Were verbal efforts to support the euro effective?

A high-frequency analysis of ECB statements

David-Jan Jansen[a,*], Jakob de Haan[b,c]

[a] *De Nederlandsche Bank, Research Division, P.O. Box 98,*
1000 AB Amsterdam, The Netherlands
[b] *Department of Economics, University of Groningen, The Netherlands*
[c] *CESifo, Munich, Germany*

Abstract

Using high-frequency euro-dollar exchange rates, we examine the effects of efforts by European central bankers to verbally support the euro. Based on a direction, a smoothing and a volatility criterion, we find little evidence that ECB verbal interventions were effective. The most important determinant of effectiveness is whether or not the verbal intervention is captured in the news report headline. Verbal interventions that coincide with releases of macroeconomic data are followed by lower exchange rate volatility. There is no difference in the effects of comments by ECB Executive Board members and NCB presidents.

*Corresponding author. Tel.: +31 20 524 3170, fax: +31 20 524 2529. E-mail address: d.jansen@dnb.nl (D. Jansen).

1 Introduction

To what extent can central bankers influence financial markets through policy statements? This issue has recently received increasing attention in the literature (see Kohn and Sack (2003), Ehrmann and Fratzscher (2004) or Rosa and Verga (2005)). One important issue is the effect of verbal efforts by central bankers to influence the external value of the currency. Can central bankers influence the exchange rate by indicating, for instance, that a currency has potential to appreciate? Similarly, can they calm markets during times of high volatility?

Recent papers on this issue come to different conclusions. Fratzscher (2004) concludes that verbal interventions can influence both the level and volatility of the exchange rate. Likewise, Beine, Janssen and Lecourt (2004) provide evidence that explanatory comments by central bankers during periods with exchange rate interventions are effective. However, Jansen and De Haan (2005) find that efforts by the European Central Bank (ECB) to talk up the euro against the dollar only had effects on volatility, without influencing the level of the exchange rate.

This paper studies the effects of verbal interventions by European central bankers during the first years of the European Economic and Monetary Union (EMU). In this period, the euro sharply depreciated against the US dollar. This worried European central bankers for two reasons. Firstly, the exchange rate was increasingly considered to be out of line with fundamentals. Secondly, there was an increasing worry that the weaker euro would lead to higher inflation in the euro area. Therefore, European central bankers were interested in a stronger euro and, as we will show, frequently stated that the euro was undervalued and was likely to appreciate. In other words, these statements were intended to 'talk up' the euro against the dollar. This paper tests to what extent these verbal interventions had an effect on the level and volatility of the euro-dollar exchange rate.

2

We extend the literature in two directions. Firstly, in contrast to previous studies, we use high-frequency exchange rate data to study the effectiveness of verbal interventions. Secondly, we consider whether releases of euro area macroeconomic data, the structure of ECB communication, and the way in which the verbal intervention is reported influence the effectiveness of verbal interventions.

We use statements by European central bankers as reported by the Bloomberg news service. We analyse 146 instances in which policy makers, both ECB Executive Board members and presidents of national central banks (NCBs), stress the likelihood of an appreciation of the euro against the dollar for the period January 1999 to mid-May 2002. We study the effects of these statements on 5-minute exchange rate data. Following Fatum and Hutchison (2003), we use an event-study approach based on the non-parametric sign test to examine the effectiveness of verbal interventions. We use three criteria: the direction, the smoothing, and the volatility criterion. The first criterion measures whether verbal interventions led to an appreciation of the euro, whereas the second measures whether verbal interventions managed to slow down the depreciation of the euro. The third criterion measures whether exchange rate volatility was lower after verbal interventions.

We find that the effects of verbal interventions are small and short-lived. The most important determinant of effectiveness is whether or not the verbal intervention is captured in the news report headline. Verbal interventions that coincide with releases of macroeconomic data are less effective in changing the direction of the exchange rate, but do lead to lower exchange rate volatility. There is no clear evidence that statements by Executive Board members were more effective than statements by NCB presidents.

The remainder of this paper is structured as follows. Section 2 discusses why and under what conditions verbal interventions may be effective. Section 3 discusses our methodology

and the data used, while section 4 gives the results. Finally, section 5 offers our conclusions.

2   Money versus mouth in currency interventions

Central banks have, over the course of many years, spent an impressive amount of financial resources on official exchange rate interventions. Whether or not interventions are successful continues to be a matter of debate (see Sarno and Taylor (2001) for a survey). As an alternative to official intervention, central bankers may revert to a less risky strategy by attempting to steer exchange rate movements through communication[1]. This strategy of verbal intervention, or talking up/down the currency, is aimed at influencing the level and/or the volatility of exchange rates.

The potential usefulness of this strategy may best be understood by the so-called *signalling* channel, first discussed by Mussa (1981), which is often used to explain the effectiveness of official exchange rate interventions. According to this view, exchange rate interventions provide currency markets with new information about future monetary policy. As a result, agents adjust their expectations and thereby the exchange rate (see Sarno and Taylor (2002), pp. 226-230). Likewise, verbal interventions may affect expectations. Through comments on the future exchange rate, central bankers may give signals about future policy intentions. Similar to official exchange rate interventions, the effectiveness of verbal interventions is determined by the extent to which financial markets perceive the signal as credible.

In general, central banks do not intervene in currency markets on a regular basis. Verbal interventions are more common. In recent years, verbal interventions have been heavily used by the Bank of Japan (see Chiu (2003) for a discussion). Similarly, during the first years of

---

[1]This is not to say that official interventions can never be profitable. See, for example, Ito (2003).

EMU, European central bankers asserted, time and again, that the euro was a strong currency with sufficient potential to appreciate against the dollar. Table 1 lists some examples from our dataset. The first column reports the timing of the verbal intervention, the second and third column give the content and the headline of the news report, respectively. The final column shows the exchange rate return in the interval following the verbal intervention.

