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Interaction between Interest Rate and Perceived Inflation

Policy Implication for Controlling Inflation

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***Abstract*— An usual method for policy makers to control inflation is manipulating interest rates. This study checks the effectiveness of using interest rates as a method to control the inflation by studying the relation between interest rate and perceived inflation. 200 undergraduate students were invited in an experiment. Our findings show there is no main effects for bank interest rate and actual inflation rate on perceived inflation. However, a significant interaction effect was found between bank interest rate, personal income and actual inflation rate on perceived inflation.**

Keywords*— *Interest rate, Personal Income, Expected Inflation, Perceived Inflation, Monetary Policy

I. Introduction

Inflation is an important issue in various economic aspects in which it affects different macroeconomic behaviors such as consumption and investment. Price theories in economics in general describe how people behave given different levels of actual prices. However, people might not possibly know exactly how the actual price changes but in fact to make decisions based upon the perceived price changes only. Thus, if we want to study the impacts of inflation over the economy in general, it is also important for us to study how people respond to changes in perceived prices.

The other reason why we care about perceived inflation is that it affects expected inflation. Expected expectation is an important variable because current economic decision makings might have consequences beyond the current circumstance. In the review of the conceptual framework Ranyard et al. [1] pointed out that perceived inflation inform individuals' expectations for future inflation, with people generally assuming that past price trends will continue. It then implies that the higher the perceived inflation, the higher the expected inflation will be.

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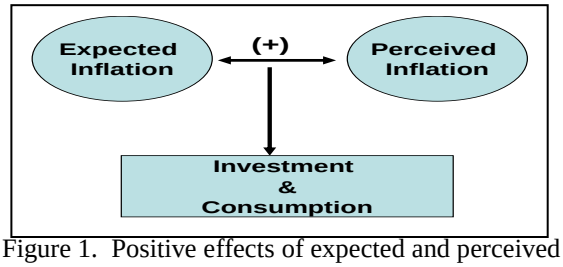

Figure 1. Positive effects of expected and perceived on investment and consumption

On the other hand, expected inflation has been shown to influence perceived inflation in turn. It is argued that in inflationary periods people may believe that prices will increase continuously which may lead to an over-estimation of price increases [2]. In other words, it implies that perceived inflation and expectation inflation are positively correlated with each other and the changes of which will have important economic consequences over the economy. This conceptual framework is described in Fig. 1.

Towards this end, it is then important for us to study the factors to which it affects perceived inflation. Many previous studies concerning the factors that influencing the cognitive process of price perceptions have been extensively investigated [1]. Instead of investigating how those factors affecting the cognitive process, this paper examines whether personal income and interest rate could directly affect perceived inflation.

Manipulation of interest rates is one of the most effective tools for controlling inflation. Many researches concerning the mechanism to which how different levels of interest rates affect inflation have been extensively discussed. But the focuses of the researches before were mainly on the relationships between interest rate and actual inflation of which perceived inflation was rarely discussed. As mentioned above, perceived inflation is also an important issue in various economic aspects and therefore it is important for us to study whether the manipulation of interest rates could control perceived inflation as well. In fact, none of the previous researches has directly addressed the relationship between the two variables. If interest rate does really have significant effect over perceived inflation, it will give rise to some new perspectives of monetary policy because perceived inflation will be another important variable to be considered in the policy. This paper therefore addresses in particular the impact of interest rate on perceived inflation.

II. Hypotheses

A. Personal income and perceived inflation

Issues about how personal income affects perceived inflation have been extensively discussed. Fischer [3] believed that consumers would evaluate price changes based on changes in personal income rather than that on reference prices because he found that people perceive their real income and therefore economic well-being fall when they perceive prices of goods and services rise faster than that of their personal income. On the other hand, in a study of the effects of income on price evaluation, Gärling & Gamble [4] showed empirical evidences that people are not quite care about their personal income when they are asked to rate the expensiveness of product prices. Gärling, Gamble and Christandl [5] also found that ratings of expensiveness of expenditure and products are varying with inflation, yet it does not vary with income.

