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Research

FAILURE OF INTEREST BASED MONETARY POLICY: EVIDENCES FROM SELECTED ISLAMIC AND NON-ISLAMIC COUNTRIES

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Abstract

Interest rate today is the most frequently used tool of monetary policy. Mainstream economists think that by increasing the interest rate, inflation can be reduced, and this provides the basis of contemporary monetary policy. However there is evidence against this theory. In this study, use the data of large number of Islamic and non-Islamic countries. We apply sophisticated econometric techniques including Granger Causality and VECM to explore the relationship between interest rate and prices. We find that the relationship between the two variables is positive but insignificant, showing the failure of interest rate as a monetary policy tool.

Keywords: Cost channel, monetary transmission mechanism, monetary policy
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Introduction

In present years, interest rate has become a major policy tool of the central banks to achieve the price stability. Banks are using the interest rate as a policy variable, despite the fact that many well-known economists like Wright Pitman[1]have very strong opinion against its validity as inflation reducing policy tool. The relation between interest rate and inflation which is presented almost in all elementary text books for e.g. Case et al. (2012) of monetary policy states that increasing interest rate will reduce inflation by reducing aggregate demand in the economy. Many central banks are now using Taylor Rule to monitor economic indicators and the interest rate is the major policy variable suggested by this rule.

There are quite contradictory opinions on how the interest rate affects inflation. The most popular view is the so called demand side of Monetary Transmission Mechanism (or simply MTM). According to the MTM, a rise in interest rate will decrease the money supply, therefore the aggregate demand will decrease and ultimately the price level will decrease (Case et al. 2012). This theory provides the basis of the monetary policy currently used by central banks. For most of economists, this mechanism is only the explanation of the relationship between interest rate and inflation.

However, there are very strong voices against the validity of interest rate as a policy tool. There are several other channels which show that the rise in interest rate would raise the price level instead of reducing it. For instance, the cost channel states that the rise of interest rate will increase the cost of production, shifting up the aggregate supply curve and thus the price level. From the last two decades monetary economists started thinking about cost channel of MTM. There are large numbers of studies on the cost channel of the MTM

[1]-In the words of Wright Patman, Chairman of the Joint Economic Committee of America Congress, *'raising interest rates to fight inflation is like throwing gasoline on fire'*(US Congress,1970, pp. 55–56)

[Barth & Ramey (2001) Chowdhury et al. (2006), Ravenna & Walsh (2006) etc]. However, no reflection of this opinion has been observed on the monetary policy.

It is also possible that the reductionary effect of MTM via decrease in AD is offset by the expansionary effect of the cost channel and the net impact of interest rate on prices remains insignificant. There are some evidences in favor of this view e.g. Bernanke & Gertler (1995).

The three cases have quite contradictory implications for the monetary policy. If the demand side effect of MTM is more effective, than using the interest rate as a policy tool might be justified. However, if the cost side effect is more effective, than using interest rate would worsen the situation instead of improving it. If the two types of effects cancel each other, than the interest rate based monetary policy would be ineffective, however, there will be a huge reduction in the output. However, even in the presence of demand side effect of MTM, the effect of interest rate on output is negative, therefore not desirable. The output will be negatively affected by appreciation of interest rate in both cases, if demand side effect is dominant or if supply side effect is dominant.

The purpose of this study is to analyze the impact of raising interest rate on inflation. We have tested the validity of demand channel of MTM for a large number of OIC and Non-OIC countries and found that for most of the countries, the effect of interest rate on inflation is insignificant. The countries for which this relation is significant, the direction of relationship is positive indicating that increasing interest is not successful in achieving low inflation.

How Do Interest Rates Affect Inflation and Output?

The monetary policy recently adopted by many central banks aims to influence inflation, output and the other real variables of economy via interest rate. Central Bank sets official bank rate then this official rate affect the all interest rates set by commercial banks and financial institutions. The effect of interest rate on inflation is bi-directional, the cost channel states that the effect of interest on inflation should be increasing and the demand channel says that it should be decreasing. However, it can be shown that there is one and only one dimensional effect of inflation on output i.e. it will reduce the output. This can be shown by simple diagrams.

Figure 1:

Demand Channel of MTM

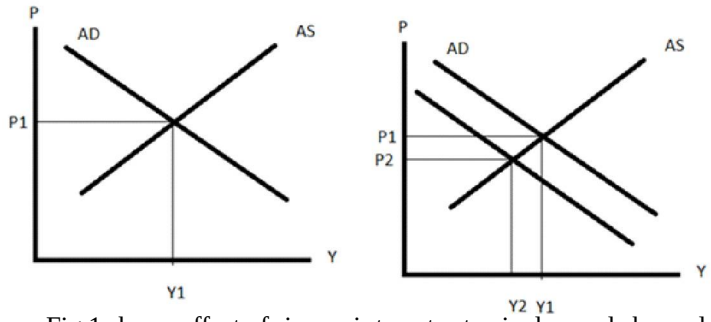


Fig 1 shows effect of rise on interest rate via demand channel of MTM. The left panel is state of equilibrium where the output and price are Y1 and P1 respectively. The monetary shock shifts AD curve inward, as a result price and output also decrease to Y2 and P2 respectively. The new equilibrium output is less than previous equilibrium output.