(Table 1 here)

This paper extends the literature by focusing on high-frequency exchange rate reactions to verbal interventions. As far as we know, this study is the first to analyse the effects of this type of ECB statements on exchange rates using intra-day data. We first analyse whether verbal interventions have any effect on the level and volatility of the euro-dollar exchange rate. Then, we study whether verbal interventions are more effective under some conditions than others. Firstly, we take the release of new macroeconomic data into account. There is a long list of papers studying the adjustment of exchange rates to macroeconomic news showing that releases of macro news may have an important effect on exchanges rates in the very short run[2]. Therefore, it is necessary to control for the influence that macroeconomic news may have on our results. There is, however, a second reason: Dominguez (2003) provides evidence that official exchange rate interventions may be more effective when they are closely timed to macroeconomic data releases. This raises the question of whether a similar conclusion holds for verbal interventions. This may imply that verbal interventions may function as a coordinating mechanism which currency traders use to interpret macro

---

[2] Frenkel (1981) is one of the earliest papers. More recent papers are Almeida, Goodhart and Payne (1998), Andersen, Bollerslev, Diebold and Vega (2003), Evans and Lyons (2003) and Bauwens, Ben Omrane and Giot (2005).

news.

Secondly, we consider whether the content of central bank communication makes a difference. We examine whether our conclusions depend on: i) whether or not verbal interventions are made in conjunction with other policy comments, ii) whether or not there are more verbal interventions on the same trading-day and iii) the central banker who makes the statement. In many cases, verbal interventions are made in conjunction with other comments on monetary policy. For example, the central banker expresses his opinion on economic growth with an accompanying implication for the exchange rate. The issue is then which piece of information is considered to be more important and whether the different pieces of information are considered to be consistent. In addition, in some cases, there is more than one verbal intervention on the same trading day. It is more likely that traders will read about the verbal intervention in this case. Furthermore, the person making the statement may be of importance. A statement by the ECB president is more likely to attract attention than a comment by the president of one of the smaller NCBs, for example. We study the possible different effects of verbal interventions by ECB Executive Board members and NCB presidents.

Finally, we consider the manner in which Bloomberg reports on the verbal intervention. It may matter whether or not the verbal intervention is mentioned in the news report headline. If not, the verbal intervention may not be noted by a currency dealer who merely scans the news headlines. Furthermore, sometimes verbal interventions by European central bankers are reported during New York, Tokio or Singapore trading hours. Traders in these locations may be less familiar with communication by European central bankers. Therefore, we pay special attention to interventions made during European trading, which we define broadly as between 8:00 and 18:00 CET.

3   Data and methodology

We conducted a search of the Bloomberg news service for reports on verbal interventions by European central bankers. We have searched the archive of news reports by scanning the report headlines. When the headline contained a reference to the ECB or an European central banker, we read the underlying news report to determine whether it contained a positive comment on the euro[3]. We focus on members of the ECB Executive Board and presidents of national central banks. The sample period is 4 January 1999 to 17 May 2002. In total, we find 203 instances of verbal interventions. We exclude, however, verbal interventions on days with Governing Council (GC) meetings and official exchange rate interventions[4]. Additionally, we exclude verbal interventions made during the weekend. In the end, our sample consists of 146 verbal interventions, made during 127 trading days. All these statements contain positive views on the euro.

Table 2 shows a classification of the verbal interventions. Interestingly, the majority of the 146 instances of verbal interventions were made by national central bankers (80). Furthermore, most of the verbal interventions were *not* mentioned in the news report headlines: only 67 of the 146 interventions made headlines.

(Table 2 here)

As may be expected, a large portion of the statements (96) were made during European

---

[3]The news reports varied in content. Some contained only loose sentences, whereas others contained complete reports.

[4]GC meetings and interventions are discussed in Sager and Taylor (2004) and Frenkel, Pierdzioch and Stadtmann (2001), respectively. See also Jansen and De Haan (2006) for an analysis of ECB communication during the first years of EMU.

trading. In total, 49 of the verbal interventions occurred on days with releases of macroeconomic data. In a few cases, there was more than one verbal intervention per day. Finally, it is noteworthy that in most cases, the verbal intervention was made in conjunction with other monetary policy comments.

Currency markets are two-way markets. So, if we consider comments by European central bankers, it would be logical to take into account whether or not US officials made any policy comments on the days in the sample. Therefore, we searched Bloomberg whether there were any comments from US officials on each day in the sample and each preceding day. We both searched for comments on the position of the dollar and comments on US monetary policy. As discussed in Fratzscher (2004), most comments from US policymakers on the dollar were made by the US Treasury and *not* by the Federal Reserve. Over the period January 1999 to May 2002, we found many instances in which Treasury officials, like Lawrence Summers or Paul O'Neill, stated the US preference for a strong dollar. However, only 4 of these comments were made on days on which also European central bankers talked about *their* preference for a strong euro. We did not find any comments by the Federal Reserve on the US dollar on the days in our sample. However, we did find 5 instances in which comments by Federal Reserve chairman Alan Greenspan coincided with European verbal interventions. Finally, we also found that on 7 days with European verbal interventions, the Federal Reserve Federal Open Market Committe (FOMC) met and/or decided to change the target for the Federal funds rate.

We use 5-minute exchange rate data, provided by Olsen Financial Technologies. The exchange rate data consists of linearly interpolated bid and ask quotes for the euro-dollar exchange rate, denoted in dollars per euro. These quotes are not the actual prices at which trades were conducted, but represent the quotes at which foreign exchange dealers were

willing to buy or sell currency. First, we calculate mid-prices by taking averages of the bid and ask prices. Then, we transform the exchange rate series to percentage returns, by calculating the first difference of the natural logarithm of the mid-price series.