In this vein, whether personal income could affect perceived inflation is controversial and it worth to be discussed further. Based upon some of the new constructs we would like to check again the relationship between personal income and perceived inflation, we then formulate the following hypothesis (see Fig. 2):

H1. Income can affect perceived inflation, products and expenditure perceived as less expensive when personal income level is higher.

B. Interest rates and perceived inflation

One of the main reasons for manipulating interest rates is that it can combat for high inflation. Suppose that a central bank intends to adopt a contractionary monetary policy and announces, for instance, an increase in the discounted rate. It may work through the following transmission mechanism: An increase in the discounted rate will increase the cost of commercial banks raising funds and thus commercial banks will in turn raise interest rates for their loans made to their customers. These may then suppress the inflationary pressure from the demand side.

Furthermore, if the credibility of monetary policy is high, such announcement may trigger the expectation that the past inflation will not continue and that people expect the prices to remain stable in the future. People are thus likely to judge prices to be not as expensive as expected than before, leading to the possibility of the fall in perceived inflation. In this vein, none of the previous researches has directly addressed. Based on the above arguments we propose the following hypothesis (see Fig. 3):

H2. Interest rate can affect perceived inflation, products and expenditure perceived as less expensive when interest rate is higher.

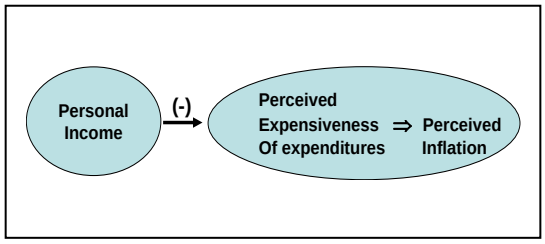

Figure 2. Effects of personal income on perceived Inflation

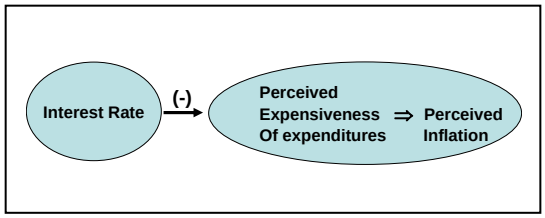

Figure 3. Effects of interest rate on perceived Inflation

III. Method

A. Participants

Two hundred participants participated in this study. They are the students from one of the universities in Hong Kong. They were all on voluntary basis and found by convenience sampling. All the participants were randomly assigned into control group (no inflation, no bank interest rate) and three experimental groups with equal size, each condition have 50 people. The experimental groups are 5% bank interest rate and 5% inflation; 5% bank interest rate and no inflation; and no bank interest rate and 5% inflation.

B. Design and Measure

The data was collected through a questionnaire survey. The task was adapted from Garling, Gamble and Christandl [5]. This task composed of three parts with different salaries. The level of salary was referred to the 2013 report on annual earnings and hours survey conducted by Hong Kong Census and statistics department. Twenty-fifth, 50th and 75th percentiles of monthly wage distribution for all employees in Hong Kong were chosen to represent different level of income in order to test the perceived inflation under different income level, and the 25th, 50thand 75th percentile is $10000, $14000 and $22000 respectively. There was an instruction at the top of each part about the rating participants were asked to perform at the same page. In the first part, participants were asked to imagine that they have $14000 salary per month. In the second part, participants were asked to imagine that their company reduced their salary from $14000 to 10000. Finally, participants were asked to imagine that they have changed their job, and their salary increased from $10000 to $22000 per month in part three. In the same page, there was a list of goods (e.g. watch) or services (e.g. mobile service) they would need to purchase in the following month after the salary had distributed. The prices of the expenditure referred to the actual prices in daily life (i.e. the price of the transportation fee referred to the price of subway in Hong Kong, the price of sport shoes was referred to sport shoes of Nike).

