The impact of economic uncertainty and financial stress on consumer confidence: the case of Japan

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Abstract

Purpose – This study explores the response of consumer confidence in policy uncertainty in the Japanese context. The study also considers the dynamism of stock market behavior and financial stress and its impact on consumer confidence, which has remained unaddressed in the literature. The role of these control variables has important implications for policy discussions, particularly when other countries can learn from Japanese experiences.

Design/methodology/approach – The nonlinear autoregressive distributed lag model postulated by Shin *et al.* (2014) was used for studying the asymmetric response of consumer confidence to policy uncertainty. This method has improved estimates compared to traditional linear cointegration methods.

Findings – The findings confirm the asymmetric impact of policy uncertainty on the consumer confidence index in Japan. The impact of the rise in policy uncertainty is greater than that of a fall in asymmetry on consumer confidence in Japan. Furthermore, the Wald test confirmed asymmetric behavior.

Originality/value – The contribution of this study is threefold. First, this study contributes to the extant literature by analyzing the asymmetric response of consumer confidence to policy uncertainty, controlling for both the financial stress and stock price indices. Second, to test the robustness of the exercise, the study utilized different frequencies of observations. Third, this study is the first to utilize the concept of Arbatli *et al.* (2017) to formulate a combined index of uncertainty based on economic policy uncertainty index, along with uncertainty indices such as fiscal, monetary, trade and exchange rate policies to study the overall impact of policy uncertainty.

Keywords Consumer confidence index, Uncertainty index, Financial stress index, Japan, NARDL

Paper type Research paper

1. Introduction

In Japan, an untenable fiscal path accompanied by monetary policy restraints magnified uncertainty in the country. The reform inventiveness of the Prime Minister of Japan, popularly known as "Abenomics" since December 2012, was a directional change towards sustained accelerated growth. However, the behavior of the economy proved that continuing with "Abenomics" was indeed challenging. Against this background, we attempt to explore the impact of policy uncertainty changes on consumer confidence. To what extent does financial stress affect consumer confidence? Considering the pioneering work of Katona (1975), a long series of studies have explored the significance of consumer confidence and its implications on economic performance.

The international economy is increasingly considered to be influenced by policy uncertainty at the global level owing to the growing underlying associations across countries. Abrupt variations in policies at both local and global levels often create disturbances in consumer confidence levels. According to Gholipour et al. (2021), deliberations in the literature on the nexus between policy uncertainty and consumer confidence increased after the global financial crisis and, recently, after the pandemic.

We contribute to extant literature by exploring, in an asymmetric empirical framework, the impact of policy uncertainty on consumer confidence along with share price behavior and financial stress for Japan. This study is expected to add novelty in the literature as (1) it establishes the interlinkages between policy uncertainty and consumer confidence in an integrated framework, (2) utilizes the novel methodology of Shin et al. (2014) to explore the asymmetry in the relationship to investigate the hypothesis of the study, and (3) discusses the specific case of Japan, unlike earlier studies wherein the country of focus is the US.

The remainder of this study is organized as follows. Section 2 reviews existing literature. Section 3 provides an overview of the dataset and the methodology used thereof. Section 4 presents our empirical results. Section 5 discusses the major findings of this study. Finally, Section 6 concludes the paper.

2. Review of literature
Empirical research on the nexus between global economic policy uncertainty and economic policy uncertainty with consumer confidence has been widely explored in the literature. Provided with both the scope and nature of our study, we analyzed the findings in the extant literature into two probable comprehensive components:

(1) Discussion of the findings on policy uncertainty and nexus with consumer confidence and business confidence.

(2) Discussion on the findings on asymmetric impact of policy uncertainty.

2.1 Policy uncertainty impact on consumer confidence and business confidence
Various studies discuss how policy uncertainty at both local and global levels impacts the consumer and investor confidence. Notable studies for illustration (De Mendonça and Almeida, 2019) investigated how macroeconomic variables and uncertainty at policy levels reduce business confidence levels, which have adverse implications on consumer confidence levels. These studies show that high policy uncertainty and low levels of credibility reduce consumer confidence levels. Benhabib et al. (2015) found that consumers' confidence affects aggregate demand, real wages and productivity decisions of an economy. The study concluded that confidence shocks affect output and employment, even if expectations are fully rational and no externalities are found. Akerlof and Shiller (2010) and, further, Mumtaz and Surico (2018) and Lee et al. (2019) discuss that economic policy uncertainty impacts consumers' risk perception, which has adversarial consequences on expenditure decisions. Moreover, for the United States economy, Mumtaz and Surico (2018) found that those shocks originating from economic policy uncertainty adversely impact the business and consumer confidence levels. The study further highlights those uncertainties on the position of public debt have persistent negative effects on consumer confidence levels, which unfavorably impact overall output levels. According to Bloom et al. (2018), the incidence of uncertainty shocks affects business cycles. Based on micro-data, this study demonstrated that uncertainty has significant impact on business downswings. The study by De Mendonça and Almeida (2019) confirms that by Mumtaz and Surico (2018) in the Brazilian context. According to Al-Thaqeb and Algharabali (2019), "Policy uncertainty is the economic risk

