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Abstract

The Fisher effect proposes that in the long run, nominal interest rates trend positively with inflation. In numerous studies the long run Fisher effect has been proved several times as compared to the short run Fisher effect phenomenon. The reason is in the long run, interest rates exhibit minimum volatility therefore resulting in the long run association. Even though the literature has been impressive in terms of validating the hypothesis, many central banks and policy makers have been lost in the lurch regarding the overall standpoint of the Fisher parity. This paper reviews the Fisher effect and examines factors that impinge on the hypothesis namely: inflation targeting, data set range and the regulation of the financial system.

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KEYWORDS: Fisher effect; interest rates; inflation

Introduction

The Fisher effect is an equilibrium relation every central bank values and appreciates. The theory postulates that nominal interest rates rise together with inflation in the long run while real interest rates remain indifferent to this transaction following Fisher (1930). Many central banks securities such as certificates and bonds usually have fixed real interest rates. In practical terms, real interests are not always stagnant. In effect, the direct relationship between nominal interest rates and inflation changes over time which impinges on the Fisher effect.

When carrying out univariate tests such as the Augmented Dickey Fuller test (ADF), KPSS and the Phillips and Perron test, the stationarity of interest rates differs as you carry out the tests at different levels such as level, first and second difference. An overview of the literature shows that the Fisher effect is not conclusive. The relationship differs from one study to another and results range from nullification to full Fisher effect. In many studies, the Fisher effect surfaces more when the data in consideration is large thus affirming the long run Fisher effect. In comparison, the short run Fisher effect does not appear often because in the short term, inflation and real interest rates are volatile. This in consequence, invalidates the Fisher parity. Many central banks are aware of the failure of this phenomenon in the short run. Practically, the Fisher effect is a useful tool in inflation targeting because nominal interest can be set to control inflation to a certain extent. Inflation targeting has been useful to many central banks because it provides a roadmap of a particular country's inflation. Also, since inflation cannot be controlled directly, the Fisher parity is the mainstay of inflation targeting. The hypothesis has also been an important concept in the field of financial asset returns because it provides an approximation of the actual returns while accounting for changes in inflation.

Even though studies have examined the Fisher effect globally, numerous studies focused on the Fisher effect in the United States of America (US). This is probably because the US affects the world greatly in many macroeconomic factors such as interest rates, exchange rates, gross domestic product, and inflation. To a reasonable extent, these factors could be examined separately when considering spillovers especially interest rates and inflation (see Bosupeng, 2015). The literature on the Fisher effect is numerous but few papers have been documented to reveal the overall standpoint of the Fisher effect. Therefore, there is a need to provide central banks with a clear direction to be able to make informed decisions about the overall standpoint of the literature. The focus with most studies has been to validate the hypothesis using advanced methodology and policy makers have been lost in the lurch as the results were not consistent. This paper solves the glitch by attempting to provide a review of the extant literature and a conclusion based on the numerous studies. In short, this study answers the question: where is the Fisher effect heading? In general, most studies which examined the Fisher effect do not account for several factors that can impinge on the validity of the Fisher effect. For instance, the Fisher effect in one country may not surface due to factors such as inflation targeting, monetary policy shocks and the deregulation of the financial system. These factors have to be accounted for and can impinge on the anticipated positive relationship between nominal interest rates and inflation. For instance, in some economies such as Australia the Fisher effect fails prior to the financial deregulation but appears to surface after the liberation of the financial system. This paper is structured as follows. Next is the literature review section and will be followed by different factors affecting the Fisher effect. Then a conclusion and summary of the study follows with implications.

The Fisher Effect Affirmation

The Fisher effect has been affirmed in many studies especially those which used a wider data span. Malliaropoulos (2000) aimed to investigate if inflation and interest rates in the US are trend stationary. Using Vector Autoregressive (VAR) models, the author concluded that the Fisher effect holds in the medium to the long term. The results of this study are proportionate to the study carried out by Million (2004). The author examined the long run relationship between nominal interest rates and inflation while accounting for structural breaks and mean-reversion using the Threshold Autoregressive (TAR) test. Further analysis employed cointegration tests. Consequently, the study proved that the Fisher effect appears to be strong in the US. In Asia, the Fisher effect was valid for eight economies under investigation (China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand) following Ahmad (2010). In the UK, the Fisher hypothesis was examined by Granville & Mallick (2004). The study supported the validity of the Fisher effect using a wide data span. The Turkish economy's Fisher effect was proved by Incekara et al. (2012) using cointegration methodology. The study revealed that in the long run, the Fisher effect is valid but fails to hold in the short term. Many studies generally channelled much attention to validate the hypothesis in each economy. Toyoshima & Hamori (2011) in consequence, examined the Fisher effect using a panel of monthly data from 1990 to 2010 for the US, UK and Japan. The study applied cointegration tests and supported the existence of the Fisher effect in the three economies. The investigation supported previous studies which have validated the Fisher effect such as Bassil, (2010); Ito, (2009); Westerlund, (2008) and Atkins & Coe (2002). The hypothesis was further validated by Berument & Jelassi (2002) through multi country analysis.

