Too little, too late – Interest rate setting and the costs of consensus

Petra Gerlach-Kristen*
University of Hong Kong
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Abstract

Central banks have been criticised for changing interest rates "too little, too late". While this pattern arises in a simple model in which policymakers are exposed to uncertainty about the optimal level of interest rates and set the policy rate in steps, we show that the problem is exacerbated if a policy committee takes decisions by consensus rather than by a vote. Policy rate changes are moreover rarer under a consensus procedure and, when there is an adjustment, the policy rate is more frequently adjusted by several steps at a time.

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*Hong Kong Institute of Economics and Business Strategy, University of Hong Kong, 919 K.K. Leung Building, Pokfulam Road, Hong Kong, email: gerlach@hku.hk. This research was fully supported by a grant from the University Grants Committee of the Hong Kong Special Administrative Region, China (Project No. AoE/H-05/99). I thank Stefan Gerlach for helpful comments.

1 Introduction

Central banks have been criticised for reacting too slowly and insufficiently strongly to changes in the state of the economy. Thus, they are seen as doing "too little, too late" (see e.g. Bank for International Settlements [1], Goodhart [5] and Guthrie and Wright [6]). The policy actions of Governing Council of the European Central Bank (ECB) in particular have been seen as too defensive and sluggish (see e.g. The Economist [11]).

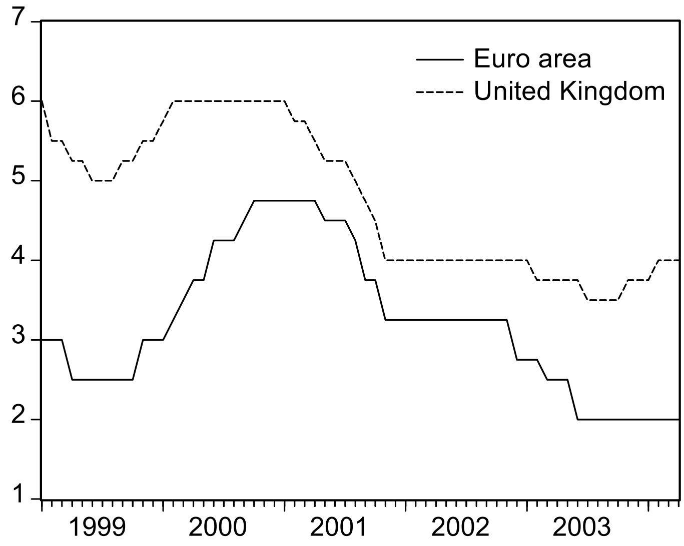
One reason why the Governing Council's interest rate decisions have been criticised is that they are taken by consensus. This contrasts the culture of policy decisions e.g. at the Bank of England (BoE), where the members of the Monetary Policy Committee (MPC) vote on the level of interest rates. This paper addresses the question whether taking decisions by consensus impacts on the interest rate setting behaviour of a central bank. We present a simple model of the policy problem and show that the consensus procedure implies indeed that interest rates are changed by too little, too late. As a consequence, cyclical fluctuations are larger than if a majority rule is used to decide on the stance of monetary policy.

2 Stylised facts

To motivate the subsequent discussion, it is useful to examine why the ECB has been criticised for its interest rate setting. To this end, Figure 1 plots the policy rates in the euro area and the UK for the period January 1999 (when the ECB began setting rates) to April 2004. Interest rate changes by the ECB tend to lag behind changes in the UK (the exception being the end of 2002, when the ECB began cutting rates before the BoE). Under the assumption that the euro area and the UK are exposed to similar shocks, this could be interpreted as supportive of the hypothesis that the ECB has responded too late to economic developments.

Table 1 documents that the ECB furthermore changed interest rates more rarely than the BoE. In particular, the probability π that a meeting of policymakers ended with a decision in favour of an interest rate change was 25.4 percent in the euro area and 29.7 percent in the UK. Interestingly, while the policy rate is changed by multiples of 25 basis

Figure 1: Policy rates



Note: Repo rates of the Bank of England and the European Central Bank, January 1999 to April 2004.

points both in the euro area and the UK, the ECB more frequently changed interest rates by 50 basis points than the BoE, resulting in average policy rate changes, Δ, of 36.7 versus 27.6 basis points. Thus, albeit adjusting policy less frequently, the Governing Council tended to agree on larger movements of the policy rate than the MPC.