associated with undefined future government policies and regulatory frameworks." The study further suggests that policy uncertainty leads to delayed economic recovery, particularly after the recession, as households defer their consumption decisions. Istiak and Alam (2020) examined the impact of US economic policy uncertainty on the stock market fluctuations for Gulf Cooperation Council (GCC) countries. Based on monthly observations from 1992 to 2018 using the linear and nonlinear structural vector autoregression models, the study found that an increase in US economic policy uncertainty leads to a significant decline in the stock market index of GCC countries. Furthermore, the study obtained a symmetric association between the GCC countries' stock market index and US economic policy uncertainty. Contrary to earlier studies, Tajaddini and Gholipour (2020) explored the relationships between economic policy uncertainty and investments, particularly in research and development, and found no negative association between economic policy uncertainty and investment decisions in R&D. In a unique study, Vanlaer *et al.* (2020) discussed that uncertainty impacts consumer confidence, which has direct negative implications on household savings and consumption behavior. For Denmark's economy, Bergman, and Worm (2020) examined how economic policy uncertainty impacts consumer confidence and the expectations of households on their financial position. The study concluded that economic policy uncertainty is key in impacting consumer confidence and household-level expectations. The study by Nowzohour and Stracca (2020) made interesting explorations on how consumer confidence is globally correlated with stock market volatility and economic policy uncertainty for a set of 27 countries from 1985 to 2016. The results are coherent with the underlying postulate specifying that consumer confidence is closely correlated with the global policy and uncertainty and stock market volatility. The study concludes that speculating on the contemporaneous impact of consumer confidence on the macroeconomy is important.

The work by Gholipour *et al.* (2021) recently made a significant contribution by investigating how the global financial crisis, the Brexit incident, and the global COVID-19 pandemic generated uncertainty inducing economic policy uncertainty. This study further discusses the impact of economic policy uncertainty on the consumer confidence of a major set of countries with inbound tourism to African countries. The results confirm the earlier discussion in the literature on how uncertainty from economic policy severely impacts consumer confidence. This has a feedback effect on inbound tourist inflows to Africa from other major nations such as France, Japan, Russia, Spain and China. The study by Ozdemir *et al.* (2021) made a noteworthy exploration on the long-drawn nexus between economic policy uncertainty and demand for hotel room booking. This study further examined the moderating impact of consumer sentiment in this context. Based on the novel econometric estimation techniques, we found a significant mediating impact of consumer sentiment on economic policy uncertainty and its relationship with demand for hotel booking. This study thus provides interesting insights on consumers' perceptions of policy-related uncertainty.

2.2 Economic policy uncertainty impact: asymmetric implications
A strand of the literature deliberates on the asymmetric impact of policy uncertainty on consumer and household decision-making and investment decisions of business houses. Notable studies include works by Aye (2019), Bahmani-Oskooee *et al.* (2021), and Murad and Salim *et al.* (2021). However, explorations in the literature continue to be scarce. Using quarterly time-series data for 1990Q1 to 2018Q2 for South African countries (Aye, 2019), we explored the asymmetric uncertainty impact of fiscal policy on the economic functioning of the nation. Results on the GARCH asymmetry model show that bad news (as opposed to good news) originating from fiscal policy uncertainty has more severe impact on real economic activity. This study concludes that the importance of asymmetric impact owing to

uncertainty from fiscal policy should be provided careful consideration owing to its association with economic growth.