We gathered data on the timing of macroeconomic announcements using an ESCB release calender. Table 3 gives an overview of the types of macroeconomic announcements that we take up in the analysis. Most of the euro area data is released by Eurostat, the exception being the Purchasing Managers Index which is released by NTC/Reuters. In most cases, the releases occurred at noon CET.

(Table 3 here)

We are interested in explaining the effects of one particular type of news on high-frequency exchange rate movements. Given that the number of verbal interventions (146) is small compared to the number of observations for the euro-dollar series on days with verbal interventions ($>$ 36,000), we limit our attention to very short and specific time frames. We do not estimate a time series model to explain the entire path of the exchange rate (as in, for example, Andersen et al. (2003)). Instead, we rely on a pure event study methodology. Using this methodology, we are able to evaluate exchange rate movements surrounding verbal interventions in a well-specified manner, whilst abstracting from noise caused by other events as well as intra-daily volatility patterns[5].

We focus on the behavior of the euro-dollar exchange rate in the period starting three hours before the verbal intervention and ending three hours after the verbal intervention. We study the behavior of cumulative exchange rate returns for each consecutive five-minute interval. In other words, we consider 5-minute returns, 10-minute returns, 15-minute returns

---

[5]See MacKinlay (1997) for an extensive survey of the event study methodology.

and so forth. We follow Fatum and Hutchison (2003), who use the non-parametric sign test to evaluate the effectiveness of official exchange rate interventions. We also follow Fatum and Hutchison (2003) in using the direction criterion and the smoothing criterion to evaluate the effectiveness of verbal interventions. In addition, we use a volatility criterion, as verbal interventions may also aim at calming turbulent currency markets[6].

The direction criterion measures the success of a verbal intervention by looking at the sign of exchange rate returns. During the sample period, ECB verbal interventions were intended to talk up the euro against the dollar[7]. Therefore, a verbal intervention is considered successful if it leads to an appreciation of the euro against the dollar. So, the direction criterion defines a successful verbal intervention as:

$$VI_t = 1 \quad \rightarrow \quad \Delta S_{t+i} > 0 \tag{1}$$

where VI_t denotes the occurrence of a verbal intervention, ΔS denotes the exchange rate return and $i = [1,36]$ denotes the 5-minute intervals over which we evaluate the change in the exchange rate[8]. Now, assume that the chance of a positive exchange rate return is equal to p. Let OCC denote the number of verbal interventions and $SUCC$ be the number of observations with a positive exchange rate return. The sign test uses p, OCC and $SUCC$ to calculate a level of significance, based on the binomial distribution. To give an example, suppose that we observe 100 occurrences of verbal interventions. Suppose that

---

[6]The use of the volatility criterion also has a methodological advantage: our classification of ECB statements is subjective. This might mean that some of the statements we classify as positive may in fact be neutral or negative. By looking at squared returns, all statements are treated equal. See Kohn and Sack (2003) for a related approach.

[7]During the sample period, less than 5 % of ECB statements on the euro were *not* explicitly positive in nature. We do not consider these in the analysis.

[8]We use dollars per euro exchange rates, so an exchange rate return larger (smaller) than zero denotes an appreciation (depreciation) of the euro against the US dollar.

58 interventions were followed by a positive exchange rate return in the 5-minute time period following the verbal intervention. The sign test shows that the probability of observing 58 successes or more is equal to 0.07, assuming that $p = 0.5$. So, in this case, the conclusion is that the verbal interventions are indeed effective.

The smoothing criterion is defined in a similar way as the direction criterion. However, in a way, it is less strict. Under the smoothing criterion, success is defined as follows:

$$VI_t = 1 \quad \rightarrow \quad \Delta S_{t+i} > 0 \ \ or \ \ \Delta S_{t+i} > \Delta S_{t-i} \tag{2}$$

So, under this criterion, a successful verbal intervention is one which leads to positive exchange rate returns *or* higher exchange rate returns than in the previous interval.

Volatility may be measured in different ways. We use a straightforward approach by focusing on squared returns. Under the volatility criterion, we define success as follows:

$$VI_t = 1 \quad \rightarrow \quad (\Delta S_{t-i})^2 > (\Delta S_{t+i})^2 \tag{3}$$

So, under this criterion, a successful verbal intervention is one which is followed by lower exchange rate volatility.

As the sign test is a non-parametric test, we do not have to pay attention to the distribution of the exchange rate returns. However, the conclusion will, of course, depend upon our choice of p. A natural choice is to base p on the observed probabilities of the events defined under the three criteria. So, for the direction criterion, we calculated the fraction of five-minute intervals with positive returns on all days between January 1999 and June 2002. This fraction was equal to 48.1 %, which leads us to choose p equal to 0.48 for the direction criterion. Secondly, for the smoothing criterion, we calculated the frequency of smoothing occurring, which was equal to 72.2 %. So, for the smoothing criterion we set p equal to 0.72. Finally, for the volatility criterion we set p equal to 0.50[9].

---

[9]Per year, the probabilities for the three criteria were as follows: 45.3 %, 70.0 % and 49.1 % (1999),

4 Results

Figure 1 summarizes the full sample results for the direction criterion. We focus on the time period between three hours before and three hours after the verbal intervention. For every five-minute point in this time frame, figure 1 plots the fraction of success according to the direction criterion, being equal to $SUCC/OCC$ (the solid line) and the associated p-value (the dotted line). Starting with the interval after (before) the one during which the verbal intervention was reported by Bloomberg, we keep adding (backwards) 5-minute returns in order to calculate returns over the respective period. For example, we observe 66 positive exchange rate returns in the 15-minute interval after the verbal interventions. The associated p-value is equal to 0.73.

