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Title :

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The Impact of Financial Literacy and Layered Communication on the Public's Expectation Formation: A Questionnaire Survey among University Students

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Abstract

This paper examines the impact of financial literacy and layered communication on the public's expectation formation. Recently, almost all central banks in advanced economies have introduced forward guidance as an instrument of non-standard monetary policies. However, the effects of such forward guidance could depend on the public's understanding and trust of the central bank. Moreover, financially illiterate people cannot understand the central bank's view and policy. In this study, a questionnaire survey was conducted among 627 Japanese university students. The survey comprised tests on basic financial literacy, and questions on future economic outlook based on the Bank of Japan's *Outlook for Economic Activity and Prices*. According to the survey, creating a visual summary like that produced by the Bank of England could have positive effects on the economic outlook of financially illiterate students. Additionally, improvement of financial literacy could help the respondents understand and trust the BOJ's economic and inflation outlook. In other words, financial education and layered communication with regard to differences in public financial literacy could improve the BOJ's communication strategies and monetary policy.

Keywords: Monetary policy; Forward guidance; Inflation expectations; Financial literacy; Financial education; Layering or layered communication;

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1. Introduction

In recent years, financial education has been encouraged in Japan. In other countries, however, various types of educational programs for financial literacy have been developed for some time. For example, the Bank of England (BOE) has been making efforts to improve communication strategies regarding public financial literacy. As described below, the Bank has been introducing layered communication in its *Inflation Report* to enable financially illiterate people to understand and trust its economic outlook. This means the BOE regards the public's expectations on the economy and inflation in the near future as one of the most important factors in its monetary policy.

Incidentally, the Bank of Japan has also been making efforts to encourage the public to understand the BOJ's view of the future economy and inflation. However, only around 40% Japanese people understand the BOJ's economic outlook, due to the lack of knowledge about the central bank, as well as financial illiteracy. Financial education and layered communication in Japan could help the BOJ's monetary policy.

This article examines the impact of financial literacy and layered communication in Japan. The author and co-researchers conducted a questionnaire among 627 students from five universities. The survey comprised two parts. The first part was a survey on financial literacy, while the second part comprised questions on expectations on the economy and inflation in the near future.

This study is organized as follows. Section 2 previews the relationship between monetary policy, especially forward guidance and financial literacy, Section 3 provides an overviews of the questionnaire and its results, Section 4 analyses the questionnaire statistically, and Section 5 provides the conclusions.

2. Relationship between Forward Guidance and Financial Literacy

In this section, the relationship between forward guidance and financial literacy is reviewed. And the purpose of this article is also provided.

2.1 Review of Forward Guidance

Forward guidance is one of the most influential channels in non-standard monetary policy. The time axis effect of forward guidance could encourage the public to form inflation expectations. Cole (2018) examines the effectiveness of central bank forward guidance in terms of inflation and price-level-targeting monetary policies with under the New Keynesian model. Cole (2018) concludes that the beneficial effects of forward guidance increase if a central bank pursues price-level-targeting rather than inflation-targeting monetary policy.

Honkapohja and Mitra (2016) also examine the global dynamics of learning under the New Keynesian model, with price-level targeting that is subject to the Zero Lower Bound. Honkapohja and Mitra (2016) describe that the economy as being hit by large expectation shocks, and assert that price-

level targeting with forward guidance is a more robust policy that out-performs inflation targeting in terms of inflation, interest rate volatility and loss.

Winkelmann (2016) empirically investigates jump probabilities of Norwegian interest rates on announcement days of Norges Bank before and after the introduction of quantitative guidance. Winkelmann (2016) provides evidence in favor of quantitative guidance over qualitative guidance.

Smith and Becker (2015) shows that forward guidance, as practiced by the FOMC since 2008, has had similar effects on the economy as past changes in the target federal funds rate. Smith and Becker (2015) suggests that changes in the FOMC's forward guidance appear to have significant effects on two macroeconomic aggregates closely related to the Federal Reserve's dual mandate.

Gerko and Rey (2017) analyzes the transmission of monetary policy in the United States and the United Kingdom. According to Gerko and Rey (2017), monetary policy shocks in the United States encompass movements in the target rate and forward guidance, and their effects on financial instruments reflect market expectations of the future policy rate. On the other hand, monetary policy shocks in the United Kingdom distinguish between movements in the target rate and forward guidance.

The previous researches described above demonstrate the effects of forward guidance theoretically and empirically. However, Morgan and Sheehan (2015) indicate that Keynesian and post-Keynesian models have paid relatively little attention to the issue of trust. According to Morgan and Sheehan (2015), the BOE introduced forward guidance to create confidence amongst economic actors.

