Department of
Economics and Finance

Working Paper No. 13-27

Economics and Finance Working Paper Series

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Long Memory in the Ukrainian Stock

http://www.brunel.ac.uk/economics

LONG MEMORY IN THE UKRAINIAN STOCK MARKET AND FINANCIAL CRISES

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October 2013

Abstract

This paper examines persistence in the Ukrainian stock market during the recent financial crisis. Using two different long memory approaches (R/S analysis and fractional integration) we show that this market is inefficient and the degree of persistence is not the same in different stages of the financial crisis. Therefore trading strategies might have to be modified. We also show that data smoothing is not advisable in the context of R/S analysis.

Keywords: *Persistence, Long Memory, R/S Analysis, Fractional Integration*

JEL Classification: *C22, G12*

**

1. INTRODUCTION

2. DATA AND METHODOLOGY

M $N =$

$M - 1$

$$N_i = \frac{Y_{t+}}{Y_t} \quad t = \quad M -$$

A A_n

$= N$ I_a a A

I_a N_k k N I_a n

e_a

$$= - \sum_{=} \quad = \quad a = \quad A$$

$X_{k,a}$ e_a I_a

$$X_{k\ a} = \sum_{i=}^{k} N_{i\ a} - e_a$$

$X_{k,a}$ $X_{k,a}$

I_a

$$= \quad - \quad \leq \ \leq$$

S_{Ia} I_a

$$= \ - \sum_{=} \ -$$

R_{Ia}

n

/ = / $\sum$ /
=

n *(M - 1)/n*

n

n = (M - 1)/2

log (R / S) = log (c) +

Hlog (n). *H*

[Insert Table 1 about here]

H

− = = ±

$$d = \quad {}_d \quad \overline{C\ d} \ - \ d\ \frac{}{m}\sum_{s=}^{m} \quad \lambda_s$$

$$\overline{C\ d} = \frac{}{m}\sum_{s=}^{m} I \quad s \quad s^{d} \qquad \lambda_s = \frac{\pi s}{T} \qquad \frac{m}{T} \to$$

d

[Insert Figures 3 – 8 about here]

[Insert Table 2 about here]

[Insert Table 3 about here]

3. EMPIRICAL RESULTS

[Insert Figures 10 -12 about here]

α β

[Insert Table 5 about here]

α β

β

[Insert Figure 13 about here]

References

Tables and Figures

Table 1: Hurst exponent interval characteristics

≤					

≤

Table 2: Hurst exponent estimation for different variants of data filtration

Table 3: Hurst exponent estimates with standard methodology (aliquot number of groups) and modified (aliquant number of groups) for different data sets

Table 5: Estimates of d and 95% confidence intervals

		1.124 (1.091, 1.162)	
		1.100 (1.049, 1.161)	
		1.099 (1.056, 1.151)	
		0.276 (0.243, 0.314)	
		0.261 (0.209, 0.311)	
		0.251 (0.207, 0.334)	
		0.259 (0.229, 0.292)	
		0.311 (0.264, 0.363)	
		0.313 (0.261, 0.376)	

