On the Short Term Objectives of Daily Intervention by the Deutsche Bundesbank and the Federal Reserve System in the U.S. Dollar - Deutsche Mark Exchange Market

By S. C. W. Eijffinger and A. P. D. Gruijters, Tilburg*

I. Introduction

In this study the objectives of official intervention by central banks in the U.S. dollar – Deutsche Mark exchange market will be examined, in particular for the short run[1]. We will try to determinate empirically the short term reaction functions with regard to the dollar-DM exchange market intervention by the Deutsche Bundesbank and/or the Federal Reserve System. Furthermore, we will study the degree of coordination between the exchange market interventions of both central banks. Finally, we will examine the effect of exchange market uncertainty on the Bundesbank and/or Federal Reserve interventions in the short run.

The points of departure of this empiral study are the following four.

Firstly, the study concentrates on intervention of both central banks in the *spot* dollar-DM exchange market. Therefore, we take no account of intervention in the forward dollar-DM exchange market, nor intervention in member currencies by the Bundesbank as a consequence of the commitments within the European Monetary System (EMS)[2].

Secondly, the study uses daily observations for the official interventions in the dollar-DM exchange market. In this respect it comprises an empirical novelty.

---

* The article originates from a Visiting Scholarship of Dr. Sylvester *Eijffinger* at the Deutsche Bundesbank during the Summer of 1988. The authors are grateful to Professors *Helmut Schlesinger* and *Leonhard Gleske* and Mr. *Franz Scholl* for very useful and stimulating discussions. Also they want to thank Dr. *Theo Nijman,* Mr. *Lex Hoogduin* and an anonymous referee for helpful comments on an earlier draft of this article. All remaining errors are the sole responsibility of the autors.

[1] The effectiveness of official intervention by central banks in the dollar-DM exchange market is studied in: *Eijffinger* and *Gruijters* (1991).

[2] An example of a reaction function for intervention on behalf of the EMS is given by: *Eijffinger* (1986), pp. 271 - 275 and 293 - 298.

Thirdly, the study focuses only on the so-called 'active' intervention which takes place inside the dollar-DM exchange market and is intended to influence the spot dollar-DM exchange rate, although it may occasionally be motivated by a policy of the central bank to build up or replenish its foreign exchange reserves. Hence, 'passive' intervention which takes place outside the market is left out of consideration. Examples of such 'passive' intervention are the purchase of dollars from and compensation payments for the U.S. army in West Germany by the Bundesbank, the customer transactions for the U.S. and West German government and the interest payments on the Bundesbank dollar reserves at the Federal Reserve and on the Federal Reserve DM-reserves at the Bundesbank.

Fourthly, the sample of period of this study comprises the Plaza Agreement of September 1985, the Louvre Accord of February 1987, the Stock Market Crash of October 1987 and its aftermath[3].

It is our opinion that this period differs essentially from the preceding period of the early 1980s which has been characterized by a 'benign neglect' policy of the Federal Reserve regarding the dollar-DM rate.

II. The Objectives of Exchange Market Interventions by Central Banks

Before turning to an empirical study of the short term reaction functions for daily interventions by the Bundesbank and Federal Reserve, the objectives of exchange market intervention by central banks (G-7 countries) are examined in general and by the Bundesbank and Federal Reserve in particular.

Figure 1 summarizes the short term, medium term, long term and other objectives of interventions by central banks during the period of floating exchange rates. These objectives are not mutually exclusive and may have varied in weight in the course of the period[4].

In the short term all central banks have a common objective of "countering disorderly exchange market conditions" as part of their commitment of promoting a stable exchange rate system in accordance with Article IV of the Articles of Agreement of the International Monetary Fund as amended in 1978. "Disorderly market conditions" are supposed to be indicated by a

[3] An excellent survey of these events and their background is presented in: *Funabashi* (1988).

[4] This summary draws upon the so-called '*Jurgensen*-Report', made by an experts group from the G-7 countries on exchange market interventions in these countries: Working Group on Exchange Market Intervention (1983).

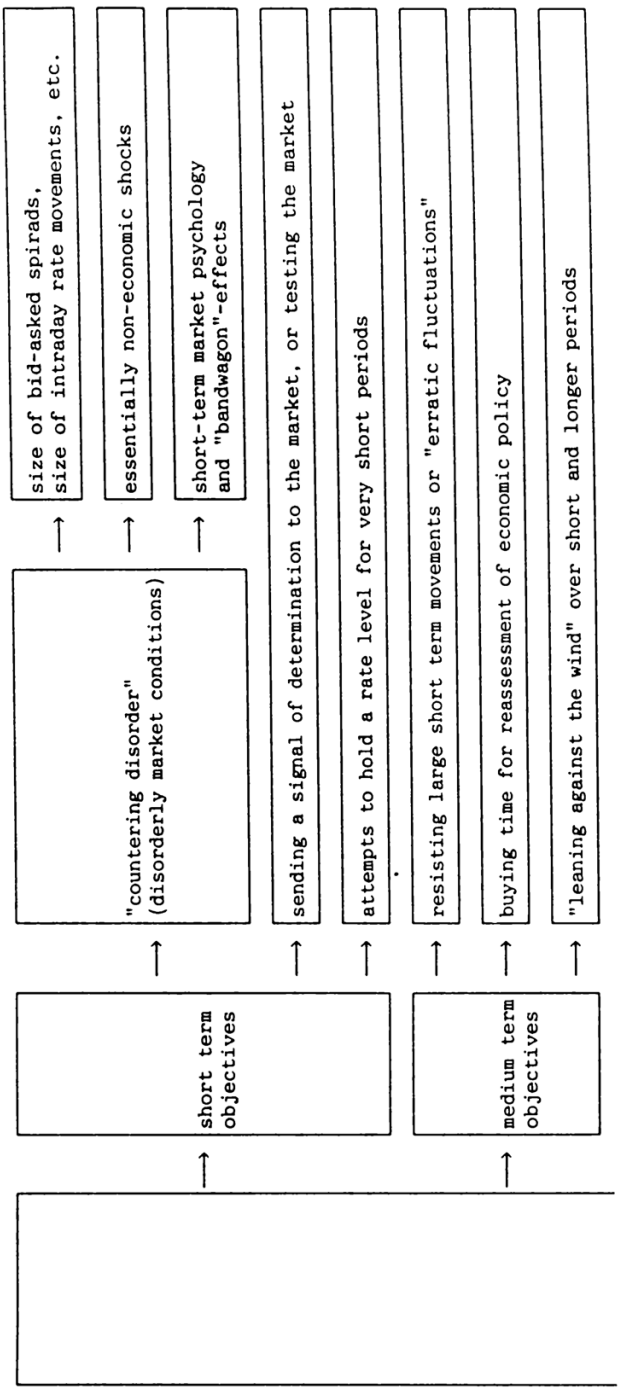
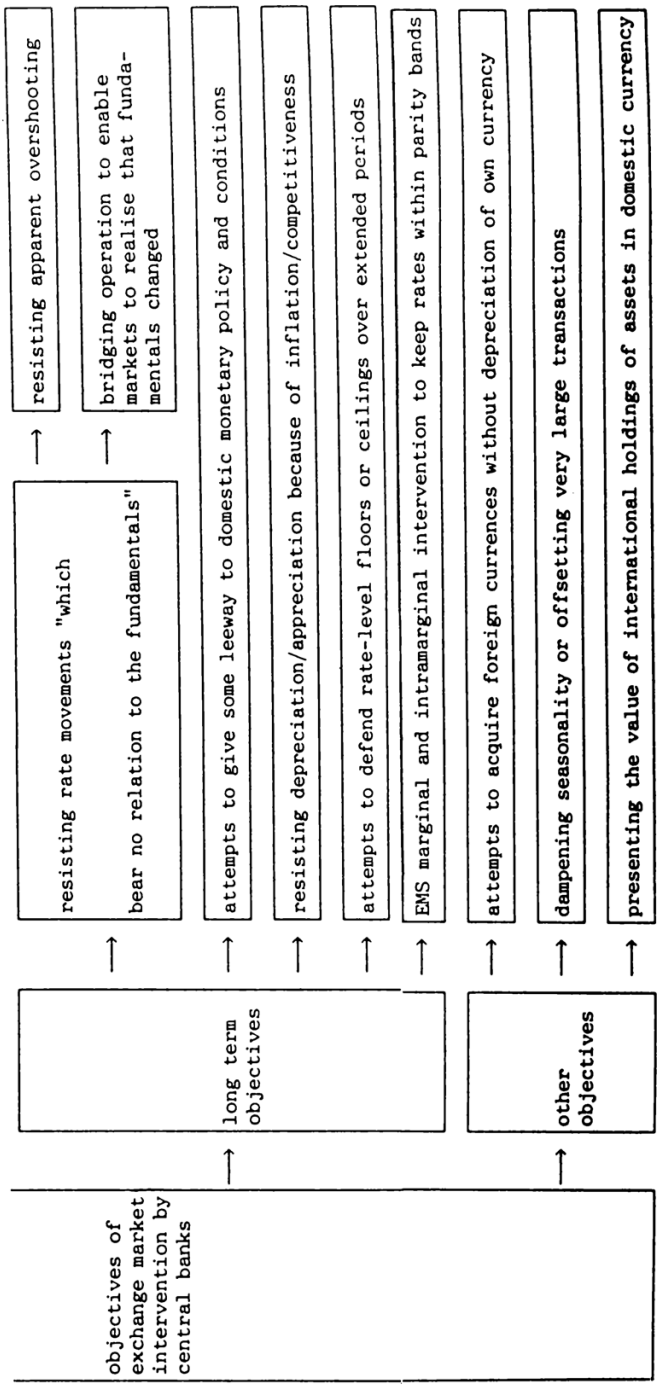


