. 1594). So not only is the positive response of long-term rates difficult to explain, the response is not even consistent in its direction: long-term rates may move up or down when the Fed increases the target rate.

Whether positive or negative, to Gürkaynak, Sack, and Swanson (2005b, p. 425) any response of long-term rates is in contradiction to standard macroeconomic models. They argue that models predict that short-term rates return quickly to their steady state and thus have only a transitory effect on the future path of interest rates. Therefore, one would expect long-term rates not to react to monetary policy changes. They refer to the fact that long-term rates move significantly in response to monetary policy decisions as *excess sensitivity* of long-term interest rates (Gürkaynak, Sack, & Swanson, 2003, p. 2).

Gürkaynak et al. (2005b, p. 426–427) focus on the response of forward interest rates as a different way of expressing the yield curve. They find that long-term forward rates move in the opposite direction as the monetary policy actions. As they note, this stands in sharp contrast to the findings of Cook and Hahn (1989) and Romer and Romer (2000), who observed a movement of long-term rates in the same direction. Gürkaynak et al. put this down to their use of forward rates, which they consider a better measure for sensitivity. Additionally, they criticize previous research for the usage of raw change in the target rate, neglecting to differentiate between expected and unexpected policy moves. In their opinion, only the unexpected components of a monetary policy action can be expected to influence the term structure (Gürkaynak et al., 2005b, p. 430–431).

Since Gürkaynak et al. observe a negative response of the long-term forward rates, they suggest that such a response is not an anomaly but has a very natural explanation. Standard macroeconomic models assume that long-run levels of inflations and real interest rates are relatively fixed and known by all market participants (Gürkaynak et al., 2005b, p. 425). Gürkaynak et al. argue that models might be misspecified and long-run inflation expectations are not as perfectly anchored as assumed. They see the most plausible explanation for the observed term structure movements in the fact that monetary policy surprises lead market participants to adjust their expectations of the long-run level of inflation (Gürkaynak et al., 2005b, p. 434–435).

Even though Gürkaynak et al. (2005b) are able to account for the negative response of long-term forward rates to an increase in the target rate, Ellingsen and Söderström (2004, p. 2) maintain that their model is unable to explain the positive response of long-term yields observed by other researchers. Thus, Gürkaynak et al. (2005b) fail to solve the puzzle as to why the yield curve shifts on one occasion but tilts at another when provoked by apparently identical monetary policy actions. Ellingsen et al. address this shortcoming in their own theoretical model (2001) and provide empirical support for their hypotheses (2003).

## 2.2 Existing Research and Explanations

Ellingsen and Söderström (2001) use a simple dynamic macroeconomic model where shocks to output and inflation exhibit some persistence and monetary policy actions have a lagged effect on output and inflation. The central bank is assumed to minimize deviations of inflation and output from their long-run averages, while market participants form rational expectations concerning the future target and short rates. On the basis of this model, Ellingsen and Söderström (2001, p. 1599–1602) make several predictions:

- *Proposition 1*: If there is symmetric information, economic shocks are observed by all market participants and affect interest rates directly. Policy actions by the central bank reveal no new information and thus will not affect the term structure of interest rates.
- *Proposition 2*: If the central bank has private information about shocks to supply or demand, market participants will infer this information from the central bank's policy actions. Thus, the yield curve of market interest rates will respond by moving in the same direction as the target rate change.
- *Proposition 3*: If the central bank has private information about changes in its own inflation preferences, market participants will infer these changes by observing the central bank's reaction to an economic shock. Consequently, they will adjust their expectations about future interest rate targets. This causes the yield curve to tilt as long rates move in the opposite direction as the target rate change.

Thus, the yield curve moves for two reasons: either the Fed reacts to new, possibly private information about the economy (what Ellingsen and Söderström call *endogenous*, outlined in proposition 2), or the Fed's policy preferences change (what Ellingsen and Söderström call *exogenous*, outlined in proposition 3). They predict that interest rates of all maturities move in the same direction after an endogenous policy action, but that short and long-rates move in opposite directions after an exogenous change (2001, p. 1594–1595).

