

Should central bankers talk to the FX market?

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Abstract :

In this paper, we study the role of official statements and speeches given by authorities in charge of direct FX market interventions. We investigate the impact of commenting and confirming statements related to such interventions at a daily frequency for the two major FX markets over a quite long period (1989 onwards). Our results suggest that appropriate speeches related to the interventions can yield valuable signalling effects, either in terms of exchange rate levels or exchange rate volatility.

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1. Introduction

For about ten years new concerns in terms of accountability and transparency of monetary policies have been raised. While the trend towards greater transparency is obvious for a set of central banks (for instance those having adopted a framework of inflation targeting), central bank transparency still remains an issue for a majority of monetary authorities (see for a recent survey Geraats, 2002). While monetary policy remains the most well-known part of central bank activities, direct interventions in the foreign exchange market are also an important instrument of exchange rate policy extensively used by monetary authorities.¹ Unsurprisingly, like for monetary policy, transparency in FX intervention policy has very recently become an issue of concern (Chiu, 2003), too.

As surveyed by Geraats (2002), the economic desirability of transparency in monetary policy is not a trivial issue. Basically, higher transparency in a given policy results in a decrease of asymmetric information between policy makers and the other involved agents. At a theoretical level, transparency generates two effects, namely uncertainty effects and incentive effects. As emphasized by Geraats (2002), whether these effects are welfare enhancing highly depends on the specific context in which monetary policy takes place. A similar question may be addressed for intervention policy.²

Theoretical analyses concerning the (economic) desirability of more transparent intervention policies are still missing in the literature. It is still unclear whether central banks with a more transparent monetary policy conduct more transparent operations in the foreign exchange markets. A major difference between the two activities is that while a central bank remains the sole supplier of base money or can fix the money interest rates by its own, it faces much greater uncertainty when directly selling or purchasing foreign currency. The final impact of such operations will primarily depend on the way market participants interpret the signal conveyed by the order flows. According to the well known signalling theory, a more

¹ While the Federal Reserve has become increasingly reluctant to rely on this instruments, foreign exchange (FX) operations have been recently conducted by the European Central Bank (ECB) and especially the Bank of Japan (BoJ) in order to counter undesired trends of the level of the exchange rates.

² Chiu (2003) verbally discusses the pro and cons of increased transparency in the intervention policy and surveys the practice of the major central banks with respect to a set of key elements of their policy.

transparent policy may improve the quality of the signal and reduce ambiguity concerning the main purposes of the intervention.

In this paper, we propose a first empirical attempt to assess the economic desirability of transparency in the foreign exchange central bank interventions (CBI hereafter). To this aim, we focus on a key element of transparency, namely statements of officials given (the same day) after the intervention(s) and aimed at infirming, confirming or commenting the operation. While transparency obviously involves other components³, speeches or statement are one major vector through which central banks influence the behaviour of market participants and overall the efficiency of central bank policies. In an empirical perspective, they also offer the advantage of being measurable.

Our work is to a certain extent related to previous studies focusing on the effect of official statements on exchange rates. Jansen and de Haan (2003) analyze the impact of statements of the European Central Bank (ECB) official on the dynamics of the Euro against the dollar over the recent period (1999-2002). They show that, in general, statements have influenced the volatility of exchange rates. They also document asymmetric reaction to negative and positive statements. Fatum and Hutchinson (2002) also consider the impact of statements made by officials both in support and not in support of past and future interventions of the ECB after the inception of the Euro. They also consider the impact of rumours of interventions and reported operations. They show that denying statements regarding interventions or statements questioning the efficiency of these operations exerted some negative effect on the level of the Euro.

Our work nevertheless clearly departs from these previous analyses in several ways. First and importantly, we measure the impact of statements or speeches on the efficiency of *actual* FX interventions. Unlike the previous literature, we disregard rumours of interventions and focus on actual interventions identified by market participants. In a policy perspective, our results can shed some light of whether and how the monetary authorities should talk to the markets when they consider a FX intervention. Second, our analysis applies to a rather long period

³ Obviously, transparency in FX intervention policies encompasses several other dimensions. One dimension is the release of intervention data to external researchers. In this respect, the Fed was the first central bank to make these data available, shortly followed by the Bundesbank. Another important dimension is the use of secret versus reported interventions (see for instance Beine and Lecourt, 2003 on this point). Here we focus on reported interventions since there is no rationale for (non denying) statements in case of secret operations.