Figure 2:

Cost Channel of MTM

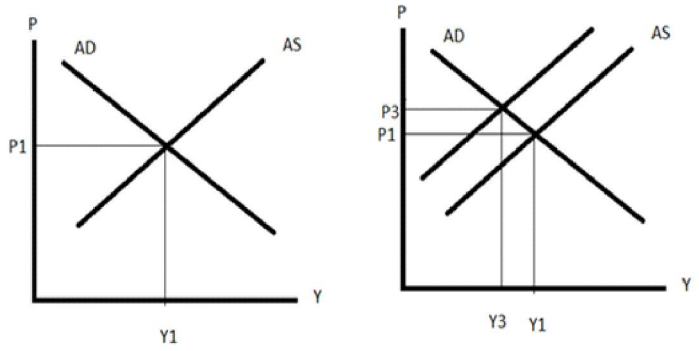


Fig 2 shows effect of rise in interest rate via cost channel of MTM. The equilibrium output and price are Y1 and P1 respectively before monetary intervention. The monetary shock increases the cost of production shifting AS supply curve to the left, as a result output decreases to Y3 and price increases to P3. The new equilibrium output is again less than previous equilibrium output.

Figure 3:

Simultaneous Effect of Demand and Supply Channels

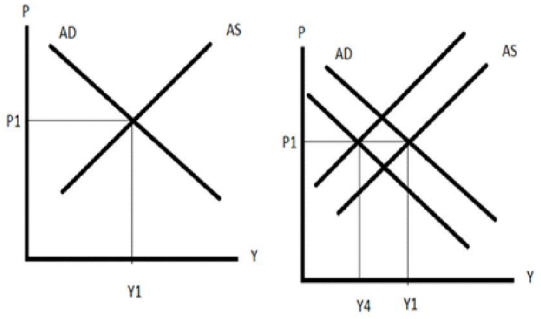


Fig 3 shows the state of economy when the cost and demand channels are working simultaneously. The monetary shock shifts AS curve and aggregate demand curve simultaneously. New equilibrium occurs at point (Y4, P1) which shows that the price remains same but output decreases Y1 to Y4. One can see the reduction in output is larger than the reduction made by one of the previous two diagrams. This is the worst situation because nothing happened to price level but the output decreased twofold which is extremely undesirable.

Finding of the Previous Studies

The studies on MTM found mixed evidences. There are a lot of studies providing support for the demand channel of MTM and a lot of studies finding evidence for cost channel of MTM. There are some studies finding insignificant effect of interest rate on prices. The selected studies of each type are summarized below.

Studies Favoring Demand Channel

The demand side's dominant view of monetary theory suggests that tight monetary policy leads towards decline in output and inflation. Most of economists have been focusing only on this channel as a sole explanation of the relationship between interest rate and prices. Therefore the list of studies on the demand channel is too large to be covered in this document. The following are some selected papers which favor the existence of text book demand channels of MTM.

Rabanal (2003, 2007) and Castelnuovo and Surico (2010) conclude that there is negative relationship between interest rate and monetary policy shock in the US economy. Castelnuovo and Surico further conclude that price puzzle is an artifact, not a fact because price puzzle arises due to model misspecification. Rabanal further argues that in the US economy demand channel dominates the cost channel. Rabanal (2003), Henzel et al (2007), Huelsewig et al (2006)

also found dominance of demand channel of monetary transmission mechanism in the Euro area economy. Mohanty (2012) found that an increase in policy rate has negative impact on inflation in Indian economy. Saleem (2010), Kashif & Qayyum (2012) found the negative relationship between interest rate and inflation in Pakistan economy.

Studies Favoring Cost Channel

Since long there are many evidences for the cost channels of MTM. Gibson (1923) found a positive correlation between interest rates and prices in the UK data over a period of 200 years (Lima, 2010). This finding was against the perception of economists, therefore they named it as a Gibson Paradox. Kitchin (1923) and Peake (1928) also report evidence of a positive correlation between interest rates and prices. Barth & Ramey (2001), Chowdhury et al (2006), Ravenna & Walsh (2006), and Tillmann (2008) found that the nominal interest rate has positive effect on inflation in the US economy. Tillmann (2008) found positive relationship between interest rate and inflation in UK & Euro Area. Qiang & Xin (2010) found significant presence of cost channel of MTM in Chinese economy. Ali (2012) revisited the high interest rate policy and its supply side effects and concluded that higher interest rate is not an effective tool and increases in the nominal interest rate is unwise policy to cope with inflation. Felipe (2009), Rehman & Malik (2010) and Javid & Munir (2010) found positive effects of interest rate on inflation in Pakistan.