2.2 Purpose of this Article

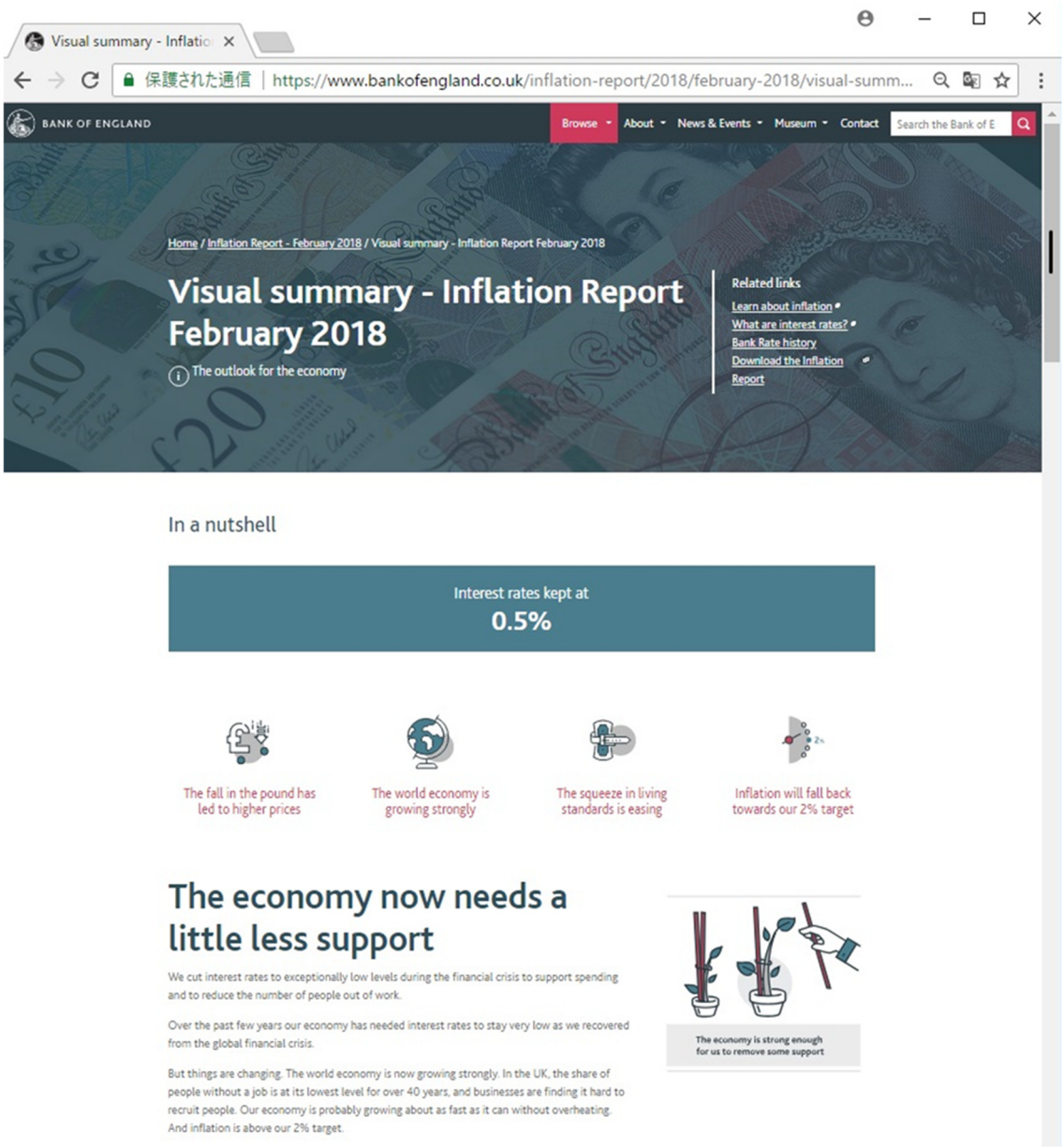
As mentioned in previous researches, forward guidance is an effective instrument of central banks. However, the impact of monetary policy can depend on whether or not the public trusts the central bank's announcement. As Morgan and Sheehan (2015) describe, the BOE introduced forward guidance to rebuild trust among citizens[1]. Andrew G Haldane, a chief economist of the BOE, has given a number of speeches on the Bank's efforts to correct the public's mistrust and misunderstanding (Haldane, 2017). Haldane (2017) describes that the Bank is seeking to make progress in communication, conversation and education. The author focuses on layering in communication. In November 2017, the Bank published the *Inflation Report* for the first time in three layers: Layer 3 was the usual "50 page, 50 chart" version; Layer 2 was a "1- 2 page, 1- 2 chart" version; while Layer 1 was a "1 line, 1 chart" version (Haldane (2017), p. 9). Layering has enabled the MPC to reach a new, wider audience without cannibalizing its existing audience (Haldane (2017), p. 9).

Indeed, the BOE launched publishing "Visual summary" in its *Inflation Report*. Figure 1 shows the "Visual summary" of the *Inflation Report* in February 2018. As you can see in Figure 1, the public was able to understand the BOE's view through simplified sentences and illustrated images. According

[1] Oxford Economics (2013) shows the detailed process that the BOE introduced forward guidance for the first time.

to Haldane (2017), website hits for the November *Inflation Report* were double the average from earlier quarters, and those extra hits were entirely accounted for by Layers 1 and 2, while Layer 3 hits were essentially unchanged. Haldane (2018) calls this "Layered communication."[2]

Figure 1: Image of "Visual summary" – *Inflation Report* February 2018



Source: Website of the Bank of England (https://www.bankofengland.co.uk/inflation-report/2018/february-2018/visual-summary)

[2] Kitano (2018) examined this topic in detail.

Incidentally, the Bank of Japan has also been making efforts to encourage the public to understand the BOJ's view of the future economy and inflation. However, around 54% of Japanese public answered that it is difficult to understand the BOJ's explanations. Three main reasons were revealed: lack of knowledge of the BOJ, difficulty to understand economics and finance, and difficulty to understand the BOJ's explanations and words. On the other hand, there is little public distrust of the BOJ. These results suggest that improvement of financial education and layered communication could correct the BOJ's communication strategy. This paper therefore examines the impact of financial literacy and layered communication on the public's expectations.

3. Questionnaire Survey among Japanese Students

This section demonstrates the results of the questionnaire survey among Japanese university students on financial literacy and layered communication.

3.1 Investigation Method

As previously mentioned, this paper examines the effects of financial literacy and layering on people's expectations. For this purpose, a questionnaire survey was conducted among Japanese university students on their financial literacy and economic outlook. The survey consisted of two parts. Part 1 comprised nine tests of basic financial literacy. Part 2 comprised 10 questions on expectations regarding such topics as economic outlook, inflation, asset management, employment and real estate. The respondents were 627 students studying at five different universities across Japan.