Table 1: Policy rate changes

Sample period January 1999 to April 2004		
	π	Δ
ECB	25.4	36.7
BoE	29.7	27.6

Given the finding that the interest rate changes in the euro area were, if rarer, on average larger than in the UK, why has the ECB been criticised for doing too little? Figure 2 shows the rates of inflation and nominal GDP growth in the euro area and the UK since 1999. Inflation in the euro area has since 2000 been close to 2 percent, the upper limit of the ECB's definition of price stability, whereas it displayed considerable fluctuations around the BoE's target of 2.5 percent in the UK.[1] However, the graphs also suggest that the BoE has been more successful at stabilising output than the ECB. While the overriding objective of both central banks is the maintenance of price stability, economic growth is often seen as a secondary goal of policy. The criticism that the ECB is doing too little hence appears founded on the comparatively poor growth performance in the euro area.

3 The model

3.1 The policy problem

We now turn to modelling the impact of different decision procedures on the interest rate setting behaviour of a policy committee. We assume a committee with n members (thus, $n = 9$ for the BoE and $n = 18$ for the ECB). We furthermore assume that policymakers do not behave strategically, agree on the goals of policy, but are uncertain about the state of the economy.[2] Rather than presenting a full model of the economy, we assume that there is an optimal level of interest rates, i_t^*.[3] We think of movements in i_t^* as reflecting changes in the inflation rate and economic activity. If for instance the rate of inflation increases, thus warranting a tightening of monetary policy, we model this as a rise in the optimal interest rate. For simplicity, we let the optimal interest rate follow the process

$$i_t^* = c + \rho i_{t-1}^* + e_t, \tag{1}$$

where ρ lies between zero and unity and where $e_t \sim N(0, \sigma_*^2)$. The mean of i_t^* hence is given by $c/(1-\rho)$.

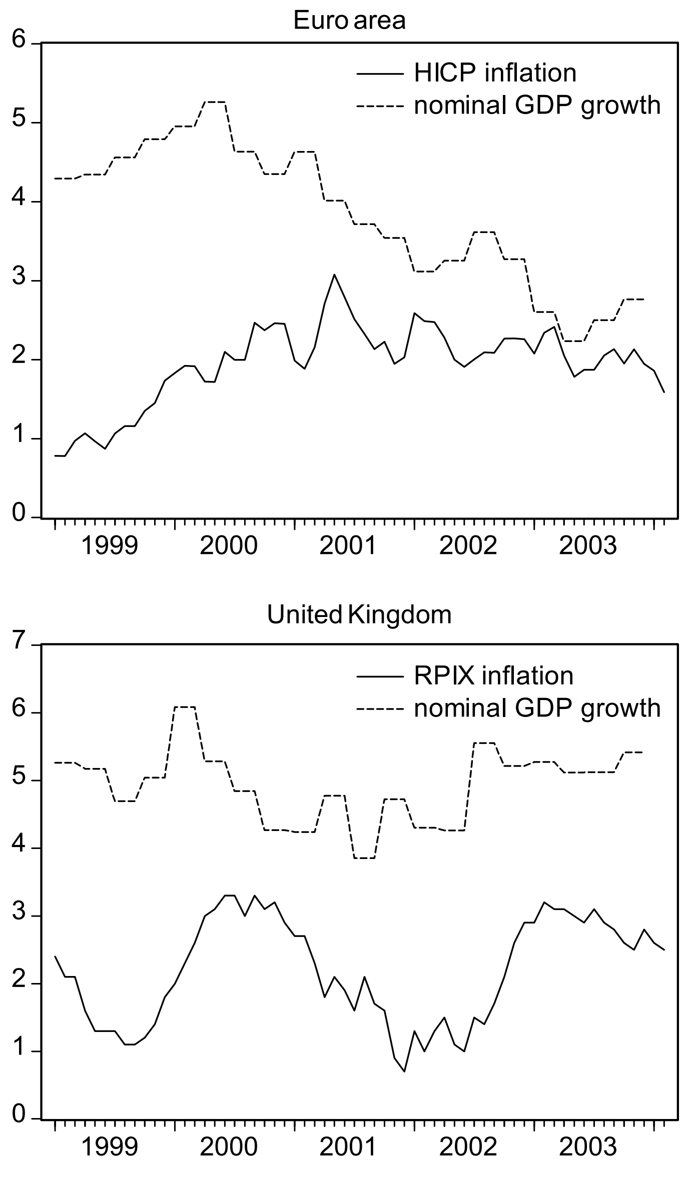
Policymakers attempt to set the policy rate i_t as closely as possible to i_t^*, but adhere to a step pattern. The interval between the admissible levels of the policy rate is given by

