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# FUTURES COMMITMENTS AND EXCHANGE RATE VOLATILITY

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## INTRODUCTION

This study examines the relationship between exchange rate variability and the number of contracts held by three major groups of futures traders. The study is motivated by the inability of prior research on the futures trading — exchange rate variability relationship to provide specific answers as to whether certain groups of traders destabilize spot markets. Such answers are thought to be of great interest to market observers, regulators and governments concerned with promoting price stability. There have been numerous calls for further regulation of futures markets, even while the debate over the impact of futures trading continues.[1]

There is relatively little evidence on whether or not the level of trading activity in currency futures affects spot exchange rate behavior. Clifton (1985) finds that volume of trading activity in the currency futures market is significantly correlated with exchange rate fluctuations in the interbank foreign exchange market. Grammatikos and Saunders (1986) indicate a bi-causal relationship between futures trading volume and futures currency prices. More recently, Chatrath, Ramchander and Song (1996) demonstrate that futures trading activity leads to conditional variance in exchange rates. The above studies employ aggregate futures activity measures and are unable to test for the relationship between the futures commitments of groups of traders (hedgers, speculators, etc.) and exchange rate variability.

The current investigation employs data compiled from the Commodity Futures Trading Commission's (CFTC) Commitment of Traders (COT) report which provides a periodic breakdown of the positions of commercial traders (large hedgers), non commercial traders (large speculators) and small traders. Figure 1 presents these commitments in four major currency markets sampled monthly since 1983. It can be seen that while hedgers make up the largest class of traders, the positions of small traders and speculators have together often eclipsed those of hedgers.[2] Such disaggregated open interest

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**Figure 1**

Commitment of Traders in Currency Futures

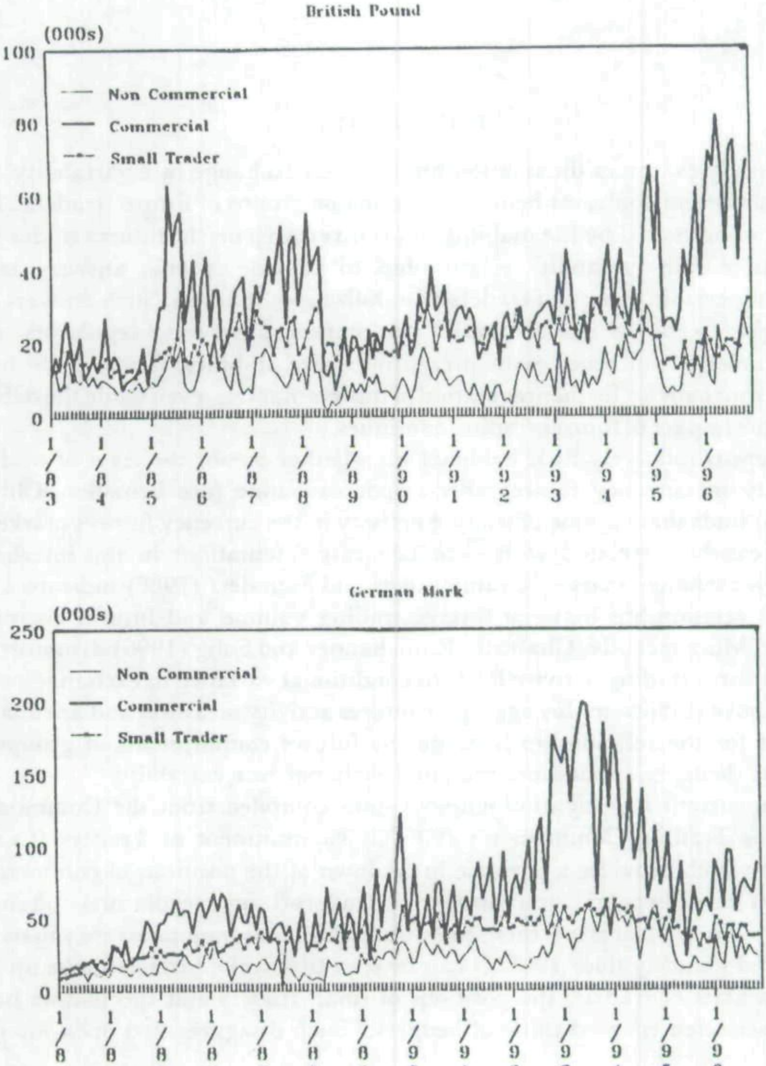
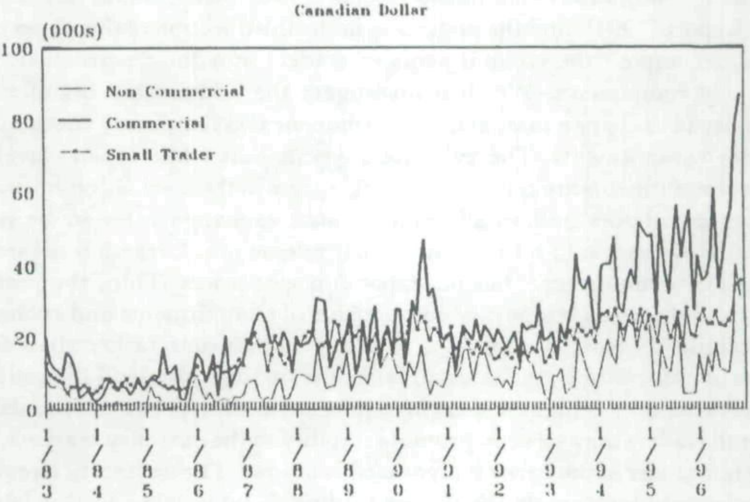
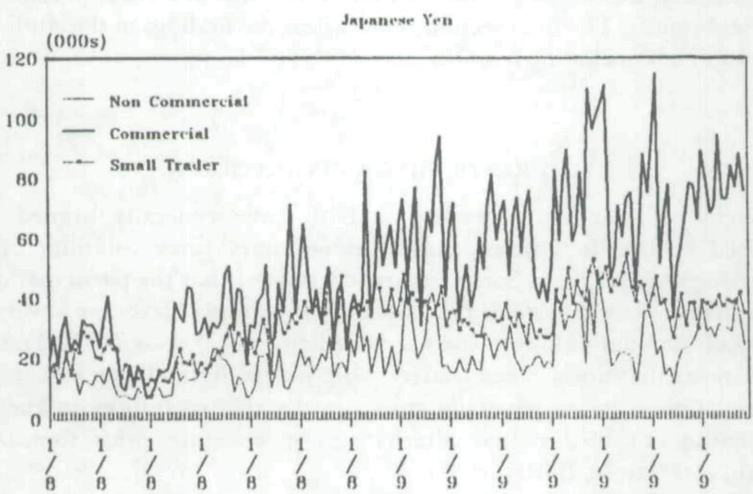