Part 2 must be given supplementary explanations. In this questionnaire, the author provided the two types of information. One was the normal summary of the BOJ's *Outlook for Economic Activity and Prices* in July 2018. The other was a visual summary of the BOJ's *Outlook* which the author created with reference to that produced by the Bank of England (BOE). The students were ramdomly selected to response based on either the normal or the visual summary. Figure 2 shows the images of the normal and visual summaries.

3.2 Results of Survey

Table 1 shows the results of the survey on financial literacy. Question No. 1 is about consultation in the event of financial trouble. No. 2 assesses the respondent's knowledge regarding the three major expenses in life: housing, education and retirement. No. 3 examines whether or not the respondent understand the concept of inflation. No. 4 is a numerical calculation of compound interest. No. 5 investigates the respondent's knowledge of the relationships between lifecycle, revenue and expenses. No. 6 assesses the respondent's ability to act prudently as a household. No. 7 concerns inappropriate reasons for debt. No. 8 examines the respondent's knowledge of the profitability of financial assets, including stocks, government bonds, corporate bonds, and term deposits. No. 9 is a multiple choice

question, in which students have to choose a financial instrument on a fixed or an adjustable rate, in the pretext or assumption that the interest rate will rise or fall.

As Table 1 shows, questions 2, 3, 5, 6, and 7 seem to be relatively easy. On the contrary, questions 8 and 9 are quite difficult. The average total score for financial literacy was 5.42, which is approximately 60% for the nine questions.

Figure 2: Images of normal summary (left) and visual summary (right)

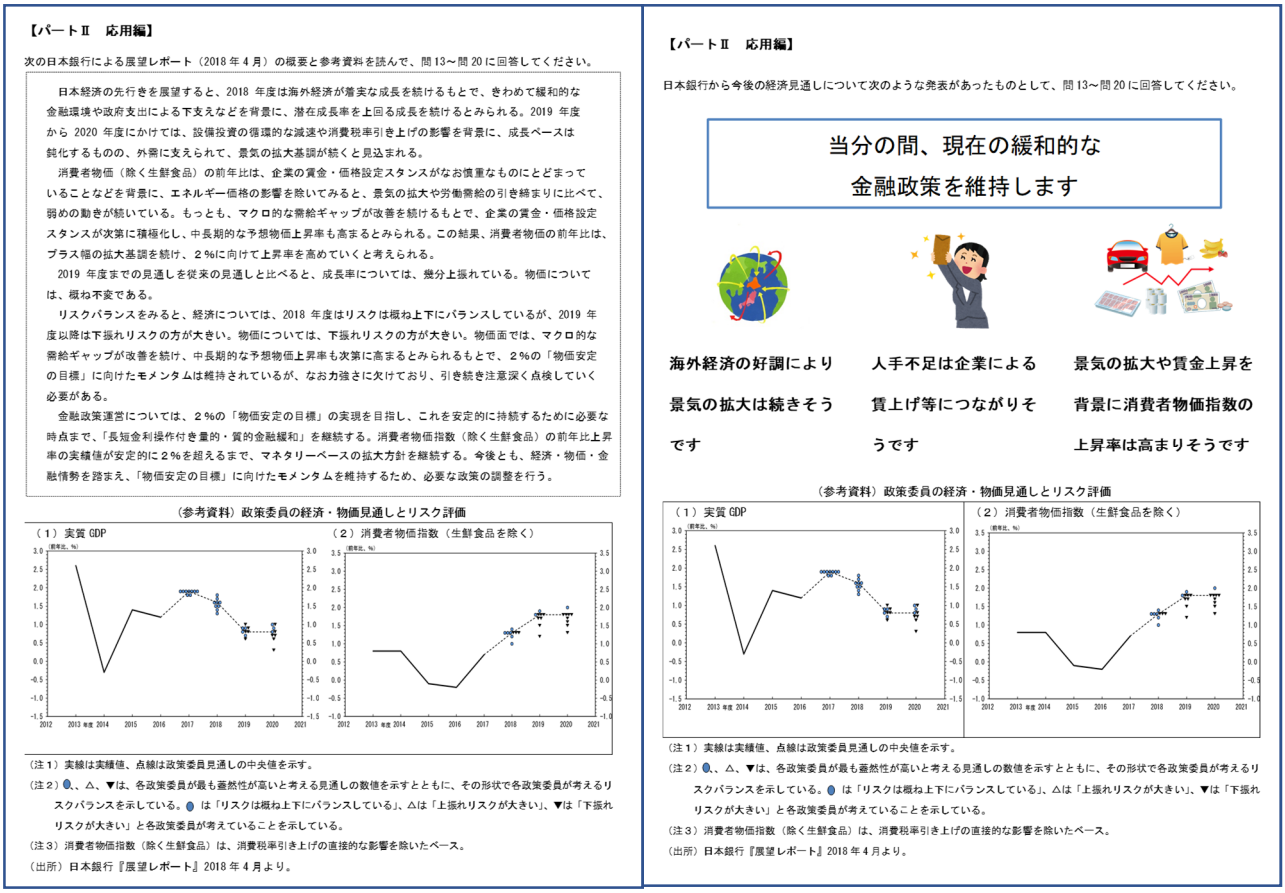


Table 2 shows the results of the students' outlook or expectations of the future economy. Before checking Table 2, the BOJ's *Outlook* must be reviewed. According to the Bank of Japan (2018), the main points of the BOJ's view were as follows: (1) The Japanese economy was expected to continue on an expanding trend, partly supported by external demand. (2) The year-on-year rate of change in the CPI had been positive, but had continued to show relatively weak developments compared to the economic expansion and the tightening labor market. (3) Companies would gradually shift toward a stance of further raising wages and prices. (4) With regard to upside and downside risks, the BOJ maintained QQE with Yield Curve Control.