The Interaction of Cost and Demand Channel

It is possible that increasing effect on prices due to supply channel is offset by decreasing the effect of the demand side and the net effect of interest rate on prices is insignificant. A premier study supporting this possibility is by Bernanke & Gertler (1995) who argue that *credit channel and traditional monetary channel working in tandem as a result both the AD curve & AS curve shifts upward, leading to a large change in output accompanied by a small change in prices'*

Some other studies also support this clue. Rehman (2011) made a model for inflation after comparing various existing models for inflation in Pakistan. His final model does not contain interest rate. This implies that according to Rehman (2011) interest rate is not a significant determinant of inflation. Ghaffari (2014) found insignificant relationship between different combination of interest rate and inflation.

Gap In Existing Literature

Different studies have shown different relationships between interest rate and inflation. These controversial evidences mislead about the relationship as the researchers focus only one channel ignoring the rival explanations. Therefore there is a need to consider all channels simultaneously, so that one could find an unbiased estimate of the relationship between two variables. There are number of other transmission mechanisms, through which a monetary policy could affect the inflation (see Ghaffari (2013). To get the results free of missing variable bias, one would have to consider all the intermediate variables occurring in other channels. Ghaffari (2013) discusses the implications of simultaneous effect of cost and demand side effects. But this study is for Pakistan only, and has smaller reliability due to small sample size. The present study utilizes a panel of large number of countries therefore its capable to provide more reliable estimates of the relationship under consideration.

What is Really Happening; the Data Based Evidences

Correlation

We have calculated Pearson correlation between interest rate and inflation. The data available in WDI CD ROM contains two measures of interest rate i.e.

Deposit interest rate (%)
Lending interest rate (%)

And two measures of inflation i.e.

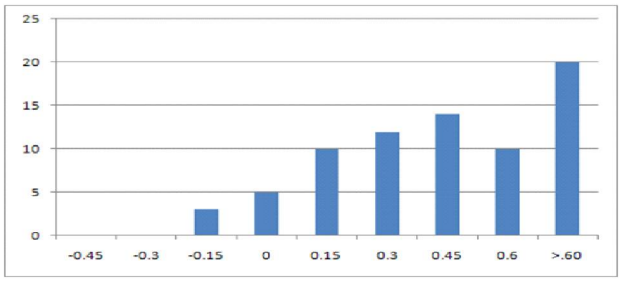
Inflation, GDP deflator (annual %)
Inflation, consumer prices (annual %)

Therefore 4 combinations of interest rate and inflation are possible. For each combination, the correlation was calculated between interest rate and inflation series for all countries having data available for at least 30 years. The results are summarized below:

Deposit Rate and CPI

We had the data of the two series described above for 74 countries. For 66 out of 74 countries the correlation was positive showing the dominance of cost channel of MTM.

Figure 1:
Histogram of the Correlation between Deposit Rate and CPI

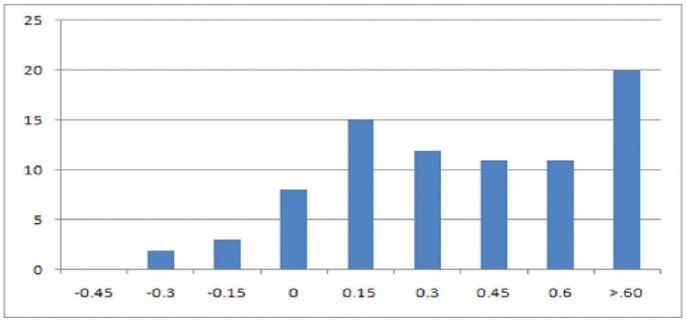


The distribution of correlation is centered at 0.15. For some countries, correlation is higher than 60%. If the correlation is negative, it is closer to zero showing insignificant relation between two series.

Deposit Interest and GDP Deflator

We had the data of the two series described above for 82 countries. For 79 countries the correlation was positive showing the dominance of cost channel.