(Figure 1 here)

Figure 1 shows that there is very little evidence that verbal interventions have been successful. The only time-frame during which we observe a significant number of positive exchange rate returns starts 10 minutes *before* the intervention (p=0.02). After the verbal intervention is reported in Bloomberg, there is no clear reaction in the euro-dollar rate. In fact, in most time frames considered, the majority of exchange rate returns are negative.

Figure 1 shows that most of the exchange rate reaction is in the hour *prior* to the Bloomberg report. What may explain this result? It is noteworthy that Dominguez (2003) finds similar evidence for official exchange rate interventions. However, in that case there are actual trades through which market participants can detect that central banks are in-

---

48.9 %, 73.2 % and 50.1 % (2000), 49.0 %, 73.2 % and 50.1 % (2001) and 48.3 %, 72.2 % and 50.0 % (2002, until June). The fact that we round off p does not influence the results.

tervening. For verbal interventions this is, naturally, not the case. We see two possible explanations for the timing of the effect. Firstly, a fraction of market participants may have information on central bank statements prior to the news-wires reports. This private information may then influence the exchange rate through the order flow channel[10]. It is by no means clear, however, how agents would obtain this prior information on the statements. Alternatively, traders may expect that ECB officials are going to make comments. They may even guess to some extent what the content of the statement is going to be. Therefore, they could take up either speculative positions or settle risky positions before the comments are made. This would then result in most of the reaction occurring *before* the news report appearing on Bloomberg (see Bauwens et al. (2005) for related evidence).

Having said all this, the main result emerging from figure 1 is that ECB verbal interventions during the first years of EMU did not have major effects on the euro-dollar exchange rate. Firstly, the effects appear to be limited in scale. When the success fraction is at its maximum, the number of *un*successful verbal interventions is still larger than 40 %. Secondly, effects are visible during a comparatively short time frame. After 15 minutes, the success fraction drops below 0.50. Although the timing of the adjustment remains puzzling, we conclude verbal interventions were not regarded as very informative by currency dealers. This raises doubts as to whether the ECB should have persevered in following this strategy[11].

This conclusion is reinforced by the results based on the smoothing and the volatility

---

[10]Order flow is the difference between buyer-initiated and seller-initiated orders for a currency. Evans and Lyons (2002) show that models incorporating order flow can explain a far larger portion of the variation in nominal exchange rates than standard macro models. Through order flow, private information is revealed to other market participants.

[11]Of course, the issue of accountability should not be forgotten here. The public is likely to expect some kind of explanatory remark from the central bank when the currency is continuously depreciating.

criterion as shown in figures 2 and 3. Once again, we report the success fraction (solid line) and the associated p-values (dotted line). As both criteria compare returns before and after the verbal intervention, we can only report results for the time period after the verbal intervention.

(Figure 2 here)

The message from figure 2 is clear: there is no evidence that ECB verbal interventions have been able to slow down the decline of the euro against the dollar. In the 25 minutes following the news report, the success fraction lies below 0.60. Starting from thirty minutes after the interventions, it rises to a level of close to 0.65. However, given that p equals 0.72, the number of successes is never significant. In the time period until 3 hours after the verbal intervention, the success fraction continues to vary around the level of 0.60. Therefore, there is no evidence that ECB verbal interventions have been able to break the downward trend in the euro-dollar exchange rate[12].

Figure 3 also has a clear message: there is no evidence that ECB verbal interventions were successful in lowering exchange rate volatility. The success fraction fluctuates starting just above a level of 0.40 before rising to a level of almost 0.55. Then it falls to a level around 0.35, before rising again to a level around 0.50. At no point in time is the number of successes significantly high.

(Figure 3 here)

---

[12]Note that the number of *failures* is significantly high. This may be interpreted as a sign of reverse causality: ECB verbal interventions are made on days when the euro is continuously falling against the dollar.

To what extent are the full sample results driven by the factors identified in section 2? To analyse this, we construct seven sub-samples using only those observations related to the special factors. Based on the direction criterion, figure 4 reports the associated success fractions per category. As most of the differences appear in the 90 minutes after the verbal intervention, we focus our discussion on this particular time frame. The top panel shows results for headlines, macroeconomic data releases and other verbal interventions. The middle panel shows results for EB members and NCB presidents. The bottom panel shows results for the remaining categories. All panels show full sample results as a benchmark.

(Figure 4 here)

Firstly, verbal interventions reported in the headline have a higher success fraction than average (see figure 4, top panel). This effect is also significant. It is visible for the first time 25 minutes after the news report (p= 0.096) and it continues to be visible after 90 minutes, when most differences between the other categories have disappeared (p= 0.03). After about 2 hours, the success fraction of verbal interventions reported in the headline reverts to the full sample level (not shown in the figure). This result is very intuitive, but it remains to be seen how one can use it from a policy perspective, given that central bankers do not determine the content of Bloomberg headlines.

Figure 4 further suggests that verbal interventions are less effective when they coincide with releases of macroeconomic data (top panel). Interventions on days with data releases have a lower fraction of success. So, in contrast to official exchange rate interventions(Dominguez (2003)), timing statements closely to data releases does not increase their

15

effectiveness. The verbal interventions may in this case be too weak to be picked up by currency traders.

Does the structure of central bank communication have an influence on the effects of verbal interventions? Firstly, figure 4 (top panel) indicates that interventions with more than one verbal intervention per trading day are not very successful. The success fraction is only between 35 and 40 % in the hour after the verbal intervention. Secondly, there are only small differences between statements by the ECB Executive Board and NCB presidents (middle panel). Initially, at the five-minute point before the news report, interventions by Executive Board members have a higher success fraction than the full sample average, whereas interventions by national central bank presidents have a lower rate of success. Moreover, the interventions by Executive Board members are significant (p= 0.04), whereas those by national central bankers are not. However, after this point in time, the differences disappear. There is no evidence that after the news report has been published on Bloomberg, the verbal interventions by the two groups have been effective. Thirdly, whether or not the verbal intervention is accompanied by comments on other policy issues does not change the full sample conclusions. Figure 4 (bottom panel) shows that in both cases the success fractions follow similar paths.

