

Relationship between Interest Rate and Rate of Inflation in India

D. Rathore^{1*}, K.P.S. Deora², I.Chhabra³, R.P.S. Deora⁴

^{1*}Dept. of Management, Aryabhata College of Management, Rajasthan Technical University, Ajmer, India

²Department of Law, Endeavor Careers, Mumbai, India

³Dept. of Management, Aryabhata College of Management, Rajasthan Technical University, Ajmer, India

⁴Department of Marketing, Wonder Cement, Beawer, India

*Corresponding Author: deepika21rath@gmail.com, Tel.: 9983773077

Available online at: www.ijcseonline.org

Abstract— This study examines and analyzes the probable, empirically existing relationship between interest rate and rate of inflation in Indian economy, The Interest rate and the inflation rate has always been the most debating subject in the Indian economy. All central banks implement some kind of monetary policy to achieve their economic goals. And India is no exception. Interest rates receive a lot of attention in the media and play an important role, in formulation of government policy. Changes in the rate of interest can have significant impact on the way individuals or other entities behave as investors and savers. These changes in investment and saving behavior subsequently have an impact on the economic activities of a country. The motivation for the study comes from two perspectives. Firstly, India is an emerging economy and findings of the study would help policy makers to take suitable policy initiatives in that economy. Secondly, all empirical studies concerning the Fisher hypothesis have primarily focused on USA and European economies. The conclusion differs from country to country. Also the important methodological issue is whether Wholesale Price Index (WPI) or the Consumer Price Index (CPI) is to be taken for inflation. Then the Treasury bill yield rate is often taken as the nominal interest rate. To achieve the objective of the study Augmented Dickey Fuller unit root test was performed, to check for Stationary. The Akaike criterion, Hannan-Quinn and Durbin-Watson test were also conducted for finding relationship in the Indian context.

Keywords—Wholesale Price Index (WPI), Consumer Price Index (CPI), Inflation

I. INTRODUCTION

Interest rate has always been the most debating subject in the economy. Nowadays, almost all central banks implement some kinds of monetary policy to achieve their economic goals. Irving Fisher was amongst the first person to address the concept of the compensation of expected loss in the purchasing power. The Fisher effect states that nominal interest rate is equal to the expected real interest rate, if the expected real inflation rate remains constant over the period. The Fisher effect proposes a one for one relationship between the nominal interest rate and the expected inflation rate in the economy. Theoretically, short-run movement in nominal interest is useful to predict the future inflation. Many, theoretical economic models assume Fisher effect holds. However, in practice the assumption of constant real interest is dubious.

Economists refer to the interest rate banks charge as nominal interest rate and the increase in purchasing power as real interest rate. If (i) denote nominal interest rate, (r) denotes real interest rate and (π) as the expected rate of inflation, then the relationship between the three variables can be written as:

$$i_t = r_t + \pi_t^e$$

$$r_t = i_t - \pi_t^e$$

The real interest rate is the difference between the nominal interest rate and expected rate of inflation.

II. OBJECTIVE OF THE PROPOSED STUDY

The inflation target is achieved through periodic adjustment to the central bank interest rate target. The interest rate used is generally the interbank rate at which banks lend to each other overnight for each cash flow purpose. The interest rate target is maintained for specific duration using open market operations. Typically the interest rate target is kept constant and will vary between months and year. This interest rate target is usually reviewed on a monthly or quarterly basis by a policy committee. Changes to the interest rate target are made in response to various market indicators in an attempt to forecast economic trends and in so doing keep the market on track towards achieving the defined inflation target. In India repo rate has been such policy variable used in last five years to mitigate the inflation.