(from 1989 onwards) and the two major FX markets, involving the three most important central banks.⁴ In this respect, the results are less dependent on a specific period and on a specific central bank. We address the following specific question: To which extent does the use of statements make the impact of direct central bank interventions (CBI) more virtuous? To this aim, we collect various kinds of statements made by officials from the ECB, the Fed and the BoJ. Using the standard approach used in the empirical literature on the impact of CBI (Dominguez 1998), we test whether the impact of interventions conditional to the occurrence of these speeches differs from the unconditional impact, both in terms of exchange rate levels and volatility. Our results are broadly in line with the signalling theory of CBI and lead us to conclude that on the whole, interventions related to speeches have a more virtuous impact on the exchange rate.

The paper is organized as follows. Section 2 reviews the theoretical background, focusing on the signalling theory of CBI in the FX markets. Section 3 provides information on the data of both CBI and speeches. Section 4 details our econometric strategy, presents and comments the empirical results. Section 5 concludes.

2. Theoretical background

2.1. The impact of CBI

The theoretical literature on CBI identifies three major channels through which interventions can influence the exchange rate: the monetary channel (for unsterilized interventions), the portfolio channel and the signalling channel.⁵ The two latter channels apply for sterilized interventions which are almost the only form recently used by the major central banks.

By far, the signalling channel is the most favoured one by researchers (see among many others Dominguez, 1998 or Sarno and Taylor, 2001). It has also received much more empirical support. The signalling theory states that through interventions, the central banks convey to the market some “inside” information (Humpage 2000) - information known to central banks but not to market participants - about future fundamentals. Under the assumption of highly efficient markets, central bank actions should act quickly on the

⁴ Furthermore, with respect to intervention policy, the BoJ has been by far the most active central bank over the recent period. This contrasts with the Fed and the ECB which were highly reluctant to use this instrument after 1995.

⁵ Hung (1997) introduced the noise-trading channel more based on a market microstructure aspect.

exchange rate by altering expectations in the exchange market (Mussa, 1981). In this context, the quality of the message which is conveyed by the intervention is of overwhelming importance to identify the future impact on the exchange rate. Also, the objective associated to the operation plays an important role.⁶

Referring to Dominguez (1998), we can identify the main theoretical predictions regarding the impact of sterilized interventions at daily or weekly horizons. Let us define S_t the level of the foreign currency (DEM or YEN) in USD terms. Let us define a discrete variable I_t which takes the value of respectively -1, 0 or 1 when there occurs respectively a direct sale of dollar, no intervention or a direct purchase of dollars by one or the two central banks. Assuming exchange market efficiency on the one hand and that the objective of the intervention is to influence the exchange rate level on the other hand, the conditional change S_t for given I_t , denoted $\Delta S_t | I_t$, depends primarily on the credibility of these interventions. If the intervention is fully credible, then $\Delta S_t | I_t > 0$, i.e. a purchase of dollars will induce a depreciation of the foreign currency. In contrast, if the intervention lacks credibility, $\Delta S_t | I_t < 0$ or $\Delta S_t | I_t = 0$. Similarly, the extent to which the signal conveyed by the intervention to the market is ambiguous or not will condition the impact in terms of volatility of exchange rate returns (denoted $Var[\Delta S_t]$). If the message is unambiguous, $Var[\Delta S_t | I_t] = 0$, i.e. the intervention should not result in significant changes in the volatility of exchange rates returns. In contrast, if the signal is ambiguous, one should get $Var[\Delta S_t | I_t] > 0$, i.e. the intervention tends to increase market uncertainty.

Of course, these results can be extended and refined in order to account for various contexts. For instance, the fact that an intervention is coordinated rather than unilateral will, in general, increase both its credibility and the quality of the associated message. Departures from the efficient market hypothesis may also explain different results, especially concerning the volatility side (see Dominguez, 1998).

⁶ In general, the main objectives of these interventions are influencing the exchange rate level, smoothing some undesirable trend, smoothing exchange rate volatility or intervening in favour of another central bank. Over our investigation periods (1989-2002 for the DEM-USD and 1991-2002 for the YEN-USD), the main objective was obviously to influence the levels of exchange rate. Nevertheless, the beginning of the period for the DEM-USD, the year 1989, is usually considered as part of the post-Louvre period during which the declared goal of concerted interventions was to get rid of excess exchange rate volatility.

2.2. The role of statements

Starting from the framework exposed above, we can tackle the role of statements in modifying the impact of a particular intervention. It is nevertheless crucial to distinguish the type of statement of central bankers around a particular FX market operation. In this paper, we distinguish confirming speeches aimed at confirming the operation the day it was carried out from commenting speeches set aside to give some details about the operation (such as the goal of the operations, etc....).

