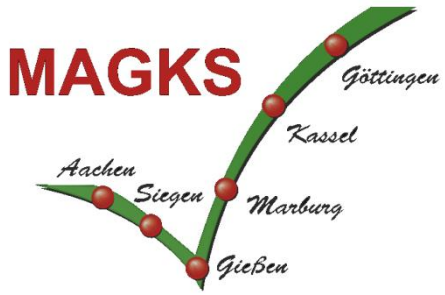

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The Relationship between Inflation Expectations and Consumption in Exceptional Times: Evidence from Thailand and Vietnam during the Covid-19 Pandemic

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Abstract

Using representative household surveys conducted during the COVID-19 pandemic in two emerging economies, Thailand and Vietnam, we examine the relationship between inflation expectations and consumption. In both countries, our results show an insignificant relationship between expected inflation and durable consumption intentions. In addition, we rigorously test whether the null overall effect of inflation expectations on consumption is due to heterogeneity across different groups of households. However, we cannot reject the homogeneity restriction and conclude that we find no evidence to support either the widely accepted intertemporal optimisation theory or the competing 'stagflationary' view of consumption.

Keywords: Inflation Expectation; Consumption; COVID-19; Thailand; Vietnam.

JEL classification: E62; E71; D12; D83; H31

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1 Introduction

In the aftermath of the global financial crisis in 2007, central banks cut nominal interest rates sharply and kept them at very low levels for a prolonged period. As a result, the (ex-ante) real interest rate was mainly affected by changes in (expected) inflation. Given this situation, many central banks were concerned about a potential risk of deflation, namely that households would start to postpone their consumption decisions. Reflecting this concern, many central banks have particularly emphasised managing inflation expectations (e.g., Bernanke, 2022; ECB, 2021; Lagarde, 2022; Mester, 2022; Adrian, 2023).

More recently, in 2020-2021, we witnessed yet another exceptional event as the COVID-19 pandemic necessitated global containment policies like social distancing, lockdowns, and fiscal stimulus packages. At least in some countries, the pandemic strongly impacted household expectations and consumption (e.g., Binder, 2020; Coibion et al., 2020; Fetzer et al., 2020).

The widely used micro-based intertemporal optimisation model includes two channels of transmission from real interest rate changes to current consumption: via (i) the substitution effect (between consumption today and consumption tomorrow) and (ii) the income effect (discounted lifetime income changes). Following a fall in the real interest rate (due to an increase in expected inflation), the model predicts that borrower households will increase their current consumption, as both the substitution and income effects have a positive sign. In contrast, the model's prediction for saver households is ambiguous, as the substitution and income effects point in different directions. Thus, the response to such a real interest rate change at the macro level depends on whether savers or borrowers dominate the household sector. Vellekoop and Wiederholt (2019) and Lieb and Schuffels (2022) discuss a wealth channel which operates similarly to the income effect in the intertemporal optimisation model.

When the real interest rate decreases due to higher inflation, net creditors expect their real wealth to fall and reduce their consumption, whereas net debtors increase their spending as their real wealth rises.

However, despite the widespread use of the intertemporal optimisation theory, we believe that analysing the link between inflation expectations and private demand should be more nuanced. On the one hand, consumers may not form expectations about the inflation rate (Hayo and Neumeier, 2023), especially when prices are stable (Cavallo et al., 2017). This implies that their consumption decisions are made independently of inflation expectations. On the other hand, consumers may combine their expectations about the inflation rate with their expectations about other macroeconomic variables and use this joint input to determine their spending. Adopting a stagflationary view of consumers, Kamdar (2019) argues that consumers often expect high inflation to be associated with bad economic times, which then depresses their spending. Some recent evidence supporting this view can be found in Candia et al. (2020), Andre et al. (2022), and Coibion et al. (2023).

Given these different perspectives, the effect of inflation expectations on consumption ultimately becomes an empirical question. However, using both macro and micro data, the literature finds no clear relationship between inflation expectations and consumption. For example, a positive relationship between the two variables is found in France (Andrade et al., 2023), Germany (D'Acunto et al., 2018; Dräger and Nghiem, 2021; D'Acunto et al., 2022), and the Netherlands (Lieb and Schuffels, 2022). In contrast, there is evidence that inflation expectations negatively impact durable goods consumption, such as when the zero lower bound is binding, as in the United States (Bachmann et al., 2015) and the Netherlands (Coibion et al., 2023). Furthermore, inflation expectations were shown to *in*significantly impact credit

card payments in Malaysia (Galashin et al., 2021) and in the US, non-durable goods spending (Burke and Ozdagli, 2023) and durable goods consumption when the federal funds rate was positive (Bachmann et al., 2015).