Tsong and Lee (2009) aimed to provide possible explanations for the empirical failure of the Fisher effect in terms of economic shocks by using quantile cointegration methodology proposed by Xiao (2009). The investigation analysed six OECD countries from 1957 to 2012 and the results suggested that nominal interest rates move together in the long run. In contribution, Pelaez (1995) aimed to test for a long run equilibrium relationship between expected inflation and actual inflation. The study tested for cointegration between the variables using Treasury bills data from 1959 to 1993. The results proved that the variables were cointegral over the period of examination. Lanne (2001) examined monthly US data covering the period 1953 to 1990 and further supported the Fisher effect in the interest rate targeting period of 1953 to 1979. In Europe, Jareno & Tolentino (2013) found positive affiliations between variations in the current expected inflation rate and the variations in nominal interest rates. The Fisher effect was examined using causality test by Daniels et al. (1996). The research proved that in the long run, there is a unidirectional causality from inflation rates to the rate of interest. This implies a long term relationship and affirms the Fisher effect. A summary of the results of the aforementioned studies is that the Fisher effect surfaces more in the long term than in the short run. This is because in the short run, interest rates and inflation dynamics are highly unstable which nullifies the expected positive relationship. Even though recent studies use advanced methodologies the results commensurate with those of previous studies such as Mishkin (1992); Wallace & Warner, (1993); Evans & Lewis, (1995); Paul, (1984); and Crowder, & Hoffman (1996). Even though advances in methodology and design are important, the Fisher parity has been nullified in several economies. The next section of the literature now focuses on studies that rejected the Fisher hypothesis. Comparatively, the short run Fisher effect has not been supported in many studies.

The Fisher Effect Nullification

Generally, when examining the Fisher effect over a wide span there is a high probability that the positive relationship between nominal interest rates and inflation may hold. Asemota & Bala (2011) for instance aimed to investigate the presence of the Fisher effect in Nigeria using unit root test and cointegration methodology. The study failed to find evidence of the long run Fisher effect from 1961 to 2009. Koustas and Lamarche (2010) used tests for unit roots and argued that nominal interest rates and inflation can drift apart from one another indefinitely which invalidate the Fisher effect. The Fisher effect was further annulled by Koustas & Serletis (1999) using the King & Watson (1997) methodology. The study rejected the Fisherian link between inflation and nominal interest rates. The failure of the Fisher effect was further provided by Arisoy (2013) using data from 1987 to 2010 for the Turkish economy. The study used cointegration tests and time varying parameters approach.

Ghazali & Ramlee (2003) examined the presence of the Fisher effect in G7 countries using an Autoregressive Fractionally Integrated Moving average model. The study showed that interest rates in the G7 countries are not linked to inflation rates in the long run (1974-1996). In extension to the extant literature, Coppock & Poitras (2000) found evidence that interest rates failed to fully adjust to inflation due to variation in the implicit liquidity premium on financial assets. Olekalns (1996) further rejected the strong form of the Fisher effect using Australian data. However, the study highlighted that the strong form of the hypothesis cannot be nullified in the period following the deregulation of the financial system using data from 1964 to 1993. The results of the study are proportionate to those of Hawtrey (1997). The author used data from 1969 to 1994 using the Johansen methodology. Similarly, the study revealed that the Fisher effect failed to surface prior to the financial deregulation of the 1980's. Another evidence of the Fisher effect was brought by Hasan (1999). Using the Adaptive Expectation Approach, diagnostic tests and Wald tests the study exposed the nullification of the Fisher effect using data from 1957 to 1991. In summation of the studies nullifying the Fisher parity, there are several points we need to cogitate. Firstly when examining the Fisher effect over a wide data span does not guarantee that the parity will hold. There are several factors at play that can affect the validity of the Fisher hypothesis such as monetary policy, the liberalization of the financial system and inflation targeting regimes. The extent to which these factors are enforced determines the long run affiliations between nominal interest rates and inflation. For instance in Australia the Fisher effect appeared to hold only after the liberation of the financial system (Hasan, 1999 and Hawtrey, 1997). In effect, even though the Fisher effect is not for specific interest rates these factors have to be considered when examining the Fisher effect.