Participants' task was to rate how expensive they found each of these products or services in the list. Nine-point rating scales were used that ranged from -4 (inexpensive) to 4 (expensive) over 0 (neither expensive nor inexpensive). Each part contains 11 trials; the whole task has 33 trials in total.

In control condition, participants were informed that they do not have any income except for the salary. In 5% bank interest rate and 5% inflation condition, the prices in the list increased by 5% but participants were informed only that the bank interest rate is 5%. In 5% bank interest rate and no inflation condition, likewise, participants were informed only that the bank interest rate is 5%. In 0% bank interest rate and 5% inflation condition, participants were asked to imagine that the bank interest rate is zero and again they were not informed anything about the inflation rate.

C. *Procedure*

Before the questionnaire was distributed, participant was required to sign the consent form first. A booklet was then disturbed to participants, which contain the condition participant assigned. Experimenters would tell the participants not to look backward the booklet in order to prevent participant's bias in such a way that they alter their behavior to what they assume the experimenters expect. Participants would also be informed that the result would be affected if they look backward to the booklet. The task takes 20 minutes to finish; participants can have a short break during the process of completing the questionnaire. During the process of completing the questionnaire, if participants asked whether the prices of the expenditures are same in each page, experimenter will answer that they can rate the same score if they think that the prices of the expenditures are the same in order to reduce the experimenter bias.

IV Result

The analyses focus on how people feel the expensiveness of products and expenditure under different bank interest rate and inflation rate. The perceived inflation was subjected to a 3 x 2 x 2 (Income [10000,14000, 22000] x inflation rate [0%, 5%] x bank interest rate [0%, 5%]) analysis of variance (ANOVA) with repeated measure in order to test the effect of bank interest rate and inflation on perception of inflation under difference income level. Since the box's test of equality of covariance matrices is significant ($p = .001$, $p <. 05$), the p value of testing the main effect and interaction effect of variables should be fewer than .001 representing the effects are significant. The result shows a significant interaction effect between income, inflation rate and bank interest rate $F(1, 196) = 14.584$, $p < .001$(See table 1, Fig. 4 & 5).

Fig. 5 shows the effects of income and inflation on ratings of expensiveness of products and expenditure when there is no inflation rate; it shows that the ratings of expensiveness of products and expenditure in $10000 income conditions are higher than $14000 and $22000 income conditions when there is no bank interest. There is an interaction between inflation and income when there is no interest rate. Figure 6 shows the effects of income and inflation on ratings of expensiveness of products and expenditure when the interest rate is 5%, it shows that the ratings of expensiveness of products and expenditure in $10000 income conditions are higher than $14000 and $22000 income conditions when there is 5% of bank interest. Moreover, there is an interaction between inflation and income also when there is 5% interest rate.

With regard to the effect of inflation and bank interest rate, there is no significant main effect of inflation on expensiveness of products and expenditure $F(1, 196) = .919$, $p = .339$ (See table 2). In addition, there is no significant main effect of bank interest rate $F(1, 196) = .349$, $p = .555$(See Table 2).The result rejects the hypothesis that bank interest can affect people's perceived inflation.

On the other hand, with regard to the effect of income, the test of Mauchly's test of Sphericity is significant ($p < .01$), so the result of greenhouse-Geisser is reviewed in this study. There is a significant main effect of income on expensiveness of products and expenditures $F(2,392) = 298.077$, $p < .001$, ratings of expensiveness of products and expenditure in $10000 income condition ($M = 1.864$, $SD = 1.202$) is significantly higher than $14000 income condition ($M = 1.067$, $SD = 1.117$), and $14000 income condition is significantly higher than $22000 income condition ($M = .194$, $SD = 1.414$).