The choice of looking at the effects of statements occurring the same day as the one of the intervention stems from the combination of two stylized facts. First, this choice is guided by the previous findings of the empirical literature on CBI. While the typical horizon at which CBI exert some significant impact is still an open question for monetary authorities (see Neely, 2001), most of the evidence indeed emphasizes short run effects.⁷ Second, there is some strong evidence that the vast majority of statements made by monetary authorities occur shortly after the operations.

It is expected that confirming speeches will add some credibility to a given operation. By informing directly the market, the spokesman of the central bank can enhance the visibility of the intervention. Such a statement can signal the resolution of the central bank to play an active role in the FX market. In turn, this may also suggest future rounds of sales or purchases of foreign currency, changing market participant's expectations about future exchange rate. Denoting such a confirming speech by $Conf_t$, we expect that $\{\Delta S_t|(I_t, Conf_t) > \Delta S_t|I_t\}$, i.e. an intervention accompanied by a confirmation has a more virtuous impact than an intervention without speech. Regarding the impact in terms of volatility, the influence of speeches is much less clear-cut, to the extent that it is unclear whether such a confirmation will increase the quality of the signal.

Commenting speeches denoted by Com_t should first of all increase the quality of the signal by clarifying key features of the message such as the motivation of the central bank to intervene. Therefore, we expect that $\{\text{var}[\Delta S_t|I_t, Com_t] < \text{var}[\Delta S_t|I_t]\}$, i.e. the intervention accompanied by a commenting speech should result in less uncertainty. The impact in terms of level is less

⁷ With respect to exchange rate returns, the effects of CBI on exchange rate returns show up mostly at an intradaily frequency (Payne and Vitale, 2003). The results concerning exchange rate volatility are less clear cut but recent evidence (Beine *et al.*, 2003) also point mean reverting intradaily effects.

obvious but in general, we can expect that it is similar to the one obtained with confirming speech: $\{ \Delta S_t | I_t, Com_t > \Delta S_t | I_t \}$.

3. Data issues

We use press reports (Dow Jones and Reuters news stored in the electronic archives) in order to identify episodes of the G-3 interventions during the period 1989-2003 for the USD/DEM and 1991-2003 for the YEN/USD. These investigation periods are constrained by the availability of the official CBI data. Along with reports of central bank interventions, we are interested in another type of reported news, i.e. official statements given the day of the intervention(s) and aimed at confirming or commenting the interventions operations. As a control variable, we also consider a specific official statements type, the ones associated to the Group of Seven meetings that explicitly refer to the intervention policy of the three central banks. Indeed, beyond their impact on the efficiency of central bank policies, statements can of course exert a direct impact on exchange rates, as documented among others by Jansen and de Haan (2003) and Fatum and Hutchinson (2002).

3.1 Central bank interventions data

In this paper, we focus on the impact of the reported CBI like among others Bonser-Neal and Tanner (1996), Dominguez (1998), Galati and Melick (1999) or Beine *et al* (2002). The use of reported interventions may be useful to disentangle official interventions into secret and reported ones. While interesting, we do not concentrate on secret interventions but only on the reported ones which represent perception of market participants (especially FX traders) concerning the occurrence of interventions. Given the profusion of news over one trading day, we have limited our study to the extraction of reported interventions, i.e. official interventions identified by (at least some of) the market participants. We thus exclude spurious reports of interventions (false rumours which can be numerous especially for the recent BOJ unilateral interventions). We use dummy variables to represent the occurrence of reported interventions. While the size of the operations may matter even in a signalling perspective, the press reports rarely mention the perceived amount of intervention.

Another interesting distinction concerns coordinated versus unilateral interventions. We define a coordinated intervention as reported if at least one central bank was detected by

market participants.⁸ Several authors (Catte *et al* 1994, Dominguez 1990) have argued that coordinated interventions turned out to be more powerful than unilateral ones. The motives for intervening in concert are that multiple coordinated signals may increase the total amount of inside information conveyed by intervention and the probability that the signal is true (Dominguez 1990). To study whether central bank interventions are more powerful when coordinated than isolated, we split the reported interventions into unilateral and concerted ones.