[1] In December 2003, the target in the UK was changed from an inflation rate of 2.5 percent as measured by the RPIX to a rate of 2.0% as measured by the CPI. We show here the RPIX.

[2] On monetary policy under uncertainty, see e.g. Blinder [2] and Goodhart [5].

[3] See Gerlach-Kristen [4] for a more detailed discussion of this model.

Figure 2: Economic performance



the constant step size s. In practice, this step size is 25 basis points for most industrialised economies.

Uncertainty about the optimal level of interest rates implies that the committee members hold different views of the appropriate stance of monetary policy. To model this, we assume that each policymaker j "observes" i_t^* with an error $u_{j,t}$, so that

$$i_{j,t} = i_t^* + u_{j,t} \tag{2}$$

with $u_{j,t} \sim N(0, \sigma_u^2)$.[4] We assume that policymakers' observation errors $u_{j,t}$ are uncorrelated and that σ_u^2 is the same for all committee members.

Equations (1) and (2) constitute a signal-extraction problem, and committee member j's best assessment of i_t^* can be shown to equal

$$i_{j,t|t} = k i_{j,t} + (1-k)(c + \rho i_{j,t-1|t-1}), \tag{3}$$

where $k = \rho v/(v + \sigma_u^2)$ and $v = 0.5[\sigma_*^2 - \sigma_u^2(1-\rho^2)] + \sqrt{\{0.5[\sigma_*^2 - \sigma_u^2(1-\rho^2)]\}^2 + \sigma_*^2\sigma_u^2}$. Equation (3) states that policymaker j's view of the optimal interest rate is a linear combination of $i_{j,t}$ and of the view of the appropriate stance of policy he held last period. The reason why he takes his past assessment into account is that the optimal interest rate is autocorrelated. If policymaker j thought last period that i_t^* was below $c/(1-\rho)$ but today observes $i_{j,t}$ above $c/(1-\rho)$, his knowledge about the autocorrelation of the optimal interest rate makes him interpolate between these two pieces of information. As a consequence, the less certain policymakers are about the optimal level of interest rate (i.e. the larger σ_u^2), the more weight do they attach to their past views (i.e. the smaller is k).[5]

Given the n different $i_{j,t|t}$:s, the committee applies a decision procedure to determine which level of the policy rate to set. Before considering alternative decision strategies, two

[4] We refer to $i_{j,t}$ as policymaker j's "observation" since this notion is common in the literature on signal extraction (see e.g. Sargent [9]). More precisely, $i_{j,t}$ represents the view of i_t^* committee member j would hold if his information set only contained data becoming available in period t.

[5] See Swanson [10] for a discussion of how certainty equivalence breaks down if policymakers are uncertain about the state of the economy and exposed to a signal-extraction problem. For the related literature on interest rate smoothing, see e.g. Sack and Wieland [8].

points are worth noting. First, if σ_u^2 is large, a shock to i_t^* feeds through to the individual $i_{j,t|t}$:s and to monetary policy only slowly . This implies that uncertain policymakers react too late. Second, the variance of $i_{j,t|t}$ is smaller than that of the optimal interest rate. Thus, the policy rate is not moved as aggressively as i_t^*, so that committee members also do too little. Policymakers' uncertainty hence on its own implies that interest rates are changed too little, too late. We next study how certain decision procedures can exacerbate this problem

3.2 Decision procedures

For those central banks where a committee conducts monetary policy, we can distinguish between at least three decision procedures. At the BoE, decisions are taken by a majority vote. Between June 1997 (when the MPC began setting interest rates) and April 2004 the smallest majority was 50 percent. This suggests that the range within which policymakers' views fall is small relative to the step size of 25 basis points.

