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Abstract

In this paper, we examine the relationship between market participants' perception of central bank predictability and their assessment of central bank communication skills and success in conveying objectives as well as the importance of transparency-enhancing measures, such as voting records, transcripts or minutes of policy meetings, and conditional interest rate projections. Our analysis is based on a unique dataset of almost 500 market participants worldwide who were asked questions with respect to the performance of the Bank of England, the Bank of Japan, the European Central Bank, and the Federal Reserve. Our results indicate a positive and economically notable relationship between central banks' ability to convey their objectives and their overall communication skills on the one hand, and market participants' perception of the banks' predictability on the other hand, for all four central banks. The dissemination of more specific information does not appear to contribute to better central bank predictability. This raises doubts about the widely-held notion that implementing ever more transparency-enhancing measures will improve central bank predictability.

Keywords: Central Bank, Communication, Financial Market Participants, Objectives, Predictability, Survey, Transparency.

JEL: E52, E58.

1. Introduction

About 20 years ago, there was near agreement among central bankers that markets should not be able to anticipate the actions of the central bank. Indeed, monetary policy was intentionally opaque. For example, in the United States prior to February 1994, market participants had to infer from observed changes in open market operations whether or not the Federal Reserve had changed its target rate (Poole, 2005). The main reason for opaqueness is that it makes it easier to surprise markets and allow for 'creative ambiguity' (Cukierman and Meltzer, 1986). Surprising markets was deemed desirable; unanticipated monetary policy actions were thought to be more effective than anticipated actions, because, among other things, they cause greater movement in market prices such as interest rates.

Nowadays, central bank opaqueness has been nearly completely replaced with transparency. Many central banks appear to be avoiding the creation of any monetary policy surprises at all. Underlying this change in monetary practice is the emergence of an academic literature emphasising the advantages of central bank transparency, which is thought to improve predictability and the anchoring of expectations (Geraats, 2002, 2009; Siklos, 2002). For instance, Woodford (2001) argues that a more predictable central bank will lead to a larger number of counterparties available to trade with the bank at a given and expected price. The consequence is that a smaller change in the market price will be required to absorb a given change in the supply of a particular instrument. Moreover, managing private-sector agents' expectations is thought to be especially important (Woodford, 2003).

From this perspective, the smaller number of monetary policy surprises or, put differently, the higher degree of predictability, can be interpreted as a consequence of central banks' efforts to increase their transparency since the mid-1990s (Dincer and Eichengreen, 2014). For instance, objectives and goals are specified and quantified, macroeconomic forecasts are published, interest rate decisions are announced and immediately explained, and some central banks provide indications of the likely course of monetary policy in the near future (Eijffinger and Geraats, 2006). In addition to these more formalised measures, central banks are also increasingly concerned with improving their informal communication with financial markets. Both a higher degree of transparency and frequent informal communications are believed to facilitate the conduct of monetary policy by anchoring inflation expectations and reducing private-

sector uncertainty over monetary policy. Indeed, several papers show that more formalised aspects of transparency (see, among many others, Demiralp, 2001; Lange et al., 2003; Swanson, 2006; Andersson and Hoffmann, 2009; Dincer and Eichengreen, 2014; Hayo and Mazhar, 2014) as well as informal communications (see, among many others, Heinemann and Ullrich, 2007; Jansen and de Haan, 2009; Hayo and Neuenkirch, 2010; Sturm and de Haan, 2011) increase central bank predictability.

Empirically, however, it is often difficult to discern exactly through which channels predictability is being improved, that is, the literature is not clear about which particular formal or informal aspect of transparency is primarily responsible for improved predictability. Put differently, the extant literature suffers from problems of identification arising from the fact that studies looking at formal aspects of transparency do not control for informal ones and vice versa. Thus, in spite of the evidence presented to date, it is arguably unclear which of the various measures proposed for enhancing central bank predictability are actually effective.

In this paper, we address this gap in the literature by examining the relationship between predictability and communication from a different angle. We asked financial market participants for their perceptions of the performance of four major central banks—the Bank of England (BoE), the Bank of Japan (BoJ), the European Central Bank (ECB), and the Federal Reserve (Fed)—and for their preferences about specific, transparency-enhancing measures (Geraats, 2009; Dincer and Eichengreen, 2014). Specifically, we assess how market participants view information dissemination by central banks in the form of conditional interest rate projections, individual voting records, minutes of policy meetings, and transcripts of policy meetings.

