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THE DETERMINANTS AND PROPERTIES OF MONETARY CONDITIONS: DIRECT SURVEY EVIDENCE FROM NEW ZEALAND

by
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THE DETERMINANTS AND PROPERTIES OF MONETARY CONDITIONS: DIRECT SURVEY EVIDENCE FROM NEW ZEALAND

In the absence of a generally accepted indicator of monetary conditions the current and expected stance of monetary policy remains undefined. However, the Reserve Bank of New Zealand, by directly surveying perceived and expected monetary conditions, have enabled both a mean index of current and future monetary conditions, as well as a proxy of respondents' uncertainty, to be generated. The principal determinants and properties of these survey responses are examined in this paper, including whether: central bank announcements dominate economic fundamentals in determining conditions; the responses are consistent over varying time horizons; and the responses are symmetrical to both a tightening and loosening in policy. The determinants of uncertainty regarding the policy-stance are also investigated empirically. The results indicate that: responses to monetary conditions are highly influenced by the recent past; respondents tend to exaggerate the implications of their short-term expectations when forming longer-term views; and uncertainty regarding the stance of policy declines only after actual inflation declines. The main policy implication is that although policy uncertainty can be lowered by periodic reiteration of the stance of policy, this is no substitute to the actual achievement and maintenance of low inflation.

* * * * *

En l'absence d'un indicateur des conditions monétaires ayant fait l'objet d'un consensus général, l'orientation courante et anticipée de la politique monétaire dmeure mal définie. Néanmoins, la Banque Centrale de Nouvelle-Zélande, à l'aide d'un sondage recueillant directement les opinions sur les conditions monétaires actuelles et anticipées, a construit à la fois un indice moyen des conditions monétaires présentes et futures ainsi qu'une proxy sur l'incertitude des personnes interrogées. Les réponses du sondage permettent d'examiner les déterminants principaux et les caractéristiques des conditions monétaires, par exemple, si les annonces de la Banque Centrale l'emportent sur les paramètres fondamentaux économiques dans la détermination des conditions monétaires ; les réponses sont comparables entre différents horizons temporels, elles sont aussi symétriques dans la perception des politiques restrictives et expansives. Les facteurs à l'origine de l'incertitude concernant l'orientation de la politique monétaire sont aussi examinés empiriquement. Les résultats indiquent que : le passé immédiat a une forte influence sur les réponses concernant l'état des conditions monétaires ; les personnes interrogées semblent exagérer les implications de leurs anticipations de court term lorsqu'elles forment leurs anticipations de long terme ; finalement, l'incertitude concernant l'orientation de la politique monétaire ne baisse qu'après une diminution de l'inflation courante. L'implication majeure de cette étude pour la politique économique montre que même si l'incertitude peut être réduite par la réaffirmation de l'orientation de la politique monétaire, il n'existe pas de substitut à la réalisation et au maintient d'un taux d'inflation faible.

Table of Contents

The Determinants and Properties of Monetary Conditions: Direct Survey Evidence from New Zealand[1]

Andreas Fischer and Adrian Orr[2]

Introduction

In the absence of a generally accepted indicator of monetary conditions, the stance of current and expected monetary policy can be continuously contested. This situation arises since the predictive power of traditional indicators are known to vary over time, as well as be misleading in certain circumstances given that they can move independently of changes in the policy stance[3]. These identification problems have led to alternative, more subjective, measures of the stance of monetary policy to be constructed. One strategy, pursued by Romer and Romer (1989) and Boschen and Mills (1993), is to create a "narrative" index of the stance of policy, identified by central bank policy statements rather than any single economic variable. Subjective judgement is critical to the identification of the stance of policy, given that a broad range of influencing factors must be aggregated. However, such an approach ignores any uncertainty regarding agents perceptions of policy and there is no ability to gauge expectations of the future stance of policy.

Directly asking economic agents how they perceive the current stance of monetary policy, and what their expectations are of the future stance, is one means of overcoming some of the above-mentioned shortcomings of the narrative index approach. Since 1987 the Reserve Bank of New Zealand (RBNZ) has surveyed perceptions and expectations of monetary conditions, thereby providing potentially valuable feedback information for policy-setting. This paper examines the properties and principal determinants of the responses to this survey of monetary conditions. Particular interest lies in determining whether: monetary conditions are dictated by economic fundamentals or by central bank announcements; longer-term expectations are consistent with those of the short-term; and respondents are symmetrical in their response to both a policy tightening and loosening. The paper also investigates some possible determinants of uncertainty surrounding the stance of monetary policy.

The results presented suggest that: responses to monetary conditions are highly influenced by recent past behaviour, especially central bank announcements; respondents tend to exaggerate the implications of their short-term expectations when forming longer-term views; there is little evidence of asymetric behaviour; and uncertainty regarding the stance of policy declines only after actual inflation comes down. The relevant policy implication is that although uncertainty about the stance of policy can be lowered by periodic reiteration of the stance of policy, this is no substitute to a good past performance on maintaining low inflation. These results are complementary to those presented in Fischer and Orr (1994). In this instance the RBNZ survey results were used to indicate that institutional factors, such as enhanced central bank independence and a legislated commitment to specific inflation goals, help lower inflation uncertainty, although uncertainty about monetary conditions remain a significant influence. The results in this paper indicate that low inflation will reduce the uncertainty surrounding monetary conditions, reinforcing a reduction in inflation uncertainty.

The paper is set out as follows. Section I outlines the technique used to quantify the RBNZ's qualitative survey responses. Section II examines whether central bank statements dominate public opinion relative to economic fundamentals in establishing monetary conditions. In so doing, RBNZ announcements are classified as being either policy or non-policy related, enabling the separation of permanent and temporary changes in monetary conditions. Several properties of the survey data are also examined,

including forecast consistency -- a necessary although not sufficient condition for rationality -- and response symmetry to conjunctural developments. Some empirical evidence of the determinants of policy uncertainty is presented in Section III, followed with some concluding remarks.

I. Quantification of the Qualitative RBNZ Survey of Monetary Conditions

Direct information on monetary conditions in New Zealand is available in the form of responses to the RBNZ Survey of Expectations. Since September 1987 the RBNZ has asked on a quarterly basis about 200 members from the business, financial, agricultural and labour community their opinions of current and future monetary conditions. The survey poses -- amongst others -- the following three questions:

Q.1. What is your perception of monetary conditions at the present moment?

Q.2. What expectation do you have for monetary conditions at the end of reference quarter, t + 1, (next quarter)?

Q.3. What expectation do you have for monetary conditions at the end of reference quarter, t + 3, (3 quarters ahead)?

The responses are constrained to the form:

Very tight			Neutral			Very relaxed
1	2	3	4	5	6	7

The results can be summarised into the proportions A, B, C, D, E, F, and G (excluding don't-knows), which correspond to the share of total responses falling respectively into the progressively more expansive categories of monetary conditions.

Given the qualitative nature of these results, this paper uses a technique for making quantitative inferences about the responses. The technique used was first developed in the context of three-category surveys by Carlson and Parkin (1975), but is generalised to seven categories in this paper. Two assumptions are necessary to quantify the monetary conditions data. The first concerns the expectations distribution, or how to map individual differences in expectations. In this regard, a log-normal distribution is utilised for computational simplicity, as in Batchelor and Orr (1988)[4]. The second assumption is that the response function is similar for both the perception and expectations questions. That is, the responses to the perceptions question (Q1) are generated on the same basis as those which apply to the expectations questions (Q2 and Q3).

Using the survey responses A, B, C, D, E, F, and G, it is assumed that at time t, individual i answers very tight (A), tight (B), quite tight (C), neutral (D), quite relaxed (E), relaxed (F), or very relaxed (G), dependent on whether the perceived or expected value (J_{it}) lies in the range $(-\infty, -\beta^{-}_{it})$, $(-\beta^{-}_{it}, -\phi^{-}_{it})$, $(-\phi^{-}_{it}, -\delta^{-}_{it})$, $(-\delta^{-}_{it}, \delta^{+}_{it})$, $(\delta^{+}_{it}, \phi^{+}_{it})$, $(\phi^{+}_{it}, \beta^{+}_{it})$ or $(\beta^{+}_{it}, +\infty)$ (see Diagram 1). Here $-\delta^{-}_{it}$ and δ^{+}_{it} are the "just-noticeable differences" (JNDs) in monetary conditions, in a tighter and looser direction, for individual i at time t. Similarly, $-\phi^{-}_{it}$ and ϕ^{+}_{it} are the tighter and relaxed conditions in monetary policy which individual i regards as "moderate". Lastly, $-\beta^{-}_{it}$ and β^{+}_{it} depict "extreme" tight and relaxed stances in monetary conditions.

Although Batchelor and Orr (1988) allow for several alternative assumptions regarding the response ranges, we follow Carlson and Parkin (1975) in assuming that the JND's are symmetric, equal for all individuals and constant over time. This implies that $-\delta^{-}_{it} = \delta^{+}_{it} = \delta$. It is also assumed that the

"moderate" and "extreme" stances in monetary conditions are equal for all individuals, and can be written $-\phi^-_t$ and ϕ^+_t and $-\beta^-_t$ and β^+_t, respectively.