Question No. 10 concerns understanding of the BOJ's outlook for the economy. The appropriate

answer is “Agree,” because the BOJ expected to continue on an expanding trend. 51.9% of respondents chose “Agree.”

No. 11 concerns the respondents’ outlook for the economy. Though the BOJ’s economic outlook was an expanding trend, 51.1% of respondents chose “Disagree,” indicating they did not think Japanese economy was likely to continue its moderate expansion.

Items	N	Answer				Total
	%	1	2	3	4	
No. 1 Financial trouble	N	169	60	303	95	627
	%	27.0	9.6	48.3	15.2	100.0
No. 2 Three major expenses	N	535	17	40	35	627
	%	85.3	2.7	6.4	5.6	100.0
No. 3 Inflation	N	41	165	402	19	627
	%	6.5	26.3	64.1	3.0	100.0
No. 4 Compoound interest	N	68	224	259	76	627
	%	10.8	35.7	41.3	12.1	100.0
No. 5 Lifecycle	N	125	431	38	33	627
	%	19.9	68.7	6.1	5.3	100.0
No. 6 Household	N	24	63	523	17	627
	%	3.8	10.0	83.4	2.7	100.0
No. 7 Debt	N	20	562	28	17	627
	%	3.2	89.6	4.5	2.7	100.0
No. 8 Investment	N	94	186	226	121	627
	%	15.0	29.7	36.0	19.3	100.0
No. 9 Fixed/adjustable rate	N	97	158	267	105	627
	%	15.5	25.2	42.6	16.7	100.0
Total financial literacy	N	Min.	Max.	Av.	S.D.	
	627	0	9	5.42	1.656	

Table 1: Results of the survey for financial literacy

Note: Each question has a choice of three answer, with a fourth option of “Don’t know.” The shaded answers are correct.

Items	N	Answer			Total
	%	Agree	Disagree	Don't know	
No. 10 BOJ's economic outlook	N	324	232	68	624
	%	51.9	37.2	10.9	100.0
No. 11 Respondents' economic outlook	N	225	319	80	624
	%	36.1	51.1	12.8	100.0
No. 12 BOJ's inflation outlook	N	333	186	104	623
	%	53.5	29.9	16.7	100.0
No. 13 Respondents' inflation outlook	N	249	222	152	623
	%	40.0	35.6	24.4	100.0
No. 14 Deposit prior to stock	N	142	284	197	623
	%	22.8	45.6	31.6	100.0
No. 15 Future policy rate	N	269	165	189	623
	%	43.2	26.5	30.3	100.0
No. 16 Correction of unemployment	N	298	229	96	623
	%	47.8	36.8	15.4	100.0
No. 17 Opportunity of capital investment	N	189	292	142	623
	%	30.3	46.9	22.8	100.0
No. 18 House purchase	N	199	310	114	623
	%	31.9	49.8	18.3	100.0
No. 19 Overseas vs. domestic investment	N	335	116	172	623
	%	53.8	18.6	27.6	100.0

Table 2: Results of students' outlook based on normal or visual summary

Note: The shaded answers indicate the most popular responses for each questions.

No. 12 concerned understanding of the BOJ's inflation outlook. The appropriate answer is "Agree," because the BOJ expected that the rate of inflation would be positive. 53.5% of respondents choose "Agree."

No. 13 concerned the respondent's outlook on the inflation rate. 40% of respondents chose "Agree."

No. 14 examined the respondents' capability of managing assets. Based on the *Outlook*, although Japan's economy would be on an expanding trend, the interest rate would be maintained. In this situation, bank deposits would be less profitable than investment in stocks. So, the appropriate choice was "Disagree." 45.6% of the students chose "Disagree."

No.15 concerned understanding of the BOJ's stance on the policy rate in the near future. The *Outlook* describes the maintenance of QQE, and the respondents were supposed to expect and agree

with an unchanging policy rate. 43.2% of the students chose “Agree.”

No. 16 investigated the student’s ability to predict the labor market based on the *Outlook*. According to the *Outlook*, the labor market would tighten. This could result in a raise in wages and improvement in the unemployment rate. 47.8% of respondents chose “Agree.”

No. 17 examined the student’s competence as a corporate manager. According to the *Outlook*, QQE with Yield Curve Control would be maintained, even though the BOJ’s outlook was for continued economic growth. If the respondent were a CEO of an enterprise, he or she might have an opportunity to invest in. However, 46.9% of respondents chose “Disagree.”

No. 18 assessed the respondent’s capability of financial planning. As already mentioned, the BOJ expected a rising or positive inflation rate, and maintained a low interest rate. A person who wanted to buy a house ought to invest in housing. However, 49.8% of the students chose “Disagree.”

No. 19 examined the respondent’s capability of asset management in global terms. According to the *Outlook*, the BOJ’s outlook for an expanding economy was supported by external demand or foreign economies. For individual investors, overseas investment was expected to be more profitable than domestic investment. 53.8% of the students chose “Agree.”

To summarize the results of Part 2 of the survey, around 40 - 50% of the students could understand the BOJ’s view based on the results of the questions 10, 11 and 15. However, it depended on the questions whether the respondents trusted the BOJ’s outlook or not. In addition, the level of the students’ financial literacy or capability could affect their understanding of the BOJ’s view and ability to make an appropriate choice. On the other hand, the results of Table 2 requires attention, because the respondents answered the questions based on different randomized information namely, the normal or the visual summary.

4. Statistical Analysis of Questionnaire Survey

This section analyzes the impact of financial literacy and layered communication statistically.