Finally, are interventions during European trading hours more likely to be noticed? The evidence is mixed (figure 4, bottom panel). For the 5-minute interval in which the verbal intervention is reported, the full sample success fraction is higher than the success fraction during European trading hours. However, in the five-minute interval following the verbal intervention, the success fraction is higher. Moreover, it is highly significant (p= 0.03) contrary to the full sample case (p = 0.13). However, thereafter the differences disappear. All in all, we conclude that there is no convincing evidence that non-European traders

16

interpret European statements differently than European traders.

We repeat the analysis per category for the smoothing criterion. Given the results in figure 2, we expect similar patterns across the six categories. Indeed, this is what we find[13]. The only new result that emerges concerns verbal interventions that are reported in Bloomberg headlines. In this case, no longer do we observe a significantly low number of successes. Whereas in other cases, the p-values are between 0.90 and 1, in the case of headlines the p-values are between 0.80 and 0.90. Admittedly, this is not overwhelming evidence of success of ECB verbal interventions, but at least it is consistent with our prior that verbal interventions in headlines are more likely to be effective.

Finally, we focus on the volatility criterion. Once again, the picture is very similar across the different categories: there is little evidence that verbal interventions have an effect on exchange rate volatility. However, the category with macroeconomic data releases provides an interesting outlier. For this category there is significant and positive evidence that verbal interventions are followed by lower volatility. After 30 minutes, the success fraction is nearly equal to 0.70 (p= 0.01). In addition, after 1 hour the success fraction is equal to 0.62 (p = 0.07). Nevertheless, the significant positive results are no longer visible after one hour. In other words, the effects are quite short-lived.

Finally, are the results robust to American comments on the position of the dollar and FOMC meetings? To answer this question, we exclude observations which coincide with the events we identified in section 3. This adjusted sample has a total of 131 observations. Figure 5 reports the results. By comparing the figure with figures 1, 2 and 3, it is clear that US events do not influence our results. The patterns in the success fraction are very similar, as are the associated p-values. Also if we consider the special factors, our earlier conclusions

---

[13]For space constraints, we do not show graphs here. Detailed results are available upon request from the corresponding author.

continue to hold.

(Figure 5 here)

5   Conclusions

Did currency traders perceive verbal interventions by European central bankers as informative? This paper investigated this issue using high-frequency euro-dollar exchange rates. We conclude that, in general, the effects of verbal interventions are small and short-lived. This result is in line with our previous finding (Jansen and De Haan (2005)). Likewise Frenkel et al. (2001) find limited effects of the ECB interventions at the end of 2000. Our result contrasts, however, with those of Fratzscher (2004) and Sager and Taylor (2004), who report reactions of the exchange rate to verbal interventions and ECB interest rate announcements, respectively.

There are additional results to consider. We show that the most important determinant of effectiveness is whether or not the verbal intervention is captured in the news report headline. Verbal interventions that coincide with releases of macroeconomic data have mixed effects: they are less effective in changing the direction of the exchange rate, but do temporarily lead to lower exchange rate volatility. There is no clear evidence that verbal interventions by Executive Board members have been more effective than those by national central bank presidents.

Based on our study, the policy advice to central bankers seems clear: they should not expect major payoffs from verbal interventions. However, we have to be careful with this recommendation, as our analysis is based on a very particular episode with verbal interventions. Furthermore, at that time, the ECB was a new institution. In the meantime,

financial markets may have learnt to better understand the message that the ECB tries to convey. In future research, it would, therefore, be interesting to extend the sample period under consideration for the ECB and to apply our methodology to other central banks that have used verbal interventions, like the Bank of Japan.

Acknowledgements

References

Almeida, A., Goodhart, C.A.E., Payne, R., 1998. The effects of macroeconomic news on high frequency exchange rate behaviour. Journal of Financial and Quantitative Analysis 33, 383 - - 408.

Andersen, T.G., Bollerslev, T., Diebold, F.X., Vega, C., 2003. Micro effects of macro announcements: real-time price discovery in foreign exchange. American Economic Review 93, 38 - - 62.

Bauwens, L., Ben Omrane, W., Giot, P., 2005. News announcements, market activity and volatility in the euro-dollar foreign exchange market. Journal of International Money and Finance, forthcoming.

Beine, M., Janssen, G., Lecourt, C., 2004. Should central bankers talk to the foreign exchange markets? Mimeo.

Chiu, P. 2003. Transparency versus constructive ambiguity in foreign exchange intervention. Bank for International Settlements Working Papers 144.

Dominguez, K.M., 2003. The market microstructure of central bank intervention. Journal of International Economics 59, 25 - - 45.

Ehrmann, M., Fratzscher, M., 2004. Central bank communication: different strategies, same effectiveness? European Central Bank Working Paper no. 488.

Evans, M.D.D., Lyons, R.K., 2002. Order flow and exchange rate dynamics. Journal of Political Economy 110, 170 - - 180.

Evans, M.D.D., Lyons, R.K., 2003. How is macro news transmitted to exchange rates? National Bureau of Economic Research Working Paper no. 9433.

Fatum, R., Hutchison, M.M., 2003. Is sterilized foreign exchange intervention effective after all? An event study approach. Economic Journal 113, 390 - - 411.

Fratzscher, M., 2004. Communication and exchange rate policy. European Central Bank Working Paper no. 363.