Table 1 provides the number of coordinated and unilateral reported interventions compared to the number of coordinated and unilateral official interventions for the two currencies over the respective sample periods. Table 1 shows that our procedure for capturing news is quite effective: a lot of official interventions were reported by market participants. For example, out of the 60 official coordinated interventions on the USD-DEM, 57 were reported and on the 23 official coordinated interventions on the YEN-USD, all were reported.⁹ Table 1 also suggests that the Bank of Japan (BoJ) has been by far the most active central bank on the foreign exchange market, at least in recent times, and that the majority of its interventions were unilateral. The Bundesbank and the ECB. have been much less active during the recent period compared to the end of the eighties and to the beginning of the nineties. The ECB has nevertheless conducted four operations at the end of 2000 in order to support the Euro against the U.S. dollar. The low number of the unilateral Fed interventions on the YEN-USD market illustrates its increasing reluctance over time to use direct interventions as a stabilisation tool. With respect to transparency, the BoJ relied on a relative large amount of secret interventions, including during the recent period.

3.2 Speech data

The intervention operations can be supported by official statements (declarations, speeches, press conferences etc...). The main purposes of these speeches are either to inform the market of the central bank presence or to comment the intervention operations, for instance in order to clarify their goals. Like for the news reporting the interventions, we collected official statements that explicitly refer to some intervention episode and which are pronounced the same day of the involved intervention.¹⁰

⁸ This definition of reported coordinated intervention is more large than the traditional which consists in retaining as coordinated interventions the report of the two central banks interventions.

⁹ On this point, see Beine and Lecourt (2003). Their estimate suggests that coordinated interventions are much more likely to be detected by market participants compared to the unilateral operations.

¹⁰ In general, speeches concerning an intervention occur within a couple of hours after the operation.

We do a clear distinction between speeches confirming an intervention, speeches commenting it and those mentioning only that the central bank in question refused to comment or to confirm the intervention (called speech of decline). The goal of a confirmation speech is basically to inform the market of the presence of one or several central banks in the market (it mostly concerns the intervention confirmation speech made by the governor of the central bank in question, the Treasury Secretary for the Fed or the Finance ministers for the Bundesbank and the Bank of Japan). In the case of coordinated interventions, a spokesman will usually confirm only the presence of his or her own central bank. A commenting speech is mainly used to inform the market of the intervention goal (for example to support a currency or to reduce exchange rate volatility) or/and the conditions under which the operation was conducted. Sometimes, intervention reports are followed by a speech of decline: most of the time, this takes the form of a statement from a central bank spokesman excluding any comment or confirmation of the operation.¹¹ Of course, a particular statement can simultaneously give details in terms of confirmation and comments.¹² In order to allow for different signals conveyed by concerted and unilateral interventions, we distinguish for the two markets (USD/DEM and yen/USD) between speeches related to coordinated reported interventions and those related to reported unilateral ones.

Table 2 reports the number of the various types of speech in interaction with reported interventions (coordinated or unilateral) for the two markets. We can observe that the coordinated reported interventions on the USD/DEM market are more frequently accompanied by a speech of confirmation or comments than the unilateral ones, whereas it is the contrary in the YEN/USD market (mostly for the BOJ because the Federal Reserve uses very few speeches in order to confirm or explain its intervention operations in this market). In order to control for the direct effects of general statements on the exchange rate dynamics, we collected data on all the G7 meeting reports that explicitly refer to the exchange rate intervention policy of the three central banks. We measure the influence of G7 meetings related statements in three different ways. First, we use a dummy variable taking 1 when there is an explicit reference to a G7 meeting, whatever the time at which this meeting took place. Second, we define a dummy variable taking 1 only for the Mondays after G7 meetings that explicitly refer to the currency policy/intervention in the communiqué. This restrictive

¹¹ We consider that this type of speech is by it-self a piece of information conveyed to the market.

¹² In this case, the dummies capturing commenting and confirming statements take both one. By contrast, if a speech is classified as a declining statement, the dummy variables capturing the confirming and commenting speeches take both zero.

approach aims at isolating potential effects of G7 statements in terms of general intervention policy. Third, we use a dummy with value 1 for all Mondays after each G7 meeting and for all Fridays preceding the meeting. This aims at capturing the effects of expectations formed by market participants. Indeed, it turns out that there are many currency related news articles leading the G7 meetings, which in turn build up speculation about currency policy.

3.3 Exchange rate quotations

We relate the occurrence of central bank interventions and/or statements to the dynamics of exchange rate. Following the theoretical background given above (see section 2), we focus on the two first moments, i.e. the conditional mean of exchange rate returns and their conditional variance. To this aim, the choice of the exchange rate quotation turns out to be of high importance. Indeed, using high frequency data, Beine, Laurent and Palm (2003) show that for coordinated interventions, the impact of central bank intervention in terms of volatility may be quick and mean reverting within a couple of hours. Therefore, it is advised to choose an exchange rate quotation not too far after the occurrence of coordinated interventions. Following this implication, we choose to use the price of the DEM-USD quoted at 17.00 (GMT+1), i.e. at the end of the overlap period between the European and the US markets during which most of the coordinated operations between the Fed and the Bundesbank (ECB) usually take place. For the YEN-USD, we use the price quoted at 21.00 (GMT+1), i.e. at the close of the American FX market.