The ECB uses a consensus approach. The literal interpretation of this concept is that all members of the Governing Council need to agree on a new level of the policy rate for interest rates to be changed. An alternative interpretation is the following. Suppose that one member in the committee believes that interest rates should be raised. This policymaker attempts to convince his colleagues of the need of a rate interest increase but, if he fails to do so, he does not let this be publicly known. Consequently, the committee takes a common position towards the outside. Even if this more lenient interpretation is correct, the fact that the ECB refers to its decision strategy as a consensus approach rather than a majority procedure suggests that the views in the Governing Council need to be strongly in favour of an interest rate change before policy is in fact adjusted. Thus, the burden of proof lies with those committee members who favour an adjustment of the policy rate.

The decision procedure of the Federal Open Market Committee (FOMC) in the US lies somewhere between the approaches of the BoE and the ECB. While the FOMC votes on the level of the federal funds rate, a dissent is generally seen as a signal that the policymaker in question strongly disagrees with the Chairman. FOMC members who disagree in principle but do not feel that a public debate is justified are thought to vote with the majority. Lambert [7] suggests that this decision procedure is effectively a consensus approach.

>From a modelling perspective, the main difference between the majority vote and the consensus procedure is the size of majority required for an interest rate change. At the BoE, this majority could in principle be as small as 22 percent (i.e. consisting of two out of the nine MPC members). By contrast, the literal interpretation of the ECB procedure requires the unanimous support of all committee members.

4 Simulations

How does the interest rate setting of a policy committee change if the majority m required for the decision of an interest rate adjustment is increased? To answer this question, we simulate the model assuming m:s in the range of 20 to 100 percent. We consider four measures to compare the interest rate setting behaviour of committees that use different decision procedures. The first measure is

$$\textit{too little} = \frac{1}{T}\sum_{t=1}^{T}[(i_t^* - i_t | i_t^* > c/(1-\rho)) + (i_t - i_t^* | i_t^* < c/(1-\rho))],$$

where T denotes the number of draws in the simulation. This metric captures whether the policy rate is as high as its optimal level if monetary policy should be tight (i.e. when $i_t^* > c/(1-\rho)$) and whether i_t is as low as i_t^* when policy should be loose. The larger the measure *too little*, the worse the decision procedure.

The second measure captures the "too late" aspect. Here, we calculate the absolute deviations between the current i_t and lagged i_t^*:s. The metric *too late* is that lag of i_t^* for which the deviation is smallest, so that

$$\textit{too late} = \arg\min_{l} \frac{1}{T}\sum_{t=l+1}^{T} |i_t - i_{t-l}^*|.$$

If *too late* $= 2$, i_t is adjusted with a lag of two periods after i_t^* has moved.

The measure π describes how probable it is that a policy meeting ends with the decision of a rate adjustment, so that

$$\pi = \frac{1}{T}\sum_{t=1}^{T}[1|(i_t - i_{t-1}) \neq 0].$$

The last measure, Δ, captures by how much the policy rate is changed when there is an adjustment. Thus,

$$\Delta = \frac{1}{T}\sum_{t=1}^{T}[(i_t - i_{t-1})|(i_t - i_{t-1}) \neq 0].$$

The more frequently the policy rate is adjusted by 50 or more basis points, the larger this metric.

It should be noticed that a decision procedure can yield high values of Δ and *too little* at the same time. This pattern emerges if policy is changed rarely (resulting in frequent deviations of i_t from i_t^*) and if, when there is an adjustment, the policy rate is moved by several steps in one go.