**Figure 1**

**(Continued)**



information in the commitment of traders (COT) report provides the unique opportunity to investigate the impact of individual trader groups on the underlying cash markets.

In light of prior argument and evidence that *surges* in futures trading activity may be especially disruptive to cash markets (for instance, see Grossman (1988), Brady Commission Report (1988), US General Accounting Office Report (1994), and the discussion in the third section of this paper), we further decompose the commitments of traders into their permanent and temporary components. We then investigate the relationship between the variability in exchange rates and the permanent and temporary components of trader commitments. The evidence suggests that while typical levels of futures commitments are not destabilizing, surges in the level of commitments of large speculators and small traders cause exchange rates to be more volatile. However, we find that the actual release of information regarding prior trader commitments has no impact on spot prices. Thus, the positive relationship between temporary components of commitments and exchange rate volatility seems to stem from trading mechanisms rather than from information disclosure. As discussed later, the findings also lend preliminary support to the notion that the margin requirements that 'penalize' speculators and small traders may serve to promote stability in the currency markets.

The remainder of the paper is organized as follows. The next section reviews some relevant literature on the futures trading — underlying asset volatility relationship. The third section describes the data and measures of exchange rate volatility and futures trading activity. The fourth section presents the empirical results. The final section summarizes the findings of the study and provides some concluding remarks.

## FUTURES TRADING AND VOLATILITY

Opponents of speculative trading activity have generally argued that increased trading in futures leads to unnecessary price volatility in the underlying cash markets. Some researchers suggest that the participation of speculative traders in systems that allow high degrees of leverage lowers the quality of the information in the market (Stein, 1987). Cox (1976), among others, notes that uninformed traders could play a destabilizing role in cash markets. Others more generally question the role of futures markets as representing an institutional alternative for accurate price forecasting (Martin and Garcia, 1981).

On the other hand, it has also been suggested that the futures markets have become an important medium of price discovery in cash markets (Schwarz and Laatsch, 1991). Several papers have argued that trading in these markets improves the overall markets' depth and informativeness (Powers, 1970), enhances market efficiency (Stoll and Whaley, 1988), increases market liquidity (Kwast, 1986), and compresses cash market volatility (Danthine, 1978; Bray, 1981; and Kyle, 1985).

There is a great deal of evidence regarding the general impact of futures/options trading on the volatility of equity or interest rate markets. The evidence generally indicates that derivative trading activity either adds to the stability, or does not impact the volatility of cash markets (for instance, Simpson and Ireland, 1985; Skinner, 1989; Edwards, 1988; Bessembinder and Seguin, 1992; and Chatrath, Ramchander and Song, 1995). In contrast, there are relatively few studies that analyze the trading-volume versus price-variability relationship in the context of currency futures. Furthermore, the evidence on the impact of currency futures trading has generally been unfavorable. Eldridge (1984) examines the impact of the futures positions taken by European traders at the end of their business day on the volatility of currency futures traded on the International Monetary Market. The author finds that the price volatility (measured by standard deviation) in German mark futures contracts temporarily rises at the close of the European business day. Grammatikos and Saunders (1986) provide evidence of bi-directional causality between futures market transactions and futures prices of five currency contracts. The authors also isolate a significant number of cases in which a sequential relationship appears between futures volume and futures prices in the currency contracts. McCarthy and Najand (1993) employ a state-space model to provide mixed evidence on the stabilizing influence of futures trading on daily futures currency prices. While the lagged levels of trading volume on the British pound futures, Swiss franc futures and German mark futures are found to have a negative (stabilizing) impact on the volatility of the respective futures price, the lagged trading volume levels on the Canadian dollar futures are found to have a positive (destabilizing) impact.