4. The Impact of speeches

4.1. Econometric specification

The impact of central bank speeches on the level and the volatility of exchange rates is modelled with a set of GARCH models. We specify the Benchmark model as a GARCH(1,1) model including dummies in the mean equation and in the variance equation, representing the occurrence of reported unilateral or coordinated central bank interventions. The Benchmark model allows for separate impacts between coordinated and unilateral interventions, following extensive evidence that concerted operations have a more “powerful” effect than the unilateral interventions (Catte *et al.*, 1992; Beine *et al.*, 2003). The specifications for the DEM and the YEN, respectively, are the following:

$$\Delta(S_{DEM,t}) = \delta_0 + \delta_1 Fed_t + \delta_2 BB_t + \delta_3 Coord_t + \varepsilon_{DEM,t}$$

$$\sigma_{DEM,t}^2 = \omega_0 + \alpha_1 \varepsilon_{DEM,t}^2 + \beta_1 \sigma_{DEM,t}^2 + \gamma_1 |Fed_t| + \gamma_2 |BB_t| + \gamma_3 |Coord_t| \quad (1)$$

$$\Delta(S_{YEN,t}) = \delta_0 + \delta_1 BoJ_t + \delta_5 Coord_t + \varepsilon_{YEN,t}$$

$$\sigma_{YEN,t}^2 = \omega_0 + \alpha_1 \varepsilon_{YEN,t}^2 + \beta_1 \sigma_{YEN,t}^2 + \gamma_1 |BoJ_t| + \gamma_5 |Coord_t| \quad (2).$$

$S_{DEM,t}$ and $S_{YEN,t}$ denote the log of the USD/DEM and the YEN/USD exchange rate at time t , respectively. Fed_t , BB_t and BoJ_t denote reported unilateral interventions conducted at time t by the Fed, the Bundesbank (ECB after 1999) and the BoJ, respectively.¹³ $Coord_t$ denotes reported coordinated intervention on either the DEM or the YEN market, i.e. operations conducted by the two central banks the same day and in the same direction and detected by market participants. ε_t is an error term with time-varying variance: $\varepsilon_t | \Psi_t \sim N(0, \sigma_t)$. $\sigma_{DEM,t}^2$ and $\sigma_{YEN,t}^2$ are the conditional variance of the exchange returns on the DEM and the JPY markets, respectively. Notice that the four intervention dummies, Fed , BB , BoJ and $Coord$, take the value -1 or 1 if the central bank purchases foreign currency or sells foreign currency, respectively. For all other observations the value is zero.

In order to measure the impact of speeches on the exchange rate return process, we extend the Benchmark model with additional dummy variables representing the various central bank statements associated to each type of FX operation¹⁴. The impacts of these statements are captured through interaction variables, i.e. dummies capturing the reported interventions multiplied by the statement dummies associated to this type of interventions. Given the low number of statements associated to unilateral interventions on the DEM (see Table 2), we will focus for this market exclusively on speeches that are associated with coordinated interventions. By contrast, for the YEN, we have enough observations to include speeches related to unilateral reported BoJ interventions¹⁵. As explained in section 3, a G7 variable measured in three different ways is also included in the conditional mean and variance

¹³ There are no speeches related to unilateral Fed interventions on the YEN/USD market.

¹⁴ To avoid multicollinearity, the corresponding central bank intervention dummy which could capture the average impact is dropped from the Benchmark model.

¹⁵ The main issue with the speeches related to unilateral interventions for the DEM is the insufficient number of observations (5 speeches of each type for the Bundesbank and 12 speeches of comment for the Fed). By contrast, for the JPY, the sample contains 59 speeches related to unilateral BoJ interventions.