Figure 2:
Histogram of the Correlation between Deposit Rate & GDP Deflator

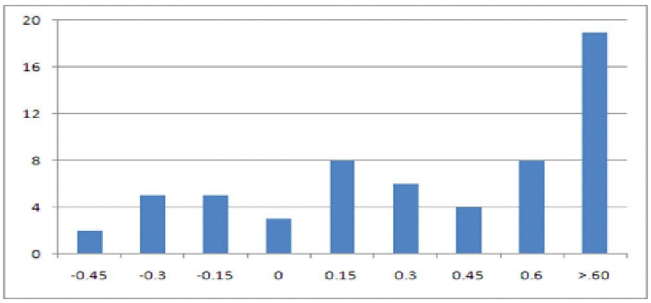


Like the previous case, the distribution of correlation is centered at 0.15 and significant correlation occurs only on positive side.

Lending Rate and CPI

We had the data of the two series described above for 60 countries. For 45 out of 60 countries the correlation was positive supporting the evidences found from other combinations of interest rate and inflation.

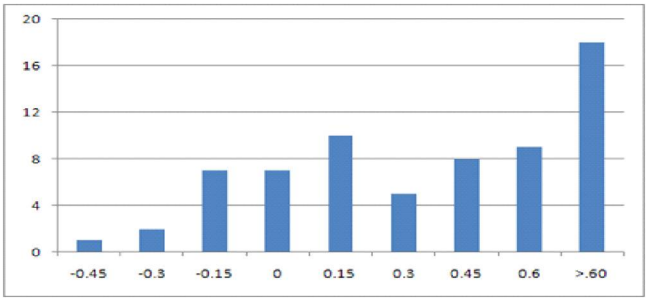
Figure 3:
Histogram of the Correlation between Lending Rate & CPI



Deposit Rate and GDP Deflator inflation

We had the data of the two series described above for 67 countries of which 50 countries have positive between interest rate and inflation, indicating a big failure of the conventional MTM.

Figure 4:
Histogram of the Correlation between Deposit Rate & GDP Deflator



Evidences Based on Time Series Models

Now we will present time series based evidence about the relationship between two variables. The necessary steps are described below:

Avoiding Missing Variables Bias:

We are interested in the relationship of only two variables i.e. interest rate and inflation, however, this relationship cannot be estimated without taking into account the covariates of inflation. Let the relationship between interest rate and inflation is described by the equation $\pi = f(int, X1, X2, \ldots Y1, Y2)$

Where X1, X2… are the variables which are correlated with π but have no correlation with the interest rate. Y1, Y2 … are the variables which are correlated both with and interest rate. We can safely ignore the variables Xi, i=1, 2,… because in absence of these variables, the coefficient of will remain unbiased. However we cannot drop any of Yi, because in absence these variables, coefficient of int will be biased.

Therefore it is necessary to incorporate all covariate of interest rate and inflation. Therefore following variables were included in further estimation process:

ipay: Interest payment on foreign debt (% of GNI)

FuImp: Fuel Imports (% of GNI)

M2G: Money Growth (annual %)

The Stationarity of Data

To avoid the possibility of spurious regression, unit root and cointegration tests were applied. The univariate unit root tests are subject to serious size and power problems in small data. We have 30 years annual data leading to sample size 30 and univariate unit root test are unreliable for this length of time series. To get good size and power, we use panel unit root tests instead. We apply Im Pesaran Shin (1997) panel unit root test to all the series involved in the relationship the results are as follows:

Table 2:

Results of IM Pesaran Shin Unit Root Test.

Null Hypothesis: Unit root (individual unit root process)		
Series	Statistic	Prob.**
Deposit Rate	-3.01361	0.0013
Fuel Imports	-4.92509	0.0000
Inflation	-227.608	0.0000
Interest Payment	-3.73614	0.0001
Money Supply Growth	-94.6413	0.0000

The results show that all variables are stationary at level. Therefore we can use conventional econometric tools without fear of spurious results.

Granger causality

There are various procedures of testing granger causality. The procedure we will adopt as follows.

- Regress π on lag value of int and other control variables

- Test restrictions of all lags of via standard LR test

- If the restriction is valid then lag values of play no role to determine & does not grange cause .

Estimation of Long Run Relationship

The long Run Relationship for any relationship can be calculated in the following way:

- Estimate the unrestricted ARDL model of the type

$$\pi_t = a + \sum_{j=1}^{p} \left(\beta_j \pi_{t-j} + \gamma_j int_{t-j} + \delta_j X_{t-j} \right) + \varepsilon_t$$

Here Xt is the vector of all control variables

- Take $\pi_t = \pi_{t-1} = \cdots = \pi_{t-}$, $int_t = int = \cdots = int_{t-j}$ and $X_t = X_{t-1} = \cdots = X_{t-j}$ and simplify the ARDL model.

- The coefficients represent estimates of parameters of long run relationship between variables.

These estimates are used further to calculate Empirical Bayes whose procedure and advantage is described as under.