The studies by Clifton (1985) and Chatrath, Ramchander and Song (1996) explicitly examine the relationship between currency futures trading and exchange rate volatility. Clifton examines the impact of currency futures trading on the interbank currency market during the early 1980s. A strong positive correlation between futures trading volume and intra-day exchange volatility for the Yen, Swiss franc, German mark and Canadian dollar is documented. The study also notes a positive correlation between the monthly volatilities in the mark and Canadian dollar, and the monthly volume of futures trading. Chatrath, Ramchander and Song (1996) provide stronger evidence on the causality between futures trading volume and exchange rate volatility. The authors employ volume standardized by open interest and demonstrate a causal influence flowing from futures activity to the conditional variance of the major currencies.

While market observers have generally acknowledged the vital role that futures markets play in risk transfer and price discovery, they have often voiced concern over the possible role of atypical futures activity in destabilizing markets. For instance, the Brady Commission Report (1988) and the GAO Report (1994) point to the fact that massive amounts of stock index futures were sold on three days prior to the October 1987 Crash. Several other commissions studying the Crash also targeted heavy futures trading as a contributor (see Barro et al., 1989). In an article written prior to the Crash, Grossman (1988) warned of the disruptive impact of unexpected volume created by dynamic insurance activities. The author suggests that suddenly occurring futures volume may catch the market when they are illiquid, exacerbating price changes (also see Grossman and Zhou, 1996).

A direct test for the impact of futures activity shocks is undertaken by Bessembinder the Seguin (1992) who examine the impact of futures volume on the S&P 500 index. The authors employ an ARIMA model to decompose the daily volume into its expected, unexpected, and moving average components. The authors then employ regression analysis to demonstrate that the unexpected component of futures activity is destabilizing, while the expected component is not.

## DATA

The investigation is conducted with respect to four major currencies, the British pound (BP), German mark (DM), Canadian dollar (CD) and Japanese yen (JY) over the interval 1/1986 through 11/1996. The futures contracts on the four currencies make up the vast majority of the futures trading in currency contracts. The interval was determined by the non-availability of bi-monthly COT data prior to 1986. Daily closing spot rates on the four currencies are obtained from the *Futures Industry Institute Data Center*, Washington, DC.

Bi-monthly data relating to the CFTC-compiled COT report on each of the four currencies is obtained from the Pinnacle Data Corporation, Webster, New York. The CFTC requires that all the futures clearing house members make a periodic report to the Commission showing each trader's position on their books. Traders are classified as commercial traders (large hedgers), non-commercial traders (large speculators) and small traders (unclassified traders). A commercial-trader classification is given to the traders whose positions exceed the CFTC reporting levels (200 contracts for currencies) and who are involved with hedging the underlying commodity/financial instrument. A non-commercial-trader classification is given to traders whose positions exceed the CFTC reporting levels but who do not use futures contracts for hedging purposes. The position of small traders do not exceed the CFTC reporting levels and no distinction is made over trader motives (hedging or speculation).[3]

The bi-monthly COT data employed here reflects the commitments of the three futures trading groups on the 15th and the last trading day of each month. If the 15th falls on a weekend or holiday, the commitments reflect the holdings on the closest prior trading day.[4] The COT reflects commitments for the contracts of all expirations so that modelling problems arising from maturity (or expiration) effects are bypassed.

*Volatility Measures*

The study employs two volatility measures, one normal and the other non-normal, that capture distinct price behaviors thought to be of interest to market observers. The normal measure is conditional variance, obtained from Bollerslev's (1986) generalized autoregressive conditional heteroskedasticity model (GARCH (1,1)) fitted to daily returns, $R_t = l(S_t/S_{t-1}) * 100$, where $S_t$ is the spot rate at the close of day $t$.[5] The deployment of the conditional variance measure is motivated by several studies that have found (G)ARCH models to provide a superior fit to financial price data (see Akgir, 1989). Notably, there is evidence that the two common properties of financial prices, leptokurtosis and volatility clustering/ persistence can be suitably modeled by ARCH-type processes. The GARCH model selected in this study coincides with the one in Chatrath, Ramchander and Song (1996).[6] The daily conditional variance measure is averaged over intervals to match the bi-monthly COT series.

The non-normal measure of volatility is jump volatility and is described in Becketti and Roberts (1990). Jumps are identified as the bi-monthly frequency of those daily changes in a return series that are less than $(R_L - 1.5R_Q)$, or greater than $(R_U + 1.5R_Q)$, where $R_L$ and $R_U$ represent the 25th and 75th percentile of returns, and $R_Q = (R_U - R_L)$ is the interquartile range. Jumps capture the occasional and extreme price changes that are arguably of greatest concern to regulators and traders (also see Darrat and Rahman, 1995).