*Figure 1: The Objectives of Exchange Market Intervention by Central Banks (G-7)**



* This figure is based on: Report of the Working Group on Exchange Market Intervention (Jurgensen-Report), March 1983.

substantial widening of bid-asked spreads, large intraday exchange rate movements, "thin" or highly uncertain trading, destablishing impacts of essentially non-economic shocks and self-sustaining exchange rate movements which may gain a momentum of their own ("bandwagon"-effects). The medium term objectives regard to resisting large short term exchange rate movements or "erratic fluctuations" which exceed a certain size, buying time by the central banks to reassess their policies and "leaning against the wind" which has been pursued by some over short periods and by others over longer periods. The frequency of this last strategy varies from occasional use in case of "disorderly market conditions" by the Federal Reserve System to more regular use by the Bundesbank. The Bundesbank '... has sought from the onset of floating to counter disorderly market conditions, dampen "erratic" short-term exchange rate fluctuations and smooth out excessive swings in the DM/US dollar rate over longer periods'[5].

The long term objectives vary from resisting exchange rate movements which are believed to be unjustified with respect to the fundamentals (inflation, money growth, balance of payments accounts, etc.) and attempts to give some leeway to monetary policy by lessening the foreign impact on domestic monetary conditions, to resisting depreciation because of its inflationary effects and resisting appreciation in order to maintain competitiveness. Other objectives are e.g. attempts to acquire foreign currencies without generating (renewed) downward pressure on the domestic currency.

Our investigation into the intervention behaviour of the Bundesbank and the Federal Reserve is based principally on the statements made by central bankers in the *Jurgensen*-report on exchange market intervention (1983). Ideally, the intervention behaviour should be explained in a general equilibrium model accounting for both short-term and long-term objectives of the central banks, but also accounting for the effectiveness of these interventions, other monetary policy objectives of the central banks, the exchange rate expectations of the economic agents and, last but not least, the development of the exchange rate determinants, the so-called market fundamentals.

The intention of this article is however more modest. We have decided to test a reaction function of the Bundesbank and the Federal Reserve referring to the short-term objective of their interventions, i.e. the smoothing of daily exchange rate volatility, for several reasons.

---

[5] From: Working Group on Exchange Market Intervention (1983), p. 13. This is confirmed by *Gleske* (1982): 'Die Interventionen am DM-$ Markt sind also in erster Linie auf die Glättung von Kursschwankungen gerichtet' (p. 266). See also *Scholl* (1983).

First of all, previous empirical studies[6] to reaction functions of central banks concentrated on the longer term objectives. On the contrary, our empirical study focuses on the shorter-term objectives, using daily intervention data of the Bundesbank and the Federal Reserve.

Secondly, the German and American authorities declared to have intervened mainly to dampen 'erratic' short-term exchange rate fluctuations and to counter 'disorderly exchange market conditions'. Furthermore, the *Jurgensen*-report points out that intervention had been especially an effective tool for influencing the behaviour of the exchange rate in the short run. Based on this past experience we investigate whether the Bundesbank and the Federal Reserve used interventions as an instrument with a short-term objective, i.e. smoothing exchange rate fluctuations.

The disadvantage of such an approach is the vanishing relation between intervention and the "fundamentals" which are measured on monthly or quarterly base. Nevertheless, this approach has an decisive advantage, because it captures better the frequency and pattern of exchange market intervention with respect to "countering disorder" and "leaning against the wind" over short periods. Our study is aiming at an explanation of the intervention behaviour of the Bundesbank and the Federal Reserve from day to day and from week to week.

Thereby it should be noticed that the intervention behaviour of central banks is not only reflected in the direction and volume, but also in the timing and technique of intervention[7]. The timing refers to the question whether the exchange market is "thin" and uncertain or not, while the technique relates to the way in which a central bank implements its intervention, i.e. by domestic and possibly foreign commercial banks or by currency brokers with different announcement effects.

Despite the importance of both timing and technique for intervention behaviour, these elements can not be taken into account by our study and will surely detract from the explanatory power of the intervention reaction functions.

---

[6] Examples of such empirical studies are: *Artus* (1976), *Branson, Halttunen & Masson* (1977), *Lehment* (1980), *Dornbusch* (1980), *König & Gaab* (1983) and *Neumann* (1984). Those studies cover the period of floating exchange rates from 1973 up to 1981.

[7] This is clearly put by *Gleske* (1982): "In einer bestimmten Situation mögen bereits geringe Interventionsbeträge genügen, eine unerwünschte Kursentwicklung zu bremsen oder gar umzukehren. In einer anderen Situation können selbst hohe Interventionsbeträge das Gegenteil bewirken, wenn nämlich die Marktteilnehmer von der Stärke eines Grundtrends überzeugt sind ..." (p. 265).

III. An Empirical Study of the Reaction Functions of the Deutsche Bundesbank and Federal Reserve System

An empirical study of the reaction functions for daily interventions by the Deutsche Bundesbank and Federal Reserve System in the spot U.S. dollar-Deutsche Mark exchange market must take account of the development of the dollar-DM exchange rate between successive days (interday), as well as in the course of these days (intraday). A complete representation of the intraday development of the dollar-DM rate would require an infinite number of observations per day causing technical problems. Therefore, in this study the intraday development is approximated by three observations per day:

1. the opening rate (primo) at 8.30 hours;
2. the fixing rate (official middle rate) at 13.00 hours;
3. the closing rate (ultimo) at 16.30 hours in Frankfurt time.

