



Do stock returns provide a good hedge against inflation? An empirical assessment using Turkish data during periods of structural change



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ABSTRACT

This paper provides empirical evidence on the relation between stock returns and inflationary expectations using a panel of firm level data covering a broad range of industries and Turkish common stock market index from 1986 to 2013. I use survey of inflationary expectations to examine Fisher hypothesis where I show, no matter the data is aggregate or disaggregate; ex-ante inflationary expectations and stock returns are positively related, whereas ex-post inflationary realizations are negatively related. I find that holding stocks of manufacturing industry firms provide for about 15% better hedge in comparison to that of service industry firms.

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1. Introduction

Ceteris paribus, inflation decreases the amount of goods and services a person would be able to purchase which reduces the standard of living. Therefore, the methods to hedge against inflation are important in investment decision making. To successfully hedge against inflation and maintain a certain purchasing power in real terms, any investment must bring returns above or at least the same rate of inflation. Stock market where savings are directly transferred to borrowers may play an important role in providing an effective shield against inflation.

Turkish economy experienced substantially high, relatively moderate, and low levels of inflation in the last thirty years to 2013 where inflation has always been a concern. Due to adverse inflationary environment and partial utilization of the stock market, many failed to sustain purchasing power in real terms. In comparison to industrialized countries, Turkey has a shallow stock market with limited financial instruments. With a high level of young and dynamic working age population, Turkey has been prescribed to deepen its stock market and encourage private savings in order to improve national savings and enhance overall productivity. If it is proved that stock returns provide an effective shield against inflation, this may stimulate private savings by encouraging more investors to participate in the stock market.

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The research question of this study is on whether stock returns provide a good hedge against inflation during periods of structural change in Turkey from 1986 to 2013. During the period under investigation, the Turkish economy experienced substantially high, relatively moderate, and low levels of inflation along with distinct inflation reduction programs.¹ Using aggregate (common stock market) and disaggregate (both company and industry level) data, I attempt to provide empirical evidence for whether stock returns provide an effective shield against expected and/or unexpected inflation. Using a dataset at aggregate and disaggregate levels gives me the opportunity to identify whether the relationship between stock returns and expected inflation differ due to data aggregation. Studying segments of time periods associated with different price dynamics allow me to evaluate on whether stock returns provide a hedge in periods of high, relatively moderate and low levels of inflation. Finally, by using survey of expectations and realized forward data values, I am able to distinguish between the impact of ex-ante, ex-post, expected and unexpected inflationary expectations on stock returns.

2. Literature review

Generalized Fisher hypothesis, when applied to assets or common stocks, suggests that there is a positive relationship between nominal stock returns and expected inflation. However, existing empirical research on the relationship between stock returns and expected inflation hasn't reached a consensus yet.

There is a large literature claiming negative relationship between inflation and stock returns. Some comparative studies, like [Bodie \(1976\)](#), [Nelson \(1976\)](#), [Fama and Schwert \(1977\)](#), focus on the performance of holding common stocks versus other financial instruments to hedge against inflation in the U.S. where they show common stocks provide poor hedge against both expected and unexpected inflation. [Fahmy and Kandil's \(2003\)](#) Johansen tests for cointegration results do not support Fisher hypothesis in the short run, but at longer terms Fisher's one-to-one relation seem to hold using U.S. data. [Geske and Roll \(1983\)](#) show that stock returns are negatively related to both expected and unexpected inflation whereas no conclusive evidence on causality is provided. [Geske and Roll \(1983\)](#) propose "reversed causality" explanation where low stock returns are consistent with higher inflationary expectations as they signal for a drop in economic activity resulting in a higher rate of monetary expansion. Using a panel of nine countries during 1971–80, [Solnik \(1983\)](#) provides empirical evidence supporting [Geske and Roll's \(1983\)](#) model where stock price movements signal negative inflationary expectations.

Some research provide mixed conclusions by providing evidence for both negative and positive relationship between inflation and stock returns using ex-ante inflationary expectations versus ex-post realizations or by studying different time periods. [Gultekin \(1983\)](#) uses Livingston survey of expectations data where he provides evidence that Fisher hypothesis holds better when ex-ante expectations versus ex-post realizations are used in the empirical estimations. Using a structural VAR identification method [Lee \(2010\)](#) provides evidence both in favor and in contrast of the so-called inflation illusion hypothesis where negative relationship between inflation and stock returns is predicted. He finds negative relationship between inflation and stock returns during the post-war period and positive relationship for the pre-war period.

Do the source and the level of inflation matter in determining the relationship between inflation and stock returns? [Ely and Robinson \(1997\)](#) show that, no matter the source of inflation, stock returns maintain their value relative to CPI inflation. [Lee, Tang, and Wong \(2000\)](#) examine the relationship between stock returns and inflation during a hyperinflation period of isolated monetary and real sectors for Germany. Isolated real and monetary sectors allow the authors to show disentangled impact of inflation on stock returns where they report positive correlation between inflation (both expected and realized inflation) and stock returns.

Studies utilizing cointegration techniques and industry level data are usually in favor of positive relationship between inflation and stock returns. Using stock price and goods price data from six industrial countries and cointegration techniques, [Anari and Kolari \(2001\)](#) show that the long run Fisher elasticities of stock prices with respect to goods prices are in the range of 1.04 to 1.65 supporting tax adjusted Fisher effect as described in [Crowder and Hoffman \(1996\)](#). [Luintel and Paudyal \(2006\)](#) use aggregate and disaggregate data (seven industry groups) along with cointegration methods to show point estimates of stock price elasticities with respect to goods prices are significantly above unity.

Recent research examines stock market dynamics in Turkey and other emerging markets. A closely related recent study to the current work is by [Pimentel and Choudhry \(2014\)](#) where they provide evidence suggesting positive relationship between composite stock returns and inflation using Brazilian stock market data during periods of high inflation. Recent studies on Turkish stock market dynamics, on the other hand, do not examine Fisher hypothesis. Instead they focus on asset price volatility ([Balcilar & Demirer, 2015](#); [Solakoglu & Demir, 2014](#)), share issuance and equity returns ([Atilgan, Demirtas, & Erdogan, 2016](#)), asset pricing models and manipulative stock market behavior ([İmişikler, Özcan, & Taş, 2015](#); [Yayvak, Akdeniz, & Altay-Salih, 2015](#)). [Atilgan, Demirtas, and Simsek \(2015\)](#) provides a detailed review of earlier empirical asset pricing studies on emerging markets including Turkey.

Earlier studies on Turkish stock market and Fisher hypothesis have contradictory finding. [İncekara, Demez, and Ustaoglu \(2012\)](#) employ Johansen cointegration technique and VAR approach, [Şimşek and Kadılar \(2011\)](#) use [Pesaran, Shin, and Smith](#)

¹ There is an extensive literature on inflationary environment in Turkey in which non targeting disinflation programs were performed during 1986–2001 while semi-formal inflation targeting was in place during 2002–2005 which eventually led to full-fledged inflation targeting beginning 2006. [Andiç, Küçük, and Ögünç \(2015\)](#) use hybrid new Keynesian Phillips curve framework to study inflation dynamics and consumer price inflation in Turkey. [Aktürk \(2011\)](#) studies inflation pressure, [Başçı, Özel and Sarıkaya \(2008\)](#) examine monetary transmission mechanism during 2002 to 2005 while [Kara \(2012\)](#) and [Özatay \(2005\)](#) elaborate on the experiences during the semi-formal inflation targeting period.

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