*Trading Activity Measures*

As indicated in the second section, there is motive for analyzing the futures trading — exchange rate variability relationship in the context of decomposed trading activity measures. We decompose the bi-monthly commitments of each trading group into their permanent (stochastic trend) and temporary (stationary) components using the technique suggested by Hodrick and Prescott (1980). The technique defines the permanent component $\bar{x}$ of a variable $x$ as the one that minimizes the function:

$$\sum_{t=0}^{T}(x_t - \bar{x}_t)^2 + \theta \sum_{t=0}^{T-1}[(\bar{x}_{t+1} - \bar{x}_t) - (\bar{x}_t - \bar{x}_{t-1})], \text{ for } \theta > 0. \tag{1}$$

Here we select $\theta = 100$, a value suggested by Kydland and Prescott (1989). The technique allows for a stochastic trend component while deriving the temporary component. To the extent that the trends in open interests of currency futures traders are associated with the general economic trends, using the Hodrick and Prescott method may be appropriate.[7]

To analyze the robustness of the results employing the decomposed commitments data, we also construct 'expected' and 'unexpected' components of commitments from an ARIMA model similar to the one in Bessembinder and Seguin (1992). There are no differences in the inferences from the results obtained from employing either of the two decomposition methodologies. In fact, there is a high degree of correlation between the 'permanent' and 'expected' components, and between the 'temporary' and 'unexpected' components. However, we elect to present results pertaining to the decompositions from the Hodrick and Prescott method alone. It is now widely recognized that all decompositions are statistical, and therefore there is an infinite number of ways to plausibly decompose a series into permanent and transitory components. An advantage of the Hodrick and Prescott method is that it relies on a minimum number of assumptions and hence is more easily defensible.

## EMPIRICAL RESULTS

### *Regression Analysis*

To evaluate the role of futures trading activity on exchange rate volatility, we fit a regression model similar to one in Bessembinder and Seguin (1992). The authors model daily volatility on past levels of volatility on the contemporaneous expected, unexpected components of daily open interest. To derive more unambiguous inferences, we model the volatility measures on past components of open interest alone, rather than on contemporaneous open interest. The regression equation estimated is:

$$\sigma_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \sigma_{t-i} + \beta_1 \mathrm{P}(\mathrm{COT}_{t-1}) + \beta_t \mathrm{T}(\mathrm{COT}_{t-1}) + \epsilon_t, \tag{2}$$

where $\sigma$ represents exchange rate volatility, P(COT) and T(COT) are the permanent and temporary commitments obtained from fitting the trader commitments to equation (1), and $\alpha$ and $\epsilon$ are the constant and error term respectively.[8]

The results from the regressions are presented in Table 1. The results generally suggest that while commercial commitments are not destabilizing, surges in non-commercial and small trader commitments are followed by higher levels of normal and jump volatility. In Panel A of Table 1, the lagged permanent and temporary components are consistently insignificant. The sum of lagged volatility coefficients are positive and significant, supporting the

**Table 1**

Regression Results

The results are from the regression:

$$\alpha_t = \alpha_0 + \sum_{i=1}^{4} \alpha_i \sigma_{t-1} + \beta_1 \mathrm{P}(\mathrm{COT}_{t-1}) + \beta_t \mathrm{T}(\mathrm{COT}_{t-1}) + \epsilon_t$$

| | *Pound* | | *D Mark* | | *Canadian \$* | | *Japanese Yen* | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel A: Commercial Traders** | | | | | | | | |
| Constant | 0.279*** | 0.100*** | 0.003*** | 0.046*** | 0.052*** | 0.033* | 0.301*** | 0.077*** |
| | (4.66) | (3.23) | (6.37) | (3.16) | (3.85) | (1.69) | (6.85) | (2.92) |
| $\mathrm{P}(\mathrm{COT}_{t-1})$ | $-0.15e^{-5}$ | $-0.87e^{-6}$ | $-0.11e^{-9}$ | $-0.53e^{-7}$ | $0.21e^{-6}$ | $0.41e^{-6}$ | $-0.23e^{-6}$ | $-0.20e^{-6}$ |
| | (−1.17) | (−1.01) | (−0.38) | (−0.38) | (0.46) | (0.55) | (−0.47) | (−0.49) |
| $\mathrm{T}(\mathrm{COT}_{t-1})$ | $0.41e^{-6}$ | $0.11e^{-5}$ | $-0.19e^{-8}$ | $-0.17e^{-6}$ | $-0.51e^{-7}$ | $0.14e^{-6}$ | $0.36e^{-6}$ | $-0.17e^{-6}$ |
| | (0.29) | (1.22) | (−0.35) | (−0.65) | (−0.08) | (0.13) | (0.84) | (−0.36) |
| $\Sigma\sigma_{t-i}$ | 0.550*** | 0.407*** | 0.433*** | 0.383*** | 0.351*** | 0.399*** | 0.339*** | 0.246** |
| | (7.67) | (4.81) | (5.51) | (4.23) | (3.96) | (4.55) | (4.08) | (2.41) |
| Adj $R^2$ | 0.25 | 0.14 | 0.17 | 0.09 | 0.10 | 0.11 | 0.12 | 0.04 |
| Durbin *h* | −1.20 | −0.53 | 0.86 | −0.39 | −0.94 | −0.26 | 0.05 | −0.12 |