Our analysis is based on a unique dataset of 479 market participants from financial institutions located across the globe that was collected by Barclays in 2013 using an extensive questionnaire jointly developed with us.[1] Methodologically, we approach the question of the effectiveness of specific instruments designed to improve monetary policy transparency by studying how these instruments are viewed by financial market participants. The main advantage of our approach compared to the extant literature is that we can assess the effectiveness of specific transparency-enhancing measures while controlling for the influences of other measures. The main drawback is that we base our

[1] Other parts of the questionnaire are used as input for studies on (i) the special role of central bank communication during the financial crisis and (ii) how financial market participants process central bank news (see Hayo and Neuenkirch, 2015a, 2015b).

conclusions on market participants' expressed opinions rather than their actions. We believe that the survey evidence in this paper can improve our understanding of how and to what extent transparency and informal communication influence private actors' expectations and, therefore, the predictability of central bank actions. Based on these findings, we provide some policy guidance for assessing how central banks can or cannot improve their perceived predictability.

The rest of the paper is organised as follows. Section 2 describes the survey instrument that we employ for our analysis as well as important descriptive statistics. Section 3 discusses our econometric approach. Section 4 contains the empirical estimation results. Section 5 concludes.

2. The Survey

The survey of financial market participants was conducted by Barclays Europe between 17 April and 1 May 2013. All subscribers to Barclays's fixed income newsletter were invited via e-mail to participate in an online survey. Our sample consists of 479 completed questionnaires.[2] Respondents are from all over the world and work in a variety of positions, for instance, as analysts, traders, or portfolio managers (see Table A1 in the Appendix for more details). A general analysis of the survey data, targeted to Barclays's clients, can be found in Barclays (2013).

In the following, we introduce the subset of survey questions relevant for this paper and discuss some descriptive results.

Q1: How well do you think the BoE/BoJ/ECB/Fed performs on predictability?
Q2: How well do you think the BoE/BoJ/ECB/Fed performs on conveying their objectives?
Q3: Please rank your overall sense of how well the BoE/BoJ/ECB/Fed communicates with the financial markets.

[2] Note that throughout the survey, participants were allowed to answer 'don't know' or skip questions. In fact, 580 respondents did not complete the entire questionnaire, possibly due to time constraints. In light of this loss in the number of observations, we investigated the possibility of sample selection bias. However, based on the questions answered by both groups, we found no evidence of notable differences between those who completed the survey and those who did not.

Q4: In your opinion, how important is it for central banks to publish the following information?

a. Conditional interest rate projections.

b. Individual voting records.

c. Minutes of policy meeting.

d. Transcript of policy meeting.

Table 1 provides some descriptive statistics. We derive a central bank's rank (Q1–Q3) and the relative importance of different types of information (Q4) based on statistical mean-comparison t-tests with unequal variances. Table 1 shows that the Fed performs better than 'well' and achieves the best ranking across all three dimensions, that is, in terms of predictability, conveying its objectives, and communication skills. The other three banks follow behind by more than half a standard deviation and are perceived to perform only between 'well' and 'fairly well'. Within this group, the BoE ranks best, followed by the BoJ, and the ECB.

Respondents consider publication of policy meeting minutes to be the most important source of information. Much less important—almost a full standard deviation behind—are the other three measures. Thus, interest rate projections and publication of transcripts of policy meetings rank second and the release of voting records ranks last.

Reassuringly in terms of the internal consistency of the survey respondents' answers, the central bank considered best in terms of predictability (the Fed) has adopted all four of these transparency measures. In contrast, the ECB had adopted none of these measures at the time the survey was conducted (April 2013). It is worth noting that the ECB changed its communication policy in 2015 and now provides an 'account' of monetary policy meetings with a four- to six-week delay. The BoE and BoJ both publish minutes, voting records, and provide some indication of the policy path via forward guidance.

In light of the academic literature, it is surprising that market participants do not perceive individual voting records to be more important. Various studies show that (attributed) voting records are informative with respect to future interest rate policy (see, among many others, Gerlach-Kristen, 2004, 2009; Horvath et al., 2012; Horvath and Jonasova, 2015). Thus, either financial market participants are not aware of the results of these academic studies, which seems unlikely, or they can obtain similar or even superior information via other channels of communication. That minutes are

preferred over all three of the other measures suggests that our respondents are more interested in the general gist of the discussion rather than in the in-depth information provided by, for instance, transcripts. Put differently, there appears to be decreasing marginal utility in central bank transparency.