Figure 1 – Periodisation of financial crisis 2007-2009

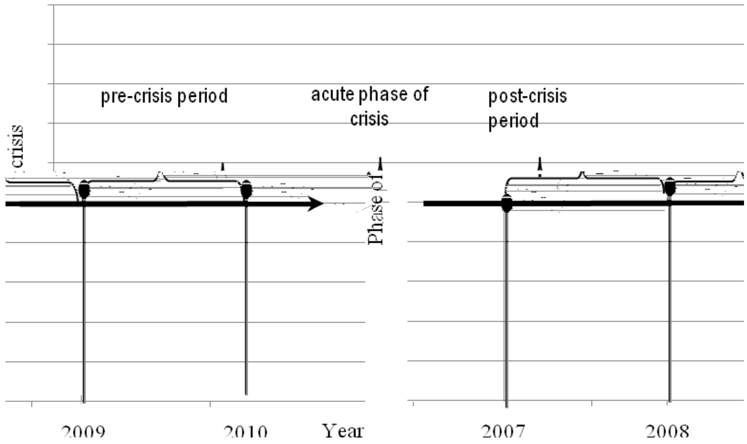


Figure 2 – Dynamics of the VIX Index in 2007-2010

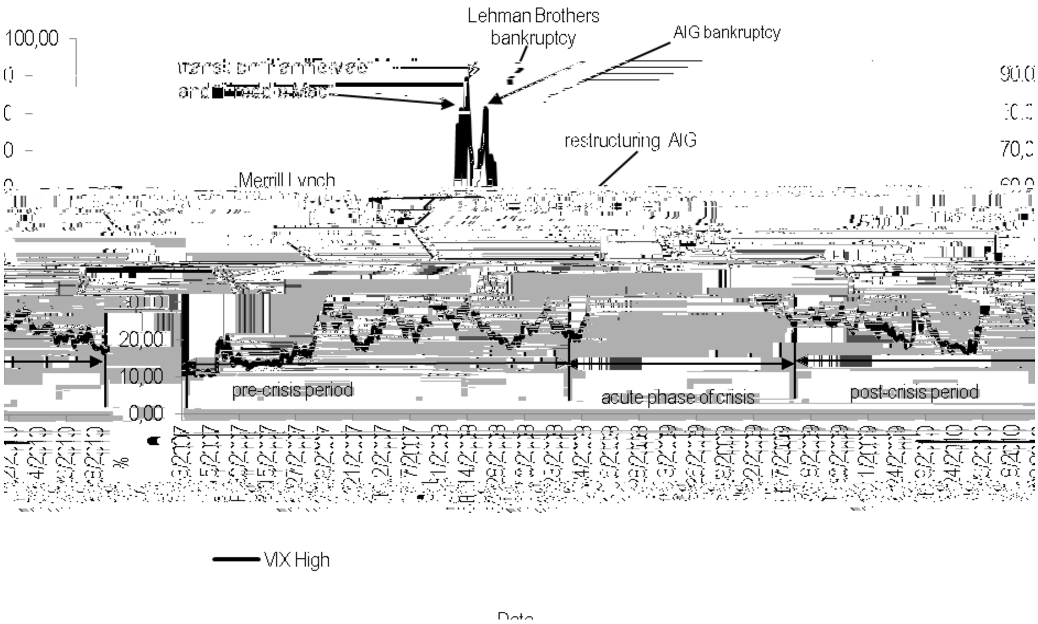
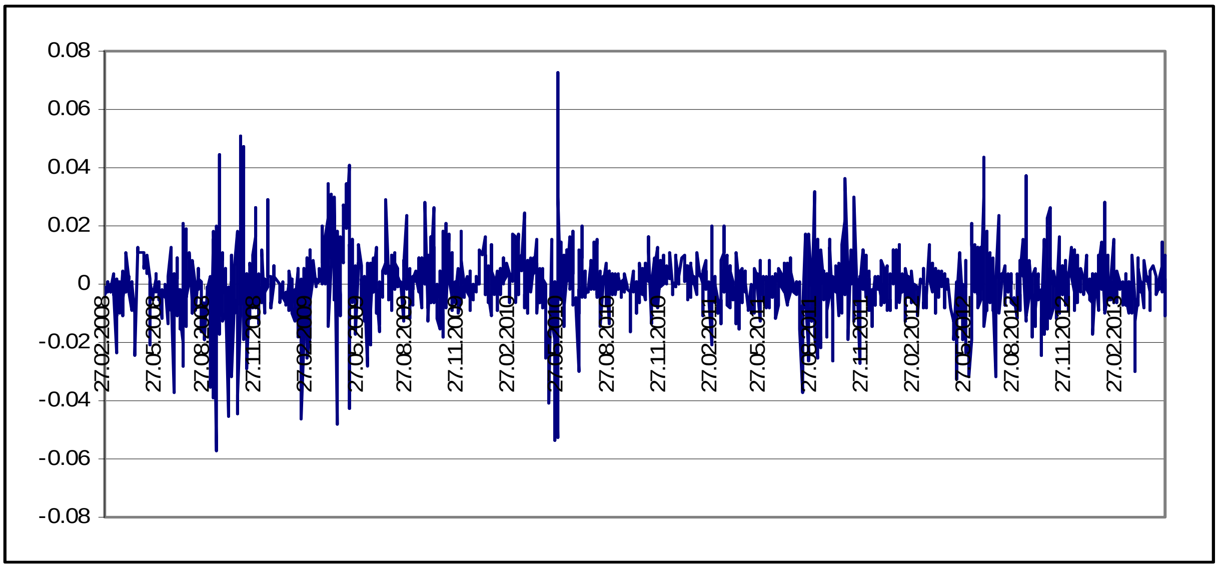