In a second paper, Ellingsen et al. (2003) analyze empirical data to find evidence for their model. In order to determine whether a policy action is endogenous or exogenous, they analyze reports on U.S policy in the *Credit Market* column of the *Wall Street Journal*. This text basis is supposed to capture the traders' opinions to a policy move and not the central bank's intention behind it, as it is the traders' opinions that move the bond prices (Ellingsen et al., 2003, p. 2). Ellingsen et al. used the articles on the day of the Fed move, as well as on the day before and the day after. They found publications on the days following a policy action to be the most informative (2003, p. 8).

They estimate the following regression (Ellingsen et al., 2003, p. 13):

$$\Delta i_t^n = \alpha + (\beta_n^{NP} d_t^{NP} + \beta_n^{Ex} d_t^{Ex} + \beta_n^{End} d_t^{End}) \Delta i_t^{3m} + v_t^n, \tag{2.1}$$

where $\Delta i_t^n$ is the change in the interest rate of maturity $n$ on day $t$; $d_t^{NP}$, $d_t^{Ex}$, and $d_t^{End}$ are dummies for non-policy, exogenous policy, and endogenous policy days respectively; and $\Delta i_t^{3m}$ is the change in the 3-month treasury bill rate on day $t$.

The one-day change in the 3-month T-bill rate is taken as a measure of unexpected monetary policy action (regressor in eq.2.1). Ellingsen et al. (2003, p. 13) argue that the 3-month rate is sufficiently short to be determined by policy actions, but also sufficiently long to avoid noise from expectation errors. If the target rate remains unchanged, that is on non-policy days, the change in the 3-month rate measures the adjustment of expectations about future monetary policy actions provoked by the day's new information. If the target rate changes, that is on policy days, any change in the 3-month rate is interpreted as the unexpected component of the policy action (Ellingsen et al., 2003, p. 12).

The main hypothesis of Ellingsen et al.'s model is that long-term interest rates respond positively to endogenous policies and negatively to exogenous policies:

$$H_0: \text{ For large } n\text{: } \beta_n^{Ex} < 0 < \beta_n^{End} \tag{2.2}$$

Using data from October 1988 to December 2001, Ellingsen et al. (2003, p. 16) find significant positive responses of the the 6-month and 1-year rate to endogenous and exogenous policy actions. For the 10-year and the 30-year rate, on the other hand, the coefficients are significant and positive for endogenous changes, and negative for exogenous changes. Ellingsen et al. conclude that their model finds strong support in U.S. data.

Yet, the author of this thesis cannot help but note that the explained variation ($R^2$) is rather small for long rates. While the model is able to account for up to 60% of the variation in short rates, this ratio drops to 15% for 10-year rates and 10% for 30-year rates (Ellingsen et al., 2003, p. 16). Additionally, Ellingsen et al. (2003, p. 20) admit that their results might be dependent on the classification of a few pivotal events. Since the classification was done manually, it is quite subjective. This could explain why von Krosigk (2017) was not able to replicate their results using text mining techniques. Von Krosigk analyzed data for the time period of January 2002 to June 2017 and found only positive coefficients, especially for exogenous events, with the only significant effect pertaining to the 6-month rate (2017, p. 36). This stands in sharp contrast to Ellingsen et al.'s results and raises doubts concerning the robustness of their findings.

## 2.3 New Insights Through Narrative Research

It is striking that Ellingsen et al. (2003), in order to find data in support of their model, naturally chose a narrative approach. In their model, they explicitly assume that the yield curve's response depends "on market participants' interpretation of the policy move" (Ellingsen & Söderström, 2001, p. 1603). They aim at classifying policy events as they are perceived by financial investors "since it is the investors' beliefs that determine the interest rate response" Ellingsen and Söderström (2001, p. 1604). They analyze newspaper articles not to determine the central bank's intentions underlying a policy move, but rather the traders' opinions. In their view it is "irrelevant whether a target change is in fact driven by policy preferences or by economic events. At any given point in time it is traders, and not the Fed, that determine the price of long-term bonds" (Ellingsen et al., 2003, p. 2). Thus, the effect on market interest rates is not driven by policy actions, but by the opinions and views market participants form about such actions. In other words, it's not the target rate change that influences the yield curve, but the stories surrounding it.