III. SCOPE OF THE PROPOSED STUDY

The current inflation crisis and the policy response to it could fundamentally alter the economic environment. The

measures employed by the monetary authorities in tandem with the government, to influence economic activity, specifically by manipulating the money supply and interest rate, have wider impact on all sections of the society. It is important for policymakers to make credible announcements. If private agents (consumers & firms) believe that policymakers are committed to lowering inflation, they will anticipate future price to be lower than otherwise. If an employee expects prices to be lower in future, he or she will draw up a wage contract with a wage contract with a low wage to match these prices. Hence, the expectation of lower wages is reflected in wages is reflected in wage setting behave our between employers are receiving a smaller wage and there is no cost push inflation because employers are paying out less in wages.

IV. TRENDS OF INFLATION IN INDIA

Inflation can be headline inflation or core inflation. Headline inflation includes the entire set of commodities in the general price index. Core inflation does not take into consideration commodities that have volatile prices for e.g. food and fuel (Batura, 2008). Inflation can be measured on a point to point to point basis i.e. compare the most recent prices index with the price index at another point of time usually a year ago. It can also be measured as an average rise in the prices over a period of time. Broadly, there are three measures of inflation in India, such as WPI, CPI and GDP described as under.

V. RELATIONSHIP BETWEEN INFLATION AND INTEREST RATE

A. Empirical Study of Fisher's Hypothesis

In chapter 7 the object is to present empirical estimates of Fisher's equation from different methods. It is because since Fisher explained the original views about the nominal rate of interest and inflation many empirical studies have been conducted. The conclusion differ from country to country. AlsoVthe important methodological issue is wWhether Wholesale Price Index (WPI) or the Consumer Price Index (CPI) is to be taken for inflation. Then the treasury bill yield rate is often taken as the nominal interest rate . On the basis of changes in data the debate is still relevant. The empirical study is presented in Table 2.

Table 1. Annual Average Inflation Rate Based on WPI

Year	Primary Articles	Fuel and Power	Manufactured Products	All Commo -dities
Weights (%)	20.12	14.91	64.97	100
2000-01	2.8	28.5	3.3	7.2
2001-02	3.6	8.9	1.8	3.6
2002-03	3.3	5.5	2.6	3.4
2003-04	4.3	6.4	5.7	5.5
2004-05	3.7	10.1	6.3	6.5
1st 5 years	3.5	11.9	3.9	5.2

average				
2005-06	4.3	13.5	2.3	4.3
2006-07	9.6	6.5	5.6	6.5
2007-08	8.3	0.0	4.9	4.8
2008-09	11.0	11.6	6.2	8.0
2009-10	12.7	-2.1	1.8	3.6
2nd 5 years average	9.2	5.9	4.1	5.5
Average 2000-2001 to 2009-10 (10 years)	6.4	8.9	4.1	5.4
2010-11	17.7	12.3	5.7	9.6
2011-12	9.8	14.0	7.3	8.9

Source: I) Economic survey 2010-11
II) RBI Annual report 2011-12

Table 2. Descriptive Statistics

	N	Range	Min	Max	Mean	Std. Dev
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
CPI	20	21.5	-3.2	18.3	6.59	4.3685
WPI	20	19.4	-1	18.4	5.669	2.7582
YIELD RATE	20	10.59	3.12	13.7	6.928	2.009
Valid N (listwise)	20					
	8					

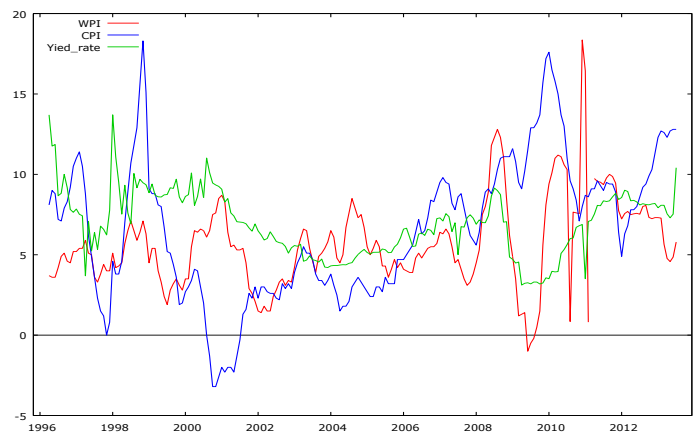


Figure 1. WPI, CPI and Yield Rate

Table 3. Descriptive Statistics

	Variance	Skewness	Kurtosis
	Statistics	Statistics	Statistics
CPI	19.084	.157	-.279
WPI	7.608	.916	2.661
YIELD RATE	4.036	.303	.189
Valid N (listwise)	208		