**Table 1 (Continued)**

| | *Pound* | | *D Mark* | | *Canadian $* | | *Japanese Yen* | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel B: Non Commercial Traders** | | | | | | | | |
| Constant | $0.275^{***}$ | $0.102^{***}$ | $0.003^{***}$ | $0.063^{***}$ | $0.001^{***}$ | $0.048^{***}$ | $0.286^{***}$ | $0.061^{**}$ |
| | (4.85) | (3.75) | (6.39) | (3.81) | (5.48) | (2.83) | (6.62) | (2.39) |
| $P(COT_{t-1})$ | $-0.35e^{-5}$ | $-0.25e^{-5}$ | $-0.13e^{-7}$ | $-0.79e^{-6*}$ | $-0.11e^{-7}$ | $-0.58e^{-6}$ | $-0.83e^{-7}$ | $0.97e^{-7}$ |
| | (−1.13) | (−1.24) | (−1.26) | (−1.68) | (−1.55) | (−1.42) | (−1.02) | (0.10) |
| $T(COT_{t-1})$ | $0.41e^{-6}$ | $0.29e^{-5}$ | $0.34e^{-7*}$ | $0.13e^{-5*}$ | $0.33e^{-7**}$ | $0.29e^{-5}$ | $0.29e^{-5**}$ | $0.25e^{-5**}$ |
| | (1.49) | (1.43) | (1.77) | (1.90) | (2.11) | (1.50) | (2.16) | (2.12) |
| $\Sigma\sigma_{t-1}$ | $0.535^{***}$ | $0.398^{***}$ | $0.438^{***}$ | $0.365^{***}$ | $0.498^{***}$ | $0.412^{***}$ | $0.346^{***}$ | $0.274^{**}$ |
| | (7.30) | (4.61) | (5.64) | (3.97) | (6.52) | (4.73) | (4.21) | (2.68) |
| Adj $R^2$ | 0.25 | 0.15 | 0.19 | 0.13 | 0.23 | 0.12 | 0.14 | 0.07 |
| Durbin $h$ | −0.98 | −0.87 | 0.52 | −0.51 | 1.15 | −0.33 | 1.08 | 0.23 |

**Table 1 (Continued)**

| | Pound | | D Mark | | Canadian $ | | Japanese Yen | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel C: Small Traders** | | | | | | | | |
| Constant | 0.379*** | 0.175*** | 0.346*** | 0.067*** | 0.057*** | 0.046* | 0.306*** | 0.089*** |
| | (4.18) | (3.21) | (5.16) | (2.59) | (3.24) | (1.65) | (6.59) | (2.88) |
| $P(COT_{t-1})$ | $-0.64e^{-5}$* | $-0.43e^{-5}$** | $-0.13e^{-5}$ | $-0.58e^{-6}$ | $-0.57e^{-7}$ | $-0.17e^{-6}$ | $-0.41e^{-6}$ | $-0.66e^{-6}$ |
| | (−1.89) | (−1.98) | (−1.06) | (−1.14) | (−0.66) | (−0.11) | (−0.44) | (−0.81) |
| $T(COT_{t-1})$ | $0.29e^{-6}$* | $0.30e^{-5}$* | $0.14e^{-5}$** | $0.76e^{-7}$ | $0.21e^{-5}$** | $0.39e^{-5}$** | $0.61e^{-6}$ | $0.61e^{-7}$ |
| | (1.77) | (1.70) | (2.12) | (1.32) | (2.36) | (2.04) | (1.52) | (0.06) |
| $\Sigma\sigma_{t-i}$ | 0.545*** | 0.383*** | 0.474*** | 0.371*** | 0.356*** | 0.409*** | 0.329*** | 0.243** |
| | (7.62) | (4.46) | (6.55) | (4.07) | (4.04) | (4.71) | (3.96) | (2.38) |
| Adj $R^2$ | 0.26 | 0.16 | 0.25 | 0.09 | 0.11 | 0.12 | 0.12 | 0.02 |
| Durbin *h* | −1.34 | −0.55 | −0.25 | −0.44 | 0.19 | −0.77 | 0.34 | −0.10 |

*Notes*:
$\sigma$ represents the alternate measures for exchange rate variability — *h* is the conditional variance and Jump is the frequency of exchange rate jumps; P() and T() are the permanent and temporary commitments from fitting the open interest data to the model suggested by Hodrick and Prescott (1980); Durbin *h* is the asymptotic-normal *t*-statistic that tests the null of no-autocorrelation (Durbin, 1970); *, **, & *** represent significance levels of 0.10, 0.05, and 0.01 respectively.

widely held notion of volatility clustering in financial instruments. In Panel B, the $P(COT_{t-1})$ coefficients are non positive, indicating that typical levels of non-commercial futures activity is not destabilizing. On the other hand, the $T(COT_{t-1})$ coefficients are generally positive, suggesting that surges in speculative activity of large traders is destabilizing. Notably, the evidence of destabilizing speculation is especially strong for DM and JY, the two most popular currency contracts. The results in Panel C suggest that surges in small trader commitments may also be destabilizing, while typical levels of small trader activity are stabilizing. However, unlike in Panel B, it is for the CD and BP contracts that the $T(COT_{t-1})$ is consistently positive, possibly indicating the relative importance of small traders in these two contracts.

