

”The present value model of U.S. stock prices revisited: long-run evidence with structural breaks, 1871-2012,” paper submitted to *Economics*

This paper aims to investigate the validity of the present value model of stock price, under the possible structural breaks. *Annual* data of the real Standard and Poor’s composite stock price index and its dividend are used. The methodology used is *exactly the same* as that in Kejriwal (2008), who in turn applies the method to the Feldstein-Horioka Puzzle.

The authors conclude (i) there are at most two breaks, one is in 1944 and the other is in 1971; (ii) the null of cointegration is *not* rejected, judging from their test statistics $\tilde{V}_2(\hat{\lambda})$ and $\tilde{V}_1(\hat{\lambda})$. The results in (i) are similar to those in Driffill and Sola (1998). While the authors do not have many interpretations, the results in (ii) seem not contradict the model in the seminal paper Campbell and Shiller (1987).

This is a potentially interesting paper. Unfortunately, the referee is unable to recommend acceptance, due to the Major comments below; and to a lesser extent, due to the Other comments below.

Major comments

(a) It is unclear whether the authors conclude that (i) there is only one break; or (ii) there are two breaks.

(b) As mentioned around equation (6), p.8, the present value model implies that the cointegrating vector is $(1, -1)'$ and thus $\gamma = 1$. In other words, apart from testing

for cointegration, the authors may also want to test $\gamma = 1$.

(c) While Driffill and Sola (1998) use the data from 1900 to 1987, the authors in this paper are using the data from 1871 to 2012. As a result, apart from the second world war and the boom in the stock market (for the break found around 1944); and the end of the Bretton Woods System, the oil crisis and the collapse of the stock market (for the break found around 1971), this paper *potentially* throws light on whether there are *impacts* or *absence of impacts* of (i) the 1987 stock market crisis; (ii) the 1997 Asian financial crisis; and (iii) the 2008 financial tsunami. Unfortunately, the authors fail to have any discussion on any of these incidents.

(d) Further to (c), as the website <http://www.econ.yale.edu/shiller/data.htm> contains data up to 2017, inference on the 2008 financial tsunami should not be a problem, even some of the observations at the two ends are deleted.

(e) Further to (c), the most recent reference on the present value model is Balke and Wohar (2002). The authors may have more insights on the interpretation of impacts or absence of impacts of the various incidents from 1987 to 2008, should they refer to the updated references on the present value model.

Other comments

(i) (p.3, the first two paragraphs) The authors may want to elaborate on the relationships between the efficient market hypothesis and the present value model.

(ii) (p.3, line 6) "stock market return" should read "stock market returns".

(iii) (p.4, the first two paragraphs) Why the authors discuss the literature on "non-linear cointegration" and "fractional cointegration"? It seems that the authors fail to relate their cointegration in the presence of structural breaks with these two topics.

(iv) (p.4, Lines 34-37) The authors wrote, "..... In our case the long-run relationship between real stock prices and dividends has probably changed due to alterations in monetary and fiscal policy, as well as because of reforms in the financial market and in the regulation of the stock market.". Please elaborate.

(v) (pp.6-10, sections 2 and 3) The notation in section 2 should be consistent with that in section 3.

(vi) (p.9, line 1) What is the definition of "strict exogeneity"?

(vii) (p.9, line 26) What is the definition of \hat{h} in equation (11)?

(viii) (p.14, lines 37-38) The authors wrote, "..... are now explained as breaks in the fundamental price that results from a change of regime". The reviewer thinks this paper only shows some empirical evidence for break(s) in the relationship between stock price and dividend.

(ix) (pp.20-21, references[62]-[63]) Please see the correct reference Stock and Watson (1999).

CORRECTED & UPDATED REFERENCES

Stock, J.H., Watson, M.W. (1999). A comparison of linear and nonlinear univariate

models for forecasting macroeconomic time series. In Engle, R.F., White, H. (eds.) *Cointegration, Causality and Forecasting: A Festschrift in Honour of Clive W.J. Granger*. Oxford University Press, Oxford, 1-44.