Likewise, Cook and Hahn (1989) used newspaper articles to analyze the reaction of the yield curve to target rate movements. They focused on perceived changes in the target rate as reported by the Wall Street Journal on the day after a target rate change to determine its magnitude and direction. Interestingly, Cook and Hahn (1989, p. 337) mention that the Journal sometimes used "speculative language" which hampered their ability to isolate the bare facts of the policy action. In their quest to determine the facts of the policy move, they did their best to strip the articles of all other information, including the manner in which the facts were presented and the interpretative value of the "speculative language."

Gürkaynak, Sack, and Swanson (2005a, pp. 86–87) drive the point home by saying that "previous studies estimating the effects of changes in the federal funds rate on bond yields [...] have been missing most of the story." Their research revealed that reactions on the financial market were at least partially driven by the statements accompanying a policy action. Announcements of the FOMC, the Federal Open Market Commitee of the Fed which regulates the funds rate target, account for at least three quarters of the variation in the movement of longer term Treasury yields around a FOMC meeting.

Similarly, Goetzmann, Kim, and Shiller (2016) support the view that market participants are highly influenced by narrative statements, especially by the financial press. A survey over a 26 year period revealed that investors generally hold an exaggerated assessment of the risk of a stock market crash and that their assessments were influenced by the news stories, in particular the front page stories, they have read. According to Goetzmann et al., newspaper articles make market returns, especially negative developments, more salient and thus influence investor behavior. Other researchers, such as Engelberg and Parsons (2011), Kräussl and Mirgorodskaya (2014), and Yuan (2015), support the view that the financial press plays an important role in focusing investor attention and thus influences their behavior.

Consequently, the author of this thesis hypothesizes that it is the interpretation of a policy event, that is the narrative surrounding a target rate change as it is perceived by the market participants, that determines the response of the financial markets and thus the movement of the long-term interest rate. Even though Ellingsen et al. (2003) employ a narrative approach, it remains closely tied to a macroeconomic model and only allows for certain predetermined aspects of a potentially much bigger narrative. Thus, it stands to reason that opening the focus of the analysis to include any type of narrative that could potentially influence a market participant's action will yield more robust results. To this end, the author proposes the following model:

$$\Delta i_t^n = \alpha + (\beta_n^{NP} d_t^{NP} + \beta_n^{N_1} d_t^{N_1} + \beta_n^{N_2} d_t^{N_2})\Delta i_t^{3m} + v_t^n, \tag{2.3}$$

where $\Delta i_t^n$ is the change in the interest rate of maturity $n$ on day $t$; $d_t^{NP}$ is a dummy for non-policy days, $d_t^{N_1}$ and $d_t^{N_2}$ are dummies for policy days that were classified as being dominated by either narrative one ($N_1$) or narrative two ($N_2$); and $\Delta i_t^{3m}$ is the change in the 3-month treasury bill rate on day $t$.

Ideally, an examination of newspaper articles with regards to narratives surrounding a target rate change will allow the identification of two distinct narratives that are able to account for the inconsistent reaction of the long-term rates. Thus, the main hypothesis stipulates that narrative one leads to a negative reaction of the long-term rate while narrative two provokes a positive reaction:

$$H_0 : \text{ For large } n\text{: } \beta_n^{N1} < 0 < \beta_n^{N2} \tag{2.4}$$

Chapter 3 outlines what narratives are and why there is reason to believe that they have a strong influence on human behavior and thus warrant more attention in financial and economic research. To circumvent the problem of subjectivity faced by previous research when it comes to the identification of narratives, this thesis uses Natural Language Processing techniques rather than manual evaluation of text data. Chapter 4 gives an overview of different methods and the extent to which they are able to identify narrative structures.

Keep in mind the check Ellingsen et al use to check for just general news related movements in the yield curve, do the same if necessary

Also: if possible, generate testing sample and try hand at out of sample prediction – see how that goes!

# Chapter 3

# Narratives and Decision Making

## 3.1 What Narratives Are

### 3.1.1 McAdams Research on Narratives

### 3.1.2 Social Psychology Background

## 3.2 How Narratives can help

### 3.2.1 Bayesian Brain and Predictive Coding

Here, there could be a direct link to the algorithms that are used in Machine Learning, AI, and NLP.