Table 1: The effect of income on expensiveness of products and expenditures and the interaction between income, inflation and bank interest rate in task one

Source	SS	df	MS`	*F*	*p*
Income	279.107	1.363	204.724	298.077	.000
Income x Inflation	1.688	1.363	1.238	1.803	.178
Income x Bank interest rate	.927	1.363	.680	.990	.346
Income x Inflation x Bank interest rate	13.656	1.363	10.017	14.584	.000
Error(perceived)	183.527	267.214	.687		

Table 2: The effect of inflation and bank interest rate

Source	SS	df	MS`	*F*	*p*
Inflation	3.453	1	3.453	.919	.339
Bank interest rate	1.312	1	1.312	.349	.555
Inflation x bank interest rate	1.886	1	1.886	.502	.480
Error(perceived)	736.854	196			

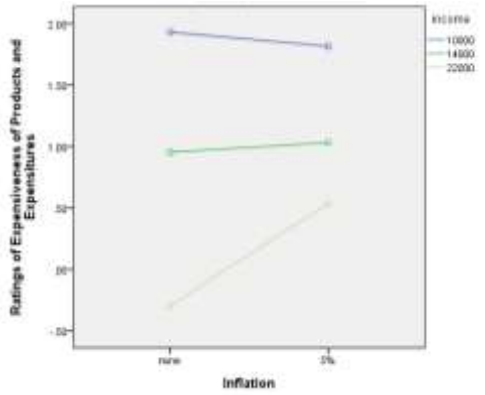

Figure 4. Interaction effect between income, actual inflation with no bank saving interest

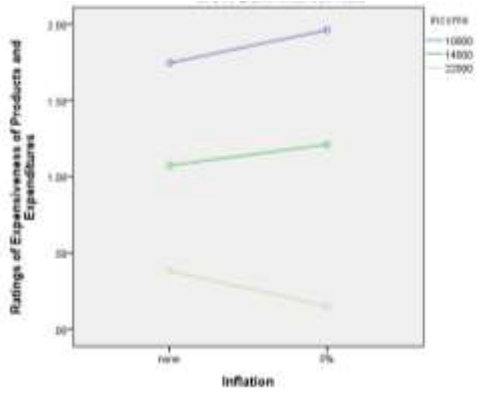

Figure 5. Interaction effect between income, actual inflation with 5% interest rate

v Discussion

One of the objectives for this study is to examine whether actual inflation rate and perceived inflation are the same to people. Results show that changes of ratings of expensiveness of products and expenditure are not equal to the price changes. It shows that there is no significant main effect of inflation rate on the ratings of expensiveness of products and expenditure. It also consists with the previous studies that people failed to perceive price increase accurately [6]. Participants were informed in the study that they were not able to look backward to the booklet in order to prevent response bias. As a result, they failed to distinguish the differences between the price and expenditure under different conditions. It then suggests that inaccurate price perception may be due to incomplete memory of price [7][8].

Besides, we also would like to examine whether income can affect perceived inflation. As mentioned there is a significant main effect of income on the ratings of expensiveness of products and expenditure which is consistent with the first hypothesis that income can affect perceived inflation. It then also suggests the ideas mentioned above that people tend to perceive that they are better off even though the inflation rate is higher than that of the rise in money income because of money illusion [4]. As discussed above, a rise in interest rate might reduce perceived inflation because of the negative effect on expected inflation. However, the statistical result shows that the above interest rate channel alone is not strong enough to produce a significant effect on perceived inflation. One of the possible explanations perhaps is that participants have low financial literacy of which they simply do not understand the transmission mechanism to which how interest rate could affect inflation. This is especially true in the economic context of Hong Kong where there is no independent monetary policy under the linked exchange rate system. But the result also indicates that there is significant interaction effect between actual inflation, income and bank interest rate on perceived inflation. We found that with the conditions of 5% inflation and 5% interest rate, participants with $22000 income perceived products and expenditure less expensive as opposed to the conditions of 5% inflation and zero interest. On the other hand, participants with $10000 income perceived products and expenditure less expensive under the conditions of 5% inflation and zero interest, but they perceived products and expenditure more expensive when they were informed that there was 5% of interest rate. Such an interaction effect between personal income, actual inflation and interest rate on perceived inflation implies that personal income might moderate the relationship between interest rate, actual inflation and perceived inflation.