Table 1: Descriptive Statistics

	Mean	Std. Dev.	Rank
Q1: Predictability			
Bank of England	2.61	0.80	2
Bank of Japan	2.34	0.91	3
European Central Bank	2.43	0.91	3
Federal Reserve	3.08	0.76	1
Q2: Conveying Objectives			
Bank of England	2.66	0.82	2
Bank of Japan	2.68	0.94	2
European Central Bank	2.48	0.95	4
Federal Reserve	3.19	0.76	1
Q3: Communication in General			
Bank of England	6.77	1.59	2
Bank of Japan	6.35	1.85	3
European Central Bank	6.44	1.81	3
Federal Reserve	7.68	1.49	1
Q4: Special Types of Information			
Interest Rate Projections	3.84	0.98	2
Voting Records	3.69	1.00	4
Minutes	4.49	0.74	1
Transcripts	3.89	1.04	2

Notes: Coding of Q1 and Q2: 4 = extremely well, 3 = well, 2 = fairly well, 1 = not well. Coding of Q3: 10 = extremely well … 1 = extremely poor. Coding of Q4: 5 = essential, 4 = important, 3 = useful, 2 = not important, 1 = distracting. Rank is determined by mean-comparison t-tests with unequal variances at a 5 per cent level of significance.

3. Empirical Methodology

In our multivariate econometric analysis, we use ordered probit models to explain the relationship between financial market participants' evaluation of central bank predictability (Q1, pred) as the left-hand side variable, and central banks' perceived ability to convey their objectives (Q2, obj), financial market participants' overall perception of central bank communication (Q3, comm), and the relative importance of different types of information provided by central banks (Q4, transp) as right-hand side variables. Since Q1–Q3 were asked separately for the four central banks in our sample,

we employ a seemingly unrelated regression (SUR) framework to account for potential correlation among the error terms for respondent i across central banks. Hence, our general specification is as follows:

$$
\begin{aligned}
pred(BoE)_i^* &= \alpha_1 obj(BoE)_i + \beta_1 comm(BoE)_i + \gamma_1' transp_i + \delta_1' pos_i + \zeta_1' loc_i + \varepsilon_{1,i} \\
pred(BoJ)_i^* &= \alpha_2 obj(BoJ)_i + \beta_2 comm(BoJ)_i + \gamma_2' transp_i + \delta_2' pos_i + \zeta_2' loc_i + \varepsilon_{2,i} \\
pred(ECB)_i^* &= \alpha_3 obj(ECB)_i + \beta_3 comm(ECB)_i + \gamma_3' transp_i + \delta_3' pos_i + \zeta_3' loc_i + \varepsilon_{3,i} \\
pred(Fed)_i^* &= \alpha_4 obj(Fed)_i + \beta_4 comm(Fed)_i + \gamma_4' transp_i + \delta_4' pos_i + \zeta_4' loc_i + \varepsilon_{4,i}
\end{aligned}
\tag{1}
$$

$pred(.)_i^*$ are the latent continuous variables representing the ordinal choice for the perception of BoE/BoJ/ECB/Fed predictability by survey participant i. $\alpha_1, \dots, \alpha_4$ and $\beta_1, \dots, \beta_4$ are the coefficients for the explanatory variables $obj(.)_i$ and $pred(.)_i$. $\gamma_1', \dots, \gamma_4'$, $\delta_1', \dots, \delta_4'$, and $\zeta_1', \dots, \zeta_4'$ are vectors of coefficients for the explanatory variables $transp_i$ and for dummy variables representing the respondent's position pos_i and geographical location loc_i. The residuals $\varepsilon_{1,i}, \dots, \varepsilon_{4,i}$ are assumed to follow a standard normal distribution and allow for a nonzero contemporaneous correlation across the four equations. The ordered probit models are estimated by maximum likelihood.

Employing a SUR approach has two major advantages over estimating separate models for each central bank. First, SUR estimation takes into account our expectation that individuals' views about central bank predictability are not independently distributed across the four central banks. Second, a SUR setup allows directly comparing coefficients and implementing efficient statistical tests in the context of one nested model.