4.1 Statistical Analysis

First, an overview of the respondents was made concerning differences in financial literacy according to the type of summary viewed. Table 3 compares the average scores of the students’ financial literacy for the normal and visual summaries. As Table 3 shows, the financial literacy of the two groups of respondents was almost the same. In fact, the difference in the students’ financial literacy between the normal and the visual summary was not statistically significant by the t-test. On the other hand, the author layered the students according to three levels of financial literacy based on the questions in part 1. Low literacy (LL) students’ scores were < 4. Mideum literacy (ML) students’ scores were 5 or 6. High literacy (HL) students’ scores were >7. As indicated in Table 4, 167 students (26.6% of the all respondents) were LL, 287 students (45.8%) were ML, and 173 students (27.6%)

were HL.

	Frequency	Av.	S.D.
Normal	306	5.40	1.653
Visual	321	5.44	1.661

Table 3: Comparison of respondents' financial literacy between the normal and visual summaries

	Frequency	Av.	S.D.	Min.	Max.
Low Literacy (LL)	167	3.26	1.013	0	4
Medium Literacy (ML)	287	5.52	0.501	5	6
High Literacy (HL)	173	7.35	0.556	7	9
Total	627	5.42	1.656	0	9

Table 4: Classification and comparison of students by financial literacy

The effect of layered communication or creating a visual summary is analyzed in Table 5. As Table 5 shows, the proportion of the appropriate answers among those viewing the visual summary was higher than among those viewing the normal summary for six out of the 10 questions. This means that layered communication like creating a visual summary, could promote the students' -or the public's- understanding of or trust in the BOJ. However, only the "BOJ's inflation" outlook was statistically significant at the p = 0.001 level by the chi-square test.

		BOJ's economic	Respondents' economic	BOJ's inflation ***	Respondents' inflation	Deposit vs stock	Policy rate	Unemployment	Capital investment	House purchase	Overseas vs domestic
		agree	agree	agree	agree	disagree	agree	agree	agree	disagree	agree
Normal	N	168	111	138	112	136	135	144	87	152	160
	%	55.4%	36.6%	45.7%	37.1%	45.0%	44.7%	47.7%	28.8%	50.3%	53.0%
Visual	N	156	114	195	137	148	134	154	102	158	175
	%	48.6%	35.5%	60.7%	42.7%	46.1%	41.7%	48.0%	31.8%	49.2%	54.5%
Total	N	324	225	333	249	284	269	298	189	310	335
	%	51.9%	36.1%	53.5%	40.0%	45.6%	43.2%	47.8%	30.3%	49.8%	53.8%

Table 5: Effect of creating a visual summary

Note 1: The percentages of appropriate answers for each question are displayed. Shaded figures indicate the highest percentages.

Note 2: ***:p<0.001, **:p<0.01, *:p<0.05, †:p<0.1 (by chi-square test, the followings are the same)

		BOJ's economic ***	Respondents' economic	BOJ's inflation *	Respondents' inflation *	Deposit vs stock **	Policy rate *	Unemployment *	Capital investment	House purchase †	Overseas vs domestic *
		agree	agree	agree	agree	disagree	agree	agree	agree	disagree	agree
LL	N	70	56	77	53	56	54	70	48	68	74
	%	42.4%	33.9%	46.7%	32.1%	33.9%	32.7%	42.4%	29.1%	41.2%	44.8%
ML	N	142	107	150	118	135	130	141	90	152	153
	%	49.5%	37.3%	52.3%	41.1%	47.0%	45.3%	49.1%	31.4%	53.0%	53.3%
HL	N	112	62	106	78	93	85	87	51	90	108
	%	65.1%	36.0%	62.0%	45.6%	54.4%	49.7%	50.9%	29.8%	52.6%	63.2%
Total	N	324	225	333	249	284	269	298	189	310	335
	%	51.9%	36.1%	53.5%	40.0%	45.6%	43.2%	47.8%	30.3%	49.8%	53.8%

Table 6: Effect of financial literasy

Note 1: The percentages of appropriate answers for each question are displayed. Shaded figures indicate the highest percentages.

The impact of financial literacy is examined. As indicated in Table 6, HL and ML students' percentages of appropriate answers were higher than those of LL students for all of the questions. In other words, acquisition of financial literacy could improve the BOJ's communication. In addition, eight of the 10 items are statistically significant by the chi-square test.

Comparing the effect of creating a visual summary and financial education, financial education is likely to be more important than a visual summary. However, the purpose of layered communication is to provide different types of economic outlook to financially literate or illiterate members of the public. In short, this paper analyzes the impact of creating a visual summary while considering students' financial literacy.

Financial literacy	Summay	Frequency	Av.	S.D.	Min.	Max.
LL	Normal	88	3.36	0.961	0	4
	Visual	79	3.15	1.063	0	4
ML	Normal	133	5.5	0.502	5	6
	Visual	154	5.53	0.501	5	6
HL	Normal	85	7.36	0.553	7	9
	Visual	88	7.33	0.562	7	9
Total		627	5.42	1.656	0	9

Table 7: Results of differences in summary type and financial literacy

Table 7 shows an overview of the results of differences in summary type and financial literacy. As Table 7 shows, the average financial literacy of each layer was not influenced by the difference in summary type.

BOJ's economic outlook **			Agree	Disagree	Don't know	Total
Normal	LL	N	38	35	13	86
		%	44.2%	40.7%	15.1%	100.0%
	ML	N	70	50	13	133
		%	52.6%	37.6%	9.8%	100.0%
	HL	N	60	20	4	84
		%	71.4%	23.8%	4.8%	100.0%
Visual	LL	N	32	32	15	79
		%	40.5%	40.5%	19.0%	100.0%
	ML	N	72	68	14	154
		%	46.8%	44.2%	9.1%	100.0%
	HL	N	52	27	9	88
		%	59.1%	30.7%	10.2%	100.0%
Total		N	324	232	68	624
		%	51.9%	37.2%	10.9%	100.0%

Table 8: Impact of layered communication on understanding of BOJ's economic outlook

The impact of visual summaries and financial literacy on the BOJ's economic outlook is examined in Table 8. As Table 8 indicates, increasing the respondents' financial literacy resulted in understanding of the BOJ's economic outlook irrespective of the difference in summary type. However, the percentage of respondents viewing the normal summary who selected "Agree" was higher than that of those who viewed the visual summary, for all layers of financial literary. This means that simplified information did not always encourage the public to understand the BOJ's view. In addition, the impact of layered communication on understanding of the BOJ's economic outlook is statistically significant at the $p = 0.01$ level.