Frenkel, J.A., 1981. Flexible exchange rates, prices and the role of 'news': lessons from the 1970s. Journal of Political Economy 89, 665 - - 705.

Frenkel, M., Pierdzioch, C., Stadtmann, G., 2001. The foreign exchange market interventions of the European Central Bank. Banca Nazionale del Lavoro Quarterly Review 54, 249 - - 287.

Ito, T., 2003. Is foreign exchange intervention effective? The Japanese experiences in the 1990s, in: Mitzen, P. (Ed.), Central banks, monetary theory and policy: Essays in honour of Charles Goodhart. Edward Elgar, Cheltenham, pp. 126 - - 153.

Jansen, D., De Haan, J., 2005. Talking heads: the effects of ECB statements on the euro-dollar exchange rate. Journal of International Money and Finance 24, 343 - - 361.

Jansen, D., De Haan, J., 2006. Look Who's Talking: ECB communication during the first years of EMU. International Journal of Finance and Economics, forthcoming.

Kohn, D.L., Sack, B., 2003. Central bank talk: does it matter and why? Finance and Economics Discussion Series no. 55. Washington: Board of Governors of the Federal Reserve System.

MacKinlay, A.C., 1997. Event studies in economics and finance. Journal of Economic Literature 35, 13 - - 39.

Mussa, M., 1981. The role of official intervention, Group of Thirty, New York, N.Y.

Rosa, C., Verga, G., 2005. Is ECB communication effective? Center for Economic Performance Discussion Paper no. 682.

Sager, M.J., Taylor, M.P., 2004. The impact of European Central Bank Governing Council announcements on the foreign exchange market: a microstructural analysis. Journal of International Money and Finance 23, 1043 - - 1051.

Sarno, L., Taylor, M.P., 2001. Official intervention in the foreign exchange market: Is it effective and, if so, how does it work? Journal of Economic Literature 39, 839 - - 868.

Sarno, L., Taylor, M.P., 2002. The economics of exchange rates. Cambridge University Press, Cambridge.
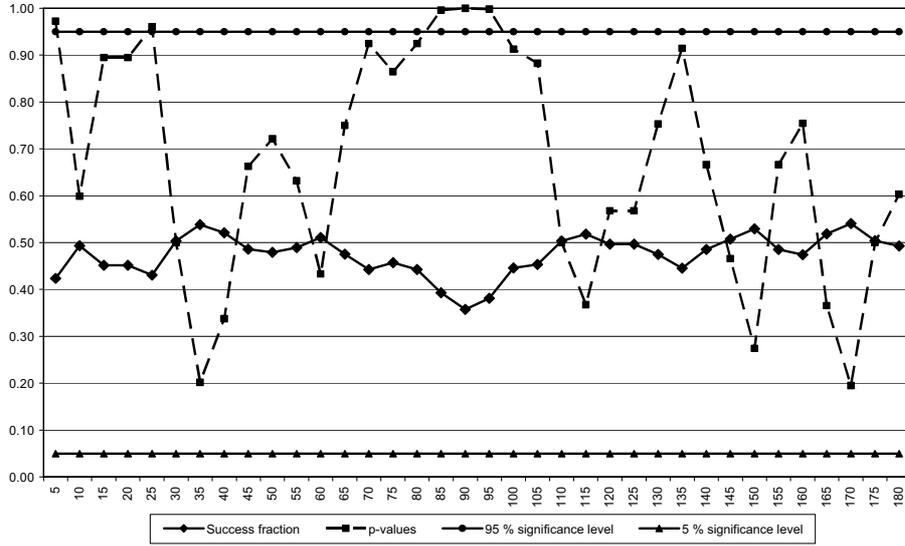
Figure 1: Results for the direction criterion
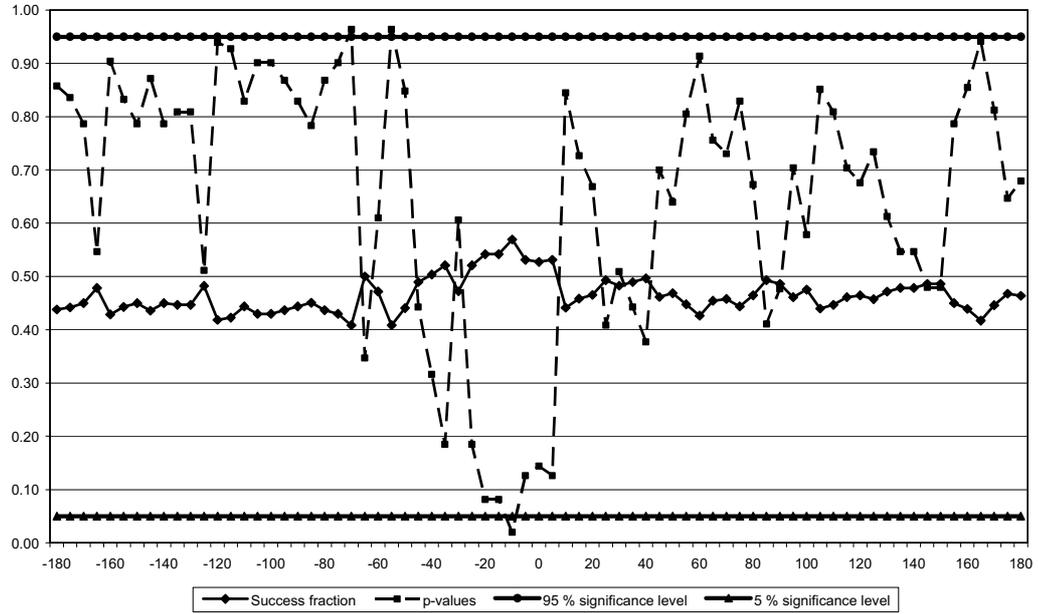
Note: This figure shows the full sample results of the direction criterion using the nonparametric sign test. The solid line represents the fraction of successful verbal interventions. The dotted line represents the associated p-values, based on a binomial distribution with p = 0.48. The two horizontal lines denote the 5 % and 95 % significance thresholds. The horizontal axis spans the time period from three hours before until three hours after the verbal intervention.

