EXCHANGE RATE ECONOMICS – LECTURE 2
THE MICRO APPROACH TO EXCHANGE RATES

3. *Public Information Arrival, Exchange Rate Volatility, and Quote Frequency*

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Introduction

Is the FX market in need of regulation?

Is trading 'self-generating' with 'excess volatility'?

Examine how quote frequency and volatility are related to public info arrival

I. The Data and Seasonality

JPY/USD & DEM/USD

1-12-93 to 26-4-95

Public info: number of news headlines

Intradaily patterns in quotes and news:

scale by hourly means for each day of week

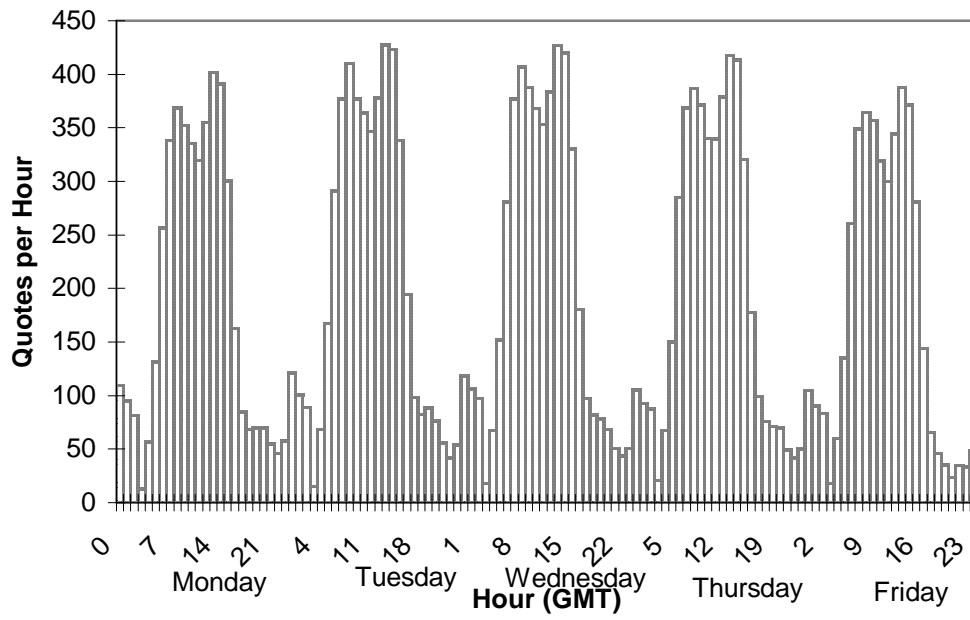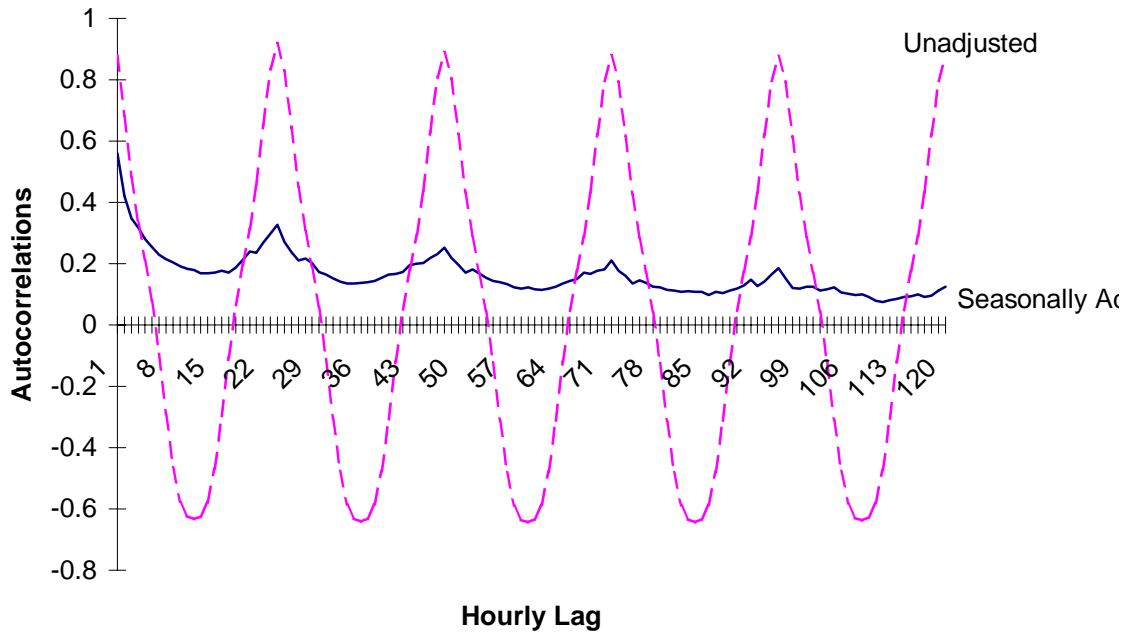## Figure 1: Average Hourly Quotes: Mark/Dollar