Because the opening and closing rates are only available since February 1985[8], as sample is chosen the period from February 1985 until September 1988. Figure 2 gives an example of the intraday changes of the opening and closing dollar-DM rate from July 1987 to June 1988. This figure shows observable differences between the rates within the day.

Furthermore, the study takes daily observations for the official interventions in the dollar-DM exchange market, which can be divided in two parts[9]:

a) U.S. dollar-interventions of the Deutsche Bundesbank expressed in DMs against the dollar-DM intervention rate of that day;

b) DM-interventions of the Federal Reserve Bank of New York, so far as these operations affect the net foreign position of the Bundesbank. This happens e.g. when the Federal Reserve finances its DM-sales by calling on the swap agreement with the Bundesbank or from its DM-balances at the Bundesbank, or when the Federal Reserve invests its DM-purchases at the Bundesbank.

---

[8] Data for the opening, fixing and closing dollar-DM rate are taken from: Statistische Beihefte zu den Monatsberichten der Deutschen Bundesbank, Reihe 5: Die Währungen der Welt, Februar 1985 – November 1988, Tabelle 6: Kassa-Kurse des US dollar im Tagesverlauf.

[9] Data for the official interventions of the Bundesbank and Federal Reserve were kindly provided by the Deutsche Bundesbank, Hauptabteilung Ausland on a confidential base. Therefore, this study comprises no exact data, nor any figures of these interventions.

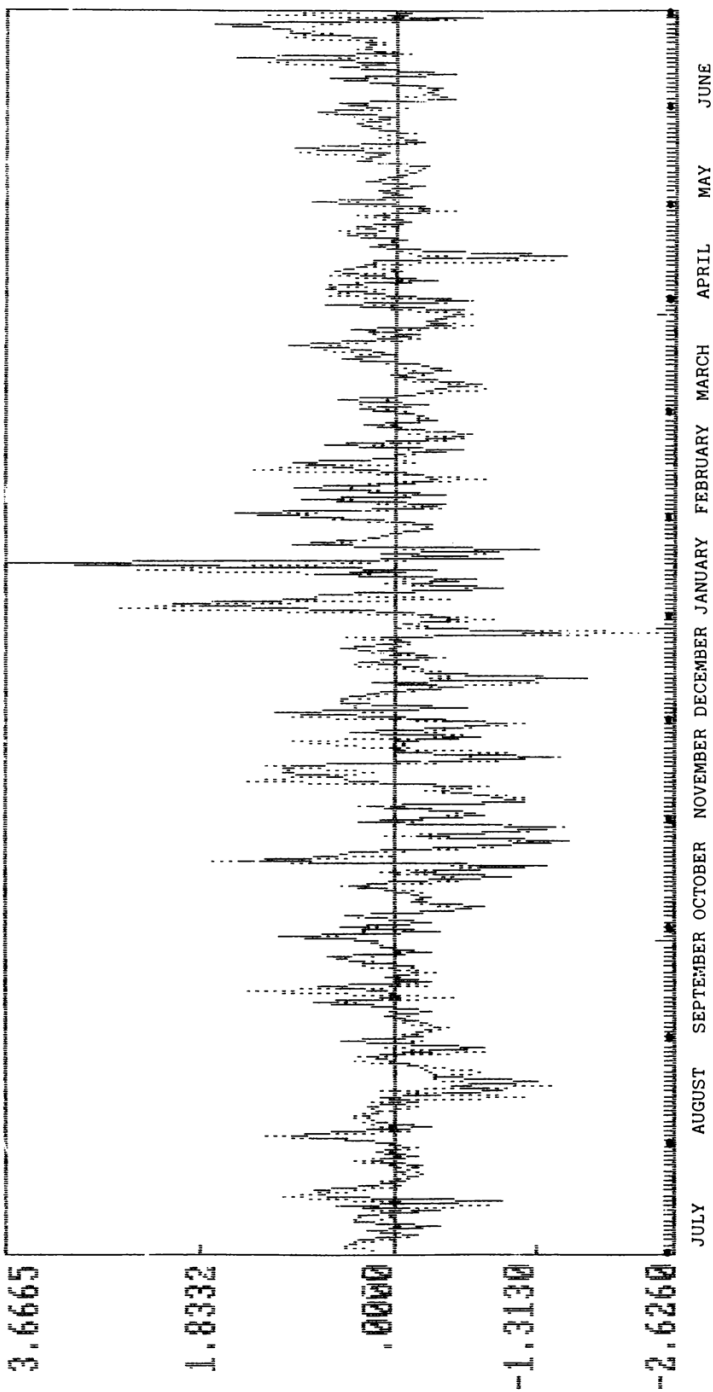


Figure 2: Relative Change of the Dollar-DM Opening and Closing Exchange Rate

Despite of the fact that the sample period (February 1985 - September 1988) consists of 43 months, the majority of these months could not be used appropriate because of the very few number of interventions per month.

Consequently, as relevant subsamples have been selected thirteen months, which comprise at least four interventions by the Bundesbank and/or Federal Reserve each month. This seems an objective criterion. Finally, in this study the method of Ordinary Least Squares (OLS) is taken as estimation technique.

1. *Exchange Market Interventions by the Bundesbank, Federal Reserve and Both Central Banks*

The intervention by the Deutsche Bundesbank (INV_t^{DBB}), the Federal Reserve System (INV_t^{FED}) or both central banks (INV_t^{TOT}) in the U.S. dollar – Deutsche Mark exchange market are explained by a constant and the difference between the opening rate of the dollar in DM (S_t^P) and a n-days moving average of the opening rate, fixing rate (S_t^F) and closing rate (S_t^U) of the dollar:

$$(1a) \qquad INV_t^{DBB} = \overset{(+/-)}{a_0} + a_1 \left(S_t^P - \frac{1}{3\,n} \overset{(-)}{\sum_{n}} S_{t-n}^{P/F/U} \right) \qquad n = 3,5,7$$

$$(1b) \qquad INV_t^{FED} = b_0 + b_1 \left(S_t^P - \frac{1}{3\,n} \sum_{n} S_{t-n}^{P/F/U} \right) \qquad n = 3,5,7$$

$$(1c) \qquad INV_t^{TOT} = c_0 + c_1 \left(S_t^P - \frac{1}{3\,n} \sum_{n} S_{t-n}^{P/F/U} \right) \qquad n = 3,5,7$$

$$\text{with: } INV_t^{TOT} = INV_t^{DBB} + INV_t^{FED}$$

The exchange market interventions of the Bundesbank and Federal Reserve are both expressed in billions of DMs. The interventions are positive if the central bank buys dollars in return for DMs and negative if the central bank sells dollars for DMs. The dollar-DM rate is defined as the spot value of one dollar expressed in DM at the Frankfurt exchange. The opening, fixing and closing exchange rates are taken at 8.30, 13.00 respectively 16.30 hours in Frankfurt time.

The constant (a_0, b_0 or c_0) reflects, when significant, a bias of the central bank(s) with respect to the dollar-DM rate based on the development of the

"fundamentals", such as the long capital account, the current account, the inflation rate and the growth rate of the money stock in West Germany and the United States.

A positive constant represents an autonomous bias of the central bank(s) towards a dollar appreciation vis-à-vis the DM and a negative constant a bias in favor of a dollar depreciation, in the medium (and long) run[10].

The smoothing coefficient (a_1, b_1 or c_1) reflects the reaction of the central bank(s) by exchange market interventions on a deviation between the actual exchange rate – i.e. the opening rate of the day – and the desired exchange rate. As a proxy for the desired rate is chosen a moving average of the opening, fixing and closing rates during the previous three, five or seven days. While the Bundesbank and Federal Reserve are supposed to pursue a policy of 'leaning against the wind', the smoothing coefficient is expected to have a negative sign.