Some more descriptive statistics are as follows:

Table 4. Descriptive Statistics continued

	Mean	Median	Minimum	Maximum
WPI	5.6677	5.4000	-1.0000	18.359
CPI	6.5899	6.6000	-3.2000	18.300
Yield rate	6.9283	6.9969	3.1159	13.701

Table 5. Descriptive Statistics continued

	Std. Dev.	C.V.	Skewness	Ex. Kurtosis
WPI	2.7643	0.48774	0.90547	2.5348
CPI	4.3685	0.66291	0.15561	-0.30075
Yield rate	2.0090	0.28997	0.30071	0.15547

Table 6. Descriptive Statistics continued

	5%	95%	IQ range	Missing obs.
WPI	1.4400	10.840	3.3000	1
CPI	-0.85000	13.700	6.3000	0
Yield rate	3.5363	10.030	3.0553	0

Correlation coefficients, using the observations 1996:04 - 2013:07 (missing values were skipped)

5% critical value (two-tailed) = 0.1361 for n = 208

Table 7. Descriptive Statistics continued

WPI	CPI	Yield rate	
1.0000	0.2364	0.1312	WPI
	1.0000	-0.0470	CPI
		1.0000	Yield rate

Model 1: OLS, using observations 1996:04-2013:07 (T = 207)

Missing or incomplete observations dropped: 1
Dependent variable: Yield rate

Table 8. Data Table for Figure 2

	Coefficient	Std. Error	t-ratio	p-value	
const	6.3855	0.317927	20.0848	<0.00001	**
WPI	0.0955844	0.0504409	1.8950	0.05950	*

Table 9. Data Table for Figure 2

Mean dependent var	6.927241	S.D. dependent var	2.013828
Sum squared resid	821.0513	S.E. of regression	2.001282
R-squared	0.017215	Adjusted R-squared	0.012421
F(1, 205)	3.590938	P-value(F)	0.059503
Log-likelihood	-436.3295	Akaike criterion	876.6590
Schwarz criterion	883.3244	Hannan-Quinn	879.3544

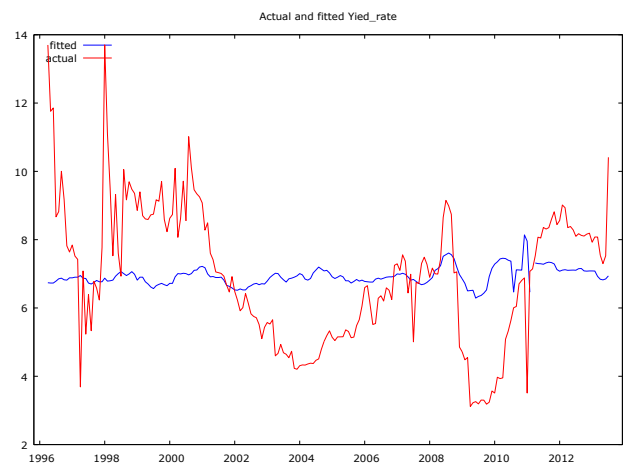


Figure 2. Actual and Fitted Yield_rate

VI. CONCLUSION

If ordinary least square is run on the level data the conclusion is that there is very low coefficient of determination in the WPI and the yield rate. The relationship with CPI is not at all significant. The error terms are high and therefore it may be concluded that the Fisher's theory of Interest does not apply in case of India. The first differences of the data are also not helpful in explain the variations. It is because the interest is almost constant over these years but there are wide variations in WPI and CPI within a year and

also along these years. Thus the application of difference in the yield rate and the inflation rate are more pertinent. On the basis of R- Square and Akaike criterion, Hannan-Quinn and Durbin-Watson.