While the results in Table 1 suggest that the temporary components of the commitments of certain groups of futures traders impacts volatility, the results do not allow us to rule out the possibility of a bi-causal relationship between volatility and futures commitments. To examine such a possibility, a vector autoregressive (VAR) models are estimated which involves regressing volatility on prior levels of volatility and the temporary components, and alternately, regressing the temporary components on prior levels of volatility and temporary components. We estimate the model:

$$\sigma_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \sigma_{t-i} + \sum_{j=1}^{n} \beta_j \mathrm{T}(\mathrm{COT}_{t-j}) + \epsilon_t, \tag{3a}$$

$$\mathrm{T}(\mathrm{COT}_t) = \tau_0 + \sum_{i=1}^{n} \tau_i \sigma_{t-i} + \sum_{j=1}^{n} \Omega_j \mathrm{T}(\mathrm{COT}_{t-j}) + u_t, \tag{3b}$$

where $\alpha_i$, $\beta_j$, $\tau_i$ and $\Omega_j$ $(i,\ j = 1 \ldots n)$ are the coefficients to be estimated, and $n$ is the lag length selected employing Akaike's final prediction error criterion.[9] $F$-statistics pertaining to the lagged coefficients are employed to derive inferences regarding causality.[10]

The summary of results from the VAR estimations are presented in Table 2. The results suggest no causality between volatility and commercial commitments (Panel A). However, as in Table 1, there is evidence that the temporary components of non commercial and small trader commitments lead volatility. The lagged T(COT) coefficients for these two trader groups ($\Sigma_{t-1}$ in Panels B and C) are consistently positive and significant. On the other hand, there is no evidence of a feedback-effect from volatility to T(COT). The results in Table 2 thus support the earlier inference regarding the destabilizing impact of surges in speculative and small-trader activity in futures markets.

### *Price Behavior Following the Release of COT Reports*

Given the evidence that surges in the commitments of some groups of futures traders leads volatility in currency markets, it becomes of some interest to

**Table 2**

Causality Results

The results are from the VAR system:

$$\sigma_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \sigma_{t-i} + \sum_{j=1}^{n} \beta_j \mathrm{T}(\mathrm{COT}_{t-j}) + \epsilon_t,$$

$$\mathrm{T}(\mathrm{COT}_t) = \tau_0 + \sum_{i=1}^{n} \tau_i \sigma_{t-i} + \sum_{j=1}^{n} \Omega_j \mathrm{T}(\mathrm{COT}_{t-j}) + \mu_t$$

| | *Pound* | | *D Mark* | | *Canadian $* | | *Japanese Yen* | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel A: Commercial Traders** | | | | | | | | |
| $\Sigma\alpha_{t-1}$ | 0.567*** | 0.432*** | 0.528*** | 0.379*** | 0.437*** | 0.389*** | 0.296*** | 0.310*** |
| | (39.59) | (21.51) | (32.05) | (14.50) | (3.13) | (5.88) | (7.80) | (7.45) |
| $\Sigma\beta_{t-j}$ | $0.68e^{-8}$ | $-0.95e^{-6}$ | $0.11e^{-7}$ | $0.17e^{-6}$ | $0.17e^{-8}$ | $-0.18e^{-6}$ | $0.33e^{-7}$ | $0.83e^{-6}$ |
| | (0.06) | (0.26) | (0.84) | (0.10) | (0.09) | (0.07) | (2.22) | (0.66) |
| $\Sigma\tau_{t-i}$ | −12000 | −1574 | 24418 | 4973 | 2929 | 2645 | −3500 | −354 |
| | (0.11) | (0.05) | (0.20) | (0.47) | (0.03) | (0.21) | (0.19) | (0.51) |
| $\Sigma\Omega_{t-j}$ | −0.380*** | −0.381*** | −0.503*** | −0.512*** | -0.191 | −0.195 | −0.454*** | −0.465*** |
| | (7.73) | (7.81) | (14.29) | (14.98) | (2.19) | (2.28) | (10.39) | (11.03) |

**Table 2 (Continued)**

| | *Pound* | | *D Mark* | | *Canadian $* | | *Japanese Yen* | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel B: Non Commercial Traders** | | | | | | | | |
| $\Sigma\alpha_{t-i}$ | 0.568*** | 0.428*** | 0.449*** | 0.398*** | 0.505*** | 0.408*** | 0.339*** | 0.278*** |
| | (62.67) | (25.37) | (33.51) | (19.30) | (44.11) | (22.07) | (16.99) | (7.44) |
| $\Sigma\beta_{t-j}$ | 0.51e$^{-5}$* | 0.60e$^{-5}$* | 0.49e$^{-7}$ | 0.29e$^{-5}$** | 0.45e$^{-7}$** | 0.56e$^{-5}$** | 0.41e$^{-5}$*** | 0.38e$^{-5}$* |
| | (3.10) | (2.89) | (2.18) | (3.87) | (4.23) | (4.12) | (5.04) | (3.37) |
| $\Sigma\tau_{t-i}$ | −1180 | −1429 | −0.17e$^{6}$ | −4549 | −4020 | −1999 | −1848 | −1783 |
| | (0.81) | (0.35) | (0.53) | (0.61) | (1.76) | (0.51) | (0.24) | (0.11) |
| $\Sigma\Omega_{t-j}$ | 0.134 | 0.137 | 0.062 | 0.071 | 0.134 | 0.138 | 0.163* | 0.162* |
| | (1.78) | (1.85) | (0.34) | (0.45) | (2.20) | (2.37) | (3.25) | (3.21) |