equations.¹⁶ Hence, the econometric specification that we developed – called the Complete model – is:

$$\Delta(S_{DEM,t}) = \delta_0 + \delta_1 Fed_t + \delta_2 BB_t + \delta_4 NoCoord_t + \delta_5 ComCoord_t + \delta_6 ConfCoord_t + \varepsilon_{DEM,t}$$

$$\sigma_{DEM,t}^2 = \omega_0 + \alpha_1 \varepsilon_{DEM,t}^2 + \beta_1 \sigma_{DEM,t}^2 + \gamma_1 |Fed_t| + \gamma_2 |BB_t| + \gamma_4 |NoCoord_t| + \gamma_5 |ComCoord_t| + \gamma_4 |ConfCoord_t| + \gamma_9 G7 \quad (3)$$

$$\Delta(S_{YEN,t}) = \delta_0 + \delta_2 NoBoJ_t + \delta_3 ComBoJ_t + \delta_4 ConfBoJ_t + \delta_6 NoCoord_t + \delta_7 ComCoord_t + \delta_8 ConfCoord_t + \varepsilon_{YEN,t}$$

$$\sigma_{YEN,t}^2 = \omega_0 + \alpha_1 \varepsilon_{YEN,t}^2 + \beta_1 \sigma_{YEN,t}^2 + \gamma_2 |NoBoJ_t| + \gamma_3 |ComBoJ_t| + \gamma_4 |ConfBoJ_t| + \gamma_6 |NoCoord_t| + \gamma_7 |ComCoord_t| + \gamma_8 |ConfCoord_t| + \gamma_9 G7 \quad (4)$$

The additional interaction variables are defined in the following way. *NoCoord* is a dummy variable taking 1 if there is no statement or a declining statement given after a reported coordinated intervention.¹⁷ *ConfCoor* is a dummy variable taking 1 if there is confirmation statement by at least one central bank after a reported coordinated central bank intervention. *ComCoord* is a dummy variable taking 1 if there is commenting speech by at least one central bank following a coordinated reported CBI. The variables *NoBoJ*, *ConfBoJ* and *ComBoJ* are the counterparts of the three previous dummy variables in the case of unilateral interventions of the BoJ. *G7* is a dummy variable capturing the occurrence of G7 meeting reports that explicitly refer to exchange rate/intervention policy of the three central banks. Finally, we specify a third model, labelled the Parsimonious model, which is equal to the Complete model without the insignificant explanatory variables.

¹⁶ For the sake of brevity, we will report only the results related to the inclusion of the second definition of the G7 variable. The results obtained with the two other variables are to a large extent similar. In particular, the G7 variable turns out to be insignificant at conventional levels in the conditional variance equation.

¹⁷ Given that there are too few observations in the variable concerning the declining speech (see Table 2), one way to take account for this variable is to capture the interaction between this variable and the reported coordinated interventions.

4.2. Results

Exchange Rate Levels

The estimated coefficients of the econometric models are synthesized in Table 3 for the case of the DEM and Table 4 for the YEN. Analysing first the parameters of the mean equations, we observe that reported coordinated interventions are significant for both exchange rates. However, for the DEM, the impact is negative (i.e. interventions have a counterproductive impact on the exchange rate level) while for the YEN the impact is virtuous. This empirical finding is to a certain extent a confirmation of the existing empirical literature. Indeed, with respect to the level of exchange rates, the literature dealing with daily data (Dominguez, 1998; Beine *et al.*, 2002) obtained quite mixed results regarding efficiency of these operations. We also notice that unilateral Fed interventions are counterproductive for the DEM. In contrast, unilateral interventions by the other two central banks, the Bundesbank and the BoJ, have no significant effect on the exchange rates.

When the impact of speeches is estimated, we get some remarkable results. In the Complete model of the DEM, the only significant variable is the *NoCoord* variable (δ_4). This suggests that the counterproductive impact of coordinated interventions is attributable to the absence of confirming or commenting speeches. Even more, the counterproductive impact of coordinated interventions is amplified when they are not followed by central bank statements. By contrast, the coordinated operations accompanied by confirming and commenting speeches do not exert any significant impact on the level.

On the whole, the virtuous impact of speeches is also observed for the YEN. Confirming (respectively commenting) speeches increase the positive impact of BoJ interventions (respectively coordinated interventions) on the JPY exchange rate. Also note that the impact of speeches associated with coordinated JPY interventions is larger than the impact of the unilateral BoJ speeches. This confirms the previous empirical results emphasizing the stronger signal conveyed by concerted operations (Catte *et al.* 1994). Interestingly, these key results are also confirmed in the Parsimonious model.

In summary, we could deduce that central bank speeches can contribute to the signalling effect of interventions in the foreign exchange markets. The absence of speeches accounts for the counterproductive impact of coordinated DEM interventions, while the presence of confirming/commenting speeches explains for the virtuous impact of coordinated JPY interventions. These findings are roughly in line with the theoretical expectations explained in Section 2. In particular, our results regarding the impact in terms of exchange rate level indicate that central bank speeches could add some credibility to central bank interventions and therefore alter the reaction of the market to the occurrence of such operations.