To avoid misinterpretation of our empirical analysis, we emphasise that we cannot exclude the possibility of a simultaneous relationship between the left-hand-side variables and some of the right-hand-side variables. Inasmuch as the regressors are endogenous, the estimated coefficients reflect conditional correlations rather than causal effects.

4. Explaining Central Bank Predictability

First, we evaluate the appropriateness of the SUR framework for estimating Equation (1). Table 2 shows the matrix of correlation coefficients of cross-equation residuals. All six correlation coefficients are significant at the 5 per cent level, indicating that

individuals' views about central bank predictability are not independently distributed across the four central banks. This finding underlines the importance of allowing for cross-equation correlations in the error terms when studying individuals' perceptions of central bank predictability.

Table 2: Explaining Predictability: Correlation of Residuals

	BoE	BoJ	ECB	Fed
BoE	**1**	**0.24**	**0.36**	**0.39**
		(0.07)	(0.07)	(0.06)
BoJ		**1**	**0.17**	**0.43**
			(0.06)	(0.06)
ECB			**1**	**0.35**
				(0.06)
Fed				**1**

Notes: Table shows correlation coefficients of the residuals across equations and their standard errors (in parentheses). Number of observations: 478. Huber (1967)/White (1980) robust standard errors are used. Correlation coefficients in bold are significant at the 5 per cent level.

Table 3 sets out the estimation results for Equation (1). Only two variables are significant at a 5 per cent level for all four central banks in the sample. First, we find a positive relationship between the assessment of central banks' ability to convey their objectives and their predictability. Second, the positive evaluation of central banks' communication skills also contributes to a positive appraisal of their predictability. The quantitative effects of communication are homogenous across all four central banks.[3] In the case of conveying objectives, however, there is some heterogeneity across central banks. First, the positive impact on predictability is significantly larger for the Fed compared to the BoJ and the ECB. Second, statistical testing reveals that financial market participants consider the BoE to be significantly better in terms of predictability than the BoJ.[4]

[3] Equality restriction for communication across all central banks: $Chi^2(3) = 1.1$, p-value: 0.78.

[4] Equality restrictions for conveying objectives across all central banks: $Chi^2(3) = 9.2$, p-value: 0.03; BoE vs. BoJ: $Chi^2(1) = 4.0$, p-value: 0.05; BoE vs. ECB: $Chi^2(1) = 0.8$, p-value: 0.39; BoE vs. Fed: $Chi^2(1) = 1.0$, p-value: 0.32; BoJ vs. ECB: $Chi^2(1) = 1.5$, p-value: 0.22; BoJ vs. Fed: $Chi^2(1) = 8.4$; p-value: 0.00; ECB vs. Fed: $Chi^2(1) = 3.8$, p-value: 0.05.

Table 3: Explaining Predictability

	BoE	BoJ	ECB	Fed
Conveying Objectives	**0.791**	**0.560**	**0.691**	**0.913**
	(0.100)	(0.086)	(0.076)	(0.095)
Communication	**0.206**	**0.256**	**0.212**	**0.212**
	(0.047)	(0.039)	(0.036)	(0.046)
Interest Rate Projections	–0.031	0.024	–0.082	**–0.127**
	(0.068)	(0.076)	(0.060)	(0.062)
Voting Records	0.036	0.004	0.027	0.045
	(0.063)	(0.073)	(0.061)	(0.058)
Minutes	–0.038	–0.135	0.133	–0.009
	(0.081)	(0.092)	(0.081)	(0.082)
Transcripts	0.003	0.079	–0.076	–0.011
	(0.056)	(0.060)	(0.056)	(0.062)
Position				
Analyst/Economist	–0.241	–0.177	0.057	**–0.582**
	(0.167)	(0.177)	(0.155)	(0.167)
Execution/Trading *(Reference)*				
Portfolio/Liability Manager	**–0.419**	**–0.405**	0.161	**–0.596**
	(0.185)	(0.188)	(0.170)	(0.187)
Other	–0.187	–0.075	0.071	**–0.410**
	(0.155)	(0.168)	(0.151)	(0.165)
Location				
Asia excl. Japan	–0.250	–0.256	0.149	**–0.563**
	(0.215)	(0.200)	(0.227)	(0.214)
Europe excl. UK *(Reference)*				
Japan	**–0.673**	**–0.644**	**–0.536**	**–0.985**
	(0.208)	(0.204)	(0.177)	(0.210)
North America	**–0.426**	**–0.481**	–0.175	**–0.351**
	(0.177)	(0.184)	(0.159)	(0.179)
United Kingdom	–0.331	–0.315	–0.053	**–0.493**
	(0.171)	(0.181)	(0.164)	(0.171)
Other	–0.012	–0.160	0.057	–0.216
	(0.266)	(0.274)	(0.251)	(0.229)
1st Cut Point	**0.955**	**1.365**	**1.867**	0.566
	(0.449)	(0.505)	(0.431)	(0.491)
2nd Cut Point	**2.583**	**2.738**	**3.258**	**2.205**
	(0.468)	(0.522)	(0.449)	(0.503)
3rd Cut Point	**4.408**	**4.084**	**4.727**	**4.010**
	(0.514)	(0.555)	(0.472)	(0.514)