### 3.2.2 Influence and Change on Human Beings

Akerlof and Shiller understand narratives as a convention, but it is more than that, it changes how people think and perceive the world. Akerlof and Snower (2016)

## 3.3 Narrative Research

Chapter 4

# Natural Language Processing

## 4.1 Methods in Natural Language Processing

### 4.1.1 Sensitivity Analysis

### 4.1.2 Topic Modeling

# Chapter 5

# Data and Methodology

## 5.1 Financial Data

## 5.2 Text Data

- Federal Funds target rates and major anouncements -¿ website of the Federal Reserve
- newspaper articles as collected by the Factiva database
- daily yield curve by Thompson Reuters Datastream.

all absolute Fed target rate changes during the sample period – ev. sind 10 Jahre nicht genug, vor allem weil es dann nur die extraordinary years sind - 20 Jahre? training and testing samples? aber dann müsste man annehmen, dass die Narrative über die Jahre gleichbleiben? oder aber man nimmt einzelne Datenpunkte aus dem sample raus? einzelne Tage (wohl zu wenige Observations) - einzelne ARtikel - sagt das was aus?

Bloomberg, Financial Times, Reuters, Wall Street Journal, Dow Jones Newswires, AFX, Market News International, the Associated Press and others as collected from the Factiva database

January, 1st 2002 until June, 27th 2017, implying 4,040 changes in the yield curve of which 33 took place during a target rate adjustment

### 5.2.1 NOTES

BEsprechung - 24.09.2018 ————————

- Frage Juan Pablo Ortega ob er Korreferent sein will - nur zwei Narrative finden, ohne Daten vorgeben (Texte nach Meeting verwenden, weil sonst ja nicht Interpretation gefunden wird), dann schauen geht die Kurve beim einten Narrativ hoch beim anderen runter - es sollten auch die non-target rate sdjustments verwendet werden, weil ansonsten j schon eine Selektion stattfindet - ABER: stimmt das wirklich, weil wenn kein adjustment, dann bewegt sich doch die Kurve nur gemäss neue Infos auf dem Markt, - also vielleicht doch besser keine adjustment heisst non-policy day?

- Example: nach nine eleven gab es tatsächlich ein paar unangemeldetet meetings und daher komische effekte weil wirklich überraschende Verschiebungen in der interest rate

- modell ist gut, unsupervised learning verwenden, nicht vorher sagen, wo geht's hoch und wo runter, und dann ev. auch out-of sample probieren, aber das wäre Paradedisplizin, keine Garantie, dass das funktoniert