Empirical Bayes (EB)

EB Estimates (Zaman, 1996) are especially useful for panel data with small time series length. Mainstream approach depends only on data and ignores any prior knowledge about the underlying economic

relationship estimated via a regression model. The Bayesian approach integrates the prior information with data information to estimate underlying relation. However, in Bayesian estimation procedure, appropriate choice of prior information is problematic. EB estimation offers a systematic procedure to choose prior. The EB Procedure information is described as follows:

- Obtain classical OLS estimates for all cross-sectional units:

  Estimate $\hat{\beta}_i = (X_i'X_i)^{-1}X_i'Y_i$, $\hat{\Sigma}_i = \sigma_i^2(X_i'X_i)^{-1}$ $i = 1,2,\ldots.N$. This is counterpart of OLS information in terminology of Classical Bayes. The estimate of relation for each cross-section is independent of estimate for other cross section. These estimates are imprecise because of small length of time series component of the panel.

- The prior information:

  Prior variance $\Omega = \left(\hat{\Sigma}_1^{-1} + \hat{\Sigma}_2^{-1} + \cdots + \hat{\Sigma}_N^{-1}\right)^{-1}$

  Prior Mean: $\mu = \Omega\left(\hat{\Sigma}_1^{-1}\hat{\beta}_1 + \hat{\Sigma}_2^{-1}\hat{\beta}_2 + \cdots + \hat{\Sigma}_N^{-1}\hat{\beta}_N\right)$

  One can see that the prior precision Ω^{-1} is sum of precisions of all cross sectional units $\hat{\Sigma}_i^{-1}$. Therefore the prior estimates are very precise than the OLS estimates. The prior mean is precision weighted average of all OLS estimates.

- Posterior estimates: these estimates integrate both OLS knowledge and the prior knowledge to update the estimate of parameter for each cross section.

Posterior Variance: $\hat{\Gamma}_i = \left(\Omega^{-1} + \hat{\Sigma}_i^{-1}\right)^{-1}$ and

Posterior Mean $\hat{\beta}_i^{EB} = \hat{\Gamma}_i\left(\Omega^{-1}\mu + \hat{\Sigma}_i^{-1}\hat{\beta}_i\right)$

Again one can see that the posterior estimates are precision weighted average of data and prior information. The precision of posterior estimate is sum of precision of the cross-sectional unit $\hat{\Sigma}_i^{-1}$ and the precision of prior. Therefore the posterior estimates are more precise than data estimates (have smaller variance).

The EB estimates utilize data of all cross-sectional units to update the knowledge about estimates of parameters for anyone cross-section. Therefore the inaccuracy due to small sample is removed. The forecast performance of EB is found to be superior in various studies.

The results of OLS estimation, EB Estimation and Granger Causality test are reported in Table 3(a) for 18 OIC and 3(b) 27 non-OIC countries. The relation being estimated is as under:

$$\pi = \alpha + \beta_1 \text{int} + \beta_2 \text{ipay} + \beta_3 \text{M2G} + \beta_4 \text{FuImp} + \varepsilon \qquad (3)$$

Table 3

(a): OIC countries

Country	Info	Const	???	??????	?????	??????	Granger Causality	
							Test Stat	P-value
ALGERIA	OLS	-1.37	1.80	-0.86	-0.18	5.69	4.64	0.03*
	EB	5.56	0.16	0.41	0.65	0.17		
BANGLADESH	OLS	-1.25	0.33	-0.53	0.00	0.37	1.79	0.21
	EB	5.68	0.16	0.42	0.65	0.17		
CAMEROON	OLS	-6.11	1.48	-0.13	0.18	0.01	0.92	0.42
	EB	5.74	0.16	0.41	0.65	0.16		
EGYPT	OLS	-4.99	0.49	0.10	0.69	0.06	5.88	0.02*
	EB	5.79	0.16	0.41	0.65	0.16		
GABON	OLS	-6.33	0.74	1.01	0.91	-0.88	0.37	0.7
	EB	5.72	0.16	0.43	0.65	0.16		
GAMBIA	OLS	-10.56	-0.08	6.11	0.44	0.07	2.81	0.1
	EB	5.60	0.16	0.51	0.65	0.16		
GUYANA	**OLS**	**-36.14**	**-1.71**	**1.01**	**1.95**	**1.21**	**10.22**	**0****
	EB	**5.16**	**0.16**	**0.57**	**0.65**	**0.19**		
INDONESIA	OLS	-39.33	0.52	4.43	0.56	1.19	0.2	0.82
	EB	4.79	0.16	0.45	0.65	0.21		
JORDAN	OLS	-7.59	-0.06	0.60	0.19	0.51	0.09	0.92
	EB	5.66	0.16	0.42	0.65	0.17		
MALAYSIA	OLS	7.57	-0.06	-0.91	-0.03	-0.23	0.2	0.82
	EB	5.87	0.16	0.39	0.65	0.16		
MALI	OLS	1.91	0.17	-0.21	0.40	-0.10	4.6	0.03*
	EB	5.79	0.16	0.41	0.65	0.16		
MOROCCO	OLS	-2.22	0.77	-0.09	0.12	-0.01	4.92	0.03*
	EB	5.72	0.16	0.41	0.65	0.16		
NIGER	OLS	21.60	-2.08	-0.93	-0.05	-0.59	1.79	0.21
	EB	5.89	0.16	0.40	0.65	0.16		
NIGERIA	OLS	-17.88	2.38	0.97	0.25	-0.42	0.92	0.42
	EB	4.87	0.16	0.45	0.65	0.16		
SENEGAL	OLS	-2.93	-0.16	1.05	0.40	0.08	5.88	0.02*
	EB	5.64	0.16	0.42	0.65	0.16		
TOGO	OLS	-0.52	0.14	0.67	0.36	0.00	0.37	0.7
	EB	5.72	0.16	0.42	0.65	0.15		
TURKEY	OLS	-25.16	1.25	1.11	0.03	0.42	2.81	0.1
	EB	5.21	0.16	0.42	0.65	0.17		
UGANDA	OLS	41.88	0.99	-71.04	1.17	-2.64	10.22	0*
	EB	6.44	0.16	0.38	0.65	0.11		