Moreover, there is still limited evidence from the recent COVID-19 pandemic, which was characterised by a high degree of uncertainty due to the pandemic itself and the unprecedented responses of world governments. Armantier et al. (2021) use data from the New York Fed's Survey of Consumer Expectations from March to September 2020 and find no significant effect of the change in inflation expectations on the savings portion of a federal government stimulus cheque issued in response to the COVID-19 crisis. In contrast, Candia et al. (2020) employ data from the Cleveland Fed's daily household survey conducted from March to July 2020, and they report a positive correlation between households' inflation expectations and their intentions to refrain from large purchases.

Given the importance of the pandemic, our main research question is: how do inflation expectations relate to consumer spending during COVID-19? We examine the extent to which the effect of inflation expectations depends on household economic characteristics relevant to theoretical model predictions and the pandemic. These characteristics include the household's net savings, expectations and concerns about the economy and personal finances, the material impact of the pandemic on the household, and the household's attitude towards its government. In other words, we analyse the impact of three sets of variables, those related to (i) the intertemporal optimisation model and the wealth channel of consumption, (ii) the stagflationary view of consumption, and (iii) the specific impact of the COVID-19 pandemic.

Employing survey data collected at the end of 2020, we study the (conditional) effects of inflation expectations on the propensity to spend on durable goods during the COVID-19

pandemic in two neighbouring emerging economies, Thailand and Vietnam.[1] We focus on emerging economies because there is already some evidence of the impact of inflation expectations on consumption in industrialised countries, but little is known about this relationship in emerging economies. The exception is Yadav and Shanar (2016), who report a positive relationship between inflation expectations and current spending in India; however, their analysis period can be described as normal rather than exceptional.

In contrast, for both Thailand and Vietnam, we find that the link between inflation expectations and consumption during the COVID-19 pandemic is not particularly strong from an economic point of view and is statistically insignificant. Moreover, we discover no evidence that the impact of inflation expectations is conditional on household wealth and savings, as assumed in the intertemporal optimisation model and the wealth channel. The homogeneous effects of expected inflation also hold for households' macroeconomic and financial expectations and pandemic-related characteristics. The remainder of the paper is structured as follows: Section 2 discusses the data, and Section 3 presents our analysis. Finally, Section 4 concludes.

2 Data

Using online surveys conducted in Thailand and Vietnam at the beginning of the second wave of the pandemic (18-27 December 2020), we asked 1,002 Thai adults and 1,178 Vietnamese residents aged 18 - 60 about their inflation expectations and willingness to spend on durable goods. Details of the survey and our representative population samples are described in Bui et al. (2022, 2023).

[1] The motivation for selecting these two countries is presented in Bui et al. (2022) and Bui et al. (2023).

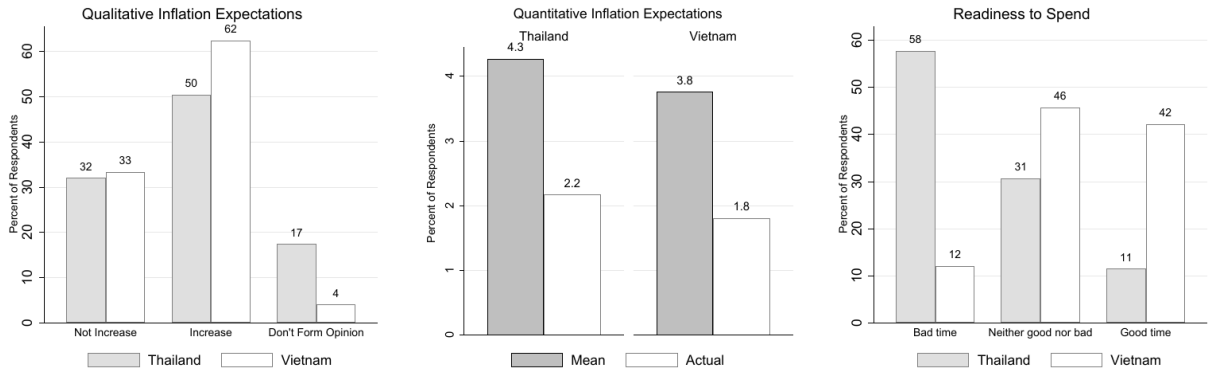
Inflation Expectations Focusing on qualitative inflation expectations, we find that at the end of December 2020, about 50% of Thai respondents and 60% of Vietnamese respondents believed that the domestic inflation rate would increase over the next 12 months (Figure 1 - left panel), while more than 30% of respondents in both countries did not anticipate an increase. Household surveys conducted during periods of low inflation suggest that not all respondents form concrete expectations about inflation (Cavallo et al., 2017; Hayo and Neumeier, 2023). This observation is consistent with the information friction view discussed by Sims (2003) and Caplin and Dean (2015). In Thailand, where prices have been stable since 2005, 17% of the population does not express inflation expectations. In contrast, in Vietnam, probably reflecting the experience of volatile and high inflation rates over the past 20 years, only a small minority (4%) of the population does *not* form expectations about future inflation. Focusing on the quantitative measure of expected inflation, we construct its mean for the two countries, which was around 4%, roughly 2 percentage points higher than the actual inflation rates for both countries (Figure 1 – centre panel).[2]