Exchange Rate Volatility

The estimation results for the variance equations are even more striking. In the Benchmark model, we notice that – apart from the typical GARCH effects – reported coordinated interventions have a positive (i.e. increasing) effect on exchange rate volatility. Along the signalling theory outlined in section 2, this points to an ambiguous signal produced by central banks. Note that the effect of unilateral interventions is not significant for the DEM volatility, and is significant but not substantial for the JPY.

When we allow for the impact conditional on the occurrences of speeches, we obtain an asymmetric effect on the volatility of both exchange rates of reported coordinated interventions. First, the absence of speeches or the presence of confirming speeches has an increasing impact on volatility. The occurrence of commenting speeches has a decreasing effect on volatility. On the contrary, there are no distinct effects from speeches associated with unilateral BoJ interventions. Also note the insignificance of the G7 variable. Once more, the asymmetric result is confirmed in the Parsimonious model.

Our empirical results strongly suggest that speeches not only play a signalling role with respect to the volatility process, but that the type of speech turns out to be of crucial importance. As expected theoretically, commenting speeches indeed enable to clarify the message of central bank interventions. On the other hand, absence of speeches or purely confirming speeches are interpreted as unclear messages that increase the uncertainty in the foreign exchange markets. Put differently, the empirical evidence allows us to conclude that central bankers should talk to the foreign exchange markets in a qualitative manner after coordinated interventions, i.e. explaining clearly the motivation and/or the purpose of the

intervention.¹⁸ Such a transparent policy – *ceteris paribus* - will reduce the ambiguity of the central bank intervention and decrease the volatility in the foreign exchange markets.

Conclusion

In this paper, we have empirically assessed the impact of transparency in the exchange rate policy conducted by the three major central banks. Transparency is captured here by the occurrence of official statements aiming at either confirming or commenting the FX operations. Consistent with the signalling theory of central bank intervention in the FX markets, we found that speeches allow central bankers to improve the signal conveyed by the direct sales or purchases of foreign currency.

In particular, it is found that commenting or confirming speeches result in a more virtuous impact of central bank interventions in terms of the level of exchange rates. This result turns out to be important since targeting the level of exchange rates or reversing undesirable trends has obviously been one major aim of such operations.¹⁹ Interestingly, this results holds for the two major exchange rate markets, i.e. the DEM (Euro) and the YEN against the USD. On the whole, our results indicate that transparency can exert virtuous effects in terms of credibility. Another interesting result concerns the negative impact of commenting speeches on exchange rate volatility. Consistent with the signalling theory of CBI, this result suggests that talking to the markets in an appropriate way can remove (some part of) the ambiguity associated to the FX operations. To the extent that removing excess exchange rate volatility is also another important aim for central bankers (as it was the case after the 1987 Louvre Agreement), this also suggests that central bank statements can have some valuable properties.

¹⁸ In a survey concerning the Forex intervention operation practices of the major central banks, Lecourt and Raymond-Feingold (2003) reported too that the effectiveness of interventions depends strongly on the credibility of the central bank, which is partly related to the quality of its communication policy and the amount of successful experience in its intervention policy.

¹⁹ See Sarno and Taylor (2001) among others on the motivations of central bank interventions. If we focus on the recent period, the goal in terms of exchange rate level is obviously the main one. Indeed, the ECB in 2000 obviously intervened in order to support the Euro. The most active bank, i.e. the BoJ, has massively intervened since 1999 to depreciate the YEN against the USD.

Tables

Table 1. Number of official and reported interventions				
USD/DEM 1989-2002				
		Official interventions		
		Coordinated	Unilateral Fed	Unilateral Bundesbank
reported interventions	total	60	66	38
	Coordinated	57	0	0
	Unilateral Fed	0	46	0
	Unilateral Bundesbank	0	0	22
yen/USD 1991-2002				
		Official interventions		
		Coordinated	Unilateral Fed	Unilateral BOJ
reported interventions	total	23	1	183
	Coordinated	16	0	0
	Unilateral Fed	3	0	0
	Unilateral BOJ	4	0	133

Table 2. Types of speeches in interaction with reported interventions							
USD/DEM 1989-2002							
		types of speeches					
		Federal Reserve			Bundesbank		
		confirmation	comment	decline	confirmation	comment	decline
reported interventions	Coordinated	5	6	3	28	15	0
	Unilateral Fed	0	12	6	0	0	0
	Unilateral Bundesbank	0	0	0	5	5	0
	Total	5	18	9	33	20	0
yen/USD 1991-2002							
		types of speeches					
		Federal Reserve			Bank of Japan		
		confirmation	comment	decline	confirmation	comment	decline
reported interventions	Coordinated	3	3	1	8	6	1
	Unilateral Fed	0	0	0	0	0	0
	Unilateral BOJ	0	0	0	22	36	1
	Total	3	3	1	30	42	2