First columns represent coefficient of different variables estimated by OLS and EB. Last two columns correspond to the Granger causality Test. This test has the null hypothesis: 'interest rate does not Granger Cause Inflation'. A rejection of null hypothesis means existence of Granger Causality. The results show that the coefficients of interest rate in the relationship described in (3) for all countries is positive when using EB Estimates. For the OLS estimates, we get negative coefficient for some countries, but for these countries, the relationship is not significant. This is clear from the P-value of Granger Causality.

Table 3(b):

Non-OIC Countries

Country	Info	Const	int	Ipay	M2G	Fulmp	Granger Causality	
							Test Stat	P-value
ARGENTINA	OLS	43.46	**-0.06**	-5.05	1.92	-17.08	214.15	0**
	EB	8.78	0.10	0.33	0.69	0.07		
BELIZE	OLS	2.61	**-0.10**	-0.11	0.28	-0.17	2.22	0.15
	EB	5.78	0.16	0.39	0.65	0.15		
BOLIVIA	OLS	92.56	**-10.61**	30.17	2.29	-9.97	0.23	0.88
	EB	6.46	0.16	0.48	0.90	0.14		
BRAZIL	OLS	102.25	0.27	-22.70	0.21	-1.67	0.97	0.41
	EB	12.26	0.20	0.16	0.47	0.06		
CHILE	OLS	1.54	0.25	1.73	-0.03	0.04	1.28	0.31
	EB	5.69	0.16	0.49	0.65	0.16		
CHINA	OLS	-3.55	1.86	-4.98	-0.03	0.45	2.79	0.1
	EB	5.69	0.16	0.41	0.65	0.17		
COLOMBIA	OLS	2.34	0.71	0.05	0.00	-0.04	2.32	0.14
	EB	5.60	0.16	0.41	0.65	0.16		
COSTARICA	OLS	0.28	0.73	0.30	-0.02	0.33	3.95	0.05
	EB	5.72	0.16	0.41	0.65	0.17		
DOMINICA	OLS	-1.89	2.36	-0.93	-0.27	0.01	0.51	0.61
	EB	5.77	0.16	0.41	0.65	0.16		
ECUADOR	OLS	15.28	**-0.05**	-2.18	0.26	-0.61	0.37	0.69
	EB	5.94	0.16	0.36	0.65	0.16		
GRENADA	OLS	4.45	**0.00**	-0.42	0.09	-0.05	0.23	0.8
	EB	5.79	0.16	0.40	0.65	0.16		
GUATEMALA	OLS	-14.79	1.71	3.67	-0.03	0.42	1.5	0.26
	EB	5.18	0.16	0.43	0.65	0.17		
HONDURAS	OLS	-8.52	0.56	2.35	0.14	0.22	0.17	0.85
	EB	5.69	0.16	0.48	0.65	0.17		
KENYA	OLS	-1.03	0.29	1.03	0.48	-0.07	0.46	0.64
	EB	5.72	0.16	0.43	0.65	0.16		
MALAWI	OLS	16.70	1.33	1.09	0.07	-1.79	3.49	0.06
	EB	5.98	0.16	0.43	0.65	0.15		
MAURITIUS	OLS	-3.94	0.71	0.38	0.19	0.02	2	0.17
	EB	5.75	0.16	0.42	0.65	0.16		
MEXICO	OLS	20.31	2.28	-12.61	-0.21	-0.54	1.13	0.35
	EB	6.11	0.16	0.38	0.65	0.16		
PARAGUAY	OLS	-7.33	0.59	-2.03	0.21	0.81	3.62	0.06
	EB	5.18	0.16	0.41	0.65	0.18		
PERU	OLS	-199.99	2.04	11.94	0.30	10.76	5.29	0.02*
	EB	0.62	0.16	0.47	0.63	0.50		
PHILIPPINES	OLS	3.61	0.87	-0.85	-0.06	0.00	1.09	0.37
	EB	5.75	0.16	0.40	0.65	0.16		
SEYCHELLES	OLS	5.77	**-0.41**	1.90	0.04	-0.15	2.02	0.17
	EB	5.81	0.16	0.45	0.65	0.15		
SOUTHAFRICA	OLS	13.58	0.32	-4.84	-0.02	-0.31	0.69	0.52
	EB	5.93	0.16	0.41	0.65	0.14		
SRILANKA	OLS	7.31	0.67	-4.03	0.00	0.08	3	0.09
	EB	5.83	0.16	0.41	0.65	0.16		
THAILAND	OLS	5.39	0.43	-1.28	-0.02	-0.10	0.61	0.56
	EB	5.80	0.16	0.40	0.65	0.16		
TONGA	OLS	10.44	1.45	-30.54	0.03	0.00	2.16	0.16
	EB	5.83	0.16	0.41	0.65	0.16		
URUGUAY	OLS	-3.96	0.57	-2.33	0.27	0.40	1.79	0.21
	EB	5.21	0.16	0.38	0.65	0.17		
ZIMBABWE	OLS	19.51	**-0.03**	-5.55	0.03	-0.41	0.08	0.92
	EB	6.21	0.16	0.36	0.65	0.13		