Respondents' economic outook			Agree	Disagree	Don't know	Total
Normal	LL	N	31	43	12	86
		%	36.0%	50.0%	14.0%	100.0%
	ML	N	52	64	17	133
		%	39.1%	48.1%	12.8%	100.0%
	HL	N	28	46	10	84
		%	33.3%	54.8%	11.9%	100.0%
Visual	LL	N	25	40	14	79
		%	31.6%	50.6%	17.7%	100.0%
	ML	N	55	82	17	154
		%	35.7%	53.2%	11.0%	100.0%
	HL	N	34	44	10	88
		%	38.6%	50.0%	11.4%	100.0%
Total		N	225	319	80	624
		%	36.1%	51.1%	12.8%	100.0%

Table 9: Impact of layered communication on respondents' economic outlook

The effects of a visual summary and financial literacy on the respondents' economic outlook is analyzed in Table 9. As Table 9 shows, the differences in summary type or level of financial literacy did not affect the respondents' economic outlook, although Table 7 indicates that over half of the respondents understood the BOJ's economic outlook. In other words, the students are likely to derive their economic outlook from other information, such as experience, mindset, rumors, and so on.

The impact of layered communication on understanding of the BOJ's inflation outlook is shown in Table 10. As Table 10 describes, increasing the respondents' financial literacy resulted in understanding of the BOJ's inflation outlook regardless with the difference in summary type. In addition, the rate of "Agree" responses among respondents viewing the visual summary was higher than for the normal summary. In the case of the inflation outlook, simplified and illustrated information could help the public to understand the BOJ's outlook. The effect of layered communication on the BOJ's inflation outlook is statistically significant at the $p = 0.001$ level.

BOJ's inflation outlook ***			Agree	Disagree	Don't know	Total
Normal	LL	N	36	27	23	86
		%	41.9%	31.4%	26.7%	100.0%
	ML	N	60	48	25	133
		%	45.1%	36.1%	18.8%	100.0%
	HL	N	42	33	8	83
		%	50.6%	39.8%	9.6%	100.0%
Visual	LL	N	41	24	14	79
		%	51.9%	30.4%	17.7%	100.0%
	ML	N	90	39	25	154
		%	58.4%	25.3%	16.2%	100.0%
	HL	N	64	15	9	88
		%	72.7%	17.0%	10.2%	100.0%
Total		N	333	186	104	623
		%	53.5%	29.9%	16.7%	100.0%

Table 10: Impact of layered communication on understanding of BOJ's inflation outlook

Table 11 shows the results of the analyses of respondents' inflation outlook as affected by visual summary and financial literacy. According to Table 11, increasing the level of financial literacy could help the respondents form an inflation expectation. However, it is noted that the respondents viewing the normal summary answered "Disagree" more often than "Agree." This might be due to details in the normal summary which provided the BOJ's inflation expectation together with upside and downside risks. On the contrary, the visual summary simply describes the willingness to raise the inflation rate caused by the expanding economy and increasing wages. These results lead to the question. Which is more important detailed information or simplified words? In the context of this paper, both are important, highlighting the benefit of layered communication. The impact of layered communication on respondents' inflation outlook is statistically significant at the $p = 0.05$ level.

Respondents' inflation outlook *			Agree	Disagree	Don't know	Total
Normal	LL	N	27	29	30	86
		%	31.4%	33.7%	34.9%	100.0%
	ML	N	51	52	30	133
		%	38.3%	39.1%	22.6%	100.0%
	HL	N	34	37	12	83
		%	41.0%	44.6%	14.5%	100.0%
Visual	LL	N	26	29	24	79
		%	32.9%	36.7%	30.4%	100.0%
	ML	N	67	48	39	154
		%	43.5%	31.2%	25.3%	100.0%
	HL	N	44	27	17	88
		%	50.0%	30.7%	19.3%	100.0%
Total		N	249	222	152	623
		%	40.0%	35.6%	24.4%	100.0%

Table 11: Impact of layered communication on respondents' inflation outlook

Deposit prior to stocks ***			Agree	Disagree	Don't know	Total
Normal	LL	N	17	35	34	86
		%	19.8%	40.7%	39.5%	100.0%
	ML	N	38	58	37	133
		%	28.6%	43.6%	27.8%	100.0%
	HL	N	23	43	17	83
		%	27.7%	51.8%	20.5%	100.0%
Visual	LL	N	24	21	34	79
		%	30.4%	26.6%	43.0%	100.0%
	ML	N	25	77	52	154
		%	16.2%	50.0%	33.8%	100.0%
	HL	N	15	50	23	88
		%	17.0%	56.8%	26.1%	100.0%
Total		N	142	284	197	623
		%	22.8%	45.6%	31.6%	100.0%

Table 12: Impact of layered communication on respondents' asset management

Table 12 shows the results of the analyses of layered communication on respondents' asset management. In the light of asset management, Table 12 indicates that the more financial literate students could understand the advantage of stocks over bank deposits in a given situation. However, among only LL students, respondents viewing the normal summary chose a higher rate of "Disagree" than the respondents viewing the visual summary. This means that simplified information was not sufficient to enable financially illiterate people to make a decision. The effect of layered communication on the respondents' asset management is statistically significant at the p = 0.001 level.