Figure 2: Results for the smoothing criterion
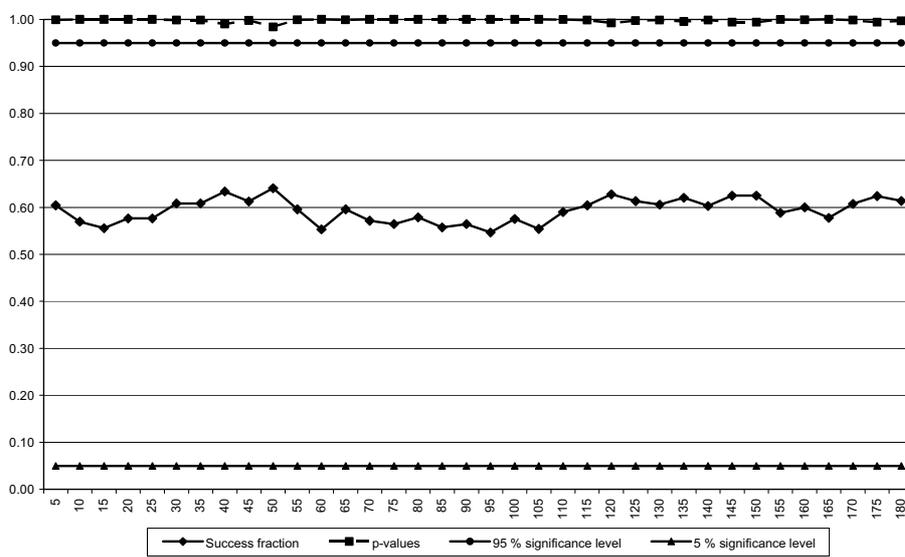
Note: This figure shows the full sample results of the smoothing criterion using the nonparametric sign test. The solid line represents the fraction of successful verbal interventions. The dotted line represents the associated p-values, based on a binomial distribution with p = 0.72. The two horizontal lines denote the 5 % and 95 % significance thresholds. The horizontal axis spans the time period until three hours after the verbal intervention.

Figure 3: Results for volatility criterion

Note: This figure shows the full sample results of the volatility criterion using the nonparametric sign test. Volatility is computed using squared returns. The solid line represents the fraction of successful verbal interventions. The dotted line represents the associated p-values, based on a binomial distribution with p = 0.50. The two horizontal lines denote the 5 % and 95 % significance thresholds. The horizontal axis spans the time period until three hours after the verbal intervention.

Text for figure 4: *Note: This figure shows the success fraction for the direction criterion per different category. The x-axis plots the time relative to the news report, ranging between 5 minutes before until 90 minutes after. The top panel shows results for headlines, macro data releases and other verbal interventions, the middle panel shows results for Executive Board members and NCB presidents whilst the bottom panel shows results for European trading hours and other policy comments. All panels show full sample results as a benchmark.*