Figure 5

a) Unfiltered UX data



27.02.20

.7.02.20

.7.I2120

Figure 6

Figure 7

a) Randomly generated data

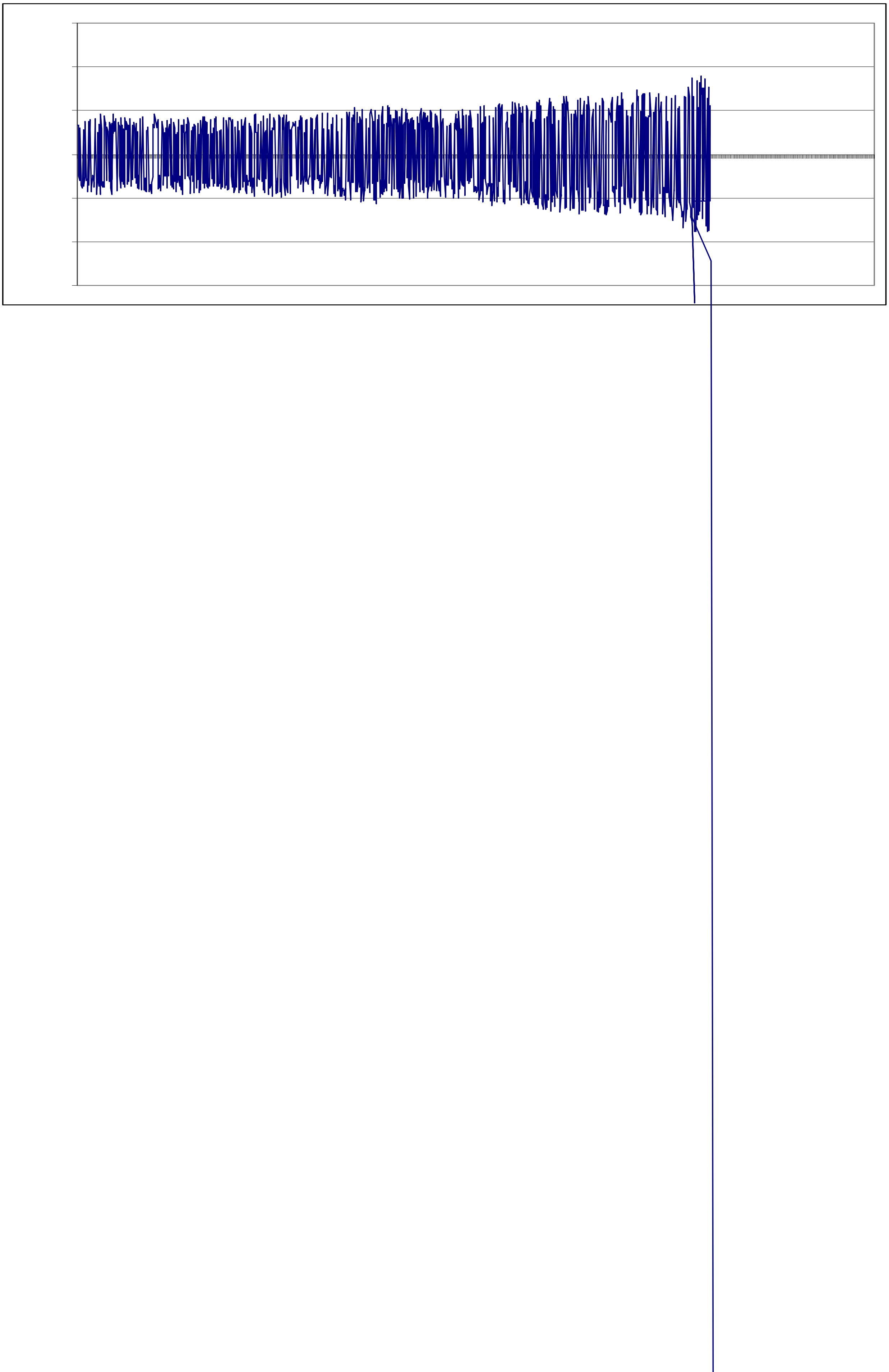


Figure 8

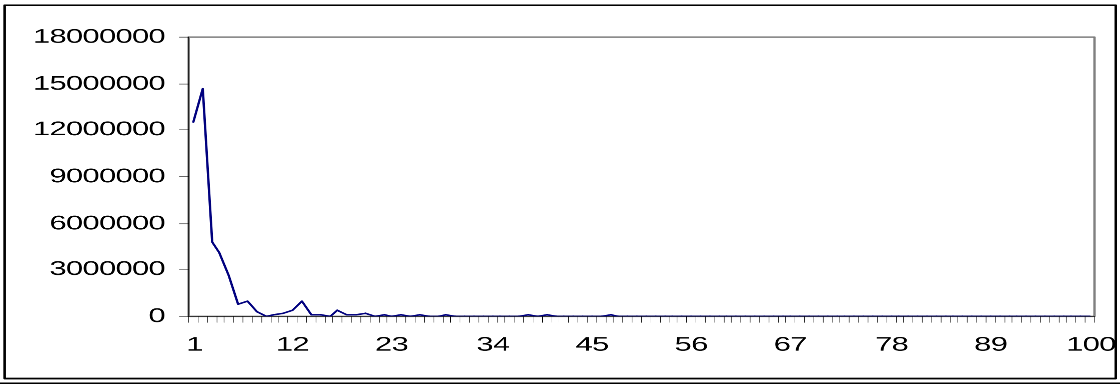
Figure 9: Dynamics of Hurst exponent during 2003-2013

Figure 11: Correlograms

a) Stock market prices

Figure 12: Periodograms