Future policy rate *			Agree	Disagree	Don't know	Total
Normal	LL	N	26	28	32	86
		%	30.2%	32.6%	37.2%	100.0%
	ML	N	61	29	43	133
		%	45.9%	21.8%	32.3%	100.0%
	HL	N	48	20	15	83
		%	57.8%	24.1%	18.1%	100.0%
Visual	LL	N	28	22	29	79
		%	35.4%	27.8%	36.7%	100.0%
	ML	N	69	43	42	154
		%	44.8%	27.9%	27.3%	100.0%
	HL	N	37	23	28	88
		%	42.0%	26.1%	31.8%	100.0%
Total		N	269	165	189	623
		%	43.2%	26.5%	30.3%	100.0%

Table 13: Relationship between layered communication and future policy rate

Table 13 indicates the relationship between layered communication and respondents' expectations for the future policy rate. As Table 13 shows, improvement in financial literacy could encourage the respondents to understand the BOJ's future monetary policy. However, the trend was more noticeable among those viewing the normal summary than among those viewing the visual summary. Though the normal summary described the detailed economic and inflation outlook with regard to risk balance, the visual summary just illustrated the future policy rate with three main simplified points. Therefore, the respondents viewing visual summary, especially HL students might not be able to form an expectation of the BOJ's future monetary policy with insufficient information. The impact of layered communication on the students' outlook on the future policy rate is statistically significant at the p =

0.05 level.

Correction of unemployment †			Agree	Disagree	Don't know	Total
Normal	LL	N	37	33	16	86
		%	43.0%	38.4%	18.6%	100.0%
	ML	N	69	53	11	133
		%	51.9%	39.8%	8.3%	100.0%
	HL	N	38	34	11	83
		%	45.8%	41.0%	13.3%	100.0%
Visual	LL	N	33	25	21	79
		%	41.8%	31.6%	26.6%	100.0%
	ML	N	72	59	23	154
		%	46.8%	38.3%	14.9%	100.0%
	HL	N	49	25	14	88
		%	55.7%	28.4%	15.9%	100.0%
Total		N	298	229	96	623
		%	47.8%	36.8%	15.4%	100.0%

Table 14: Respondents' outlook for unemployment with layered communication

The respondents' outlook for correction of the unemployment rate with layered communication is examined in Table 14. As Table 14 indicates, improvement in financial literacy with a visual summary could stimulate the students' expectation for a correction in the rate of unemployment. On the contrary, the respondents viewing the normal summary would not show any clear trend. However, except among HL students, the rate of "Agree" responses among respondents viewing the normal summary was higher than that among respondents viewing the visual summary. In the terms of the unemployment outlook, both creating a visual summary and financial education might be important. The impact of layered communication on the outlook for unemployment is statistically significant at the $p = 0.1$ level.

Table 15 shows the results of respondents' outlook for firms' capital investment with layered communication. As Table 14 indicates, although improvement in financial literacy was likely to make the students choose "Disagree," the differences in summary type or in the layers of financial literacy had little effect on the respondents' expectations. The author supposed that financial education could also raise the students' ability to manage business. However, this hypnosis is not demonstrated in this survey. In the following research, the financial literacy for the management of enterprises must be examined.

Opportunity of capital investment			Agree	Disagree	Don't know	Total
Normal	LL	N	24	36	26	86
		%	27.9%	41.9%	30.2%	100.0%
	ML	N	41	62	30	133
		%	30.8%	46.6%	22.6%	100.0%
	HL	N	22	44	17	83
		%	26.5%	53.0%	20.5%	100.0%
Visual	LL	N	24	35	20	79
		%	30.4%	44.3%	25.3%	100.0%
	ML	N	49	72	33	154
		%	31.8%	46.8%	21.4%	100.0%
	HL	N	29	43	16	88
		%	33.0%	48.9%	18.2%	100.0%
Total		N	189	292	142	623
		%	30.3%	46.9%	22.8%	100.0%

Table 15: Respondents' outlook for capital investment with layered communication

House purchase			Agree	Disagree	Don't know	Total
Normal	LL	N	28	37	21	86
		%	32.6%	43.0%	24.4%	100.0%
	ML	N	39	72	22	133
		%	29.3%	54.1%	16.5%	100.0%
	HL	N	30	43	10	83
		%	36.1%	51.8%	12.0%	100.0%
Visual	LL	N	32	31	16	79
		%	40.5%	39.2%	20.3%	100.0%
	ML	N	44	80	30	154
		%	28.6%	51.9%	19.5%	100.0%
	HL	N	26	47	15	88
		%	29.5%	53.4%	17.0%	100.0%
Total		N	199	310	114	623
		%	31.9%	49.8%	18.3%	100.0%

Table 16: Respondents' outlook for housing investment with layered communication

The impact of layered communication on the respondents' outlook for housing investment is analyzed in Table 16. As Table 16 shows, improvement to ML or HL would encourage students to understand opportunities for housing investment irrespective of difference in summary type. However, the effect of layered communication on the "House purchase" is not statistically significant.

Oveasess vs. domestic investment *			Agree	Disagree	Don't know	Total
Normal	LL	N	36	16	34	86
		%	41.9%	18.6%	39.5%	100.0%
	ML	N	67	30	36	133
		%	50.4%	22.6%	27.1%	100.0%
	HL	N	57	13	13	83
		%	68.7%	15.7%	15.7%	100.0%
Visual	LL	N	38	18	23	79
		%	48.1%	22.8%	29.1%	100.0%
	ML	N	86	25	43	154
		%	55.8%	16.2%	27.9%	100.0%
	HL	N	51	14	23	88
		%	58.0%	15.9%	26.1%	100.0%
Total		N	335	116	172	623
		%	53.8%	18.6%	27.6%	100.0%

Table 17: Respondents' ability to manage globally assets with layered communication

Table 17 indicates the results of the respondents' capability of managing global assets with layered communication. According to Table 17, improvement in financial literacy could help students to manage their financial assets in globalization regardless the difference in summary type. However, it was interesting that only among HL students was the rate of "Agree" among those viewing the normal summary higher than that among those viewing the visual summary. Overly simplified information interrupts financially literate people. The impact of layered communication on global asset management is statistically significant at the $p = 0.05$ level.