# Chapter 6

# Results

# Chapter 7

# Conclusion

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Appendix A

# Data on Target Rate and FOMC Meetings

| Dates of all FOMC meetings over the last 20 years | | | | | | |
|---|---|---|---|---|---|---|
| 26.09.2018 | 18.03.2015 | 13.12.2011 | 07.02.2009 | 12.12.2006 | 12.08.2003 | 31.01.2001 |
| 01.08.2018 | 28.01.2015 | 28.11.2011 | 28.01.2009 | 25.10.2006 | 25.06.2003 | 03.01.2001 |
| 13.06.2018 | 17.12.2014 | 02.11.2011 | 16.01.2009 | 20.09.2006 | 06.05.2003 | 19.12.2000 |
| 02.05.2018 | 29.10.2014 | 21.09.2011 | 16.12.2008 | 08.08.2006 | 16.04.2003 | 15.11.2000 |
| 21.03.2018 | 17.09.2014 | 09.08.2011 | 29.10.2008 | 29.06.2006 | 08.04.2003 | 03.10.2000 |
| 31.01.2018 | 30.07.2014 | 01.08.2011 | 07.10.2008 | 10.05.2006 | 01.04.2003 | 22.08.2000 |
| 13.12.2017 | 18.06.2014 | 22.06.2011 | 29.09.2008 | 28.03.2006 | 25.03.2003 | 28.06.2000 |
| 01.11.2017 | 30.04.2014 | 27.04.2011 | 16.09.2008 | 31.01.2006 | 18.03.2003 | 16.05.2000 |
| 20.09.2017 | 19.03.2014 | 15.03.2001 | 05.08.2008 | 13.12.2005 | 29.01.2003 | 21.03.2000 |
| 26.07.2017 | 04.03.2014 | 26.01.2011 | 24.07.2008 | 01.11.2005 | 10.12.2002 | 02.02.2000 |
| 14.06.2017 | 29.01.2014 | 14.12.2010 | 25.06.2008 | 20.09.2005 | 06.11.2002 | 21.12.1999 |
| 03.05.2017 | 18.12.2013 | 03.11.2010 | 30.04.2008 | 09.08.2005 | 24.09.2002 | 16.11.1999 |
| 15.03.2017 | 30.10.2013 | 15.10.2010 | 18.03.2008 | 30.06.2005 | 13.08.2002 | 05.10.1999 |
| 01.02.2017 | 16.10.2013 | 21.09.2010 | 10.03.2008 | 03.05.2005 | 26.06.2002 | 24.08.1999 |
| 14.12.2016 | 18.09.2013 | 10.08.2010 | 30.01.2008 | 22.03.2005 | 07.05.2002 | 30.06.1999 |
| 02.11.2016 | 31.07.2013 | 23.06.2010 | 21.01.2008 | 02.02.2005 | 19.03.2002 | 18.05.1999 |
| 21.09.2017 | 19.06.2013 | 09.05.2010 | 09.01.2008 | 14.12.2004 | 30.01.2002 | 30.03.1999 |
| 27.07.2016 | 01.05.2013 | 28.04.2010 | 11.12.2007 | 10.11.2004 | 11.12.2001 | 03.02.1999 |
| 15.06.2016 | 20.03.2013 | 16.03.2010 | 06.12.2007 | 21.09.2004 | 06.11.2001 | 22.12.1998 |
| 27.04.2016 | 30.01.2013 | 27.01.2010 | 31.10.2007 | 10.08.2004 | 02.10.2001 | 17.11.1998 |
| 16.03.2016 | 12.12.2012 | 16.12.2009 | 18.09.2007 | 30.06.2004 | 17.09.2001 | 15.10.1998 |
| 27.01.2016 | 24.10.2012 | 04.11.2009 | 16.08.2007 | 04.05.2004 | 13.09.2001 | 29.09.1998 |
| 16.12.2015 | 13.09.2012 | 23.09.2009 | 10.08.2007 | 16.03.2004 | 21.08.2001 | 21.09.1998 |
| 28.10.2015 | 01.08.2012 | 12.08.2009 | 07.08.2007 | 28.01.2004 | 27.06.2001 | 18.08.1998 |
| 17.09.2015 | 20.06.2012 | 24.06.2009 | 28.06.2007 | 09.12.2003 | 15.05.2001 | 01.07.1998 |
| 29.07.2015 | 25.04.2012 | 03.06.2009 | 09.05.2007 | 28.10.2003 | 18.04.2001 | 19.05.1998 |
| 17.06.2015 | 13.03.2012 | 29.04.2009 | 21.03.2007 | 16.09.2003 | 11.04.2001 | 31.03.1998 |
| 29.04.2015 | 25.01.2012 | 18.03.2009 | 31.01.2007 | 15.09.2003 | 20.03.2001 | 04.02.1998 |