The response fractions A_t, B_t, C_t, D_t, E_t, F_t and G_t from the survey questions can be regarded as the maximum likelihood estimators of the areas under the perceptions distribution in their respective response ranges. Let a'_t, b'_t, c'_t, d'_t, e'_t and f'_t represent the abscise of the cumulative standard logistic distribution corresponding to probabilities of A_t, $(A_t + B_t)$, $(A_t + B_t + C_t)$, $(A_t + B_t + C_t + D_t)$, $(A_t + B_t + C_t + D_t + E_t)$, $(A_t + B_t + C_t + D_t + E_t + F_t)$, while the log-odds statistics are constructed as $a_t = \ln\{A_t/(1-A_t)\}$, $b_t = \ln\{(A_t + B_t)/(1 - A_t - B_t)\}$, ... and so on. In this instance, estimators for the mean μ_t and standard deviation σ_t of the perceptions distribution can be presented as:

$$\mu_t = \delta[(c_t + d_t)/(c_t - d_t)] \quad (1)$$

$$\sigma_t = -\delta[1/(c_t - d_t)] \quad (2)$$

$$-\phi^-_t = \delta[(2b_t - c_t - d_t)/(c_t - d_t)] \quad (3)$$

$$\phi^+_t = \delta[(-2e_t + c_t + d_t)/(c_t - d_t)] \quad (4)$$

$$-\beta^-_t = \delta[(2a_t - c_t - d_t)/(c_t - d_t)] \quad (5)$$

$$\beta^+_t = \delta[(-2f_t + c_t + d_t)/(c_t - d_t)] \quad (6)$$

A similar set of estimators can be derived for the one quarter and three quarter ahead expectations' distributions by using the corresponding responses from Q2 and Q3 of the survey. The one and three month expectations variables are respectively denoted with t|t+1 and t|t+3 in the following discussion.

A. Some general observations

Diagram 2 plots the unscaled means of monetary conditions (μ_t) relating to the responses from questions 1-3, providing an indication of how monetary conditions were perceived and expected to change throughout the period 1987:3- 1993:4. The more positive the index is, the more expansionary monetary conditions are considered to be. Policy was both perceived and expected to be more restrictive prior to 1991, especially in the early period, before trending towards a more neutral stance (i.e. $\mu_{t|t+1}$ and $\mu_{t|t+3}$ lie close to zero).

These trends appear broadly consistent with conjunctural factors over this period. For example, Diagram 3 indicates that yield curve developments (as measured by the difference between the five-year bond and the 30-day interest rates) follow the survey responses of monetary conditions relatively closely. However, it is unclear whether they best map perceptions or expectations of monetary conditions. Diagram 4 plots surveyed monetary conditions against a weighted index of exchange rate and interest rate movements -- a monetary conditions index (MCI) -- as used, for example, by the Bank of Canada as a policy instrument (see Freedman, 1994)[5]. It can be seen that the MCI also trends with both perceived and expected monetary conditions (Diagram 4)[6]. However, both the yield curve and the MCI are considerably less volatile than the survey responses. For example, both indicators fail to account sufficiently for the sharp restriction in surveyed monetary conditions in 1990:3. This corresponds with efforts by the RBNZ to tighten monetary conditions following some exchange rate weakness and a sharp rise in oil prices following the Iraqi invasion of Kuwait. This response suggests that factors other than actual movements

in interest rates and the exchange rate are important determinants of monetary conditions, perhaps, for example, central bank announcements.

Another interesting aspect of the survey responses is how temporary perceived and expected changes in the level of monetary conditions appear, especially when compared with movements in the MCI. This suggests that respondents treat the monetary conditions survey as a "relative" (i.e. to the last period) question, despite it being posed in an "absolute" or level form. One implication of this, should it prove correct, is that policy-makers would have to publicly reiterate their stance more often to ensure a consistent change in respondents' behaviour.

Diagram 5 plots the dispersion of the mean forecasts, which could broadly be interpreted as an index of the average degree of subjective uncertainty surrounding the stance of policy (see Section III). However, given that there is no single objective definition of monetary conditions it is unclear whether panellists are concerned about their individual circumstances or some general concept of "monetary conditions" when forming their responses. For example, producers of traded goods are likely to be concerned with exchange rate developments when assessing the stance of policy, while an individual producing domestic services may focus more on interest rates or aggregate demand developments. Hence, there may be a mixture of both general and specific factors which influence the variance of perceived and expected monetary conditions.

From Diagram 5 it can be seen that although the standard deviations of the three survey series appear quite correlated, their magnitudes are significantly different in the period prior to 1990. Indeed, the standard deviation of current perceptions (σ_t) only converges with the expectations series ($\sigma_{t|t+1}$ and $\sigma_{t|t+3}$) in late 1989, after the introduction of the Reserve Bank Act. This Act defined price stability as the sole objective of monetary policy and provided considerable independence to the RBNZ[7]. Hence, one possible explanation of the decline in σ_t is that the Act provided an anchor on which individuals could base their perceptions. The introduction of a specific policy goal and a time frame for achieving price stability (first detailed in the Policy Targets Agreement in February 1991), established a benchmark against which individuals could assess current conditions, thereby reducing the divergence in views as to the actual stance of policy. Nevertheless, the Reserve Bank Act does not specify a formal operating rule against which respondents could assess monetary conditions. Indeed, reductions in all three variance series were not consistently achieved until the latter period of the sample, coinciding with the emergence of a clearer operating procedure via the announcement of inflation forecasts (see Grimes and Wong, 1993).

Diagram 6 plots the mean (μ) with respect to the moderate tight/relaxed (ϕ) and extreme tight/relaxed (β) parameters for the three forecast horizons. Some general observations are also pertinent. First, fluctuations in moderate and extreme stances of monetary policy are not obviously correlated with their respective means. The mean is generally the least volatile series, with the extreme position the most volatile. Second, the moderate and extreme parameters are of similar magnitude for all three series, suggesting a similar response function. Third, in the case of perceptions, the moderate and extreme stances declined in absolute terms during the sample period, suggesting increased sensitivity to just-noticeable-differences in conditions as actual inflation declined. Finally, symmetry is suggested between the positive and negative changes in the extreme and moderate views of monetary conditions.

In light of these general observations, the following sections formally examine the key determinants and properties of the survey responses. Section II is concerned with assessing the relative importance of central bank announcements *vis-á-vis* more traditional indicator variables in determining monetary conditions. The responses are also tested for consistency across the various survey horizons, as well as asymmetry to conjunctural developments. Section III assesses whether the standard deviation of the survey responses approximate the degree of uncertainty surrounding monetary conditions. This involves

separating the possible determinants into general, individual-specific, and policy-related groups before empirically assessing their signficance.

II. Monetary Policy and Indicator Variables

Given the lags and indirect connections between the instrument (in the case of New Zealand, the quantity of settlement cash in the banking system) and the ultimate goal of monetary policy (in the case of New Zealand, 0-2 per cent annual inflation, as defined by the Policy Targets Agreement) central banks often utilise other variables to bridge this gap when setting policy. These variables can be classified as either operational or intermediate targets, or indicator variables. From the above discussion, it is apparent that surveyed monetary conditions are potentially useful as indicator variables for policy setting, given that they potentially summarise movements in other indicator variables (e.g. the yield gap), as well as possibly accounting for other influences on monetary conditions, such as central bank announcements. The survey responses also provide a measure of the degree to which views about the stance of policy diverge, possibly influenced by the particular sector the responses originate from. Finally, future policy expectations are provided, enabling some assessment of both policy credibility and future inflation pressures. In sum, it appears that such survey variables potentially alleviate many of the criticisms surrounding other indicator variables of monetary policy, as briefly discussed in the introduction.

A. The role of central bank announcements

An important channel for the RBNZ to communicate its policy intentions is through the release of public statements, often referred to as "open mouth" (rather than open market) operations. Open mouth operations serve several functions, they inform the public as to: why particular policy actions were undertaken; how the Bank assesses the current stance, and under what circumstances a policy change could occur; and whether any change in their policy instruments signals a permanent or temporary shift in monetary conditions.

To assess the market reaction to the varying types of open mouth operation, we follow Cook and Hahn (1988) by classifying the various RBNZ announcements (as extracted from the "RBNZ Bulletin" and summarised in Table 1) into three dummy variables. The first (**ANN-P**) indexes RBNZ statements that refer to actual changes in the stance of monetary policy. It is constructed such that +1 refers to an expansionary announcement, -1 a contractionary announcement, with 0 indicating no policy change (denoted by P in Table 1). The second dummy variable (**ANN-CP**) corresponds to conditional announcements, which outline what changes are necessary to avoid policy intervention (denoted by CP in Table 1). More and more frequently the RBNZ has managed to sway the market in a desired direction by making conditional policy statements, thereby pre-empting any necessity for an official intervention. Although conditional statements may prompt changes in expectations of future monetary conditions, they should have no influence on the perception of current monetary conditions. The final dummy variable (**ANN-CASH**) defines only temporary technical adjustments to policy, such as changes to the cash-target (monetary base), the RBNZ's primary instrument for setting monetary conditions. These can arise, for example, from efforts to avoid disruption in the interbank payment system but should have no effect on perceptions or expectations of monetary conditions.

Regressions of the survey means (μ) on the announcement dummies are presented in Table 2. The policy announcements dummy (**ANN-P**) is found to be significantly related to movements in the survey mean for each of the three forecast horizons, in contrast to both the conditional policy announcements (**ANN-CP**) and those concerning technical changes in the cash target (**ANN-CASH**). These results are confirmed in a cross-section regression, which stacks $\mu_{t|t}$, $\mu_{t|t+1}$ and $\mu_{t|t+3}$ as the dependent variable. It appears that survey participants have correctly interpreted the RBNZ policy signals, using them to revise

their expectations of monetary conditions accordingly. However, whether these open mouth operations provide information in addition to movements in other indicators, and whether the subsequent response adjustments are consistent across time horizons, remains unclear.