Towards this end, an increase in interest rate alone might not have strong impact on expected and therefore perceived inflation. But what if both interest rate and personal income increase simultaneously? A rise in income might reduce perceived inflation. In addition, as discussed above a fall in perceived inflation might reduce expected inflation in turn [9][10] which might therefore reinforce the negative impact of a rise interest rate on perceived inflation (See Fig. 6). In other words, it is possible that a rise in interest rate might reduce perceived inflation if there is a strong income effect.

As mentioned above, it might be due to the problem of low financial literacy that comes up the result that a rise in interest rate could not reduce perceived inflation. Thus, in order to increase the effectiveness of monetary policy on perceived inflation, the government needs to provide more financial education to promote the public awareness of the influences of interest rates on inflation.

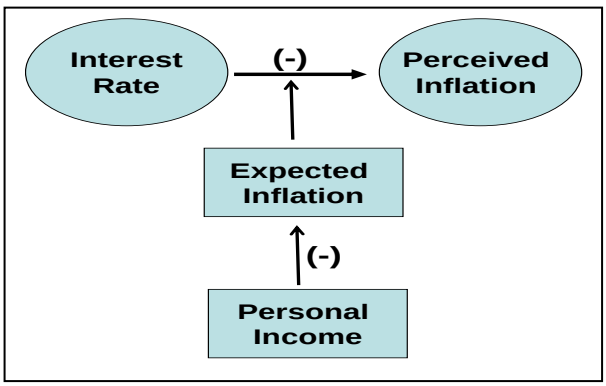

Figure 6. Interaction effect between income, actual inflation and interest rate on perceived inflation

Besides, the effectiveness of monetary policy on perceived inflation might be higher if the government could maintain a transparent and credible monetary policy. First about, if the Central Bank could share as much relevant information on all major drivers of inflation as possible with the general public, it will effectively help to rationalize inflationary expectation as well as inflationary perception. Besides, if the Central Bank could implement consistent and quick policy responses to inflation developments, it would help to communicate monetary policy stance, and all these improve the Bank's transparency and credibility [11] thereby increases the effectiveness of monetary policy, including the effect on perceived inflation.

References

[1] R. Ranyard, F.D. Missier, N. Bonini, D. Duxbury and B. Summers, "Perceptions and expectations of price changes and inflation:A review and conceptual framework," Journal of Economic Psychology, 29(4), pp.378-400, 2008.

[2] J.M. Bates and A. Gabor, "Price perception in creeping inflation: Report on an enquiry, Journal of Economic Psychology, 7(3), pp.291-332, 1986.

[3] C.C. Fischer, "The differential impact of inflation on key societal interest groups and public polciy implications," Journal of Economic Psychology, 219 (4), pp.371-388, 1986.

[4] T. Gärling and A. Gamble, "Change in perceived value of money without change in nominal representation," University of Gothenburg, Göteborg psychological reports, no 36:4, 2006.

[5] T. Gärling, A. Gamble and F. Christand, "Inocme increases do not compensate for perceived inflation: A price-consumption anomaly," The Journal of Social-Economics, 47, pp.11-15, 2013.

[6] F. ChristandI and T. Gärling, "The accuracy of consumers' perception of future inflationary price changes," Journal of Physchology, 219 (4), pp.209-216, 2011.

[7] S. Kemp, "Remembering and dating past prices," Journal of Economic Psychology, 12 (3), pp.431-445, 1991.

[8] S. Kemp, "Estimation of past prices," Journal of Economic Psychology, 8 (2), pp.181-189, 1987.

[9] L. Jonung, "Perceived and expected rates of inflation in Sweden," The American Economic Review, 71(5), pp.961-968, 1981.

[10] K.E. Warneryd, "Introduction the psychology of inflation," Journal of Economic Psychology, vol 7, pp.259-268, 1986.

[11] A. Chowdhury, "Inflation and inflationary-uncertainty in India: the policy implication of the relationship," Journal of Economic Studies, 41 (1), pp. 71-86, 2014.

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