This means that the central banks try to smooth the volatility of the dollar-DM rate in the short run by exchange market intervention[11].

Table 1 gives the results of the regressions for the dollar-DM exchange market interventions by the Deutsche Bundesbank on a constant and the difference between the opening dollar rate and a three, five respectively seven days moving average of the opening, fixing and closing dollar rates[12]. The constant (a_0) is for half of the regressions significant, but always relatively small. A positive constant reflects a bias of the Bundesbank towards a dollar appreciation, a negative constant indicates a bias in favor of a dollar depreciation vis-à-vis the DM. The smoothing coefficient (a_1) has in nearly all regressions the expected, negative sign and is in general significant, particularly in case of the five and seven days moving averages. This means that the Bundesbank was trying to smooth the dollar-DM rate in the short run by intervention.

---

[10] The constant is a consequence of the monthly or quarterly base of the data on "fundamentals" (inflation, money growth, balance of payments accounts, etc.). These data would lead to rather sticky regressors for the "fundamentals" in a daily model of exchange market intervention.

[11] However, if the smoothing coefficient unexpectedly has a positive sign, then the central bank concerned actually reacts by a policy of 'leaning with the wind' and thus amplifies the exchange rate volatility in the short run. Such a policy is expected to be an exception.

[12] The t-values are shown within brackets under the constant and coefficient(s). An asterisk (*) indicates that they are significant at a 95%-confidence level (critical value: 1,725). Furthermore, the squared multiple correlation coefficient (R^2) idem adjusted for degrees of freedom ($\bar{R}^2$) and the *Durbin-Watson* statistic (DW) for first-order autocorrelation are given for each regression.

Table 1: **Exchange Market Interventions by the Deutsche Bundesbank (DBB)**

Equation (OLS)	$INV_t^{DBB} = a_0 + a_1(S_t^{P} - \frac{1}{9}\sum_{n=1}^{3} S_{t-n}^{P/F/U})$ (three days moving average)					$INV_t^{DBB} = a_0 + a_1(S_t^{P} - \frac{1}{15}\sum_{n=1}^{5} S_{t-n}^{P/F/U})$ (five days moving average)					$INV_t^{DBB} = a_0 + a_1(S_t^{P} - \frac{1}{21}\sum_{n=1}^{7} S_{t-n}^{P/F/U})$ (seven days moving average)				
Month	a_0	a_1	R^2	$\overline{R^2}$	DW	a_0	a_1	R^2	$\overline{R^2}$	DW	a_0	a_1	R^2	$\overline{R^2}$	DW
September 1985	-0.026 * (-2.22)	0.642* (2.99)	0.320	0.284	0.877	-0.024 * (-2.43)	0.630* (4.58)	0.525	0.500	1.024	-0.024 * (-2.60)	0.535* (4.96)	0.564	0.541	1.101
October 1985	-0.096 * (-3.80)	-1.802 (-1.41)	0.087	0.043	1.141	-0.103 * (-4.07)	-2.154 * (-1.82)	0.136	0.095	1.197	-0.114 * (-4.42)	-2.282 * (-2.27)	0.197	0.159	1.241
October 1986	0.100 (1.57)	-7.349 (-1.64)	0.114	0.072	2.390	0.096 (1.52)	-6.112 (-1.68)	0.119	0.077	2.348	0.093 (1.45)	-4.396 (-1.48)	0.094	0.051	2.310
January 1987	0.071* (2.61)	1.488 (1.13)	0.063	0.014	1.990	0.081* (2.69)	1.414 (1.36)	0.088	0.040	2.123	0.102* (2.99)	1.755* (1.84)	0.151	0.106	2.271
August 1987	-0.026 (-1.48)	-2.719 * (-2.19)	0.202	0.160	1.785	-0.025 (-1.43)	-1.895 * (-2.06)	0.183	0.140	1.850	-0.026 (-1.48)	-1.585 * (-2.14)	0.194	0.151	1.910
September 1987	0.021* (2.21)	-1.827 (-1.54)	0.106	0.061	1.495	0.021* (2.39)	-1.977 * (-2.17)	0.191	0.150	1.608	0.021* (2.36)	-1.706 * (-2.20)	0.195	0.155	1.625
October 1987	0.014 (0.35)	-5.698 * (-2.57)	0.248	0.210	1.391	-0.006 (-0.15)	-5.998 * (-3.48)	0.377	0.346	1.490	-0.009 (-0.24)	-5.430 * (-3.25)	0.346	0.314	1.464
November 1987	0.043* (1.87)	-2.940 * (-2.25)	0.219	0.175	1.639	0.031 (1.36)	-2.798 * (-2.83)	0.309	0.270	1.834	0.016 (0.70)	-2.756 * (-3.41)	0.392	0.358	2.058
December 1987	0.048 (1.53)	-6.193 * (-2.71)	0.279	0.241	1.227	0.041 (1.20)	-4.920 * (-2.46)	0.241	0.201	1.270	0.035 (0.93)	-4.408 * (-2.20)	0.203	0.161	1.216
January 1988	0.040* (1.74)	-1.233 (-1.05)	0.058	0.005	0.922	0.048* (2.07)	-1.651 (-1.62)	0.127	0.078	0.946	0.057* (2.47)	-2.098 * (-2.14)	0.203	0.159	1.071
June 1988	-0.106 * (-1.90)	-3.084 (-0.84)	0.038	-0.016	1.870	-0.718 (-1.21)	-4.463 (-1.55)	0.118	0.069	2.095	-0.051 (-0.80)	-4.524 * (-1.82)	0.155	0.108	2.154
July 1988	-0.333 * (-5.39)	-14.092* (-2.75)	0.284	0.247	2.127	-0.314 * (-4.89)	-12.404* (-2.65)	0.270	0.232	2.194	-0.293 * (-4.31)	-11.461* (-2.56)	0.257	0.218	2.111
August 1988	-0.157 * (-3.06)	-3.981 (-1.34)	0.079	0.035	1.597	-0.155 * (-3.03)	-3.669 (-1.43)	0.089	0.046	1.585	-0.150 * (-2.89)	-3.262 (-1.32)	0.077	0.033	1.556

The adjusted correlation coefficient varies for the five and seven days moving averages between 0.04 and 0.54, but exceeds mostly 0.15 and sometimes 0.35. This implies that the equations explain on average one fifth of the Bundesbank interventions.

The *Durbin-Watson* statistic lies – except for September 1985 and January 1988 – above 1.2 (lower limit) and is usually higher than 1.4 (upper limit), which means that there is generally no first-order autocorrelation among the residuals.

Table 2 shows the outcomes of the regressions for the dollar-DM exchange market interventions by the Federal Reserve System on a constant and the difference between the opening dollar rate and a three, five respectively seven days moving average of the opening, fixing and closing dollar rates[13]. The constant (b_0) is rarely significant. A positive or negative constant reflects a bias of the Federal Reserve towards a dollar appreciation respectively depreciation vis-à-vis the DM. The smoothing coefficient (b_1) has in case of the five and seven days moving averages almost always the expected, negative sign and is often significant. Therefore, the Federal Reserve was aiming too at a policy of 'leaning against the wind', but intervened less than the Bundesbank. The volume of the Federal Reserve interventions was in general smaller than that of the Bundesbank interventions. The adjusted correlation coefficient exceeds for the five and seven days moving averages in most cases 0.12 and is in July 1988 even more than 0.40. On average the equations explain one tenth of the Federal Reserve interventions.