B. Announcements versus fundamentals

In addition to "open mouth operations", New Zealand's monetary policy is conducted with the use of both operational targets and indicator variables, albeit in the absence of an intermediate target. As mentioned above, the *policy instrument* used to achieve the ultimate target of stable inflation (defined as 0-2 per cent annual consumer price increases) is the control on the quantity of interbank settlement cash. This provides a mechanism for influencing the major *operational targets*; the level of short-term interest rates and, more indirectly, the effective exchange rate. These targets are established on the basis of forecast inflation, as detailed in the RBNZ's publicly released bi-annual "Monetary Policy Statement" and quarterly "Economic Forecasts". However, a host of other *indicator variables* are also utilised to enhance policy-setting decisions. These include the structure of interest rates, estimates of the output gap, inflation expectations, wage settings, and to a lesser extent, monetary aggregates[8]. Given that the predictive power of these traditional indicators may vary both over time and independent of changes in policy stance -- e.g. in response to unexpected real developments -- whether a particular indicator is useful remains a continuous matter of judgement. This decision rests primarily on whether there is a stable relationship between the indicator and the ultimate target, assuming that the indicator responds consistently and predictably to changes in the central bank's policy instrument.

In this light, an indicator role for the monetary conditions survey responses could be found if it can be shown that they summarise information which is included in the current list of indicators, as well as include additional information, such as central bank announcements, which are useful for monitoring the stance of policy. In order to formally assess this, several current indicator and policy instrument variables have been included in the Table 2 regressions, with the subsequent results presented in Table 3. These include annual changes in real GDP, and quarterly changes in the log of; the US/NZ dollar exchange rate, short-term (30 and 90 day) interest rates, the five-year bond rate, the spread between the five-year bond and the 90-day interest rate, and the consumer price index (CPI).

In all of the regressions presented, the survey responses are shown to react in a consistent manner with more traditional monetary policy indicators. Further, in each of the regressions for *perceptions* of monetary conditions, the policy announcement variable **ANN-P** remained statistically significant, implying that it provides information for $\mu_{t|t}$ in addition to the current indicators. However, the opposite result arises for the *expectations* of monetary conditions, where the central bank announcement variable became statistically insignificant. These results suggest that, although policy announcements may provide additional information concerning perceptions of monetary conditions, expectations remain dependent on movements in conjunctural factors such as short-term interest rates, the exchange rate, and the slope of the yield curve.

C. Consistency

Although respondents appear to correctly perceive the relative importance of various central bank policy-announcements and developments in economic fundamentals, whether their subsequent adjustments to expectations are consistent has yet to be determined. That is, do short-term expectations when compounded into the future match those of the equivalent long-term expectation? This section formally tests for consistency in respondent's expectations across both horizons, a necessary, although not sufficient condition for rationality. Failure of consistency would imply that the respondents themselves are unwilling to live with the implications of their own short-run forecasts.

To test for consistency Froot and Ito's (1989) methodology is utilised, estimating a system of the form:

$$\begin{pmatrix} x_{1\,|\,t+1} \\ x_{k\,|\,t+k} \end{pmatrix} \begin{pmatrix} \gamma_1 \\ \gamma_k \end{pmatrix} = \begin{pmatrix} \gamma_1 \\ \gamma_k \end{pmatrix} + \begin{pmatrix} a_{1,1} \cdots a_{1,p} \\ a_{k,1} \cdots a_{k,p} \end{pmatrix} \begin{pmatrix} x_{1\,|\,t} \\ \cdot \\ \cdot \\ \cdot \\ x_{1\,|\,t-p+1} \end{pmatrix} + \begin{pmatrix} \nu_{1\,|\,t} \\ \nu_{k\,|\,t} \end{pmatrix} \tag{7}$$

where $x_{k|t+k}$ is the expectation k periods ahead made at time t. The variable x = (μ, ϕ, and β) and ν_t includes any measurement errors in the survey. An extension of the GMM estimate of the parameter covariance matrix -- as suggested originally by Hansen (1982) and modified by Newey and West (1987) -- is used to estimate (7). This provides a consistent estimate of the covariance matrix and allows for conditional heteroscedasticity in the residuals[9].

In specifying the lag length *p*, an incremental approach was used commencing with *p*=1. Froot and Ito (1989) provide consistency restrictions for γ_k and a_k. In the case of *p*=1, the long-term expected stance of monetary conditions is the sum of the individual short-term expected changes which have been raised to a power equal to the number of periods it lies into the future: $a_k = \Sigma^k_{j=1} a^j_1$. The restriction for γ_k is $k[(1- a_1) - (a^k_1 - a_1)]\gamma_1/(1- a_1)^2$. In almost all cases lags greater than *p*=1 proved statistically insignificant. The results presented in Table 4 are therefore confined to *p*=1, noting that the qualitative nature of the results do not depend on the precise value of *p*.

The results indicate that the coefficient on the compounded perceived mean is statistically significant for both horizons. These imply that a 1 per cent contraction in perceived monetary conditions leads to an expected contraction of 0.5 and 0.2 per cent respectively over the following one and three-quarter horizons. Wald tests for the consistency restrictions for γ_1 and a_1 are presented in the last two columns, rejecting the restrictions of the mean for a_1 (the slope coefficient), but not for γ_1 (the constant). With regard to the moderate and extreme stances in monetary conditions, it is the constant restrictions which are rejected. These latter results are not surprising given that the slope coefficient (a_1) was statistically insignificant in both cases. In sum, expectations of the mean, moderate and extreme stances of monetary conditions appear inconsistent across the two time horizons. That is, respondents tend to over react to the implications of their short-term expectations when adjusting their longer-term expectations.

D. Symmetry

The proposition that monetary policy has asymmetric effects on macroeconomic variables has recently been empirically examined by, for example, Cover (1992), Morgan (1993) and DeLong and Summers (1988) -- using derivations of some monetary growth variable to identify monetary conditions -- with their results generally supporting the hypothesis[10]. In attempting to explain this outcome, it is of potential interest to determine whether perceptions and/or expectations of monetary conditions behave symmetrically to both a contraction and expansion in policy. For example, are the extreme stances of monetary conditions $\beta^+_{t|t+k}$ and $\beta^-_{t|t+k}$ influenced to a similar magnitude by the same variables? Should this prove to be untrue, it would provide one explanation of the asymmetrical effects of monetary policy. In order to answer this question the following regressions have been performed for both perceptions and expectations:

$$x^*_{t|t+k} = \mathbf{b}Z_{t-1} + e_t, \quad (8)$$

where $x^*_{t|t+k} = x^+_{t|t+k} - |x^-_{t|t+k}|$ for k = (0, 1, and 3) and $x = (\beta, \phi)$ from the survey responses.

In the case where the moderate and extreme stances of monetary conditions are symmetric, the difference between the relaxed and tight conditions should be orthogonal to past information (Z_{t-1}). Table 5 summarises the orthogonality results based on LM omitted variables tests. In this instance, Z_{t-1} is defined by the quarterly (log) change in the following variables: the CPI index, the unemployment rate, real GDP, M1 money, M3 money, private credit, the US/NZ dollar exchange rate, and the 30-and 90-day and five-year interest rates.

The results indicate that the differences between both the moderate (Φ) and extreme (β) tight/relaxed parameters are uncorrelated with past information, as highlighted by the chi-squared test results displayed in parentheses[11]. That is, the null hypothesis of $\boldsymbol{b} = 0$ is accepted. However, in the case of $\beta^*_{t|t+1}$ -- the extreme stance for short-term expectations -- private credit, the 90-day interest rate, and the interest rate spread all appear significant. Hence, although in general the results provide little evidence of asymmetric behaviour, there is some indication of asymmetric treatment of changes in short-term expectations.

III. Uncertainty and the Dispersion of Monetary Policy

In addition to the mean (μ), the standard deviation (σ) of perceptions and expectations about monetary conditions have been derived from the responses to the RBNZ survey (as described in Section I and displayed in Diagram 5). Levi and Makin (1980) and Cukierman and Wachtel (1982) have interpreted the dispersion of mean inflation forecasts to be a proxy of the average degree of subjective uncertainty felt by individual respondents. The uncertainty proxy hypothesis asserts that $\sigma_t = \sigma(\tau_t)$, where τ_t is the average of the individual measures of subjective uncertainty τ_{it} about the stance in monetary conditions.

Although this uncertainty-proxy could remain robust for expectations of monetary conditions, the dispersion of survey responses may be influenced by experiences both unique to certain individuals and common to all respondents, thereby potentially weakening its relevance as a proxy of uncertainty. That is, given that there is no single objective definition of monetary conditions about which to form expectations, one cannot measure τ_t directly. Instead, two types of explanatory variables must be accounted for when attempting to explain the dispersion in expectations about monetary conditions, those *specific* to certain groups of individuals (e.g. the variance across bilateral exchange rate movements), and *general* factors common to all respondents (e.g. aggregate inflation). However, in the following analysis a third possible source of uncertainty is identified, that related to the actual goals and operation of *monetary policy*. Table 6 provides a list of variables, by broad category type, that are possible determinants of uncertainty regarding monetary conditions.

In testing for the relative importance of these variables as determinants of policy uncertainty, a two-step regression strategy is followed (see Table 7). First a "base" equation has been established, which incorporates only those variables which were statistically significant across all three forecast horizons. Second, using an omitted variables test in the relevant "base" equation, other explanatory variables which proved statistically significant only in certain forecast horizons are subsequently included.

From Table 7 it becomes apparent that the only *general* factor that is consistently significant is lagged actual inflation. The positive correlation between inflation and the standard deviation of perceived/expected monetary conditions is consistent with results in Fischer and Orr (1994) who show that uncertainty relating to the stance of monetary policy is positively correlated with the variability of

price-related expectations and actual inflation. In contrast, *specific* and *monetary policy* factors are shown to play no significant role in the base equations, with the omitted variables tests insignificant in the stacked regressions. With regards to the individual results, uncertainty relating to perceived monetary conditions appears to have also been influenced by the variability in relative prices and the exchange rate, as well as the moving standard deviation in aggregate inflation and the trade-weighted exchange rate. However, expectations are solely influenced by past inflation. In all cases, RBNZ announcements, legislation concerning the inflation target (i.e. the Reserve Bank Act or the Policy Targets Agreement), and the gap between actual inflation and RBNZ forecast-inflation, did not have any bearing on the standard deviations in addition to past actual inflation[12].