Table 3. Role of speeches in the impact of reported CBI DEM against the USD 1989-2002.						
Variable	Benchmark		Complete		Parsimonious	
δ_0	-0.006		-0.005		-0.005	
	[0.010]		[0.010]		[0.010]	
$\delta_{1,Fed}$	-0.197	**	-0.202	**	-0.202	**
	[0.091]		[0.091]		[0.091]	
$\delta_{2,BB}$	0.224		0.202		0.200	
	[0.141]		[0.133]		[0.133]	
$\delta_{3,Coord}$	-0.202	**	-		-	
	[0.097]					
$\delta_{4,Nocoord}$	-		-0.314	*	-0.312	*
			[0.163]		[0.164]	
$\delta_{5,Comcoord}$	-		-0.062		-	
			[0.169]			
$\delta_{6,Confcoord}$	-		-0.160		-	
			[0.165]			
ω_0	0.010	***	0.008	***	0.008	***
	[0.003]		[0.002]		[0.002]	
α_1	0.046	***	0.040	***	0.041	***
	[0.007]		[0.007]		[0.007]	
β_1	0.931	***	0.940	***	0.939	***
	[0.011]		[0.010]		[0.011]	
$\gamma_{1,Fed}$	-0.026		-0.028	*	-0.028	*
	[0.019]		[0.017]		[0.017]	
$\gamma_{2,BB}$	-0.046		-0.077	*	-0.077	*
	[0.046]		[0.044]		[0.045]	
$\gamma_{3,Coord}$	0.079	**	-		-	
	[0.036]					
$\gamma_{4,Nocoord}$	-		0.162	***	0.163	***
			[0.060]		[0.060]	
$\gamma_{5,Comcoord}$	-		-0.129	***	-0.129	***
			[0.047]		[0.048]	
$\gamma_{6,Confcoord}$	-		0.171	***	0.174	***
			[0.065]		[0.065]	
$\gamma_{9,G7}$	-		-0.007		-	
			[0.015]			
Log-Likelihood	-3529.29		-3523.55		-3524.573	

Table 4. Role of speeches in the impact of reported CBI YEN against the USD, 1991-2002.						
Variable	Benchmark		Complete		Parsimonious	
δ_0	-0.005		-0.004		-0.003	
	[0.012]		[0.012]		[0.012]	
$\delta_{1,BoJ}$	0.017		-		-	
	[0.059]					
$\delta_{2, NoBoJ}$	-		-0.050		-	
			[0.073]			
$\delta_{3, ComBoJ}$	-		-0.005		-	
			[0.130]			
$\delta_{4, ConfBoJ}$	-		0.314	**	0.322	**
			[0.151]		[0.132]	
$\delta_{5, Coord}$	0.413	**	-		-	
	[0.174]					
$\delta_{6, NoCoord}$	-		0.286		-	
			[0.305]			
$\delta_{7, Comcoord}$	-		0.527	**	0.488	**
			[0.279]		[0.249]	
$\delta_{8, Confcoord}$	-		0.452		0.451	
			[0.295]		[0.287]	
ω_0	0.008	***	0.009	***	0.010	***
	[0.002]		[0.002]		[0.003]	
α_1	0.037	***	0.040	***	0.042	***
	[0.006]		[0.007]		[0.007]	
β_1	0.947	***	0.940	***	0.937	***
	[0.009]		[0.010]		[0.010]	
$\gamma_{1, BoJ}$	-0.020	**	-		-	
	[0.009]					
$\gamma_{2, NoBoJ}$	-		-0.010		-	
			[0.018]			
$\gamma_{3, ComBoJ}$	-		-0.011		-	
			[0.037]			
$\gamma_{4, ConfBoJ}$	-		-0.034		-	
			[0.029]			
$\gamma_{5, Coord}$	0.235	***	-		-	
	[0.065]					
$\gamma_{6, Nocoord}$	-		0.285	*	0.221	**
			[0.147]		[0.096]	
$\gamma_{7, Comcoord}$	-		-0.150	*	-0.227	***
			[0.091]		[0.067]	
$\gamma_{8, Confcoord}$	-		0.469	***	0.428	***
			[0.128]		[0.124]	
$\gamma_{9, G7}$	-		-0.009		-	
			[0.029]			
Log-Likelihood	-3110.89		-3102.62		-3104.42	

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