Readiness to Spend To obtain data on consumption, we asked respondents about their willingness to purchase a durable good. We use the following question from the Michigan Survey of Consumers, which is typically interpreted as readiness to spend (Bachmann et al., 2015): *Generally speaking, do you think now is a good or bad time for people to buy major household items, such as furniture, refrigerator, stove, television, and things like that? [Very good, Good, Neither good nor bad, Bad, Very bad, Don't know]*. Figure 1 (right panel) combines the responses into three categories: 'Bad time', 'Neither good nor bad time', and 'Good time'.

[2] We ask respondents to choose their inflation expectation from the following options: '<0%', '0%', '0%-1%', '1%-2%', '2%-3%', '3%-4%', '4%-5%', '5%-6%', '6%-7%', '7%-8%', '8%-9%', '9%-10%', '>10%', and 'don't know'. Following Hayo and Meon (2023), we then construct the means of all options except 'don't know' by setting the values for each option respectively as follows: -0.5%, 0%, 0.5%, 1.5%, 2.5%, 3.5%, 4.5%, 5.5%, 6.5%, 7.5%, 8.5%, 9.5%, and 10%.

In the Thai sample, almost 60% believed that the end of 2020 was not a good time to buy durable goods. In contrast, more than 40% of our Vietnamese respondents thought it *was* a good time to spend money on large consumer goods.

Figure 1: Inflation Expectations and Consumption during COVID-19



3 Regression Results

We employ an ordered probit model to estimate the effect of both qualitative and quantitative inflation expectations on the likelihood of spending. However, in models with discrete dependent variables, the impact of a marginal change in an explanatory variable on the probability of an event depends on the value of other variables. Thus, an essential question in this context is whether and to what extent the estimated impact of inflation expectations on the willingness to spend is affected by underlying household heterogeneity as well as factors related to the COVID-19 pandemic. In this context, we are interested in exploring whether the interactions between inflation expectations and other variables significantly influence the likelihood of household consumption. Berry et al. (2010) recommend that analysts use the estimated parameters from the logit/probit model with product terms when an explicit theory predicts that the interaction of independent variables will affect the latent

dependent variable. At the same time, they argue that standard coefficient tests are appropriate to determine whether or not to retain the interaction term.[3]

In light of these considerations, we consistently analyse the relationships of interest employing a general-to-specific modelling approach (Hendry, 1993). The consistent reduction of the model allows us to test for heterogeneity and improves the efficiency of estimation. We consider the interactions of inflation expectations with households' net savings and economic outlook and investigate whether they influence the likelihood of household consumption, as predicted by the intertemporal optimisation model and the stagflationary view, respectively.

We estimate equation (1), where Y_i^* is a latent variable for the probability that household i states that it is a 'good time' to buy durables; π^e is a variable indicating what household i expects inflation to be in the next 12 months; D is a vector of control variables, and includes socio-demographic indicators, such as gender, education level, marital status, age group, a dummy indicating urban residence, employment status, income quartiles, household size, self-reported health status, and the number of elderly people in the household.