IV. Conclusions

The RBNZ's survey of monetary conditions reveals useful information for policy makers. The mean responses appear to summarise other more traditional indicator variables -- including developments in the yield gap, interest rates and the exchange rate -- as well as respond to relevant central bank announcements. However, it is only in the case of perceptions that RBNZ announcements provide information in addition to the current set of policy indicators. The volatility of the mean survey responses, especially compared to the MCI, also suggests that responses are formed relative to the recent past, as opposed to some absolute level. For example, a perceived tightening in one quarter is often reversed in the following quarter, even in the absence of a significant change in interest or exchange rates. In this instance, the RBNZ may find it useful to reiterate their policy stance regularly in order to ensure that desired match perceived monetary conditions.

With regards to specific features of the survey responses, expectations of monetary conditions are not consistent, a necessary although not sufficient property of rationality. Instead, participants tend to exaggerate the implications of their short-term expectations when forming longer-term ones. This raises the importance of the determinants of perceptions when forming expectations of future monetary conditions, implying that RBNZ announcements remain central to the setting of policy. In addition, both perceptions and expectations of monetary conditions appear, in general, to be symmetric in their reaction to changes in economic fundamentals. Only in the case of the "extreme" response category for short-term expectations was there any evidence of asymmetric behaviour. Although further analysis is warranted, these results provide few insights as to why monetary policy effectiveness differs dependent on whether there is a tightening or loosening in the policy-stance. The variance around the mean perceived and expected stance of monetary policy appears to provide a credible indication of the degree of policy uncertainty. Although certain individual-specific variables were significant in explaining uncertainty regarding the current policy-stance, the only variable which proved significant across all three survey horizons was past actual inflation -- a variable common to all respondents.

In sum, the results suggest that although the periodic reiteration of the stance of policy -- primarily through central bank announcements -- may clarify the stance of policy, the most effective way to lower policy uncertainty is through the actual achievement and maintenance of low inflation. These results are complementary to those presented in Fischer and Orr (1994), which indicated that institutional features such as the Reserve Bank Act, the announcement of inflation targets, and the publication of inflation forecasts, are all useful in achieving the goals of monetary policy. However, the most effective means of reducing the overall policy-stance uncertainty is through the actual establishment of low inflation. This is understandable given that neither the Reserve Bank Act, nor the Policy Targets Agreement, provide a formal operating procedure for monetary policy against which the public can form their judgements as to the policy stance.

NOTES

1. The authors would like to thank Malcolm Edey, Michael P. Feiner, Ketil Hviding, Michael Kennedy and Hannes Suppanz for helpful comments, and Eric Hansen and Peter Jolly for making the Reserve Bank of New Zealand survey data available. They also thank Andrea Prowse and Paula Simonin for excellent secretarial assistance. The views expressed in this paper are those of the authors and are not necessarily shared by the OECD.

2. Andreas Fischer works for the Swiss National Bank, Zurich and Adrian Orr works in the Money and Finance Division of the OECD, Paris.

3. For example, unexpected variations in monetary growth could simply reflect unexpected output growth, rather than a discrete change in policy stance.

4. Pesaran (1987) shows that the original Carlson and Parkin quantification method is robust to alternative choices among the class of symmetric unimodal distributions, to which the normal distribution belongs.

5. The use of a monetary conditions index (MCI) is justified by two considerations. First, in a flexible exchange rate regime such as New Zealand, monetary policy operates through both the interest rate and exchange rate, although the relative movement of the two variables depends largely on financial market responses to RBNZ actions. Second, should an exogenous shock to the exchange rate occur due to a non-monetary event, RBNZ policy actions should attempt to offset the effects on aggregate demand. Hence, in both circumstances it is important to account for combined exchange rate and interest rate movements when assessing the stance of policy. In this analysis, the MCI is a combination of the short-term interest rate and the trade-weighted exchange rate, less their values in a base period. This is constructed as suggested by the Bank of Canada (see Freedman, 1994);
MCI = [Interest rate - interest rate at base period] + (weight)*[(trade-weighted exchange rate index/exchange rate index at base period)-1]*(100)
Although the index measures the relative degree of tightening or loosening in policy, the level of the index is meaningless and instead based on its value at the same starting period as the surveyed monetary conditions (i.e. 1987:3). The relative weights on the components of the index were chosen to minimise the root mean squared error between the MCI and the mean perceived and expected monetary conditions over the entire sample period. The weight for the exchange rate was 0.4. The RBNZ recently adjusted their exchange-rate pass through coefficient onto prices to 0.3, down from an initial estimate of 0.4 (see RBNZ Economic Forecasts, September 1993).

6. Regressing the monetary conditions index on the mean survey responses provided the following results:

(1) MCI = -5.12 + 0.45 Mean perceptions
(-1.80) (1.29)
$R^2 = 0.06$

(2) MCI = -4.87 + 1.38 Mean expectations (+1 quarter)
(-1.90) (2.68)
$R^2 = 0.24$

(3) MCI = -5.43 + 2.13 Mean expectations (+3 quarters)
(-2.13) (2.67)
$R^2 = 0.24$. Figures in parentheses are t-statistics.

7. See OECD (1993) for a description of the Reserve Bank Act and inflation target framework.

8. In the early-to-mid 1980s, monetary aggregates were treated more as an intermediate target rather than an indicator variable.

9. Although point estimates of the parameters in system (7) can be obtained using ordinary least squares (OLS), incorrect estimates of the standard errors will result due to the presence of contemporaneous and serial correlation in the residuals. Contemporaneous correlation of $\upsilon_{1|t}$ and $\upsilon_{k|t}$ occurs since the information used in generating short-term forecasts is likely to be the same as that used to generate longer-term forecasts. Serial correlation is likely -- even in the presence of the large measurement errors -- given the absence of actual outcomes between survey periods, against which expectations could have been adjusted. In sum, the presence of non-zero autocorrelations in the residuals from (7) implies that the coefficient variance-covariance matrix cannot be obtained using OLS.

10. Ball and Mankiw (1994) provide a theoretical rational for the empirical findings that monetary shocks have asymmetric effects. The authors present a menu-cost model in which positive trend inflation causes firms' relative prices to decline automatically between price adjustments.

11. Preliminary analysis showed that lagged values of $x^*_{t|t+k}$ were not significant, neither were the mean and standard deviation of $\mu_{t|t+k}$ in regression (8).

12. Only in the case of perceptions did the RBACT prove statistically significant in lowering the standard deviation when entered alone into the above regressions.

Table 1. **RBNZ announcements and their classification**

September 1987	= -1,	Reduction in daily cash target from 30 to 20 million from 2 September, response to an improvement in the Bank's ability to forecast daily cash influences. **(Cash)**
December 1987	= +1,	Increase in daily cash target from 20 to 30 million, seen to be warranted in view of the current uncertainty in financial markets following the recent share market decline. **(Cash)**
June 1988	= 1,	Increase in the daily cash target from 30 to 40 effective 29 February. The increase was intended to offset seasonal pressures in the short-term money market, resulting from uncertainty over end-of-year tax flows. Daily cash target reduced from 40 to 30 million on 23 March. The RBNZ states that the seasonal pressures had passed and it was therefore appropriate to return to the previous policy setting. **(Cash)**
September 1989	= 1,	Temporary cash target change of 20 to 50 million on Monday, 12 June 1989. The increase was aimed at countering manipulation of the cash market, rather than representing a change in monetary policy settings. **(Cash)**
March 1990	= 1,	Temporary cash target change: increase of 15 million on 1 December, reduced back to 30 million on 5 December. **(Cash)**
September 1990	= -1,	1 August, the Bank announced that it undertook actions to firm monetary conditions. This action followed exchange rate weakness in the weeks prior to this move, disappointing inflation outcomes and continuing high expectations of inflation. **(P)**
December 1990	= -1,	Reserve Bank responds to exchange rate movements: exchange rate falls been leading some investors to question the Reserve Bank's commitment to price stability. The Bank responded with a public statement on 17 October, reiterating its intention to maintain monetary conditions consistent with price stability. Another statement on 18 October was made emphasising the Bank's commitment to achieving price stability. **(CP)**
March 1991	= -1,	In response to the emergence of an upward sloping interest rate yield curve, the RBNZ released a public statement on 11 January, reiterating that short-term rates should generally exceed long-term rates while inflation is being reduced. **(CP)**
June 1991	= -1,	The Governor of the RBNZ gave a speech on 23 April outlining the conditions under which a flat or positive yield curve could emerge over the coming year. **(CP)**
December 1991	= +1,	Increase in Cash Target on 25 September from 15 to 20 million. The decision was taken because it appeared that inflation would fall below the indicative inflation ranges for the years to December 1991 and December 1992. **(P)**
March 1992	= -1,	On 6 January the Bank released a statement saying it would be concerned if the exchange rate weakened further, because at the current levels inflation outcomes for 1992 and 1993 were expected to be towards the top end of the targets ranges. Also announced in a Bank statement on 6 January, the Bank would be concerned if there were further weakening in the exchange rate, because at the current levels inflation outcomes for 1992 and 1993 were expected to be towards the top end of the target ranges. **(CP)**
December 1992	= -1,	The Bank stated on 9 and 30 September that, were the fall in the exchange rate to be sustained, the price stability targets could be put at risk. **(CP)**
March 1993	= -1	On 15 and 24 of December the Bank responded to the weakness in the exchange rate through disclosed open market operations. **(P)**
	Rest of the values are set to zero.	