The *Durbin-Watson* statistic is mostly – except for December 1987 and June 1988 – higher than 1.4 (upper limit) and points to no first-order autocorrelation in these cases. Only in the two months mentioned the residuals are positively correlated among themselves.

Table 3 comprises the results of the regressions for the total dollar-DM exchange market interventions by both central banks on a constant and the difference between the opening dollar rate and a three, five, respectively seven days moving average of the opening, fixing and closing dollar rates[14]. The constant (c_0) is sometimes significant and relatively small. It equals by approximation the sum of both constants for the individual interventions

[13] No regressions are made for the Federal Reserve interventions in September and October 1985, October 1986, January and September 1987, because the number of interventions in these months is less than 4.

[14] The regressions for the total interventions in September and October 1985, October 1986, January and September 1987 correspond with the Bundesbank interventions in those months (see table 1) because of the lack of Federal Reserve interventions.

Table 2: **Exchange Market Interventions by the Federal Reserve System (FED)**

Equation (OLS)	$INV_t^{FED} = b_0 + b_1(S_t^P - \frac{1}{9}\sum_{n=1}^{3} S_{t-n}^{P/F/U})$ (three days moving average)					$INV_t^{FED} = b_0 + b_1(S_t^P - \frac{1}{15}\sum_{n=1}^{5} S_{t-n}^{P/F/U})$ (five days moving average)					$INV_t^{FED} = b_0 + b_1(S_t^P - \frac{1}{21}\sum_{n=1}^{7} S_{t-n}^{P/F/U})$ (seven days moving average)				
Month	b_0	b_1	R^2	$\overline{R^2}$	DW	b_0	b_1	R^2	$\overline{R^2}$	DW	b_0	b_1	R^2	$\overline{R^2}$	DW
September 1985	No interventions by FED					No interventions by FED					No interventions by FED				
October 1985	No interventions by FED					No interventions by FED					No interventions by FED				
October 1986	No interventions by FED					No interventions by FED					No interventions by FED				
January 1987	No interventions by FED					No interventions by FED					No interventions by FED				
August 1987	-0.071 (-1.49)	-3.261 (-0.96)	0.046	-0.004	1.888	-0.074 (-1.58)	-2.967 (-1.21)	0.072	0.023	1.942	-0.077 (-1.66)	-2.744 (-1.39)	0.093	0.045	1.990
September 1987	No interventions by FED					No interventions by FED					No interventions by FED				
October 1987	0.008 (0.38)	-2.642 * (-2.15)	0.188	0.148	1.525	-0.001 (-0.06)	-2.827 * (-2.90)	0.296	0.261	1.643	-0.002 (-0.08)	-2.469 * (-2.60)	0.253	0.216	1.590
November 1987	0.035 (1.10)	-3.226 * (-1.74)	0.145	0.097	1.522	0.022 (0.66)	-3.121 * (-2.19)	0.211	0.167	1.587	0.010 (0.29)	-2.801 * (-2.27)	0.223	0.179	1.659
December 1987	0.063 (1.58)	-4.244 (-1.46)	0.101	0.054	0.776	0.046 (1.13)	-4.704 * (-1.98)	0.171	0.127	0.856	0.037 (0.84)	-4.476 * (-1.92)	0.162	0.118	0.826
January 1988	0.023 (0.91)	0.854 (0.66)	0.024	-0.031	1.866	0.026 (0.96)	0.249 (0.21)	0.002	-0.053	1.794	0.035 (1.26)	-0.630 (-0.54)	0.016	-0.039	1.810
June 1988	-0.057 * (-1.81)	1.150 (0.56)	0.017	-0.038	0.333	-0.039 (-1.12)	-0.638 (-0.38)	0.008	-0.047	0.462	-0.021 (-0.56)	-1.506 (-1.03)	0.056	0.003	0.559
July 1988	-0.157 * (-3.30)	-12.249 * (-3.10)	0.335	0.300	1.163	-0.134 * (-2.94)	-12.564 * (-3.80)	0.432	0.402	1.356	-0.110 * (-2.32)	-12.051 * (-3.89)	0.443	0.413	1.364
August 1988	-0.166 * (-3.39)	-7.333 * (-2.59)	0.242	0.206	1.623	-0.162 * (-3.41)	-7.028 * (-2.96)	0.295	0.261	1.666	-0.152 * (-3.09)	-6.265 * (-2.68)	0.255	0.220	1.617

Table 3: **Total Exchange Market Interventions by Both Central Banks (TOT)**

Equation (OLS)	$INV_t^{TOT} = c_0 + c_1(S_t^P - \frac{1}{9}\sum_{n=1}^{3} S_{t-n}^{P/F/U})$ (three days moving average)					$INV_t^{TOT} = c_0 + c_1(S_t^P - \frac{1}{15}\sum_{n=1}^{5} S_{t-n}^{P/F/U})$ (five days moving average)					$INV_t^{TOT} = c_0 + c_1(S_t^P - \frac{1}{21}\sum_{n=1}^{7} S_{t-n}^{P/F/U})$ (seven days moving average)				
Month	c_0	c_1	R^2	$\overline{R^2}$	DW	c_0	c_1	R^2	$\overline{R^2}$	DW	c_0	c_1	R^2	$\overline{R^2}$	DW
September 1985	See table 1					See table 1					See table 1				
October 1985	See table 1					See table 1					See table 1				
October 1986	See table 1					See table 1					See table 1				
January 1987	See table 1					See table 1					See table 1				
August 1987	-0.096 (-1.63)	-5.970 (-1.42)	0.096	0.048	1.902	-0.099 (-1.70)	-4.862 (-1.59)	0.118	0.072	1.970	-0.103 * (-1.79)	-4.329 * (-1.77)	0.142	0.097	2.032
September 1987	See table 1					See table 1					See table 1				
October 1987	0.022 (0.37)	-8.340 * (-2.46)	0.232	0.194	1.389	-0.007 (-0.12)	-8.826 * (-3.33)	0.357	0.325	1.491	-0.011 (-0.18)	-7.900 * (-3.07)	0.321	0.287	1.457
November 1987	0.078 (1.71)	-6.165 * (-2.35)	0.235	0.192	1.788	0.053 (1.17)	-5.918 * (-3.02)	0.337	0.300	1.992	0.027 (0.57)	-5.557 * (-3.38)	0.389	0.355	2.193
December 1987	0.112* (1.84)	-10.437* (-2.38)	0.229	0.189	0.680	0.087 (1.39)	-9.624 * (-2.63)	0.267	0.229	0.735	0.072 (1.06)	-8.884 * (-2.44)	0.239	0.199	0.680
January 1988	0.063* (1.79)	-0.379 (-0.21)	0.002	-0.053	0.566	0.074* (2.04)	-1.402 (-0.88)	0.041	-0.012	0.546	0.093* (2.59)	-2.727 * (-1.82)	0.155	0.108	0.585
June 1988	-0.163 * (-2.03)	-1.935 (-0.37)	0.007	-0.048	1.281	-0.111 (-1.30)	-5.101 (-1.23)	0.077	0.026	1.510	-0.071 (-0.80)	-6.029 (-1.70)	0.138	0.091	1.635
July 1988	-0.491 * (-5.39)	-26.341* (-3.49)	0.391	0.358	1.767	-0.448 * (-4.94)	-24.968* (-3.78)	0.430	0.400	2.001	-0.403 * (-4.22)	-23.513* (-3.74)	0.425	0.394	1.931
August 1988	-0.323 * (-3.87)	-11.314* (-2.34)	0.207	0.169	1.148	-0.317 * (-3.88)	-10.697* (-2.61)	0.245	0.209	1.129	-0.302 * (-3.58)	-9.527 * (-2.38)	0.212	0.175	1.093

($a_0 + b_0$) in the corresponding months. The smoothing coefficient (c_1) has always the expected, negative sign and is usually significant, in particular for the seven days moving averages. Also, this coefficient approximates the sum of both smoothing coefficients for the individual interventions ($a_1 + b_1$) in the months concerned. The adjusted correlation coefficient exceeds for the five and seven days moving averages generally 0.20 and in some cases even 0.35. Consequently, the equations explain on average one fifth of the total interventions and equal the explanatory power of the equations for the Bundesbank interventions (see table 1).