Notes: Table shows coefficients and their standard errors (in parentheses) for ordered probit models allowing for correlation in the error terms across equations. Number of observations: 478. Coding of dependent variable: 1 = not well, 2 = fairly well, 3 = well, 4 = extremely well. Huber (1967)/White (1980) robust standard errors are used. Coefficients in bold are significant at the 5 per cent level.

We find no systematic relationship between the more specialised types of information (interest rate projections, voting records, minutes, and transcripts) and the predictability of central banks.[5] Given, first, that the Fed regularly engages in all four special forms of transparency and the ECB did not at the time of the survey and, second, the very favourable picture of the Fed and the unfavourable assessment of the ECB, one could have expected a positive relationship between some of these variables and the perceived level of predictability. However, it appears to be the general assessment of communication skills that explains perceived predictability of central banks rather than the dissemination of specific information. This raises serious concerns about the effectiveness of individual central bank transparency measures. Put differently, studies showing positive effects of such transparency measures may suffer from omitted variables biases, as they do not control for the influence of informal communication channels.

How participants perceive central bank predictability is significantly influenced by the positions they hold. Portfolio and liability managers have a less favourable rating of BoE, BoJ, and Fed predictability compared to the reference group of those working in execution and trading. In the case of the Fed, analysts and economists as well as 'other' participants also assess the bank's predictability as worse compared to the reference group. In addition, there are differences between participants based on geographical region. Japanese respondents consider the predictability of all four central banks to be worse compared to the ratings of the reference group, that is, respondents living in Europe (excl. the United Kingdom). A similar picture emerges for respondents from North America, who express a less favourable assessment of the BoE, BoJ, and Fed; respondents from Asia (excl. Japan) and the United Kingdom come to a similar conclusion for the Fed.

The estimated coefficients of ordered probit models are difficult to interpret, as they measure the influence of the explanatory variables on the latent variable $pred(.)_i^*$. Marginal effects, in contrast, measure changes in the probability of perceiving the central bank's predictability as 'not well'/'fairly well'/'well'/'extremely well' due to changes in the explanatory variable of interest, keeping all other explanatory variables at fixed values. Table 4 sets out average marginal effects for selected variables, which

[5] Exclusion restriction for interest rate projections across all central banks: $Chi^2(4) = 6.8$, p-value: 0.15; exclusion restriction for voting records: $Chi^2(4) = 0.8$, p-value: 0.94; exclusion restriction for minutes: $Chi^2(4) = 5.3$, p-value: 0.25; exclusion restriction for transcripts: $Chi^2(4) = 4.1$, p-value: 0.40.

are computed as the average of all marginal effects evaluated at each observation. That is, we keep all other explanatory variables at their fixed values for each observation while changing the variable of interest by one standard deviation (SD) (see Table 1).