Table 2. **Monetary conditions and announcements**

Forecast horizon	Perception		1 Quarter ahead		3 Quarter ahead		Stacked	
Dependent variable - mean								
Constant	-1.582*	-1.438*	-0.204	-0.134	-0.126	-0.126	-0.397*	-0.435*
	(0.461)	(0.526)	(0.179)	(0.201)	(0.123)	(0.126)	(0.155)	(0.182)
Lagged dependent variable	0.181	0.189	-0.6533*	0.641*	0.406*	0.378*	0.532*	0.527
	(0.183)	(0.186)	(0.138)	(0.140)	(0.175)	(0.169)	(0.154)	(0.089)
ANN-P	1.726*	1.767*	0.977*	1.005*	0.682*	0.618*	1.097*	1.080*
	(0.848)	(0.864)	(0.396)	(0.401)	(0.327)	(0.274)	(0.350)	(0.351)
ANN-CP		-0.518		-0.168		0.252		-0.372
		(0.594)		(0.274)		(0.215)		(0.218)
ANN-Cash		-1.185		-0.586		-0.412		-0.671*
		(0.827)		(0.388)		(0.302)		(0.218)
ANN-CP+ANN-Cash	-0.762		-0.318		0.011		-0.462	
	(0.424)		(0.199)		(0.162)		(0.277)	
R^2	0.296	0.308	0.627	0.638	0.347	0.424	0.425	0.431
s.e.	1.458	1.481	0.680	0.686	0.559	0.538	1.041	1.043

* Denotes significance at the 5 per cent level. Figures in parentheses are standard errors.

Table 3. **Monetary conditions and announcements**

Dependent variable	Mean perception						
Constant	-8.192*	-0.382	-0.541	-0.510	-1.545*	-1.527*	-1.957*
	(3.962)	(0.899)	(0.817)	(1.126)	(0.300)	(0.437)	(0.329)
ANN-P	2.043*	1.642*	1.724*	1.786*	1.540*	1.783*	1.951*
	(0.594)	(0.623)	(0.634)	(0.650)	(0.699)	(0.736)	(0.648)
Independent variable	ex rate US/NZ	30-day rate	90-day rate	5-year bond	Spread	Inflation	GDP
	-11.828	-0.124	-0.111	-0.120	0.504	-0.072	0.163
	(7.010)	(0.091)	(0.083)	(0.097)	(0.371)	(0.108)	(0.141)
R^2	0.421	0.257	0.234	0.201	0.315	0.174	0.198
s.e.	1.267	1.435	1.457	1.481	1.377	1.513	1.523
Dependent variable	Mean 1 quarter ahead expectation						
Constant	-6.165*	1.338*	1.304*	1.814*	-0.368*	-0.110	-0.848*
	(1.364)	(0.351)	(0.364)	(0.514)	(0.116)	(0.358)	(0.201)
ANN-P	1.304*	0.876	0.981	1.076	0.479	1.066	1.258
	(0.586)	(0.637)	(0.643)	(0.622)	(0.809)	(0.768)	(0.803)
Independent variable	ex rate US/NZ	30-day rate	90-day rate	5-year bond	Spread	Inflation	GDP
	-10.122*	-0.175*	-0.174*	-0.229*	0.527*	-0.163	0.168
	(2.416)	(0.035)	(0.036)	(0.044)	(0.945)	(0.093)	(0.084)
R^2	0.616	0.257	0.638	0.595	0.645	0.443	0.261
s.e.	0.662	1.435	0.643	0.679	0.632	0.797	0.919
Dependent variable	Mean 3 quarter ahead expectation						
Constant	-2.400*	-0.647*	0.639*	0.862*	-0.129	-0.105	-0.347*
	(0.944)	(0.297)	(0.303)	(0.395)	(0.111)	(0.186)	(0.138)
ANN-P	0.855	0.675	0.722	0.765	0.626	0.758	0.844
	(0.527)	(0.540)	(0.539)	(0.532)	(0.589)	(0.580)	(0.609)
Independent variable	ex rate US/NZ	30-day rate	90-day rate	5-year bond	Spread	Inflation	GDP
	-3.948*	-0.078	-0.078*	-0.102	0.255*	-0.087*	0.077
	(1.748)	(0.023)	(0.024)	(0.032)	(0.087)	(0.033)	(0.056)
R^2	0.352	0.432	0.427	0.402	0.428	0.396	0.236
s.e.	0.543	0.508	0.511	0.522	0.510	0.526	0.601

* denotes significance at the 5 per cent level. Figures in parentheses are standard errors.

Table 4. **Consistency of monetary conditions expectations**

Dependent variable	Forecast horizon (k)	γ_k	a_k	s.e.	Likelihood	Consistency LM test	
						for γ_k	for a_k
Mean							
$\mu_{t\|t+1}$	1	0.103	0.458	0.704	24.98	1.57	7.32*
		(0.218)	(0.088)				
$\mu_{t\|t+3}$	3	0.1001	0.215	0.538			
		(0.166)	(0.067)				
Moderate stances							
$\Phi^-_{t\|t+1}$	1	-3.158	0.113	0.556	13.44	24.94*	2.13
		(0.396)	(0.098)				
$\Phi^-_{t\|t+3}$	3	-3.498	0.038	0.499			
		(0.356)	(0.088)				
$\Phi^+_{t\|t+1}$	1	4.461	-0.151	0.821	14.51	4.84*	0.95
		(0.478)	(0.113)				
$\Phi^+_{t\|t+3}$	3	3.523	-0.059	0.528			
		(0.308)	(0.073)				
Extreme stances							
$\beta^-_{t\|t+1}$	1	-4.617	0.274	1.389	15.45	7.51*	3.08
		(0.806)	(0.100)				
$\beta^-_{t\|t+3}$	3	-5.124	0.096	1.228			
		(0.715)	(0.088)				
$\beta^+_{t\|t+1}$	1	6.658	0.041	1.567	12.44	20.68*	0.46
		(0.831)	(0.119)				
$\beta^+_{t\|t+3}$	3	6.105	0.020	1.239			
		(0.657)	(0.094)				

* Denotes significance at the 5 per cent level. Figures in parentheses are standard errors.

Table 5. **Symmetry tests of monetary conditions survey**

Independent variable	$\Phi^*_{t\|t}$	$\Phi^*_{t\|t+1}$	$\Phi^*_{t\|t+3}$	$\beta^*_{t\|t}$	$\beta^*_{t\|t+1}$	$\beta^*_{t\|t+3}$
Inflation	2.054	0.141	0.002	0.500	2.017	0.413
	(0.168)	(0.966)	(0.711)	(0.488)	(0.172)	(0.528)
M1	1.308	0.047	0.287	0.759	2.908	0.009
	(0.267)	(0.830)	(0.599)	(0.395)	(0.104)	(0.924)
M3	0.401	0.018	0.206	0.001	0.437	0.657
	(0.534)	(0.895)	(0.655)	(0.971)	(0.516)	(0.428)
Private credit household	0.553	0.409	0.111	1.054	4.361*	0.088
	(0.466)	(0.530)	(0.742)	(0.318)	(0.050)	(0.772)
US/NZ dollar	0.032	0.419	2.198	4.068	0.231	0.026
	(0.866)	(0.530)	(0.155)	(0.056)	(0.636)	(0.847)
30-day rate	0.091	0.095	0.060	0.018	0.001	0.000
	(0.766)	(0.761)	(0.807)	(0.895)	(0.973)	(0.988)
90-day rate	2.325	1.220	0.103	0.450	10.218*	1.562
	(0.148)	(0.280)	(0.751)	(0.509)	(0.004)	(0.224)
5-year rate	1.892	0.033	0.317	1.764	0.035	0.339
	(0.185)	(0.856)	(0.582)	(0.198)	(0.825)	(0.567)
Spread (5-year bond-90 day rate)	1.471	0.458	0.166	0.584	7.166*	0.693
	(0.237)	(0.508)	(0.687)	(0.452)	(0.813)	(0.413)
Real GDP growth	0.269	0.449	2.437	1.288	0.508	0.177
	(0.609)	(0.509)	(0.132)	(0.268)	(0.483)	(0.677)
Unemployment	1.580	0.007	0.044	0.595	2.053	0.332
	(0.224)	(0.934)	(0.835)	(0.450)	(0.168)	(0.571)

Notes: $x^*_{t|t+k} = x^+_{t|t+k} - |x^-_{t|t+k}|$ for k = (0, 1 and 3). The marginal degree of significance is given in parentheses.

Table 6. **Possible sources of monetary policy uncertainty**

Specific

SDRER	=	Standard deviation across annual growth rate in real exchange rate across five main trading partners (the United Kingdom, the United States, Japan, Germany, Australia).
SDRELQ	=	Standard deviation across nine major GDP production groups in annual GDP growth rate.
RSDR	=	Standard deviation across three interest rates -- 90 day, base lending, mortgage rate.
RSDMPG	=	Standard deviation across nine manufacturing sectors in annual change in real exchange rate.
RSDTWI	=	Standard deviation in quarterly change in nominal exchange rate across the five main trading partners.
SDRP	=	Standard deviation across five major CPI groups in annual inflation.

General

90 day	=	90 day interest rate.
5-year rate	=	5-year bond rate.
Inflation	=	CPI annual inflation.
MSDQ	=	4-quarter moving standard deviation in annual GDP growth.
MSDR	=	4-quarter moving standard deviation in 90 day interest rate.
MSDTWI	=	4-quarter moving standard deviation of quarterly changes in trade-weighted nominal exchange rate.
MSDP	=	4-quarter moving standard deviation in annual inflation rate.