The *Durbin-Watson* statistic lies mostly – except for December 1987, January and August 1988 – above 1.4 (upper limit) and indicates no first-order autocorrelation in general. In August 1988 the residuals are somewhat positively correlated, while this was not the case for the regressions of the individual interventions.

2. *Coordination of Exchange Market Interventions by Both Central Banks*

In general, the regressions with the difference between the opening rate and five days moving average ($n = 5$) proved to be most successful – in the sense of a statistical fit – for the individual and total interventions. Therefore, these equations are taken as a point of departure for additional variables or factors. First of all, the interventions of one central bank are added as an extra explanatory variable to the equation for the interventions of the other central bank, mutatis mutandis. So, the Bundesbank and Federal Reserve interventions are explained by a constant, the deviation between the opening rate and five days moving average and the Federal Reserve respectively Bundesbank interventions:

$$(2a) \quad INV_t^{DBB} = \overset{(+/-)}{a_0} + a_1 \left(S_t^P - \frac{1}{3\,n} \overset{(-)}{\sum_{n}} S_{t-n}^{P/F/U} \right) + \overset{(+)}{a_2} \cdot INV_t^{FED} \qquad n = 5$$

$$(2b) \quad INV_t^{FED} = b_0 + b_1 \left(S_t^P - \frac{1}{3\,n} \sum_{n} S_{t-n}^{P/F/U} \right) + b_2 \cdot INV_t^{DBB} \qquad n = 5$$

The coordination coefficient (a_2 or b_2) reflects the degree of coordination between the intervention in the dollar-DM exchange market. Both central banks try to tune their interventions to each other in order to strengthen the effectiveness of both interventions. The announcement effect of coordinated intervention may be greater than the effect of non-coordinated intervention. If significant, the coordination coefficient represents to what extent the

Bundesbank and Federal Reserve interventions are correlated[15]. The coefficient is expected to have a positive sign and will not exceed 1 in case of equal, simultaneous interventions by both central banks.

Table 4 gives the outcomes of the regressions for the dollar-DM exchange market interventions by the Bundesbank respectively Federal Reserve with each other interventions as an additional explanatory variable[16].

The constant (a_0 and b_0) becomes even less significant for both interventions (see tables 1 and 2). The smoothing coefficient (a_1 and b_1) looses also significance, sometimes considerably, and diminishes, but keeps mostly the expected, negative sign. Obviously, explanatory power is pulled away from the smoothing variable.

The coordination coefficient (a_2 and b_2) has always the expected, positive sign and is generally significant (exactly the same t-value). This coefficient varies, when significant, from 0.2 to 1.6 for both interventions and usually does not exceed 1, except for August and October 1987 due to unequal interventions by both central banks. The adjusted correlations coefficient lies in most cases above 0.25. On average the equations "explain" (see footnote 15) one third of the Bundesbank and Federal Reserve interventions. The *Durbin-Watson* statistic is mostly within the range of 1.5 to 2.5 (upper limits) and points to no first-order autocorrelation in general. Only in June 1988 the residuals are clearly positively correlated for the Federal Reserve interventions. In two cases the statistic is indecisive.

3. *Effect of Exchange Market Uncertainty on Exchange Market Interventions*

Furthermore, the equation with the difference between the opening rate and five days moving average as explanatory variable for the exchange market interventions can be extended with an additional factor representing the uncertainty at the Dollar-DM exchange market. The degree of exchange market uncertainty is approximated by the variance of the opening, fixing and closing dollar rates in the past five days (σ_n^2 with $n = 5$). So, the Bundes-

[15] However, the causal relation between both interventions is not evident in practice. It is not clear which central bank leads and which central bank follows with intervention as a consequence of the daily concertation procedure between both banks.

[16] No regressions are made for the total interventions of both central banks, because the constant and coefficients proved to be – by approximation – the sum of the constant and coefficients of the corresponding regressions for the Bundesbank and Federal Reserve (see tables 1, 2 and 3).

Table 4: **Coordination of Exchange Market Interventions by Both Central Banks**

Equation (OLS)	$INV_t^{DBB} = a_0 + a_1(S_t^P - \frac{1}{15}\sum_{n=1}^{5} S_{t-n}^{P/F/U}) + a_2.INV_t^{FED}$ (exchange market interventions by Bundesbank)						$INV_t^{FED} = b_0 + b_1(S_t^P - \frac{1}{15}\sum_{n=1}^{5} S_{t-n}^{P/F/U}) + b_2.INV_t^{DBB}$ (exchange market interventions by Federal Reserve)					
Month	a_0	a_1	a_2	R^2	$\overline{R^2}$	DW	b_0	b_1	b_2	R^2	$\overline{R^2}$	DW
September 1985	See table 1						No interventions by FED					
October 1985	See table 1						No interventions by FED					
October 1986	See table 1						No interventions by FED					
January 1987	See table 1						No interventions by FED					
August 1987	-0.010 (-0.62)	-1.287 (-1.57)	0.205 * (2.76)	0.426	0.362	1.697	-0.038 (-0.88)	-0.213 (-0.09)	1.454 * (2.76)	0.348	0.276	1.789
September 1987	See table 1						No interventions by FED					
October 1987	-0.004 (-0.23)	-1.409 (-1.68)	1.623 * (10.06)	0.902	0.891	2.793	-0.002 (0.19)	0.284 (0.56)	0.519 * (10.06)	0.889	0.877	2.947
November 1987	0.027 (1.17)	-2.158 * (-1.98)	0.205 (1.28)	0.369	0.295	1.555	0.008 (0.25)	-1.928 (-1.15)	0.427 (1.28)	0.280	0.195	1.308
December 1987	0.026 (0.78)	-3.383 (-1.62)	0.327 * (1.79)	0.355	0.284	1.672	0.027 (0.67)	-2.436 (-0.94)	0.461 * (1.79)	0.296	0.217	1.249
January 1988	0.047 * (1.93)	-1.661 (-1.58)	0.039 (0.19)	0.129	0.026	1.030	0.023 (0.75)	0.335 (0.26)	0.052 (0.19)	0.004	-0.113	1.878
June 1988	-0.031 (-0.62)	-3.790 (-1.63)	1.055 * (3.28)	0.460	0.396	2.182	-0.013 (-0.43)	1.003 (0.69)	0.368 * (3.28)	0.393	0.321	0.549
July 1988	-0.249 * (-3.33)	-6.243 (-1.04)	0.490 (1.57)	0.358	0.286	2.060	-0.057 (-0.86)	-9.530 * (-2.56)	0.245 (1.57)	0.500	0.445	1.222
August 1988	-0.089 (-1.48)	-0.808 (-0.28)	0.407 * (1.82)	0.218	0.140	2.184	-0.107 * (-2.00)	-5.748 * (-2.44)	0.349 * (1.82)	0.395	0.334	2.265

bank, Federal Reserve and total interventions are explained by a constant, the five days moving variance and the deviation between the opening rate and five days moving average:

$$(3a) \qquad INV_t^{DBB} = a_0 + a_1 \cdot \sigma_n^2 \left(S_t^P - \frac{1}{3\,n} \cdot \sum_{\overline{n}}^{(+/-)} S_{t-n}^{P/F/U} \right) \qquad n = 5$$

$$(3b) \qquad INV_t^{FED} = b_0 + b_1 \cdot \sigma_n^2 \left(S_t^P - \frac{1}{3\,n} \cdot \sum_{\overline{n}}^{(-)} S_{t-n}^{P/F/U} \right) \qquad n = 5$$

$$(3c) \qquad INV_t^{TOT} = c_0 + c_1 \cdot \sigma_n^2 \left(S_t^P - \frac{1}{3\,n} \cdot \sum_{\overline{n}} S_{t-n}^{P/F/U} \right) \qquad n = 5$$

$$\text{with: } \sigma_n^2 = \sum_{\overline{n}} \left(S_{t-n}^{P/F/U} - \frac{1}{3\,n} \cdot \sum_{\overline{n}} S_{t-n}^{P/F/U} \right)^2$$