a) Stock market prices



b) Stock market returns

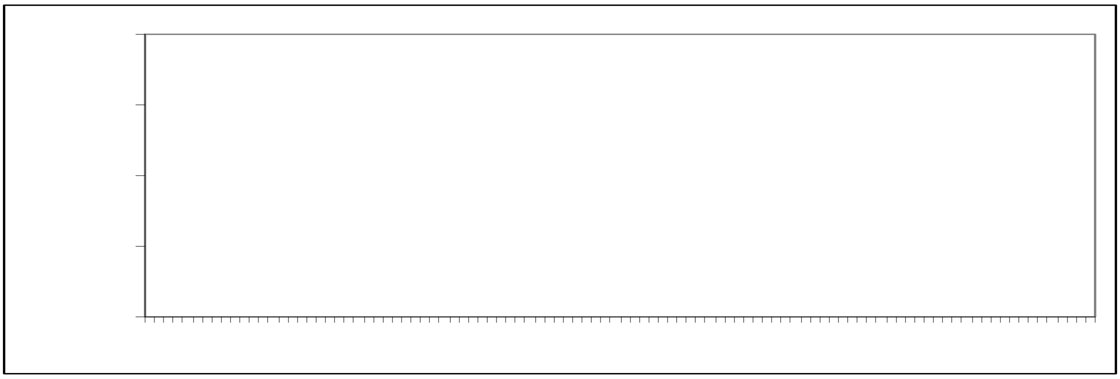


Figure 13: Semipar [redacted]

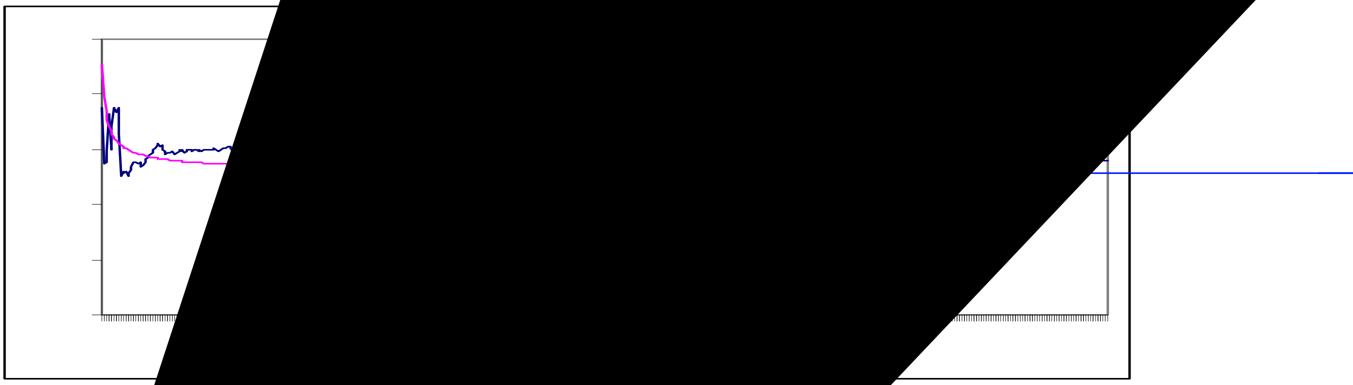


Figure 14: Stability results based on recursive estimates

a) Stock market prices	
Adding 10 observation each time	**Moving windows of 300 observations**