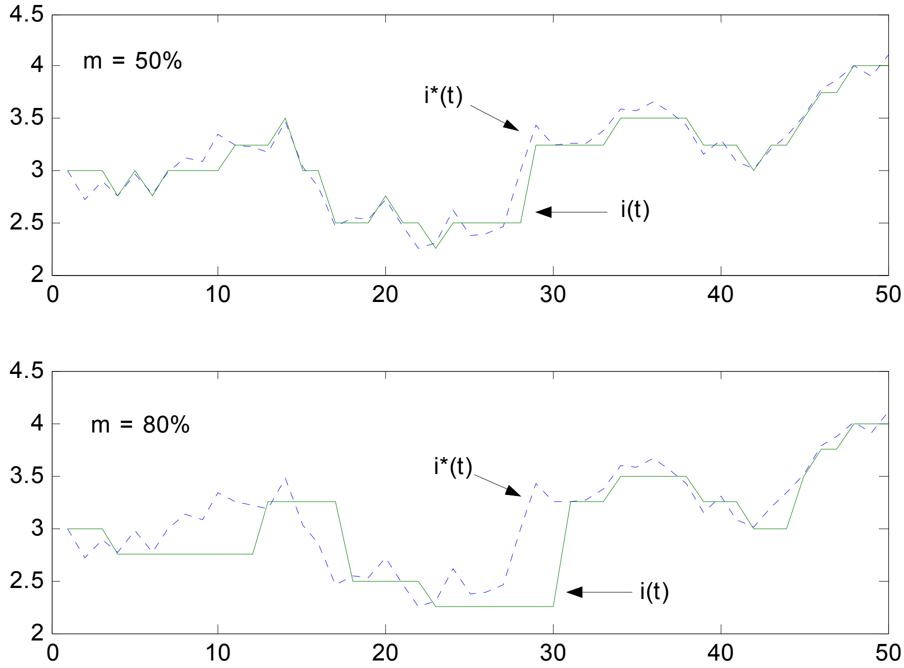
In the simulations, we assume a step size s of 25 basis points and a committee size of $n = 10$.[6] We furthermore assume that the optimal interest rate has an AR coefficient ρ of 0.99, a mean $c/(1-\rho)$ of 3 percent and the variance $\sigma_*^2 = 0.05$. Thus, we let the shocks affecting the optimal interest rate lie within in the range of $\pm$ 43.8 basis points in 95 percent of all cases. Finally, we set $\sigma_u^2 = 0.01$. This assumption implies that 95 percent of policymakers' observation errors are smaller than 19.6 basis points. We choose this comparatively narrow range since the voting record of the BoE suggests that the dispersion of policymakers' views is small relative to the step size.

As an illustration, Figure 3 shows a simulation of i_t^* and i_t for $m = 50\%$ and $m = 80\%$. Quite clearly, the deviation between the policy rate and i_t^* is smaller for $m = 50\%$, and i_t lags less behind i_t^* than when $m = 80\%$. Thus, the "too little, too late" problem seems to be more severe for larger m. The plots also suggest that policy adjustments are more frequent and smaller if only a small majority is required for the decision of an interest rate change.

Table 2 reports the measures *too little*, *too late*, π and Δ for $m = 20\%$ to 100%. The statistics are based on simulations for $T = 100,000$ and suggest that the larger m, the

[6] We assume an n larger than 9 to ensure that $m = 90\%$ and $m = 100\%$ yield different outcomes.

Figure 3: Simulated interest rate paths



Note: Simulations for $n = 10$, $s = 0.25$, $c = 3$, $\rho = 0.99$, $\sigma_*^2 = 0.05$ and $\sigma_u^2 = 0.01$.

poorer the policy outcome. The first column shows that *too little* is simulated as half a basis point for $m = 50\%$. Thus, the policy rate is changed roughly as aggressively as if there were no uncertainty about the optimal level of interest rates. By contrast, $m = 80\%$ results in a more defensive path of interest rates. On average, policy is simulated to be too defensive by 2.1 basis points each period. The measure *too late* indicates that the policy rate set using an m up to 70 percent lags one period behind movements in i_t^*, while larger m:s cause longer lags.