X^T includes various indicators of the household's financial situation: (i) spending minus earnings (*Net Saver*), (ii) assets minus liabilities (*Net Assets*), and (iii) change in savings over the past five months (*Decreased Saving*). It also includes an indicator describing the respondent's expectations about the state of the economy in the short term (12 months) and medium term (5 years), as well as their personal financial situation in the next 12 months

[3] For the probit model $Y_i^* = \beta_0 + \beta_1 X_i^1 + \beta_2 X_i^2 + \beta_p X_i^1 X_i^2 X_2 + \cdots + \beta_k X_i^k$, Berry et al. (2010) show that the marginal effect of X_i^1 on the probability of Y ($\Pr(Y_i)$) depends on the inclusion of the product term $\beta_p X_i^1 X_i^2$:, due to (i) $\frac{\partial \Pr(Y_i)}{\partial Y_i^*}$ (by changing Y_i^*) and (ii) by adding $\beta_p X_i^2$ to $\frac{\partial Y_i^*}{\partial X_i^1}$.

$$\frac{\partial \Pr(Y_i)}{\partial X_i^1} = \left[\frac{\partial \Pr(Y_i)}{\partial Y_i^*}\right]\left[\frac{\partial Y_i^*}{\partial X_i^1}\right] = [\Phi'(Y_i^*)]\left[\beta_1 + \beta_p X_i^2\right]$$

(*Economic Outlook*). The first three indicators measure heterogeneity from the perspective of the intertemporal optimisation model and the wealth channel, whereas the last indicator provides information on how households view the prospects for the macroeconomy, which is important for the stagflationary view.

Furthermore, given our focus on exceptional times, we hypothesise that the COVID-19 pandemic could lead to heterogeneous effects of inflation expectations on consumption. Model (1) includes indicators for the COVID-19 pandemic X^{Covid} that indicate whether a household member experienced a job loss due to COVID-19 (*Job Loss*) and whether a household has received pandemic-related financial support from the government (*Received Financial Support*). In addition, we add a qualitative assessment of the government's performance before the pandemic (*Govt. Assessment before COVID*), an index of respondents' assessment of the government's support for households and firms during the pandemic (*Govt. Assessment during COVID*), and an index of trust in the government to deal with the pandemic and to recover the economy (*Trust in Government during COVID*).

$$Y_i^* = \alpha + \beta_1 \pi_i^e + \beta_2 \pi_i^e X_i^T + \beta_3 \pi_i^e X_i^{Covid} + \theta_1 X_i^T + \theta_2 X_i^{Covid} + \gamma D_i + \epsilon_i \qquad (1)^4$$

In the next step, we use coefficient tests to test the significance of β_2 and β_3 in model (1). These general-to-specific tests allow us to reduce unnecessary product terms and re-estimate our model with fewer or no product terms, as the tests do not reject the hypothesis that the product terms are statistically insignificant. Our reduced model excludes both countries'

[4] The marginal effect of inflation expectation on the likelihood of answering readiness to spend is 'good time':

$$\frac{\partial \Pr(Y_i = good\_time)}{\partial \pi_i^e} = \left[\frac{\partial \Pr(Y_i)}{\partial Y_i^*}\right]\left[\frac{\partial Y_i^*}{\partial \pi_i^e}\right] = [\Phi'(Y_i^*)]\left[\beta_1 + \beta_2 X_i^T + + \beta_3 X_i^{Covid}\right]$$

interaction terms (model (2)). Details of the testing-down procedure are presented in Table A1 of the Appendix.

$$Y_i^* = \alpha + \beta_1 \pi_i^e + \theta_1 X_i^T + \theta_2 X_i^{Covid} + \gamma D_i + \epsilon_i \qquad (2)^5$$

Table 1 shows the marginal effects of inflation expectation on the probability of stating that it is a good time to buy durable goods.[6] Columns (1) through (4) report the results of using the qualitative measure for inflation expectation, whereas columns (5) and (6) show results obtained with quantitative inflation expectation. Columns (3) through (6) demonstrate the robustness of the results by utilising the two measures of expected inflation applied to the same samples. For both countries, we generally find that expected inflation has no statistically significant effect on households' spending intentions. This result is in line with Bachman et al. (2015) for the period when the zero lower bound is not binding in the United States, Burke and Ozdagli (2023) for US consumption of non-durable goods before COVID-19, and Armantier et al. (2021) during the first year of COVID-19 for the US household savings.