The second column in the table 3 (b) shows that coefficient of interest rate estimated via OLS and EB methods. We see that OLS estimates for most of the countries, the coefficients of interest rate is positive, indicating that that increase in interest rate will associated with increase in inflation. The coefficient of interest rate is negative only for six countries. However for these countries the granger causality test is insignificant. This implies that the coefficient is

significant whenever it carries negative sign, indicating a cancellation of demand and supply side effects.

On the other hand, if we see the EB estimates, EB estimates are positive for all covariates indicating a dominance of cost side effects of the monetary policy. Among the OIC countries, EB estimate of coefficient of interest is positive for all countries, but classical estimates are negative for 6 countries. For only one of these 6 countries, the relationship is significant as indicated by The Granger Causality. Therefore we can say, the evidence of dominance of demand channel of MTM was found for only one country, and for remaining countries, the existence of this channel is opposed. Among the non-OIC countries, the coefficient of interest rate is again positive for all countries. Classical estimates show the relationship to be negative only for 7 countries, out of which, the relationship is significant only for one country i.e. Argentina.

These results show that there are no evidences of existence of demand channel of MTM. The evidence for cost channel is very strong. These results support the claim of Wright Pitman, i.e. using interest rate to control inflation is like throwing gasoline on fire.

Conclusion

Interest rate is the most frequently used tool of contemporary monetary policy. The discussion presented in this paper shows interest rate could have three types of impact on inflation:

1. If interest rate affects the economy through demand channel increase in interest rate would decrease inflation.

2. If interest rate affects the economy through cost channel,the increase in interest rate would increase inflation.

3. If interest rate affects through two channels simultaneously the effect on inflation would be insignificant and there will be huge reduction in output.

The evidences presented in this paper go against the working of demand channel. Figure no 1, 2, 3 and 4 show that contemporaneous correlation between interest rate and inflation is positive as majority of pairs (π_t, I_t) provide positive coefficients. Table 3 and 3(b) show that in majority of the OIC countries the interest rate does not Granger cause the inflation and for the countries where the Granger cause exists, the long run relationship between interest rate and inflation is positive which is also not desirable due to cost channel of MTM. Therefore we can say the evidence of dominance of demand channel of MTM is opposed by the data. These results show that there are no evidences of existence of demand channel of MTM. However the evidence for cost channel is very strong.

Therefore, either there is no relationship between interest rate and inflation or even if the relationship is there, its direction is positive indicating that the monetary policy is either non-function or counterproductive. So it should not be used in the way it is used for reducing inflation.

References

Ali, S. Z. (2012). Supply Side Shocks Near Rational Expectations, Cost Channel, and Monetary Policy. DPRC Working Paper (LUMS).