The Effects of Data Span, Inflation Targeting and Financial Deregulation

An overview of the extant literature demonstrates that there are several factors affecting the Fisher effect. In general, when examining the Fisher effect using a wide data span the relationship is likely to surface. For instance Granville & Mallick (2004) examined the Fisher hypothesis using annual data for the UK between 1900 and 2000; Tsong & Lee (2013), 1957-2012; Pelaez, (1995), 1959-1993; Lanne, (2001), 1953-1990; Hawtrey, (1997), 1969-1994. This is because in the long run, the volatility of interest rates and inflation is minimal hence the long run affiliation between the variables. However, it is important to note that the Fisher effect can still fail when examining the hypothesis over a wide data span. Consider the study of Asemota & Bala (2011). Asemota & Bala (2011) used data from 1961 to 2009 and the

study nullified the Fisher effect in Nigeria. Ghazali & Ramlee (2003) considered a wide data span from 1974 to 1996 and proved that interest rates in the G7 countries were not linked to inflation in the long run.

The Fisher effect is more likely to hold when considering the data in a wide data range. As a caveat, a wide data span is also prone to certain macroeconomic policy effects. For instance, if you consider a wide data span that means your study will include for instance periods of inflation targeting (pre and post). Also there are several factors that can affect inflation such as exchange rates stability. Studies have demonstrated that countries with high exchange rate stability tend to experience lower inflation (Aizenman et al., 2009). These factors can affect the validity of the Fisher effect and the anticipated positive relationship between nominal interest rates and inflation. In summary, using a wide data span raises the probability of the Fisher effect existence.

Few studies on the Fisher effect take into consideration the effects of financial regulation on the Fisher parity. In Australia, the regulation of the financial system was found to have effects on the Fisher effect (Hasan, 1999 and Hawtrey, 1997). Hasan (1999) and Hawtrey (1997) demonstrated that the Fisher effect failed to hold before the Australian financial deregulation. The Fisher hypothesis was valid post the financial deregulation. Hypothetically, there is a reasonable explanation to this situation. If the financial system is liberated, everything is left to the market dynamics and interest rates figures are freely determined. For instance if we consider the Fisher effect as:

$$i_t = r_t + \pi_t^e \quad (1)$$

The definition of terms is as follows: i_t = nominal interest rates; r_t = real interest rates and π_t^e = inflation. Under financial regulations it is imperative to monitor and control interest rates by setting them within certain boundaries. The relationship can now be written as

$$\check{i}_t = \check{r}_t + \pi_t^e \quad (2)$$

The interest rates can be fixed at a certain rate and this will invalidate the Fisher parity, hence financial regulation impinges negatively on the Fisher effect. The other issue that has to be considered when examining the Fisher hypothesis is inflation targeting. Lanne (2001) demonstrated that there is support for the Fisher effect for the US in the interest rate targeting period of 1953 to 1979. The Fisher effect also failed to surface in the period 1979 to 1990. In summary, when testing for the Fisher effect one has to examine inflation targeting period of the central bank. Financial liberation is also an important factor to consider.

Concluding Remarks

This paper intended to provide an overview of the factors affecting the Fisher effect as well as where the current research on the Fisher effect is heading. This review has demonstrated that the Fisher effect tends to hold when examining the data with a wide range. This paper has further demonstrated that when examining the Fisher effect one should account for monetary policy changes, inflation targeting regimes and the deregulation of the financial

system. Considering the raw data alone will not be sufficient in the analysis of the Fisher effect.

Macroeconomic policies such as inflation or interest rate targeting are critical because they affect the values of inflation, and interest rates subsequently the Fisher effect. The current research on the Fisher effect is encouraging as there have been quite advances in methodologies such as the Kalman Filter approach; ARDL bounds tests; quantile cointegration and SETAR models. The direction of current research has focused mainly on validating the Fisher effect from one country to the other without attempting to find out the adverse effects of factors such as monetary policy on the Fisher hypothesis. It will be therefore be important now to address factors that impinge on the Fisher effect as the hypothesis has been proved well enough. In conclusion of this review, the Fisher effect appears to be long run phenomenon. It will be vital to address several factors affecting the Fisher parity such as inflation targeting, and monetary policy.

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