Based on the reduced models shown in equation (2), we consider the degree of heterogeneity in the effect of inflation expectations on consumption. Figures A1 and A2 in the Appendix depict the average marginal effects of qualitative and quantitative inflation expectations for specific values of X^T and X^{Covid}. In general, for both countries, we find homogeneous insignificant effects of inflation expectations across the various indicators we consider: households' net savings/wealth positions, households' outlook about the economy/financial

[5] The marginal effect of inflation expectation on the likelihood of answering readiness to spend is 'good time':

$$\frac{\partial \Pr(Y_i = good\_time)}{\partial \pi_i^e} = \left[\frac{\partial \Pr(Y_i)}{\partial Y_i^*}\right]\left[\frac{\partial Y_i^*}{\partial \pi_i^e}\right] = [\Phi'(Y_i^*)][\beta_1]$$

[6] The results for the other options 'bad time' and 'neither good nor bad' time are similar and can be found in Table A2 in the Appendix.

situation, and households' experience in job loss and receiving support and their attitude towards their governments.

In summary, our results show no impact of inflation expectations on consumption for Thai and Vietnamese households during the COVID-19 pandemic. Moreover, this conclusion is unaffected by the underlying heterogeneity of households' economic, financial, or attitudinal characteristics.

Table 1. The Marginal Effects (ME) of Inflation Expectations on the Probability of Answering 'Good time' for Consumption of Durables

		Qualitative Inflation Expectation			Quantitative Inflation Expectation	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
	(1)	(2)	(3)	(4)	(5)	(6)
Average MEs	-0.04	-0.07	-0.04	-0.07	-0.003	-0.01
	(0.02)	(0.04)	(0.02)	(0.04)	(0.003)	(0.01)
ME at mean	-0.03	-0.08	-0.03	-0.08	-0.003	-0.01
	(0.02)	(0.05)	(0.02)	(0.05)	(0.003)	(0.01)
Interaction Terms	No	No	No	No	No	No
X^T and X^{Covid}	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.18	0.11	0.18	0.11	0.18	0.11
Number of Observations	627	830	589	810	589	810

Note: All regressions include the following demographic control variables: male, university education, married, urban, age group, employed, income quartiles, household size, health condition, and the number of elderly in the household. Qualitative Inflation Expectation = 1 if a respondent expects a higher inflation rate; otherwise, Qualitative Inflation Expectation = 0. Quantitative Inflation ranges in [-0.5%; 0%; 0.5%; 1.5%; 2.5%; 3.5%; 4.5%; 5.5%; 6.5%; 7.5%; 8.5%; 9.5%; 10%]. Standard errors are in parentheses. * p<0.05, **p<0.01, ***p<0.001.

4 Conclusion

This paper examines the relationship between inflation expectations and planned consumption of durable goods during the COVID-19 pandemic for two emerging economies, Thailand and Vietnam. Using the results of our representative online surveys conducted at the end of 2020, we observe different effects of the expected inflation rate on the consumption of durable goods across countries. The average impact and the impact at the mean values for

both countries are insignificant, which is consistent with the result from Armantier et al. (2021) for the United States within the first year of the COVID-19 pandemic, and some other findings before the onset of the COVID-19 crisis (Bachmann et al., 2015; Burke and Ozdagli, 2023; Galashin et al., 2021).

Our analysis allows for a high degree of heterogeneity across households in the consumption response to inflation expectations. However, our rigorous general-to-specific modelling approach shows that the observed effects are generally homogeneous across important household characteristics in both samples. Given the homogeneity of our results, we have to conclude that they are inconsistent with the predictions of the intertemporal optimisation model or wealth channel, which state that, during times of low nominal interest rates, the reactions of debtors and creditors are easily distinguished. We also do not find evidence for the link between high expected inflation and worse economic conditions with lower consumption, as predicted by the stagflationary view. Under the circumstances of exceptional times, i.e. specific aspects related to the COVID-19 pandemic, the impact of expected inflation on spending is still insignificant.

In summary, our analysis of two emerging markets finds little support for a notable role of inflation expectations in the consumption of durable goods. In terms of economic policy implications, this suggests that central banks in Thailand and Vietnam need not be particularly concerned about the potentially detrimental impact of inflation expectations on household consumption during the pandemic. In light of the results of Bui et al. (2022), this suggests that fiscal policy in the form of direct transfers to households plays a more critical role in these exceptional times than a monetary policy focused on guiding inflation expectations.