Figure 4: Correlogram: Mark/Dollar Quotes

II. Public Information Arrival and Exchange Rate Changes

N traders

Market arrives at sequence of equilibria each hour
*new info arrives $\Rightarrow$ new equilibrium
*length of time between within-period equilbrium determined
by info arrival

IIa. A Mixture of Distributions Model

1) $P_{in} = \gamma(s_{in}^* - s_i)$
desired position of nth trader at i determined by perceived
'true value' of currency relative to current spot rate

2) $\sum\limits_{n=1}^{N} P_{in} = 0$
market clearing condition

3) $s_i = \dfrac{1}{N} \sum\limits_{n=1}^{N} s_{in}^*.$
market cleared by average of reservation spot rates

4) $ds_i = \dfrac{1}{N} \sum\limits_{n=1}^{N} ds_{in}^*, \ \ ds_i \sim N(0, \sigma_i^2).$
change in spot rate from info arrival

5) $ds = \sum\limits_{i=1}^{I} ds_i, \ \ ds \sim N(0, \sigma_i^2 I).$

_I_ info events in hour is random

hourly change is mixture of indep. normals with mixing variable _I_

quote frequency records _I_

6) $I_t = a + bI_{t-1} + u_t,$

with autocorrelated news, get autocorrelated variance of _ds_

7) $h_t = \sigma^2 a + bh_{t-1} + \sigma^2 u_t.$

IIIb. Public Information Arrival and Quote Frequency

implication of model:

10) $q_t = \alpha_0 + \alpha_1 I_t + \varepsilon_t$

$h_t = b_0 + b_1 h_{t-1} + b_2 \varepsilon^2_{t-1}.$

with S.A. data: when more than normal amount of news arrives is there more than normal amount of quotes?
*answer: _yes_

IIc. Public Information Arrival and Exchange Rate Volatility

Model implies volatility should also depend on *I*
estimate with and without *I

8) $ds_t = \alpha + \varepsilon_t$

$\quad h_t = b_0 + b_1 h_{t-1} + b_2 \varepsilon^2 t-1 \cdot$

9) $ds_t = \alpha + \varepsilon_t$

$\quad h_t = b_0 + b_1 h_{t-1} + b_2 \varepsilon^2 t-1 + b_3 I_{t-1} \cdot$

When there is more than normal amount of news, is there more than normal volatility?
answer: *no
If no S.A., then find strong positive effect of *I* on *h*

IId. Joint Estimation

estimate bivariate model to increase efficiency given potential correlations across quotes and returns

$\quad Y_t = \beta X_t + \varepsilon_t$

$\quad H_t = C_0' C_0 + G \circ A' \varepsilon_{t-1} \varepsilon_{t-1}' A + N' I_t N + B \circ H_{t-1}$

mean equations as before

now find *I* significant in both mean for quotes and variance for returns

III. Implications of Results and Conclusions

More than the normal amount of news $\Rightarrow$ more than the normal amount of quotes and volatility

*no support for "self-generating" trading
*no support for regulation

FX trading is probably adjusting prices and quantities to efficiently allocate resources

Reference: Melvin & Yin, "Public Information Arrival, Exchange Rate Volatility, and Quote Frequency," *The Economic Journal*, July 2000 or http://www.public.asu.edu/~mmelvin.