Chapter 9

TESTING GIBSON PARADOX FOR TURKEY: AN ASYMMETRIC THRESHOLD COINTEGRATION ANALYSIS

Burcu KIRAN BAYGIN[1]

INTRODUCTION

The empirical evidence of strong positive correlation between price level and long term interest rate first presented by Gibson (1923). Gibson (1923) pointed out that interest rates rose and fall roughly concurrently with the level of prices in the United Kingdom over 150 years. Since there was no theoretical reason for this relation, Keynes brought attention to the long run relationship between the level of price index and the rate of interest and observed in a well-known quote, "the tendency of prices and interest rates to rise together and to fall together" is one of the most completely established empirical facts within the whole field of quantitative economics (Ram, 1987). This phenomenon is named by Keynes (1930) the "Gibson paradox". Keynes (1930) suggests that increases in the demand for loans raise the interest rates and result in an increased money supply and level of prices, and conversely for decreases in the demand for loans. This explanation is generalized to changes in aggregate supply and demand which result in a positive correlation between interest rates and prices by Sargent (1973). Fisher's analysis, on the other hand, suggested a long run relationship between inflation rate and interest rate.

The Gibson paradox has been investigated in a large number of recent studies, using recent advances in the field of applied econometrics. But, there is no clear agreement among researchers in regard to this phenomenon. Sargent (1973) examines the statistical relationships between prices and interest rates to explain the Gibson paradox and finds two main conclusions: The first one is that interest rates are indeed correlated with the price level, i.e., the Gibson paradox does exist. The second is that Fisher's explanation of this phenomenon is inadequate. Shiller and Siegel (1977) analyze the correlation between interest rates and prices and their results from spectral techniques confirm the correlation between long term interest rates and prices for very long term swings, but indicate

[1] Asc.Prof. Dr., Istanbul University, Faculty of Economics, Department of Econometrics, kburcu@istanbul.edu.tr

studies find no empirical evidence for the correlation. Using cointegration and asymmetric threshold cointegration approaches on quarterly data over the period from 1990:01 to 2018:02, this paper examines the validity of the Gibson paradox for Turkey. The results obtained from Engle and Granger cointegration test show that price level and nominal interest rate are cointegrated, hence the Gibson paradox is valid for Turkey. Since the power of asymmetric threshold cointegration method of Enders and Siklos (2001) is much higher than the traditional cointegration tests with symmetric adjustment if the true adjustment process is asymmetric, we also investigate the Gibson paradox by considering TAR and M-TAR models as alternative adjustment processes for cointegration. The results obtained from TAR and M-TAR models indicate that there is threshold cointegration relationship between price level and nominal interest rate for Turkey with asymmetric adjustment, supporting the Gibson paradox for Turkey.

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REFERENCES

1. Atkins, F. J. & Serletis, A. (2003). Bounds tests of the Gibson paradox and the Fisher effect: Evidence from low-frequency international data. *Manchester School*, *71*, 673-679.
2. Caporale, G.M. & Skare, M. (2018). A nonlinear analysis of Gibson's paradox. *Engineering Economics*, *29*(4), 367-375.
3. Chen, C. & Lee, C.J. (1990). A VARMA test on the Gibson paradox. *Review of Economics and Statistics*, *72*, 96–107.
4. Corbae, D. & Oualiris, S. (1989). A random walk through the Gibson paradox. *Journal of Applied Econometrics*, *4*, 1-47.
5. Enders, W. & Siklos, P. (2001). Cointegration and threshold adjustment, *Journal of Business and Economic Statistics*, *19*, 166–176.
6. Engle, R.F. & Granger, C.W.J. (1987). Cointegraiton and error correction: Representation, estimation and testing. *Econometrica*, *55*, 251-276.
7. Gibson, A.H. (1923). The future course of high class investment values. *Banker's Magazine*, *115*, 15-34.
8. Halicioglu, F. (2004). The Gibson paradox: An empirical investigation for Turkey. *European Research Studies Journal*, *27*, 111-119.
9. Keynes, J.M. (1930). *Treatise of Money*. Vol. II, Harcourt, Brace and Company, New York.
10. Klein, L.R (1995). An economic interpretation of the Gibson relationship. *Atlantic Economic Journal*, *23*, 159-176.
11. Lee, C. J. & Petruzzi, C.R. (1986). The Gibson paradox and the monetary standard. *The Review Bulletin of Economics and Statistics*, *68*, 189-196.

12. Milne, W.J. & Torous, W.N. (1984). Long-term interest rates and the price level: The Canadian evidence on the Gibson paradox. *Canadian Journal of Economics*, *17*, 327-339.
13. Ng, S. & Perron, P. (2001). Lag length selection and the construction of unit root tests with good size and power. *Econometrica*, *69*,1519-1554.
14. Ram, R. (1987). A broader multicountry perspective on the Gibson paradox and Fisher's hypothesis. *De Economist*, *135*, 219-230.
15. Sargent, T.J. (1973). Interest rates and prices in the long run: A study of the Gibson paradox. *Journal of Money, Credit and Banking*, *4*, 385-449.
16. Serletis, A. & Zestos, G. (1999). On the Gibson paradox. *Review of International Economics*, *7*, 117-125.
17. Shiller, R.J. & Siegel, J. (1977). The Gibson paradox and historical movements in real interest rates. *Journal of Political Economy*, 85, 891-907.
18. Şimşek, M. & Kadılar, C. (2008). Gibson çelişkisinin Türkiye verileri ile analizi. *Sosyal Bilimler Dergisi*, *20*, 115-127.
19. Tong, H. (1983). *Threshold models in non-linear time series analysis*. New York: Springer-Verlag.