Barth III, M. J., & Ramey, V. A. (2001). The Cost Channel of Monetary Transmission. NBER Macroeconomics Annual 2001 , 16, 199-239.

Bernanke, B. S., & Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy. Journal of Economic Perspective , 9 (4), 27-48.

Case, E. K., Fair, C. R., & Oster, M. S. (2012). *Principles of Economics.* Prentice Hall.

Castelnuovo, E., & Surico, P. (2010, December). Monetary Policy, Inflation Expectation and The Price Puzzle. The Economic Journal , 1262–1283.

Chowdhury, I., Hoffmann, M., & Schabert, A. (2006). Inflation dynamics and the cost channel of monetary transmission. European Economic Review 50 , 995–1016.

Engle, R. and C. Granger (1987). "Cointegration and Error-Correction Representation, Estimation and Testing." Econometrica: 251-276.

Felipe, J. (2009). Does Pakistan Need To Adopt Inflation Targeting? Some Questions. SBP Research Bulletin , 5 (1).

Granger, C. W. J., Newbold, P. (1974). Spurious regressions in econometrics. *Journal of Econometrics* 2: 111- 120.

Ghaffari et al. (2014), Interest Rate and Inflation: A case study of Pakistan Business Review, 16 (3), pp 451-515

Ghaffari A (2013), Interest Rate, Inflation and Output; Relationship Revisited, Unpublished MS Economics thesis, IIIE International Islamic University, Islamabad

Gibson, A. (1923). The future course of high class investment values, Banker's Magazine, January, pp. 15–34.

Henzel, S., Huslewig, O., Mayer, E., & Wollmershauser, T. (2007), The Price Puzzle Revisited: Can the Cost Channel Explain A Rise In Inflation After A Monetary Policy Shock?

Huelsewig, O., Mayer, E., & wollmershaeuser, T. (2006), Bank Behavior and Cost Channel of Monetary Transmission. Cesifo Working Paper No 1831 . Germany.

Im, Pesaran and Shin (1997), Testing Unit Root in Heterogeneous Panels, Journal of Applied Econometrics, John Wiley & Sons, Ltd., vol. 22(2), pp 265-312.

Javid, M., & Munir, K. (2010). The price puzzle and monetary policy transmission mechanism in Pakistan: Structural vector autoregressive approach. The Pakistan Development Review , 449–460.

Kitchin, J. (1923) Cycles and trends in economic factors, Review of Economics and Statistics, 5,
pp. 10–16.

Lima, G. T., & Setterfield, M. (2010). Pricing Behaviour and the Cost-Push Channel of Monetary Policy. Review of Political Economy , 22 (1), 19-40.

Mohanty, D. (2012), Evidence of Interest Rate Channel of Monetary Policy Transmission in India. WPS (DEPR) : 6 / 2012 RBI Working Paper Series . The Reserve Bank of India (RBI), Department of Economic and Policy Research.

Munir, K., & Qayyum, A. (2012). Measuring the effects of Monetary policy in Pakistan: A factor augmented vector autoregressive approach. (MRPA) http://mpra.ub.uni-muenchen.de/35976/.

Peake, E.G. (1928) Connection between the prices of commodities and the prices of securities, Bankers' Magazine, 125, p. 720.

Qiang, T. J., & Xin, l. Z. (2010). Existence of The Cost Channel of China's Monetary Transmission. IEEE 2nd International Conference , 329-332. School of Economic & Management Beihang University Beijing China.

Rabanal, P. (2007). Does inflation increase after a monetary policy tightening? Answers based on an estimated DSGE model. Journal of Economic Dynamics & Control 31, 906–937.

Rabanal, P. (2003). The Cost Channel of Monetary Policy Further Evidence for the United States and the Euro Area.

Ravenna, F., & Walsh, C. E. (2006). Optimal monetary policy with the cost channel. Journal of Monetary Economics 53 , 199–216.

Rehman, M. (2010). Resolving Controversies About Determinants of Inflation. Unpublished Thesis for PhD Econometrics at IIIE International Islamic University, Islamabad .

Rehman, F. U., & Malik ,W.S. (2010). A structural VAR (SVAR) approach to cost channel of monetary policy MRPA http:// mpra.ub.uni-muenchen.de/32349/.

Saleem, N. (2010). Adopting Inflation Targeting in Pakistan: An Empirical Analysis. The Lahore Journal of Economics , 51-76.

Tillmann, P. (2008). Do interest rates drive inflation dynamics? An analysis of the cost channel of monetary transmission. Journal of Economic Dynamics & Control 32 , 2723–2744.

US Congress Joint Economic & Committee Report on the January 1970 Economic Report of the President (Washington, DC: US Government Printing Office).

Zaman, A., 1996, Statistical Foundations of Econometric Techniques, Academic Press.