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Appendix

Table A1. Testing Interaction Terms with Inflation Expectations

	Interaction Terms with Inflation Expectation	Restriction(s)	df	χ^2 Statistics Qualitative Inflation Expectation		χ^2 Statistics Quantitative Inflation Expectation		
		(1)	(2)	(3) Thailand	(4) Vietnam	(5) Thailand	(6) Thailand	(7) Vietnam
1	Assessment of the Govt. before COVID	1-9	12	20.27*	9.13	21.93**		18.94*
2	Trust in the Govt during COVID	2-9	10	9.12	8.94	16.73*		17.19*
3	Assessment of the Govt. during COVID	3-9	9	7.97	6.74	16.72*		15.51*
4	Job Loss	4-9	8	7.88	4.88	15.20*		14.99*
5	Received Financial Support	5-9	7	6.14	4.50	4.30		6.46
6	Eco-Fin Outlook	6-9	6	5.13	1.72	3.16		5.69
7	Net Assets	7-9	5	5.09	1.28	1.55		5.59
8	Decreased Savings	8-9	3	1.45	0.46	0.31		2.60
9	Net Saver	9	2	1.37	0.33	0.31		2.19
10	Assessment of the Govt. before COVID	10	2				3.39	
	Interaction Term(s)			1-9	1-9	1-9	1	1-9
	Demographic Controls			Yes	Yes	Yes	Yes	Yes
	Pseudo R-squared			0.19	0.12	0.20	0.18	0.12
	Number of Observations			627	830	589	589	810

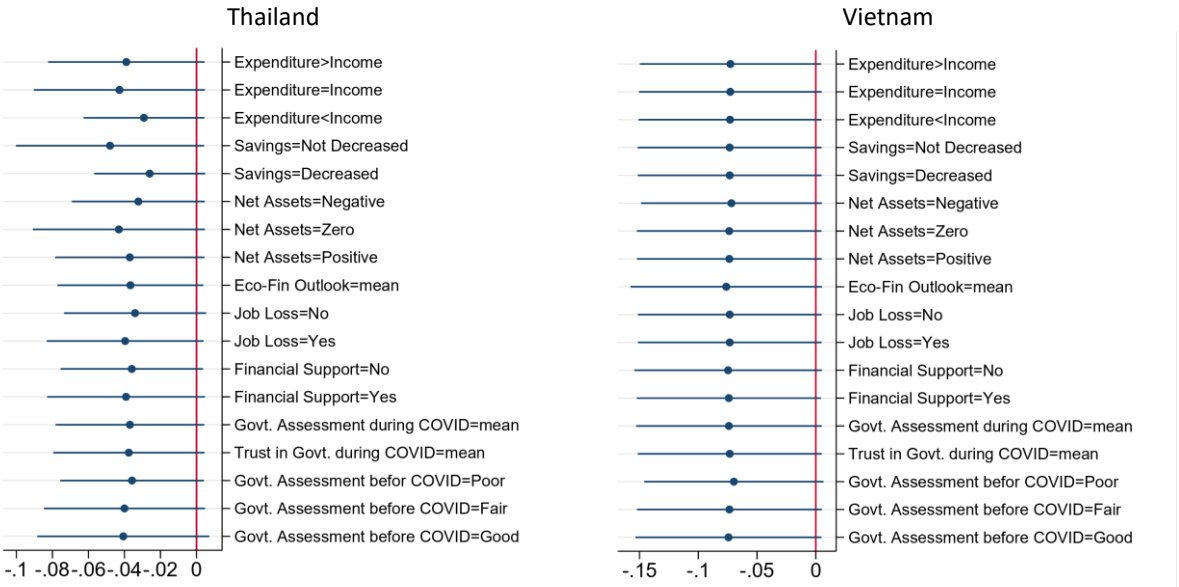
Note: All regressions include the following demographic control variables: male, university education, married, urban, age group, employed, income quartiles, household size, health condition, and the number of elderly in the household. Qualitative Inflation Expectation = 1 if a respondent expects a higher inflation rate; otherwise, Qualitative Inflation Expectation = 0. Quantitative Inflation ranges in [-0.5%; 0%; 0.5%; 1.5%; 2.5%; 3.5%; 4.5%; 5.5%; 6.5%; 7.5%; 8.5%; 9.5%; 10%]. Standard errors are in parentheses. * p<0.05, **p<0.01, ***p<0.001.