Figure 4: Success ratios per factor (direction criterion)
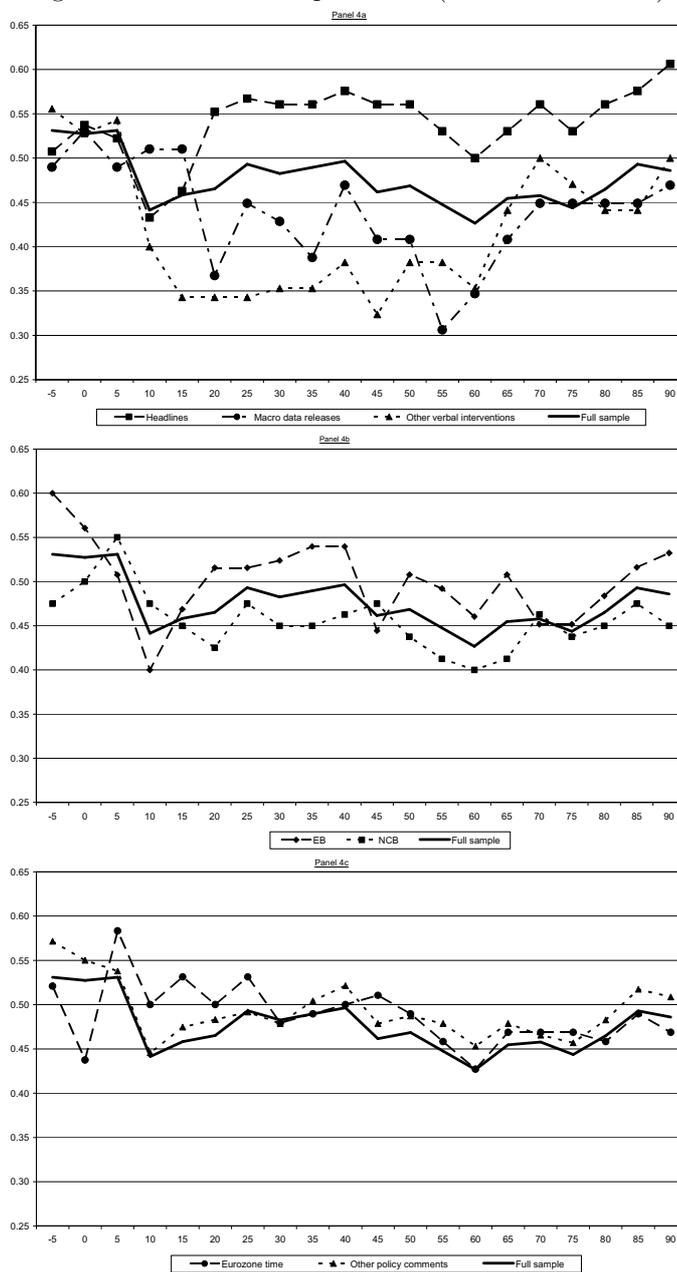
Text for figure 5: *Note: This figure shows the results of the sign tests for the sample without US event days. The top panel shows results for the direction criterion, the middle panel shows results for the smoothing criterion whilst the bottom panel shows results for the volatility criterion.*
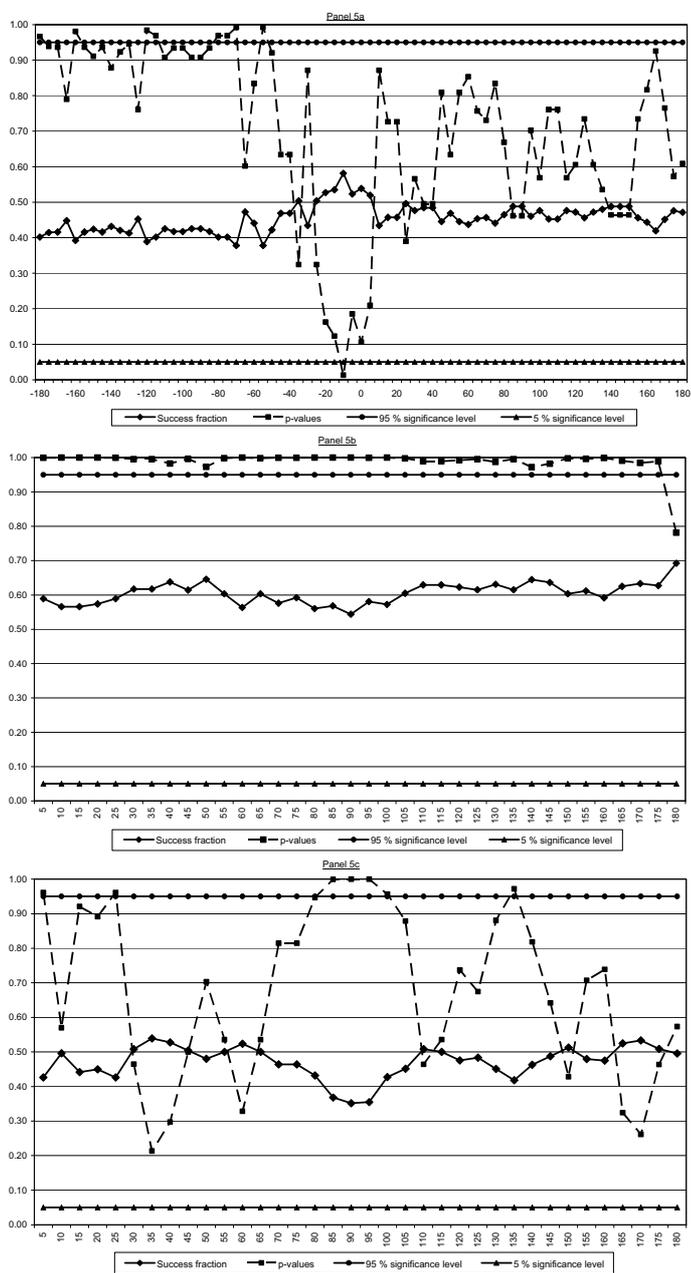
Figure 5: Results without US events

Table 1: Examples of verbal interventions

Timing	Comment	Report headline	Δs_t
9 June 1999, 20:18	'In the mid-term I see the euro strenghtening against the dollar'	Bundesbank's Welteke says euro to strenghten in the medium term	0.0000
28 January 2000, 10:18	'..the euro has a very strong potential to appreciate.'	ECB's Trichet says euro has strong potential to gain	0.0001
23 March 2000, 13:26	'..the euro's potential for appreciation should almost inevitably unfold'	ECB's Issing says euro to rise on faster growth, stable prices	0.0001
12 October 2000, 21:07	'..the euro has a strong potential to appreciate'	ECB's Duisenberg says euro has potential	-0.0004
20 November 2001, 7:51	'I am very confident over time the euro will show its strength ..'	ECB Vice President Noyer comments on euro's potential to gain	-0.0004

Note: This table shows examples of verbal interventions as reported by Bloomberg. The exchange rate movement in the 5-minute period after the one during which the comment was made is recorded in the last column. A value larger (smaller) than zero denotes an appreciation (depreciation) of the euro against the dollar. All times are in CET.

Table 2: Classification of ECB verbal interventions

Series:	Observations
Number of verbal interventions	146
of which:	
During European trading	96
Reported in headline	67
coinciding with:	
Other policy comments	120
Other verbal interventions	36
Data releases	49
made by	
Executive Board	66
National Central Bank	80

Note: This table shows characteristics of ECB verbal interventions between 4 January 1999 and 17 May 2002. There are 127 days in the total sample. Days with ECB Governing Council meetings and official exchange rate interventions are excluded from the analysis. In addition, we exclude verbal interventions made during Saturdays and Sundays.

Table 3: Releases of macroeconomic data

Series	Source
Real activity	
National Accounts	Eurostat
Industrial Production Index	Eurostat
Retail Trade Turnover	Eurostat
Foreign Trade	Eurostat
Employment	Eurostat
Prices and wages	
Harmonised Consumer Price Index	Eurostat
Wages	Eurostat
Earnings	Eurostat
Industrial Producer Price Index	Eurostat
Forward looking	
Purchasing Managers Index	NTC/Reuters
Business Opinion Survey	Eurostat
Consumer Opinion Survey	Eurostat