**Table 2 (Continued)**

| | *Pound* | | *D Mark* | | *Canadian $* | | *Japanese Yen* | |
|---|---|---|---|---|---|---|---|---|
| | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* | *h* | *Jump* |
| **Panel C: Small Traders** | | | | | | | | |
| $\Sigma\alpha_{t-i}$ | 0.593*** | 0.462*** | 0.509*** | 0.387*** | 0.505*** | 0.408*** | 0.339*** | 0.278*** |
| | (44.67) | (24.86) | (30.02) | (15.15) | (44.11) | (22.07) | (16.99) | (7.44) |
| $\Sigma\beta_{t-j}$ | $0.17e^{-5}$*** | $0.74e^{-5}$* | $0.46e^{-7}$* | $0.21e^{-5}$* | $0.45e^{-7}$** | $0.56e^{-5}$** | $0.41e^{-5}$*** | $0.38e^{-5}$* |
| | (6.95) | (3.25) | (2.73) | (2.81) | (4.23) | (4.12) | (5.04) | (3.37) |
| $\Sigma\tau_{t-i}$ | −8879 | −2024 | −88540 | −7565 | −4020 | −1999 | −1848 | −1783 |
| | (0.23) | (0.20) | (0.03) | (0.36) | (1.76) | (0.51) | (0.24) | (0.11) |
| $\Sigma\Omega_{t-j}$ | −0.591*** | −0.617*** | −0.811*** | -0.763*** | 0.134 | 0.138 | 0.163* | 0.162* |
| | (15.14) | (15.53) | (49.59) | (50.55) | (2.20) | (2.37) | (3.25) | (3.21) |

*Notes*:
$\sigma$ represents the alternate measures for exchange rate variability — *h* is the conditional variance and Jump is the frequency of exchange rate jumps; T(COT) is the temporary component of commitment of traders obtained from fitting the commitments to the model suggested by Hodrick and Prescott (1980); the *F*-values in () test the null hypothesis that the sum of lagged coefficients is zero; *, **, & *** represent significance levels of 0.10, 0.05, and 0.01 respectively.

examine the impact on the currency markets of the actual release of commitment surprises. Since October of 1992, the CFTC compiles the COT weekly, reflecting the holdings as of the close of each Tuesday. The data is released electronically to the public every other Friday (starting from October 16, 1992) at 3:30 pm eastern time, and contains the commitments of the previous two Tuesdays.

We examine the impact of the electronic COT report release on the Japanese Yen. We obtain hourly rate information on the Japanese Yen over the interval 10/1992 through 11/1996 from the Futures Industry Institute. The rates are sampled between 8:20am eastern time (market's open) and 3:00pm eastern time (market's close). We then compare the volatility in the JY market over the weekend and the Monday following the Friday release against the weekend — and Monday volatility following Fridays without the COT release.[11]

Table 3 presents the average volatility over weekends and Mondays following COT-release Fridays and no-COT-release Fridays. There is no evidence that there is an increase in volatility following the release of the COT reports. Neither the weekend volatility, nor the day-time (Monday) volatility is higher for intervals following Fridays on which there was a COT release. We also tested for a difference in the means of volatility following no-COT-release Fridays with those in which there were surprises in the COT report and arrived at similar results.[12] These results suggest that the COT reports themselves are not a source of exchange rate volatility.

**Table 3**

Volatility Following COT Announcements: the Case of the Yen

| | *No COT Release n=98* | *COT Release n=90* | *F-value* |
|---|---|---|---|
| 3:00pm *F* — 8:20am *M* | 0.0043 | 0.0042 | 0.111 |
| 8:00am *M* — 9:00am *M* | 0.0014 | 0.0013 | 0.154 |
| 9:00am *M* — 10:00am *M* | 0.0013 | 0.0014 | 0.310 |
| 10:00am *M* — 11:00am *M* | 0.0013 | 0.0015 | 1.109 |
| 11:00am *M* — 12:00am *M* | 0.0012 | 0.0014 | 1.411 |
| 12:00am *M* — 1:00pm *M* | 0.0011 | 0.0010 | 0.942 |
| 1:00pm *M* — 2:00pm *M* | 0.0012 | 0.0011 | 0.694 |
| 2:00pm *M* — 3:00pm *M* | 0.0013 | 0.0013 | 0.065 |

*Notes*:
Volatility figures are averages of $|\log(S_t/S_{t-1})|$, where $S_t$ is the rate on the Japanese Yen at the beginning of hour $t$. The report on the Commitments of Traders (COT) is released electronically every other Friday at 3:30 pm e.t. (starting date October 16, 1992). Data points are excluded if there is no futures trading on either Friday ($F$) or following Monday ($M$). The data spans October 6, 1992–December 6, 1996. The $F$-value tests the null that the level of volatility across release and no-release intervals is identical.

## SUMMARY AND CONCLUSIONS

It has often been argued that futures traders are major contributors to volatility in cash markets. Such arguments have translated to increased regulation via measures such as margin requirements and price and position limits. This paper examines whether certain groups of traders play a role in destabilizing the currency markets. There is some prior evidence that futures trading may destabilize currency markets, but no evidence relating to the impact of individual groups of traders.

