Accepted Manuscript

On fractality and chaos in Moroccan family business stock returns and volatility

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PII: S0378-4371(17)30023-7
DOI: http://dx.doi.org/10.1016/j.physa.2017.01.033
Reference: PHYSA 17926

To appear in: *Physica A*

Received date: 28 March 2016
Revised date: 6 December 2016

Please cite this article as: S. Lahmiri, On fractality and chaos in Moroccan family business stock returns and volatility, *Physica A* (2017), http://dx.doi.org/10.1016/j.physa.2017.01.033

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Cover letter and Highlights

On Fractality and Chaos in Moroccan Family Business Stock Returns and Volatility

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Abstract. The purpose of this study is to examine existence of fractality and chaos in returns and volatilities of family business companies listed on the Casablanca Stock Exchange (CSE) in Morocco, and also in returns and volatility of the CSE market index. Detrended fluctuation analysis based Hurst exponent and fractionally integrated generalized autoregressive conditional heteroskedasticity (FIGARCH) model are used to quantify fractality in returns and volatility time series respectively. Besides, the largest Lyapunov exponent is employed to quantify chaos in both time series. The empirical results from sixteen family business companies follow. For return series, fractality analysis show that most of family business returns listed on CSE exhibit anti-persistent dynamics, whilst market returns have persistent dynamics. Besides, chaos tests show that business family stock returns are not chaotic while market returns exhibit evidence of chaotic behaviour. For volatility series, fractality analysis shows that most of family business stocks and market index exhibit long memory in volatility. Furthermore, results from chaos tests show that volatility of family business returns is not chaotic, whilst volatility of market index is chaotic. These results may help understanding irregularities patterns in Moroccan family business stock returns and volatility, and how they are different from market dynamics.

Keywords: Fractality, chaos, family business, stock returns, volatility, FIGARCH process, Hurst exponent, largest Lyapunov exponent.

Highlights:

- We examine existence of fractal and chaos in business family stock returns and volatility
- We consider data from Casablanca Stock Exchange in Morocco.
- Empirical findings indicate that dynamics in returns and volatilities of business family companies are different from those of the market index.

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