As all of the results were reviewed above, the information from the BOJ was not always trusted by the respondents, due to lack of understanding or financial literacy. The author then additionally analyzed trust in the BOJ's economic and inflation outlook among the public, because the Bank's views of the future economy and inflation are regarded as the most important factors in the light of forward guidance.

Trust in BOJ's economic outlook			Trust	Distrust	Total
Normal	LL	N	44	22	66
		%	66.7%	33.3%	100.0%
	ML	N	79	29	108
		%	73.1%	26.9%	100.0%
	HL	N	44	26	70
		%	62.9%	37.1%	100.0%
Visual	LL	N	45	11	56
		%	80.4%	19.6%	100.0%
	ML	N	91	39	130
		%	70.0%	30.0%	100.0%
	HL	N	46	25	71
		%	64.8%	35.2%	100.0%
Total		N	349	152	501
		%	69.7%	30.3%	100.0%

Table 18: Trust in the BOJ's economic outlook with layered communication

Note: "Trust" means at match of answers in economic outlook between the BOJ and respondent. The "Distrust" means at mismatch of answers. Respondents who answered "Don't know" were removed from this table.

Table 18 shows the results of trust in the BOJ's economic outlook among the respondents. As Table 18 indicates, the results were divided by summary type. For those viewing the normal summary, ML students constituted the highest proportion of "Trust." On the other hand, for those viewing visual summary, LL students constituted the highest proportion of "Trust." It is most interesting that HL students constituted the highest proportion of "Distrust" in the case of both summaries. In short, improvement of financial literacy could discourage students from trusting the BOJ's economic outlook. Reasons might be given, such as their circumstances, experiences, news, and so on. In addition, some financially literate respondents posed the author the interesting question of why the BOJ would not raise the policy rate despite expectations of an expanding Japanese economy. This could indicate inconsistency between the BOJ's view and actual policy. Of course, this inconsistency was attributable to uncertainty of the Japanese economy, but it was very difficult for financial literate public to understand the BOJ's outlook and policy. However, the rate of trust for the BOJ in this survey was greater than in the Bank's survey previewed above, albeit with different research methods. The BOJ may have to begin to make efforts to encourage the public to read the *Outlook for Economic Activity and Prices*. The effect of layered communication on trust in the BOJ's economic outlook is not

statistically significant.

Trust in BOJ's inflation outlook *			Trust	Distrust	Total
Normal	LL	N	29	19	48
		%	60.4%	39.6%	100.0%
	ML	N	68	24	92
		%	73.9%	26.1%	100.0%
	HL	N	54	12	66
		%	81.8%	18.2%	100.0%
Visual	LL	N	43	6	49
		%	87.8%	12.2%	100.0%
	ML	N	84	25	109
		%	77.1%	22.9%	100.0%
	HL	N	50	17	67
		%	74.6%	25.4%	100.0%
Total		N	328	103	431
		%	76.1%	23.9%	100.0%

Table 19: Trust in the BOJ's inflation outlook with layered communication

Note: "Trust" means at match of answers in inflation outlook between the BOJ and the respondent. "Distrust" means at mismatch of answers. Respondents who answered "Don't know" were removed from this table.

Table 19 indicates the result of trust in the BOJ's inflation outlook in layered communication. As Table 19 shows, the improvement in respondents' financial literacy increased the rate of "Trust" among those viewing the normal summary. On the other hand, the enhancement of students' financial literacy decreased the rate of "Trust" among those viewing the visual summary. These results are much interesting. In short, creating a visual summary could encourage LL or ML students to understand and trust the BOJ's inflation outlook, and describing the normal summary could facilitate HL students' understanding and trust in the BOJ's expectation of inflation. In fact, the impact of layered communication on the respondents' trust in the BOJ's inflation outlook is statistically significant at the $p = 0.05$ level.

4.2 Discussion

As mentioned previously, creating a visual summary had positive effects on the respondents' understanding of the BOJ's inflation outlook, asset management, and expectation of correction of the

unemployment rate. The improvement in the students' financial literacy positively affected all of these items. However, overly simplified information was not valid for some items, for example, financially literate students needed sufficient information like a normal summary. On the other hand, simplified and illustrated information helped financially illiterate students understand the economic outlook. In short, both financial education and creating a visual summary are effective instruments for the BOJ.

5. Conclusion

This paper points to the following four key themes from the questionnaire survey among Japanese university students on financial literary and the outlook for the future economy.

(1) Layered communication like a creating visual summary encourages the public, especially financially illiterate people to understand and trust the central banks' view and policy.
(2) Education to enhance financial literacy enables people to understand economic situations and make financial decisions based on the central banks' information.
(3) For financially literate people, normal summary of the *Inflation Report or Outlook for Economic Activity and Inflation* is likely to provide better information than a visual summary.
(4) In the light of forward guidance, both creating a visual summary and improving financial literacy have positive effects on the public's inflation expectations with regard to differences in people's financial literacy.

From these points, this paper concludes that financial education and layered communication could improve the BOJ's communication strategies or monetary policy.

Incidentally, some questions remain in this paper. The survey respondents were limited to 627 students from five universities. A survey among the broader public will have to be conducted. The adequacy of visual summaries created by the author must be re-examined. It remains unclear what kind of financial literacy can affect the public's outlook to any strong degree. These problems will require future attention.

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