Operating procedures for monetary policy

RBACT	=	Introduction of Reserve Bank Act 1989 (dummy variable: 0 prior to 1989:4, rest = 1).
TAR12	=	|Actual inflation -- RBNZ 12 month inflation forecast| (see Fischer and Orr, 1994).
TAR24	=	|Actual inflation -- RBNZ 24 month inflation forecast| (see Fischer and Orr, 1994).
ANN-CASH	=	Announcement variable for changes in the Cash target (dummy variable defined in Table 3).
ANN-P	=	Announcement variable for policy changes (dummy variable defined in Table 3).
ANN-CP	=	Announcement variable for conditional policy changes (dummy variable defined in Table 3.
PTA	=	Policy Targets Agreement (dummy variable 0 prior to 1991:1, rest = 1).

Table 7. **Baseline regressions of uncertainty of monetary conditions**

Dependent variable	Individual			Stacked		
	$\tau_{t\|t}$	$\tau_{t\|t+1}$	$\tau_{t\|t+3}$	$\tau_{t\|t}$ $\tau_{t\|t+1}$	$\tau_{t\|t+1}$ $\tau_{t\|t+3}$	$\tau_{t\|t}$ $\tau_{t\|t+1}$ $\tau_{t\|t+3}$
Constant	1.509*	1.939*	1.763*	1.472*	1.693*	1.320*
	(0.429)	(0.370)	(0.454)	(0.283)	(0.262)	(0.234)
Dummy 1				0.188		0.175
(first stacked variable)				(0.161)		(0.152)
Dummy 2					0.223*	0.198
(second stacked variable)					(0.107)	(0.149)
τ_{t-1}	0.178	0.1073	0.210	0.212*	0.177	0.264*
	(0.155)	(0.147)	(0.195)	(0.109)	(0.132)	(0.095)
$Inflation_{t-1}$	0.212*	0.116*	0.046*	0.156*	0.081*	0.113*
	(0.047)	(0.023)	(0.019)	(0.026)	(0.026)	(0.019)
s.e.	0.685	0.355	0.359	0.561	0.369	0.530
R^2	0.634	0.622	0.259	0.599	0.483	0.537
Number of observations	26	26	26	52	52	78
SER(1)	0.27	0.18	0.08	0.68	0.00	2.60
	[0.61]	[0.67]	[0.78]	[0.41]	[0.97]	[0.11]
SER(5)	1.60	0.05	0.06	1.29	0.21	1.34
	[0.21]	[0.99]	[0.99]	[0.28]	[0.95]	[0.25]
ARCH(1)	0.00	0.21	0.06	0.00	0.59	0.00
	[0.97]	[0.64]	[0.80]	[0.97]	[0.44]	[0.99]
ARCH(5)	1.56	1.51	0.44	4.77**	0.63	7.29**
	[0.24]	[0.25]	[0.81]	[0.00]	[0.67]	[0.00]
NORM(2)	3.16	2.25	1.09	20.93**	0.04	4.17
Het	1.50	0.46	0.65	2.02	1.14	3.11**
	[0.24]	[0.75]	[0.63]	[0.09]	[0.35	[0.01]
Omitted variables F-test						
Specific	3.27*	0.64	0.60	0.99	1.12	0.86
(significant var: rsdtwi/sdrp)	[0.03]	[0.69]	[0.72]	[0.44]	[0.13]	[0.51]
General	3.87**	1.36	0.93	0.95	1.71	0.80
(significant var: msdp/msdtwi)	[0.01]	[0.28]	[0.49]	[0.46]	[0.14]	[0.57]
Monetary policy	1.41	0.81	2.39	0.34	1.67	0.42
	[0.27]	[0.59]	[0.07]	[0.92]	[0.13]	[0.88]

* Denotes significance at the 5 per cent level. Values in parentheses are White's (1980) corrected standard errors for heteroscedasticity. **SER** is a F-test for first order serial correlation. **ARCH** is a F-test for first-order autocorrelated heteroscedasticity. **Het** is White's (1980) test for general heteroscedasticity. **NORM** is a Jarque-Bera (1980) test for normality distributed chi-square 2. Values in brackets are marginal level of significance.