A higher degree of exchange market uncertainty (σ_n^2) is supposed to provoke relatively a greater volume of intervention by the Bundesbank, Federal Reserve or both, either positive or negative. Given their short term objectives, the central banks then have a greater incentive to react on a divergence between the actual and desired exchange rate. The smoothing coefficient adjusted for uncertainty (a_1, b_1 or c_1) reflects also a policy of 'leaning against the wind' of the central bank concerned and is expected to have a negative sign as a consequence of the positive moving variance. This implies that the Bundesbank and/or the Federal Reserve try to smooth the volatility of the dollar-DM rate depending on the degree of exchange market uncertainty.

Table 5 shows the results of the regressions for the dollar-DM interventions by the Bundesbank, Federal Reserve respectively both central banks with the five days moving variance of the opening, fixing and closing dollar rate as an additional factor to the difference between the opening dollar rate and a five days moving average.

The constant (a_0, b_0 and c_0) stays relatively small and sometimes significant for individual and total interventions (see tables 1, 2 and 3). The smoothing coefficient adjusted for uncertainty (a_1, b_1 and c_1) keeps almost always the expected, negative sign[17] and stays overall mostly significant. The coefficient becomes considerably higher because of the moving variance and gains

[17] Evidently, the Bundesbank pursued a policy of 'leaning *with* the wind' in September 1985. The equation explains then nearly 90% of the interventions. A closer inspection of the data reveals that the Bundesbank interventions were guided by other objectives than smoothing – i.e. the development of "fundamentals" – as from 22 September 1985, when the Plaza Agreement was constituted by the G-5.

Table 5: **Effect of Exchange Market Uncertainty on Exchange Market Interventions**

Equation (OLS)	$INV_t^{DBB} = a_0 + a_1 \cdot \sigma_5^2 (S_t^{P} - \frac{1}{15} \sum_{n=1}^{5} S_{t-n}^{P/F/U})$ (interventions by Bundesbank)					$INV_t^{FED} = b_0 + b_1 \cdot \sigma_5^2 (S_t^{P} - \frac{1}{15} \sum_{n=1}^{5} S_{t-n}^{P/F/U})$ (interventions by Federal Reserve)					$INV_t^{TOT} = c_0 + c_1 \cdot \sigma_5^2 (S_t^{P} - \frac{1}{15} \sum_{t=1}^{7} S_{t-n}^{P/F/U})$ (total interventions by both banks)				
Month	a_0	a_1	R^2	$\overline{R^2}$	DW	b_0	b_1	R^2	$\overline{R^2}$	DW	c_0	c_1	R^2	$\overline{R^2}$	DW
September 1985	-0.010 * (-1.85)	12.219* (11.51)	0.875	0.868	1.758	No interventions by FED					See interventions by DBB				
October 1985	-0.096 * (-3,53)	-219.64 (-0.80)	0.029	-0.017	1.141	No interventions by FED					See interventions by DBB				
October 1986	0.109 (1.65)	-1462.3 (-1.20)	0.064	0.020	2.222	No interventions by FED					See interventions by DBB				
January 1987	0.071* (2.89)	148.17 (1.45)	0.100	0.053	2.196	No interventions by FED					See interventions by DBB				
August 1987	-0.021 (-1.03)	-196.63 (-0.78)	0.031	-0.020	1.729	-0.074 (-1.48)	-517.25 (-0.83)	0.035	-0.016	1.891	-0.094 (-1.48)	-713.88 (-0.90)	0.041	-0.010	1.874
September 1987	-0.020* (2.24)	-2722.8* (-1.95)	0.160	0.118	1.470	No interventions by FED					See interventions by DBB				
October 1987	-0.003 (-0.10)	-1321.7* (-5.47)	0.600	0.580	1.760	0.002 (0.10)	-585.45* (-3.77)	0.416	0.387	1.954	-0.001 (-0.02)	-1907.1* (-4.91)	0.547	0.524	1.791
November 1987	0.042* (1.80)	-585.62* (-2.20)	0.212	0.169	1.852	0.028 (0.90)	-771.30* (-2.14)	0.202	0.158	1.575	0.070 (1.56)	-1356.9* (-2.63)	0.278	0.238	1.996
December 1987	0.052 (1.43)	-1214.5* (-1.74)	0.137	0.092	1.373	0.020 (0.59)	-2417.1* (-3.71)	0.421	0.390	0.896	0.073 (1.23)	-3631.6* (-3.23)	0.355	0.321	0.815
January 1988	0.046* (1.90)	-185.63 (-1.23)	0.077	0.026	1.001	0.033 (1.20)	-69.356 (-0.41)	0.009	-0.046	1.808	0.079* (2.17)	-254.99 (-1.12)	0.066	0.014	0.596
June 1988	-0.058 (-1.20)	-1601.1* (-2.80)	0.304	0.265	2.308	-0.019 (-0.65)	-617.00* (-1.75)	0.146	0.098	0.637	-0.077 (-1.13)	-2218.1* (-2.73)	0.292	0.253	1.793
July 1988	-0.360 * (-5.40)	-3540.9* (-1.73)	0.136	0.091	2.107	-0.180 * (-3.61)	-3835.0* (-2.51)	0.249	0.210	1.427	-0.540 * (-5.38)	-7375.9* (-2.40)	0.232	0.192	1.911
August 1988	-0.169 * (-3.29)	-1234.3 (-1.40)	0.086	0.042	1.608	-0.187 * (-3.83)	-2227.1* (-2.66)	0.252	0.216	1.685	-0.356 * (-4.27)	-3461.4* (-2.42)	0.218	0.181	1.188

significance in months with a high level of exchange market uncertainty, such as October and December 1987 and June 1988 (see figure 2).

The adjusted correlation coefficient rises in these months with much uncertainty substantially, but diminishes in months with little uncertainty (e. g. August 1987). Hence, the equations explain on average one fifth of the Bundesbank, Federal Reserve and total interventions, which implies that the explanatory power for the Federal Reserve interventions has doubled on average (see table 2). The *Durbin-Watson* statistic exceeds in most cases 1.4 (upper limit) and indicates no first-order autocorrelation in general. In this respect the outcomes of the regressions with the moving variance do not differ much from those without the moving variance.

IV. Conclusion

In the previous section an empirical study has been made of the reaction functions for the dollar-DM exchange market interventions by the Bundesbank and/or Federal Reserve in thirteen relevant months during the period from February 1985 till September 1988. The most important conclusions of this empirical study are the following.

Firstly, the sometimes significant, but relatively small constant indicates a limited bias of the central banks towards a dollar appreciation or depreciation vis-à-vis the DM based on the development of the 'fundamentals'.