The best models were chosen which has been presented. The residuals along with actual and fitted data show that almost all the data are within 2.5 times of the standard error. The 95% confidence ellipse and 95% marginal intervals are also presented. Thus both CPI and WPI have been related with yield rate.

REFERENCES

- [1] Agarwal R. (1970), "An Econometric Model of India", 1948-61. Ahluwalia, I J (1979): 'Behavior of Prices and Output in India: A Macro-Economic Aggregates', RBI Occasional Papers.
- [2] Ahluwalia M. S. (2002), "Economic reforms in India since 1991: has gradualism worked?", Journal of Economic Perspectives, 16, 67-88.
- [3] Almon S. (1965), "The Distributed Lag between Capital Appropriations and Expenditures", *Econometrica* 33, 178-196.
- [4] Baillie R. T. and Chung C. (1996), "Analyzing inflation by the fractionally Bank", working paper 301.
- [5] Balakrishnan P. (2005), "Macroeconomic policy and economic growth in the 1990s", *Economic and Political Weekly*, XXXX, 3969-3977.
- [6] Barro R. J. (1995), "Inflation and economic growth", NBER Working Paper 5326. Cambridge. Fisher I. (1930), *The Theory of Interest*. Macmillan, New York.
- [7] Fisher I. (1930), "The Theory of Interest", Macmillan, New York
Gandolfi, A.E. (1982), "Inflation, Taxation and Interest Rates", *Journal of Finance* 37 797-807
Garcia M.G. P. (1993), "The Fisher Effect in a Signal Extraction Framework: The Recent Brazilian Experience", *Journal of Development Economics* 41, 71-93.

Authors Profile

Dr. D. Rathore is associated with Aryabhata college of Management, Ajmer since August 2015 as a Faculty of Finance and Economics. She is an MBA in finance from Rajasthan Technique University and Ph.D. in Management from Pacific College of Management, Udaipur. She has more than thirteen research papers on her credit in reputed journals and presented more than 7 papers in various National and International conferences. Her area of interest includes Economics, Finance, Research and other Allied subjects.

Mr. K. P. S. Deora is a well-known public speaker, Indian legal educator & human rights activist. He is frequently invited to seminars, conferences and workshops across India to spread awareness and motivate the students for correct career choice decisions and enhance performance for Schools, Junior Colleges, Educational Institutes, and others. He has worked with many Social Activists, Senior Lawyers, Additional Solicitor Generals, Advocate General etc. And he has won several awards & accolades at many International and National Moot Courts, Parliamentary Debates, Model United Nations and Conferences. K.P. believes 'Legal awareness' is the best tool for empowerment and he has

taken up the mission of spreading awareness regarding 'Human Rights', 'Law as a Career Choice', 'Child Rights', 'Sexual Harassment at workplace', 'Moot Courts', 'Environment Protection' by organizing seminars and workshops at schools, colleges, BAR Offices etc.

Dr. I.P. Chhabra, Ph.D. (HR), MBA (CM), M.Com (EAFM), B.Sc. is associated with Aryabhata College of Management, Ajmer as a Professor and Principal. She is having an experience of 10 years in academics and research. During this span she has organized various Seminars and Workshops. She has guided almost 35 MRPs of management students. Dr. Chhabra has published many research papers in reputed National and International Journals. She has also attended a number of International, National Conferences, Seminars, Workshop and FDPs. She has represented as a member of organizing committee for various events. Her areas of interest include Information Technology, Human Resource Management, SHRM, MIS, Organizational Behaviors, Business Communication, Business Management, Banking and other allied subjects.

Mr. R.P.S. Deora is MBA(Marketing), BA(English Literature) and having seven years of corporate working experience. He is presently working with one of the reputed and renowned Wonder Cement Industry at Beawar, as a Marketing Manager. He is a well-known public speaker and frequently invited to seminars, conferences and workshops across India to spread awareness and motivate the students for marketing and sales promotions.