Diagram 1. Perception distribution seven category survey

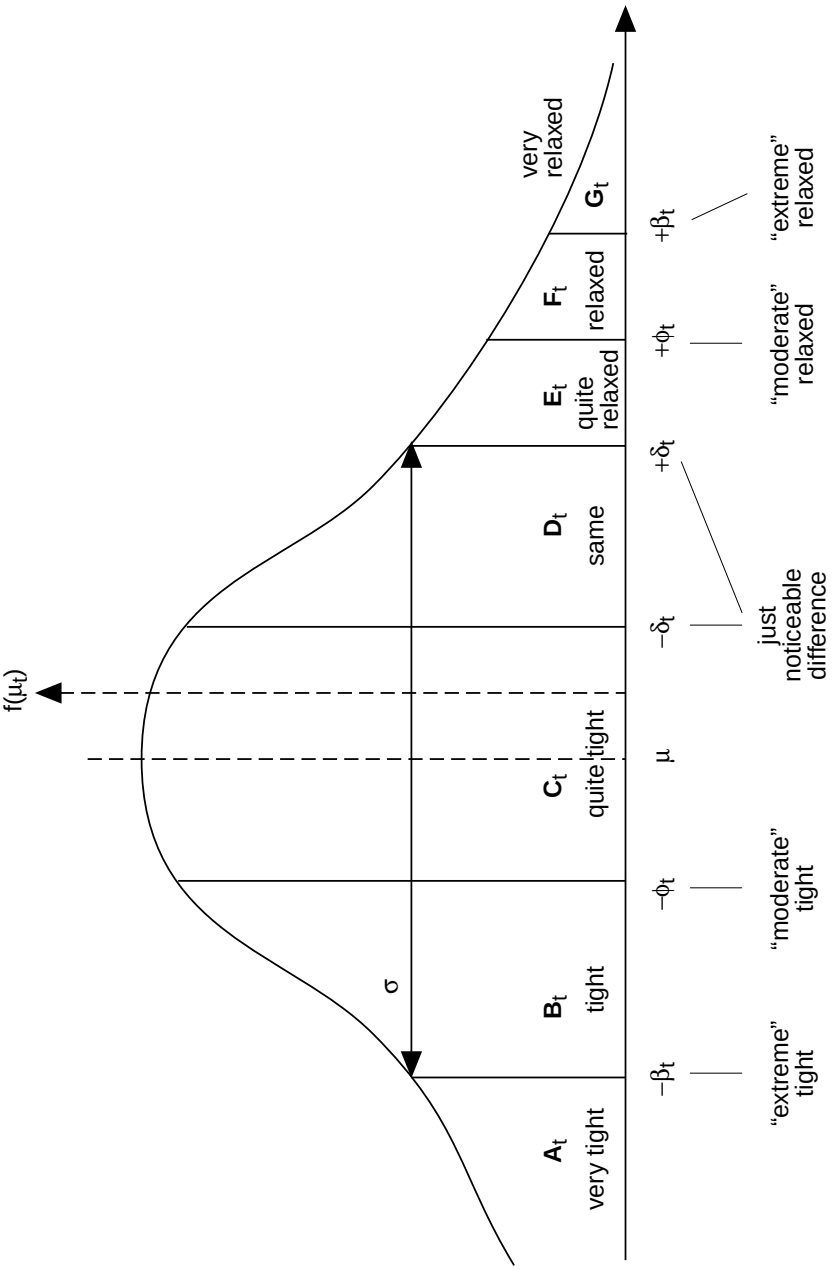


Diagram 2. MONETARY CONDITIONS: SURVEY MEANS

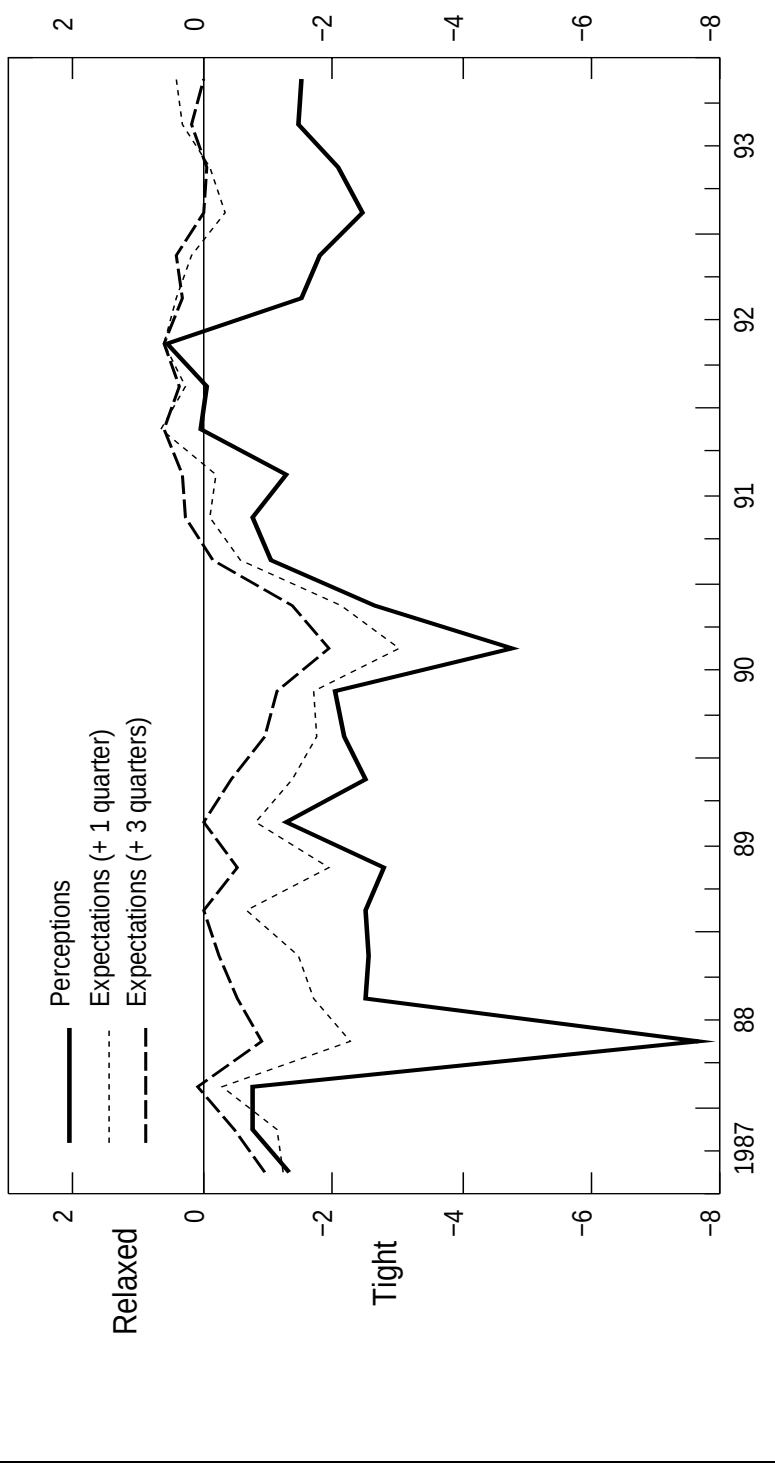
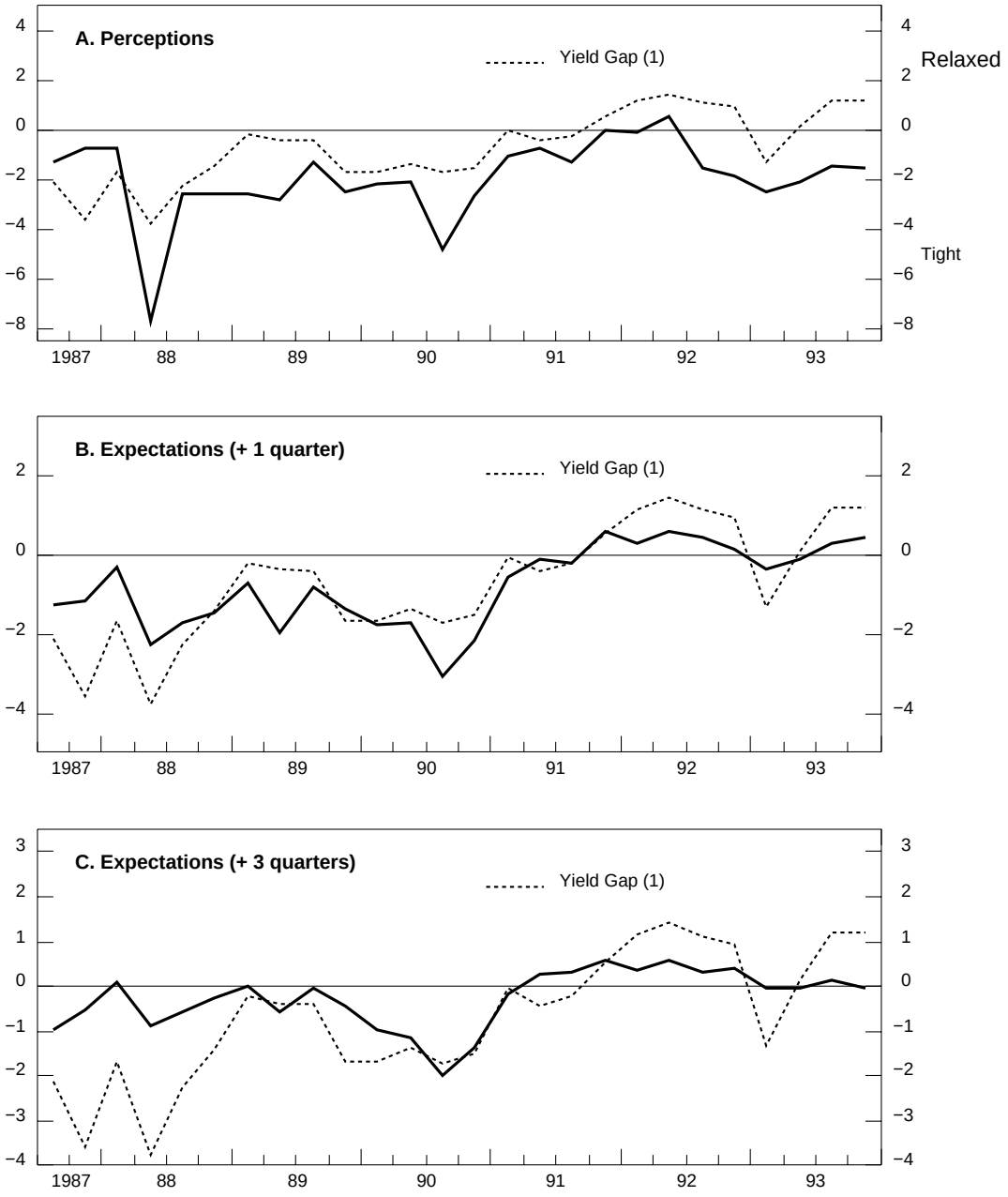