The results suggest that while the secular growth in futures commitments has not caused currency markets to be more volatile, surges in the participation of large speculators and small traders do destabilize the markets. We also present evidence that the release of the information regarding trader commitments does not have an impact on volatility. Thus, the positive relationship between temporary components of speculative and small trader commitments and exchange rate volatility seems to stem from trading mechanisms rather than COT disclosure.

The evidence that surges in futures commitments are destabilizing is consistent with several observers and researchers who suggest that unexpectedly heavy futures activity will cause cash market volatility (Brady Commission Report, 1988; Grossman, 1988; and Bessembinder and Seguin, 1992). The empirical evidence concerning non-commercial and small traders warrants a careful analysis on the possible measures to prevent (or offset the impact of) the suddenly occurring waves of funds into futures markets.

Earlier studies, such as Brorsen (1991), have suggested that volatility arising from futures market pressures can be decreased by measures such as increasing margins or increasing transaction costs. However, such measures may be counterproductive to the typical levels of volume generated by futures trading (Hartzmark, 1986). Another measure, more direct though possibly more intrusive to market liquidity, could be to impose stricter position limits on futures to altogether eliminate the possibility of unexpectedly large positions in stock index futures.

A natural extension to this study would be to examine the relationship between initial and maintenance margin requirements and trader commitments in currency futures. For instance, if higher margins are found to dampen the permanent components of commitments and not to have an impact on the temporary components, margin hikes may actually be deemed counterproductive. It should also be noted that the COT data employed in this study may not effectively reflect the position of some important classes of traders, such as day-traders, scalpers and noise traders, whose trading horizons are shorter than a few weeks. Therefore, it may be useful to examine the relationships investigated in this study in the framework of commitments sampled at shorter intervals (for instance daily). Finally, it may also be informative to study the relationship between the position of futures traders over finer intervals and the volatility implied by currency option prices. Such data could offer a sharper test on the relationship between trader commitments and the variability in exchange rates. Given the non-availability of finer COT data at this time, we leave such an exercise for future research.

## NOTES

1 The proposals for regulation of these markets include increased margin requirements, further limitations on index arbitrage and program trading, and position limits (for instance, see the US General Accounting Office (1994) and Committee on Banking, Finance and Urban Affairs (1988)).

2 The COT report is discussed in greater detail in the Data section of this paper.

3 The CFTC COT report also compiles Spreader commitments after 1986. However, since their positions are relatively minor (often non-existent), the investigation does not include Spreader commitments.

4 The CFTC also compiles weekly COT reports since 10/1992. We arrive at similar results from the analysis of weekly data over the shorter 1/1993-11/1996 interval. These results are available from the authors.

5 Specifically, the conditional variance is given by $h_t$ in the maximum likelihood estimation of the model,

$$R_t = \mu_{t-1} + \epsilon_t,$$
$$\epsilon_t(\epsilon_{t-1}, \epsilon_{t-2} \ldots) \sim N(0, h_t),$$
$$h_t = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \alpha_2 h_{t-1},$$

where $\mu_{t-1}$ is the conditional mean, and (following common practice) is proxied by $R_{t-1}$.

6 Standard tests were conducted to confirm the suitability of this measure of volatility. The daily return series is found to be highly kurtotic and the return and squared-return series are found to be autoregressive. On the other hand, the conditional variance-standardized return residuals exhibit no linear or non-linear dependencies and are less kurtotic. Similar robustness tests are conducted in Hsieh (1989).

7 See, for example, Kydland and Prescott (1990) and Backus and Kehoe (1992).

8 Several sensitivity tests were conducted with respect to the regression model. The equation was estimated employing combinations of variables, with the absence of lagged volatility, and with greater lags on volatility. The coefficients were also estimated employing variance estimators for models with first order autocorrelated disturbances as indicated in Newey and West (1987). Given that the permanent (trend) component of the commitments are nonstationary, the regression equation was also estimated without the permanent component. The implications of the results are unchanged across the various specifications.

9 An intuitive guide to establish the optimal length in a VAR model is to select a lag length that results in an estimated model without significant autocorrelation.

10 For instance, the $F$-statistic pertaining to the null hypothesis that T(COT) does not cause $\sigma$ is given by $[(\mathrm{SSE}_{r(3a)} - \mathrm{SSE}_{f(3a)})/n] \div [(\mathrm{SSE}_{f(3a)}/(\mathrm{T}-2n-1)]$ where $\mathrm{SSE}_{r(3a)}$ and $\mathrm{SSE}_{r(3a)}$ are residual sum of squares from the reduced and full form solutions of (3a), $T$ is the number of observations, and $n$ is the number of lags.

11 There is the obvious shortcoming to this technique in that it does not control for other announcements/information that may impact exchange rates. Nonetheless, if the COT release data does have a significant impact on JY volatility, overnight price changes should reflect differences in volatility across COT release and no-release days. Almost all macroeconomic announcements in the US that are likely to impact exchange rate volatility (such as employment and consumer/producer price index reports) occur between 8:30 and 10:00am. Moreover, there is prior evidence that US announcements tend to have a much larger influence on the JY rate across the US and Japanese markets than the announcements in Japan (Ito and Roley, 1987).

12 For instance, we defined a COT surprise as one in which the temporary components of non-commercial or small trader commitments are positive.

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