Table 4: Explaining Predictability: Marginal Effects for Selected Variables

	Pr(Pred.=1)	Pr(Pred.=2)	Pr(Pred.=3)	Pr(Pred.=4)
Bank of England				
Conveying Objectives	**–0.069**	**–0.120**	**0.090**	**0.099**
	(0.011)	(0.013)	(0.012)	(0.013)
Communication	**–0.035**	**–0.061**	**0.046**	**0.050**
	(0.008)	(0.014)	(0.011)	(0.011)
Bank of Japan				
Conveying Objectives	**–0.110**	**–0.043**	**0.076**	**0.077**
	(0.016)	(0.008)	(0.011)	(0.012)
Communication	**–0.098**	**–0.038**	**0.068**	**0.069**
	(0.014)	(0.009)	(0.011)	(0.012)
European Central Bank				
Conveying Objectives	**–0.119**	**–0.077**	**0.094**	**0.102**
	(0.012)	(0.009)	(0.011)	(0.012)
Communication	**–0.069**	**–0.045**	**0.055**	**0.059**
	(0.012)	(0.008)	(0.010)	(0.011)
Federal Reserve				
Conveying Objectives	**–0.026**	**–0.110**	**–0.051**	**0.187**
	(0.005)	(0.011)	(0.011)	(0.017)
Communication	**–0.012**	**–0.050**	**–0.023**	**0.085**
	(0.003)	(0.012)	(0.006)	(0.018)

Notes: Table shows selected average marginal effects and their standard errors (in parentheses) for ordered probit models allowing for correlation in the error terms across equations. Number of observations: 478. Coding of dependent variable: 1 = not well, 2 = fairly well, 3 = well, 4 = extremely well. Huber (1967)/White (1980) robust standard errors are used. Marginal effects in bold are significant at the 5 per cent level.

To economise on space, we focus our interpretation on the change in probability of the extreme category 4 (extremely well). A one SD increase in perceived success in conveying objectives is associated with an increase in the likelihood of assessing the central bank's predictability as 'extremely well' by about 10 percentage points (pp) (BoE), 8 pp (BoJ), 10 pp (ECB), and 19 pp (Fed). We consider these magnitudes to indicate a notable positive economic effect of central banks' ability to convey their objectives on perceived predictability. Put differently, clearly specifying the central bank's objective makes it easier for financial markets to anticipate monetary policy actions. This linkage appears to be especially strong in the case of the Fed.

Moreover, a one SD increase in perceived communication skills also contributes to an increase in the probability of the central bank receiving the highest rating for predictability. In the case of the BoE (5 pp), the ECB (6 pp), and Fed (9 pp), the figures are roughly half as large compared to the ones for conveying objectives. In the case of the BoJ, the marginal effect (7 pp) for communication skills is almost the same size as the one for conveying objectives. Thus, the magnitude of the estimated effects is still economically relevant and suggests that general communication skills are associated with higher predictability. Again, this relationship is particularly pronounced in the case of the Fed, which is in line with evidence presented by Hayo and Neuenkirch (2010) on the predictive power of informal central bank communication for predicting interest rate changes.

5. Conclusions

In this paper, we examine the relationship between market participants' perception of central bank predictability on the one side, and their assessment of central bank communication skills and success in conveying objectives as well as the importance of transparency-enhancing measures, such as voting records, transcripts or minutes of policy meetings, and conditional interest rate projections on the other side. Our analysis is based on a unique dataset of 479 market participants worldwide who were asked questions about the performance of the Bank of England, the Bank of Japan, the European Central Bank, and the Federal Reserve.

For all four central banks in the sample, our results indicate a positive association between the assessment of central banks' ability to convey their objectives and their overall communication skills on the one hand and the perception of predictability on the other hand. We find not only significant statistical associations, but also effects of notable economic magnitude.

In contrast, the dissemination of specific types of information does not seem to contribute to better central bank predictability when controlling for informal communication. This suggests that the individual effects of these instruments in a world where informal communication channels are well developed are relatively unimportant. Moreover, the descriptive analysis of our data suggests that of all four transparency instruments, minutes are perceived as most important by financial market actors. Given that minutes contain much less information than other transparency measures, for

instance, transcripts, this suggests that central bank transparency may be characterised by substantial decreasing marginal utility. Thus, our findings raise doubts that the adoption of more and more instruments potentially fostering transparency is helpful for improving the financial market's ability to predict central bank actions. Thus, in contrast to much of the extant literature, our recommendation to central banks is that—from the perspective of financial market participants—a clearly defined monetary policy objective and a sound general communication strategy are more important than the dissemination of very specific and detailed information.

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Appendix

Table A1: Distribution of Respondents

Location		**Position**	
Asia excl. Japan	42	Analyst/Economist	141
Europe excl. UK	98	Execution/Trading	86
Japan	69	Portfolio/Liability Manager	103
North America	112	Other	149
United Kingdom	119		
Other	39		
Sum	479	Sum	479