Diagram 3. MEAN MONETARY CONDITIONS, THE YIELD CURVE AND THE MONETARY CONDITIONS INDEX



1. Yield Gap = 5 year − 30 day interest rates.

Diagram 4. MEAN MONETARY CONDITIONS AND THE MONETARY CONDITIONS INDEX

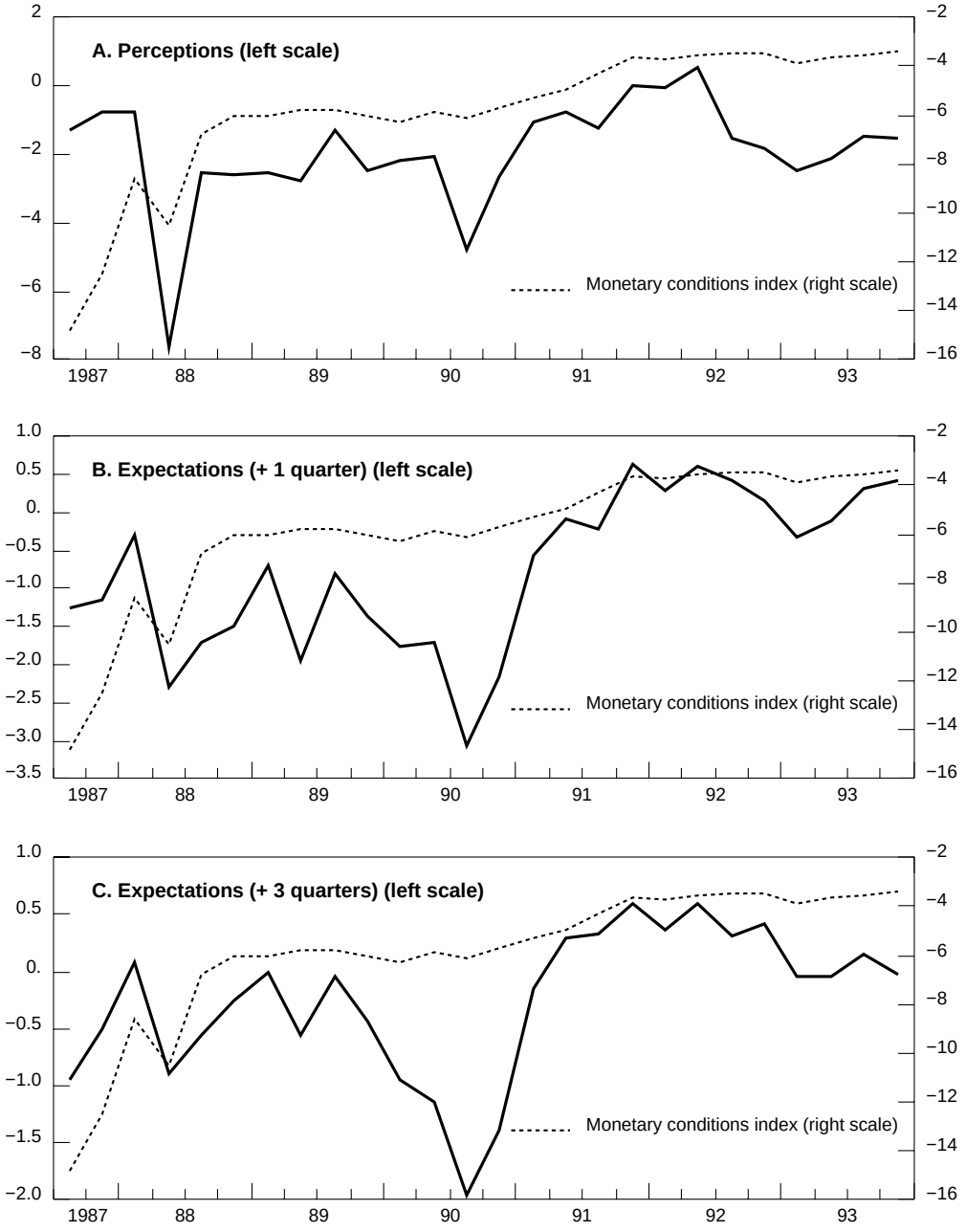


Diagram 5. MONETARY CONDITIONS: STANDARD DEVIATION

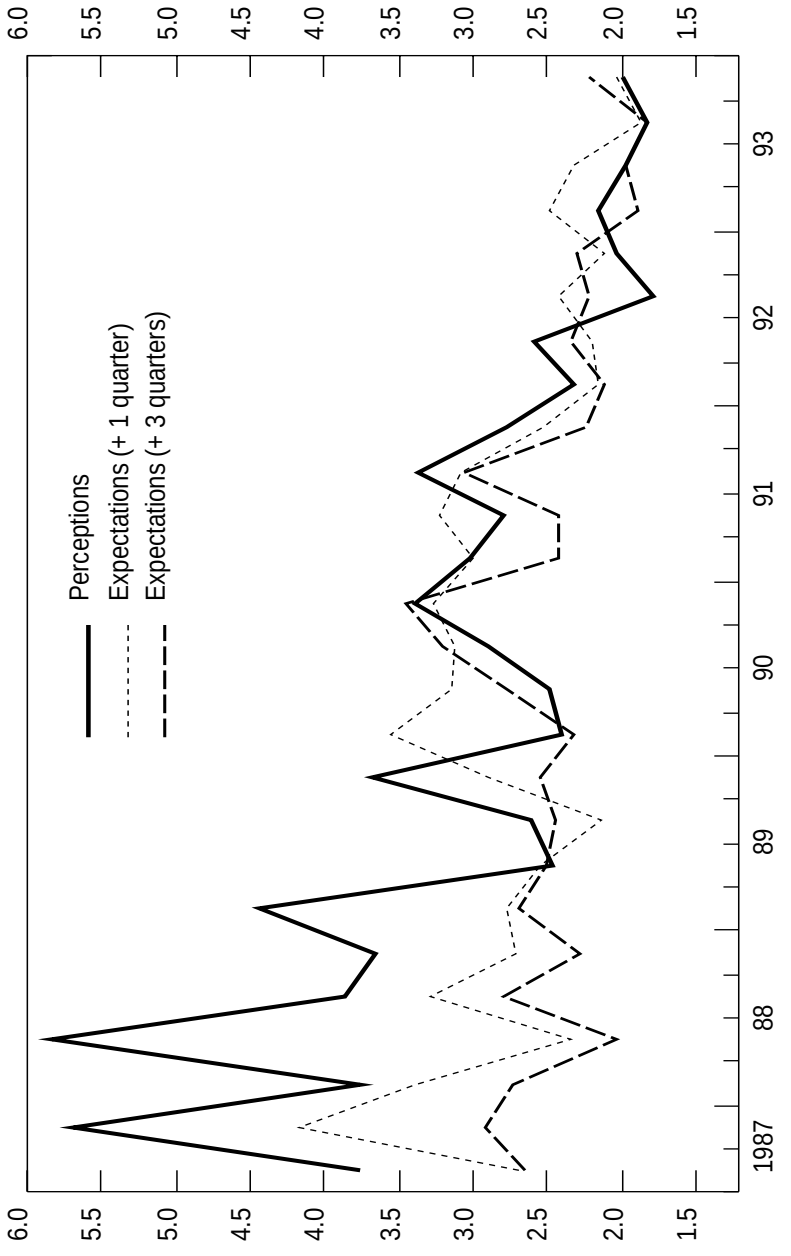
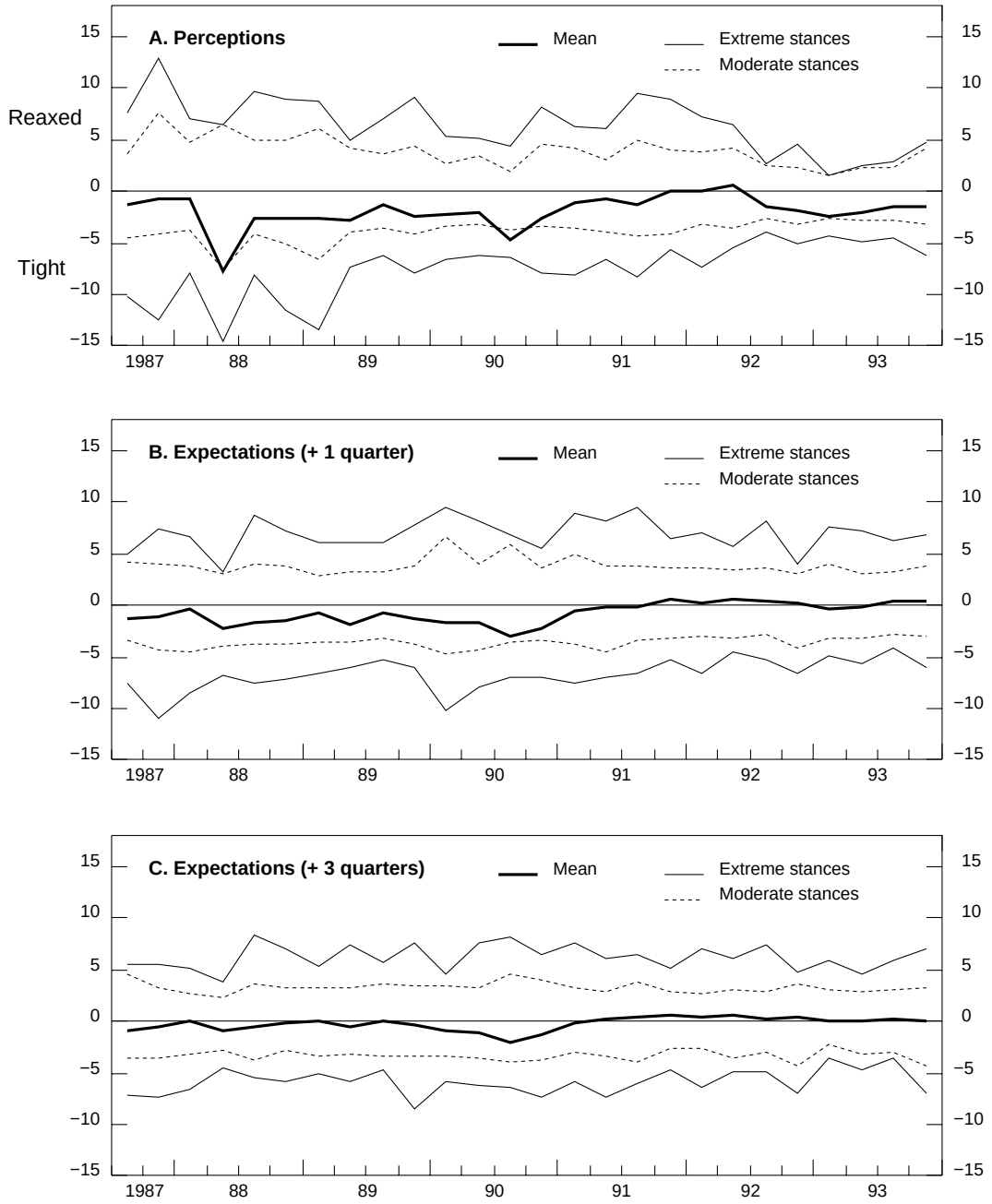


Diagram 6. SURVEY MODERATE AND EXTREME STANCES



BIBLIOGRAPHY

BALL, L. and N.G. MANKIW (1994) "Asymmetric Price Adjustment and Economic Fluctuations," *Economic Journal*, No. 104, pp. 247-261.

BATCHELOR, R.A. and A.B. ORR (1988) "Inflation Expectations Revisited," *Economica*, No. 55, pp. 317-31.

BOSCHEN, J.F. and L.O. MILLS (1993) "The Narrative Approach to Evaluating Monetary Policy: Consistency of Interpretation and the Relation to Monetary Activity," *mimeo*, Federal Reserve Bank of Richmond.

CARLSON, J.A. and M. PARKIN (1975) "Inflation Expectations," *Economica*, No. 42, pp. 123-38.

COOK, T. and T. HAHN (1988) "The Information Content of Discount Rate Announcements and their Effect on Market Interest Rates," *Journal of Money, Credit and Banking*, No. 20, pp. 167-180.

COVER, J.P. (1992) "Asymmetric Effects of Positive and Negative Money-Supply Shock," *The Quarterly Journal of Economics*, November, pp. 1261-82.

CUKIERMAN, A. and P. WACHTEL (1982) "Relative Price Variability and Nonuniform Inflationary Expectations," *Journal of Political Economy*, No. 90, pp. 146-57.

DELONG, J.B. and L.H. SUMMERS (1988) "How Does Macroeconomic Policy Affect Output?" *Brookings Papers on Economic Activity*, No. 2, pp. 433-94.

FREEDMAN, C. (1994) "The Use of Indicators and of the Monetary Conditions Index in Canada", Bank of Canada.

FROOT, K.A. and T. ITO (1989) "On the Consistency of Short-Run and Long-Run Exchange Rate Expectations," *Journal of International Money and Finance*, No. 8, pp. 487-510.

FISCHER, A.M. and A.B. ORR (1994) "Monetary Policy Credibility and Price Stability: The New Zealand Experience of Inflation Targeting," *OECD Economic Studies*, Spring.

GRIMES, A. and J. WONG (1992) "The Role of the Exchange Rate in New Zealand Monetary Policy," *Pacific Basin Working Paper Series*, No. PB93-03.

LEVI, M. and J. MAKIN (1980) "Inflationary Uncertainty and the Phillips Curve: Some Empirical Evidence," *American Economic Review*, No. 70, pp. 1022-27.

MORGAN, D.P. (1993) "Asymmetric Effects of Monetary Policy," Federal Reserve Bank of Kansas City, *Economic Review*, Second Quarter, pp. 21-33

NEWEY, W.K. and K.D. WEST (1987) "A Simple, Positive, Semi-Definite, Heteroscedasticity and Autocorrelation Consistent Covariance Matrix," *Econometrica*, No. 55, pp. 703-708.

OECD (1993) *OECD Economic Surveys, New Zealand*, Paris.

PESARAN, H. (1987) "The Limits to Rational Expectations," Oxford: Basil Blackwell.

ROMER, C.D. and D.H. ROMER (1989) "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," in O. J. Blanchard and S. Fischer, eds., *NBER Macroeconomics Annual*, pp. 121-80.

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