Intuitively, these results can be explained as follows. If the optimal interest rate starts to increase, the distribution of policymakers' views begins to shift upwards. A majority of 50 percent relatively early on favours a policy rate increase, while it takes longer for a larger majority to form. Consequently, policy is changed later under the consensus procedure than under the majority vote, so that *too late* is increasing in m. The measure *too little* is comparatively small for small m:s since the policy rate is adjusted soon after the optimal interest rate has started to move, which implies that the difference between

Table 2: The costs of consensus

$m =$	*too little* (in basis points)	*too late* (in periods)	π (in percent)	Δ (in basis points)
20%	0.54	1	55.30	28.48
30%	0.54	1	55.30	28.48
40%	0.54	1	55.30	28.48
50%	0.55	1	54.95	28.51
60%	0.76	1	46.63	29.63
70%	1.14	1	37.91	31.63
80%	2.15	2	28.04	35.49
90%	4.31	3	16.57	43.98
100%	15.23	10	5.68	69.39

Note: Simulations for $T = 100,000$, $n = 10$, $s = 0.25$, $c = 3$, $\rho = 0.99$, $\sigma_*^2 = 0.05$ and $\sigma_u^2 = 0.01$.

i_t and i_t^* cannot become very large.

Table 2 also shows that the metric π is decreasing in m. Decisions in favour of a policy rate adjustment are taken at 28.0 percent of all meetings for $m = 80\%$, but roughly at every other meeting if $m = 50\%$. The reason for this is that often several periods have to pass before a large majority in the committee favours an interest rate adjustment. As a result, the need for adjustment often is large under the consensus procedure. The measure Δ suggests an average size of change of 35.5 basis points if $m = 80\%$ and of 28.5 basis points if $m = 50\%$. Thus, the larger the required majority, the higher the probability that an interest rate change is by 50 rather than 25 basis points.

Unreported robustness checks suggest that the results presented in Table 2 are not sensitive to the exact size of parameters.[7]

[7]In particular, we consider n between 10 and 21, s between 5 and 50 basis points, ρ between 0.50 and 0.99, σ_*^2 between 0.05 and 0.5 and σ_u^2 between 0.01 to 0.5.

5 Conclusions

This paper assumes that the policy interest rate is set in steps and shows that uncertainty about its optimal level causes monetary policy to be adjusted too little, too late. We establish that this result is stronger if a large, rather than a small, majority is required to agree on interest rate changes. We also demonstrate that interest rate changes are rarer, but tend to be larger, if the consensus approach is chosen. This suggests that policy committees using a majority vote are likely to react faster to changes in economic conditions than committees that take decisions by consensus.

It has been argued before that the majority vote used at the BoE is attractive because the publication of the voting record helps financial markets forecast future monetary policy (see Gerlach-Kristen [3]). This paper suggests that even if no voting record is published, a majority vote appears more desirable than a consensus procedure since it is more successful at stabilising the macroeconomic conditions.

References

[1] Bank for International Settlements (1998), 68th annual report.

[2] Blinder, Alan S. (1997), What central bankers could learn from academics – and vice versa, Journal of Economic Perspectives 11(3), 2-19.

[3] Gerlach-Kristen, Petra (forthcoming), Is the MPC's voting record informative about future UK monetary policy?, Scandinavian Journal of Economics.

[4] Gerlach-Kristen, Petra (2004), Taking two steps at a time: On the optimal pattern of policy rates, mimeo.

[5] Goodhart, Charles Goodhart, Charles (1999), Central bankers and uncertainty, Bank of England Quarterly Bulletin, February, 102-121.

[6] Guthrie, Graeme and Julian Wright (forthcoming), The optimal design of interest rate target changes, Journal of Money, Credit, and Banking.

[7] Lambert, Richard (2004), Boring bankers – Should we listen?, speech available under www.bankofengland.co.uk/speeches/speech219.pdf

[8] Sack, Brian and Volker Wieland (2000), Interest-rate smoothing and optimal monetary policy: A review of recent empirical evidence, Journal of Economics and Business 52, 205-228.

[9] Sargent, Thomas J. (1979), Macroeconomic theory, Academic Press, New York.

[10] Swanson, Eric T. (2004), On signal extraction and non-certainty-equivalence in optimal monetary policy rules, Macroeconomic Dynamics 8(1), 27-50.

[11] The Economist (2003), Better late than never, June 5.