



FACULTEIT ECONOMIE
EN BEDRIJFSKUNDE

TWEEKERKENSTRAAT 2
B-9000 GENT
Tel. : 32 - (0)9 - 264.34.61
Fax. : 32 - (0)9 - 264.35.92

WORKING PAPER

Testing for a rational bubble under long memory

Published in Quantitative Finance, 12:11, 2012, 1723-1732 (a1)

**Michael Frömmel
Robinson Kruse**

May 2011

2011/722

D/2011/7012/27

Testing for a rational bubble under long memory*

Michael Frömmel[†] and Robinson Kruse[‡]

March 2011

Abstract

We analyze the time series properties of the S&P500 dividend-price ratio in the light of long memory, structural breaks and rational bubbles. We find an increase in the long memory parameter in the early 1990s by applying a recently proposed test by Sibbertsen and Kruse (2009). An application of the unit root test against long memory by Demetrescu et al. (2008) suggests that the pre-break data can be characterized by long memory, while the post-break sample contains a unit root. These results reconcile two empirical findings which were seen as contradictory so far: on the one hand they confirm the existence of fractional integration in the S&P500 log dividend-price ratio and on the other hand they are consistent with the existence of a rational bubble. The result of a changing memory parameter in the dividend-price ratio has an important implication for the literature on return predictability: the shift from a stationary dividend-price ratio to a unit root process in 1991 is likely to have caused the well-documented failure of conventional return prediction models since the 1990s.

JEL-number: C12, C22, G12.

Keywords: Rational bubbles, dividend-price ratio, fractional integration, changing persistence.

*We would like to thank three anonymous referees for their helpful comments and suggestions which improved the quality of the paper significantly. We are indebted to Jörg Breitung, Tom Engsted, Andreas Schrimpf and Philipp Sibbertsen for their valuable comments and suggestions. Robinson Kruse gratefully acknowledges financial support from CREATES funded by the Danish National Research Foundation.

[†]Ghent University, Department of Financial Economics, W. Wilsonplein 5D, 9000 Gent, Belgium

[‡]Corresponding author. CREATES, Aarhus University, School of Economics and Management, Building 1322, Bartholins Allé 10, 8000 Aarhus C, Denmark