**Table A.1** – FOMC meetings

| Date | $Tgt_{low}$ | $Tgt_{up}$ | $\Delta Tgt_{low}$ | $\Delta Tgt_{up}$ | FOMC Meeting on day prior | FOMC Meeting on same day | Date | $Tgt_{low}$ | $Tgt_{up}$ | $\Delta Tgt_{low}$ | $\Delta Tgt_{up}$ | FOMC Meeting on day prior | FOMC Meeting on same day |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27.09.2018 | 2.00% | 2.25% | 25 | - | 1 | 0 | 14.12.2004 | 2.25% | - | 25 | - | 0 | 1 |
| 14.06.2018 | 1.75% | 2.00% | 25 | - | 1 | 0 | 10.11.2004 | 2.00% | - | 25 | - | 0 | 1 |
| 22.03.2018 | 1.50% | 1.75% | 25 | - | 1 | 0 | 21.09.2004 | 1.75% | - | 25 | - | 0 | 1 |
| 14.12.2017 | 1.25% | 1.50% | 25 | - | 1 | 0 | 10.08.2004 | 1.50% | - | 25 | - | 0 | 1 |
| 15.06.2017 | 1.00% | 1.25% | 25 | - | 1 | 0 | 30.06.2004 | 1.25% | - | 25 | - | 0 | 1 |
| 16.03.2017 | 0.75% | 1.00% | 25 | - | 1 | 0 | 25.06.2003 | 1.00% | - | -25 | - | 0 | 1 |
| 15.12.2016 | 0.50% | 0.75% | 25 | - | 1 | 0 | 06.11.2002 | 1.25% | - | -50 | - | 0 | 1 |
| 17.12.2015 | 0.25% | 0.50% | 25 | - | 1 | 0 | 11.12.2001 | 1.75% | - | -25 | - | 0 | 1 |
| 16.12.2008 | 0.00% | 0.25% | -75 | -100 | 0 | 1 | 06.11.2001 | 2.00% | - | -50 | - | 0 | 1 |
| 29.10.2008 | 1.00% | - | -50 | - | 0 | 1 | 02.10.2001 | 2.50% | - | -50 | - | 0 | 1 |
| 08.10.2008 | 1.50% | - | -50 | - | 1 | 0 | 17.09.2001 | 3.00% | - | -50 | - | 0 | 1 |
| 30.04.2008 | 2.00% | - | -25 | - | 0 | 1 | 21.08.2001 | 3.50% | - | -25 | - | 0 | 1 |
| 18.03.2008 | 2.25% | - | -75 | - | 0 | 1 | 27.06.2001 | 3.75% | - | -25 | - | 0 | 1 |
| 30.01.2008 | 3.00% | - | -50 | - | 0 | 1 | 15.05.2001 | 4.00% | - | -50 | - | 0 | 1 |
| 22.01.2008 | 3.50% | - | -75 | - | 1 | 0 | 18.04.2001 | 4.50% | - | -50 | - | 0 | 1 |
| 11.12.2007 | 4.25% | - | -25 | - | 0 | 1 | 20.03.2001 | 5.00% | - | -50 | - | 0 | 1 |
| 31.10.2007 | 4.50% | - | -25 | - | 0 | 1 | 31.01.2001 | 5.50% | - | -50 | - | 0 | 1 |
| 18.09.2007 | 4.75% | - | -50 | - | 0 | 1 | 03.01.2001 | 6.00% | - | -50 | - | 0 | 1 |
| 29.06.2006 | 5.25% | - | 25 | - | 0 | 1 | 16.05.2000 | 6.50% | - | 50 | - | 0 | 1 |
| 10.05.2006 | 5.00% | - | 25 | - | 0 | 1 | 21.03.2000 | 6.00% | - | 25 | - | 0 | 1 |
| 28.03.2006 | 4.75% | - | 25 | - | 0 | 1 | 02.02.2000 | 5.75% | - | 25 | - | 0 | 1 |
| 31.01.2006 | 4.50% | - | 25 | - | 0 | 1 | 16.11.1999 | 5.50% | - | 25 | - | 0 | 1 |
| 13.12.2005 | 4.25% | - | 25 | - | 0 | 1 | 24.08.1999 | 5.25% | - | 25 | - | 0 | 1 |
| 01.11.2005 | 4.00% | - | 25 | - | 0 | 1 | 30.06.1999 | 5.00% | - | 25 | - | 0 | 1 |
| 20.09.2005 | 3.75% | - | 25 | - | 0 | 1 | 17.11.1998 | 4.75% | - | -25 | - | 0 | 1 |
| 09.08.2005 | 3.50% | - | 25 | - | 0 | 1 | 15.10.1998 | 5.00% | - | -25 | - | 0 | 1 |
| 30.06.2005 | 3.25% | - | 25 | - | 0 | 1 | 29.09.1998 | 5.25% | - | -25 | - | 0 | 1 |
| 03.05.2005 | 3.00% | - | 25 | - | 0 | 1 | | | | | | | |
| 22.03.2005 | 2.75% | - | 25 | - | 0 | 1 | | | | | | | |
| 02.02.2005 | 2.50% | - | 25 | - | 0 | 1 | | | | | | | |

**Table A.2** – Target rate adjustments

# Appendix B

# Whatever may come...

## B.1 For Example...

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

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Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

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