Table A2. The Marginal Effects (ME) of Inflation Expectations on the Probability of Answering 'Bad time' and 'Neither Good nor Bad time' for Consumption of Durables

	Qualitative Inflation Expectation				Quantitative Inflation Expectation	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
	(1)	(2)	(3)	(4)	(5)	(6)
The Probability of Answering 'Bad time'						
Average MEs	0.07	0.03	0.07	0.03	0.007	0
	(0.04)	(0.02)	(0.04)	(0.02)	(0.006)	(0)
ME at mean	0.09	0.03	0.09	0.03	0.008	0
	(0.05)	(0.02)	(0.05)	(0.02)	(0.007)	(0)
The Probability of Answering 'Neither Good nor Bad time'						
Average MEs	-0.03	0.04	-0.03	0.04	-0.003	0
	(0.02)	(0.02)	(0.02)	(0.02)	(0.003)	(0)
ME at mean	-0.06	0.05	-0.06	0.05	-0.005	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.005)	(0.01)
Interaction Terms	No	No	No	No	No	No
XT and Xcovid	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.18	0.11	0.18	0.11	0.18	0.11
Number of Observations	627	830	589	810	589	810

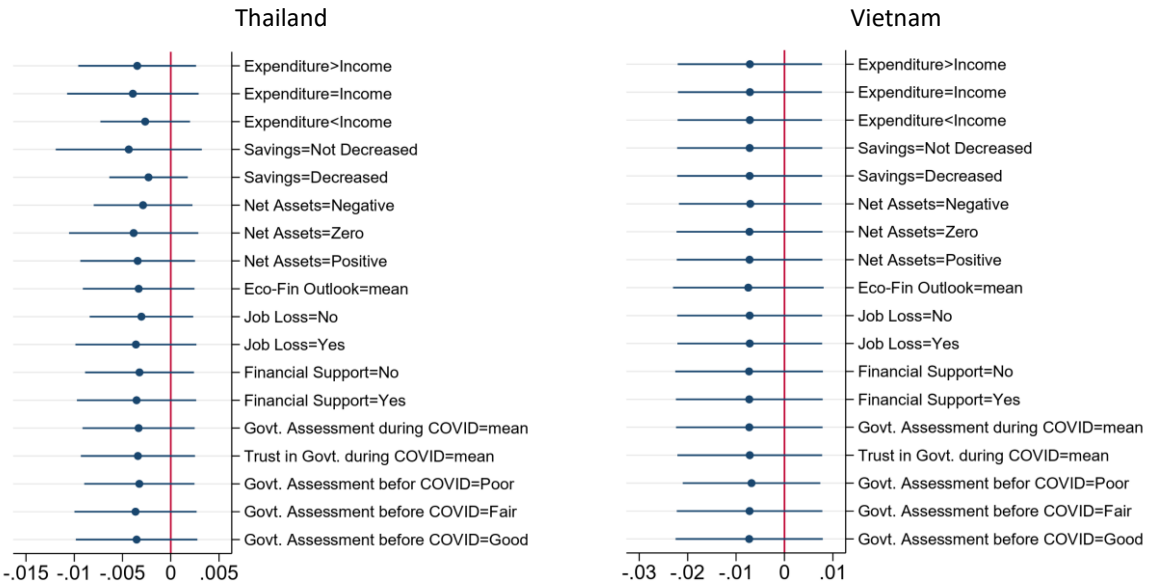
Note: All regressions include the following demographic control variables: male, university education, married, urban, age group, employed, income quartiles, household size, health condition, and the number of elderly in the household. Qualitative Inflation Expectation = 1 if a respondent expects a higher inflation rate; otherwise, Qualitative Inflation Expectation = 0. Quantitative Inflation ranges in [-0.5%; 0%; 0.5%; 1.5%; 2.5%; 3.5%; 4.5%; 5.5%; 6.5%; 7.5%; 8.5%; 9.5%; 10%]. Standard errors are in parentheses. * p<0.05, **p<0.01, ***p<0.001.

Figure A1: Average Marginal Effects of Qualitative Inflation Expectation on Consumption during COVID-19 with 95% Confidence Intervals



Note: The average marginal effects are generated directly from the regressions in Column 3 and Column 4 in Table 1 for Thailand and Vietnam, respectively.

Figure A2: Average Marginal Effects of Quantitative Inflation Expectation on Consumption during COVID-19 with 95% Confidence Intervals



Note: The average marginal effects are generated directly from the regressions in Column 5 and Column 6 in Table 1 for Thailand and Vietnam, respectively.