Secondly, the mostly significant, negative and relatively (very) high smoothing coefficient points to a policy of 'leaning against the wind' by both central banks in order to smooth the dollar-DM rate from day to day.

Thirdly, the generally significant, positive and variable coordination coefficients shows a rather divergent degree of coordination between the Bundesbank and Federal Reserve on top of a higher frequency of Bundesbank intervention.

Fourthly, the smoothing coefficient adjusted for exchange market uncertainty becomes more significant in months with much uncertainty and leads in these months to a higher adjusted correlation coefficient. It appears that both central banks take full account of exchange market uncertainty with respect to their intervention policy[18].

[18] This contradicts the empirical finding of *Neumann* (1984) that the Bundesbank intervened – acting like a private investor – for a relatively smaller scale in the dollar-DM market with rising exchange rate uncertainty. *Neumann* (1984) estimated reaction functions for the exchange market interventions by the Bundesbank on a monthly base over the period March 1974 - December 1981.

Finally, the equations explain on average one fifth and in case of a coordination variable one third of the exchange market interventions by the Bundesbank and/or Federal Reserve. It should be noticed that the equations *without* a moving variance of opening, fixing and closing rates are relatively more successful in months with little exchange market uncertainty, while the equations *with* the moving variance have more explanatory power in months with much uncertainty. In the latter case the equations my explain 40% or more of the exchange market interventions in months with a high volatility of the dollar-DM exchange rate, e.g. October and December 1987. These general conclusions seem a sound base for future research of the short term reaction functions of the Deutsche Bundesbank and Federal Reserve System in the dollar-DM exchange market.

References

Artus, J. R.: Exchange Rate Stability and Managed Floating: The Experience of the Federal Republic of Germany, IMF Staff Papers, July 1976, Vol. 23, pp. 312 - 333. – *Branson,* W. H., H. *Halttunen* & P. *Masson:* Exchange Rates in the Short Run, The Dollar-Deutsche-Mark Rate, European Economic Review, December 1977, Vol. 10, pp. 303 - 324. – *Dornbusch,* R.: Exchange Rate Economics: Where Do We Stand?, Brookings Papers on Economic Activity, 1980, Vol. 1, pp. 143 - 185. – *Eijffinger,* S. C. W.: Over de Beheersbaarheid van de Geldhoeveelheid (On the Controllability of the Money Supply), Free University Press, Amsterdam, 1986. – *Eijffinger,* S. C. W. & A. P. D. *Gruyters:* On the Effectiveness of Daily Intervention by the Deutsche Bundesbank and the Federal Reserve System in the U.S. dollar-Deutsche Mark Exchange Market, in: *Baltensperger,* E. & H. W. *Sinn* (eds.): Exchange Rates Regimes and Currency Union, Proceedings of the Confederation of European Economic Associations 1990, McMillan Publishers, London, 1991. – *Funabashi,* Y.: Managing the Dollar: From the Plaza to the Louvre, Institute for International Economics, Washington D.C., 1988. – *Gleske,* L.: Die Devisenpolitik der Deutschen Bundesbank: Interventionen am DM-$-Market und im Europäischen Währungssystem sowie geldmarktorientierte Devisentransaktionen, Kredit und Kapital, 1982, Vol. 15, pp. 259 - 274. – *König,* H. & W. *Gaab:* Smoothing Exchange Rates by Central Bank Interventions?, Economic Notes, Monte dei Paschi di Siena, 1982, pp. 177 - 198. – *Lehment,* H.: Devisenmarktinterventionen bei flexiblen Wechselkursen. J. C. B. Mohr, Tübingen 1980. – *Neumann,* M. J. M.: Intervention in the Mark/Dollar Market: the Authorities' Reaction Function, Journal of International Money and Finance, 1984, Vol. 3, pp. 223 - 239. – *Scholl,* F.: Implications of Monetary Targeting for Exchange-Rate Policy, in: P. *Meek* (ed.), Central Bank Views on Monetary Targeting, Federal Reserve Bank of New York, New York, 1983, pp. 118 - 125. – Working Group on Exchange Market Intervention (Chairman: *Philippe Jurgensen),* Report, March 1983.

Zusammenfassung

Beitrag zu den kurzfristigen Zielen der täglichen Beeinflussung des US-Dollar-/Deutschmarkkurses seitens der Deutschen Bundesbank und des Federal-Reserve-System

Zweck dieses Artikels ist es, eine kurzfristige Reaktionsfunktion der Interventionen der Deutschen Bundesbank und des Federal-Reserve-System auf dem Devisenmarkt im einzelnen darzulegen und zu erproben. Auf der Grundlage des *Jurgensen*-Berichts und neuerer Veröffentlichungen wird angenommen, daß beide Zentralbanken es als das wichtigste Ziel ihrer Interventionspolitik erachten, die Volatilität der Tages- und Wochenkurse zu glätten. Unter Zugrundelegung der Tageskurse sowie von in der laufenden Interventionspraxis täglich gewonnenen Daten für den US $-/DM-Kurs im Zeitraum Februar 1985 bis September 1988 stellen sich die wichtigsten Schlußfolgerungen wie folgt dar: Erstens, beide Zentralbanken verfolgten eine Politik des „Sich-gegen-den-Wind-Lehnens", um eher die Tages- als die wöchentlichen US $-/DM-Kursschwankungen zu glätten. Zweitens, beide Zentralbanken berücksichtigen voll in ihrer Interventionspolitik die Unsicherheiten der US $-/DM-Kursbeeinflussung.

Summary

On the Short Term Objectives of Daily Intervention by the Deutsche Bundesbank and the Federal Reserve System in the U.S. Dollar-Deutsche Mark Exchange Market

The purpose of this article is to specify and to test a short term reaction function of the foreign exchange market intervention by the Deutsche Bundesbank and the Federal Reserve System. Based on the *Jurgensen*-report and more recent publications, it is assumed that both central banks have as their main objective for intervention policy to smooth exchange rate volatility from day to day and from week to week. Using daily intervention data of the Deutsche Bundesbank and the Federal Reserve System and intra-day data of the U.S. Dollar-Deutsche Mark exchange rate for the period February 1985 – September 1988, the most important conclusions are the following. Firstly, both central banks conducted a "leaning against the wind" policy in order to smooth the U.S. Dollar-Deutsche Mark exchange rate fluctuations more from day to day than from week to week. Secondly, both central banks take full account of the uncertainty in the U.S. Dollar-Deutsche Mark exchange market with respect to their intervention policy.

Résumé

Les objectifs à court terme de l'intervention quotidienne de la Deutsche Bundesbank et du Federal Reserve System sur le marché des changes du dollar américain et du Deutsche Mark

L'auteur de cet article essaie de spécifier et de tester une fonction de réaction à court terme de l'intervention sur le marché des changes de la Deutsche Bundesbank et du

Federal Reserve Systeme. En se basant sur le rapport de *Jurgensen* et sur des publications plus récentes, on présume que les deux banques centrales poursuivent principalement avec leur politique d'intervention l'objectif de réduire la volatilité des taux de change au jour le jour et de semaine en semaine. En utilisant des données d'intervention quotidiennes de la Deutsche Bundesbank et du Federal Reserve System, ainsi que des données internationales quotidiennes des taux de change du dollar américain et du DM pour la période, s'étendant de février 1985 à septembre 1988, l'auteur tire les conclusions principales suivantes: (1) les deux banques centrales mènent une politique «contre le vent», en vue de diminuer les fluctuations des cours de change du dollar américain et du DM, davantage au our jour le jour que de semaine en semaine. (2) Les deux banques centrales tiennent entièrement compte de l'incertitude sur le marché des changes du dollar américain et du DM en ce qui concerne leur politique d'intervention.