Bahmani-Oskooee et al. (2021a) discussed the asymmetric impact of policy uncertainty on investment and consumption decisions in the context of G7 nations. Their study concludes that increased uncertainty damages the domestic economy for G7 nations more severely compared to favorable impact owing to a decline in uncertainty. Moreover, they suggest the strategic need to control for the adverse implications of uncertainty, particularly on the consumption and investment decisions in the G7 nations. Chen et al. (2020) examined the effect of economic policy uncertainty on the volatility of the exchange rate for China using annual observations from December 2001 to November 2018. The findings of the study based on quantile regression demonstrate the asymmetric impact of economic policy uncertainty on exchange rate volatility. Bahmani-Oskooee et al. (2021) explored the asymmetric impacts of economic policy uncertainty on income volatility for 41 states in the United States. The study obtained asymmetric implications on income volatility for both the short and long run. Aydin et al. (2021) explored the asymmetric impact of economic policy uncertainty on the stock prices of BRICS nations from March 2003 to March 2021. The findings confirm asymmetries across economic policy uncertainty and stock markets for the BRICS nations. This study concludes that the findings provide interesting insights into the impact of positive and negative shocks on stock market performance in BRICS countries. The study by Ugurlu-Yildirim et al. (2021), which uses the nonlinear autoregressive distributed lag model, explored the cointegrating association between stock market conditions, monetary policy uncertainty, and sentiments of the investors for the US economy. These findings demonstrate cointegrating relationships across the variables. Furthermore, the impact of monetary policy uncertainty on investors' sentiment is negative and significant. An interesting study by Rehman et al. (2021) using novel estimation techniques of nonparametric causality in quantiles examined the asymmetric impact of economic policy uncertainty on the US markets using observations from January 1995 to December 2015. The results demonstrate the nonlinear impact of economic policy uncertainty on investor sentiment across the US markets. Murad et al. (2021) explored the symmetric and asymmetric impact of economic policy uncertainty in the context of demand for money in India. The observation period runs from 2003M1 to 2018M4. This study demonstrates that the asymmetric impact on the demand for money in India is a short-run manifestation.

The preceding discussion reflected the importance of policy uncertainty as a major driver of consumer confidence and household expenditure plans. However, in the literature, only limited information can be found on the interconnectedness of the major drivers of consumer confidence, which is indispensable for policy implications on monitoring the role of uncertainty on consumer perceptions. Research on the potential drivers of consumer confidence alongside the resounding importance of macro-variables is increasingly needed. Building on these research gaps, this study attempts to examine the impact of policy uncertainty in a multivariate framework on consumer confidence. The current study, considering the limitations of the linear model, attempts to explore the behavior of policy uncertainty in a nonlinear framework.

2.3 Research question and the hypothesis

Literature suggests that uncertainty impacts macroeconomic performance (Bloom, 2014). Early empirical discussions in the literature focused on the impact of uncertainty on the business environment. However, higher uncertainty because of policy behavior impacts consumer perception, which affects consumers' confidence. This creates changes in the savings and precautionary behavior of consumers, which have bearing on household expenditures. We suggest that policy uncertainty is associated with consumer confidence

through an important conduit. High levels of policy uncertainty create bad news, which implies uncertainty in consumer perception and a decline in consumer confidence. However, unlike the commonly explored macroeconomic variables, the policy uncertainty variable may not impact consumer confidence identically when an environment of declined uncertainty, and thus the background of good news, is present. Particularly, we propose that policy uncertainty is a leading indicator contributing to consumers' perception of the state and the economy. Hence, it has a crucial bearing on confidence levels. Second, an asymmetric response of consumer confidence to bad news disseminated from policy uncertainty vis-à-vis good news may be found. Accordingly, we frame our study's hypotheses as follows:

H1. Policy uncertainty impacts consumer confidence.

H2. Policy uncertainty impacts consumer confidence asymmetrically.

3. Dataset, description of variables and methodology
3.1 Dataset [1] and description of variables
The dependent variable is the consumer confidence index denoted by CCI. The data set are obtained in monthly observations, beginning from the first month of 1995 to the third month of 2018. The variables chosen were seasonally adjusted. The data set are available from OECD (2019).

The major explanatory variable is the overall policy uncertainty index denoted by GU. GU is constructed as a composite index of economic uncertainty policy index, fiscal policy uncertainty index, monetary policy uncertainty index, trade policy uncertainty index and exchange policy uncertainty index. The Principal Component Analysis is applied for the construction of the index GU. The data on the economic uncertainty policy index, fiscal policy uncertainty index, monetary policy uncertainty index, trade policy uncertainty index and exchange policy uncertainty index, are compiled from Arbatli *et al.* (2017). The financial stress index denoted by FS and the share price index denoted by S is the major control variables. The FS indicator is obtained from the Asia Regional Integration Center, Tracking Asian Integration. The data on the share price index is obtained from the OECD (2019). The data sets for all the variables are obtained in monthly observations, beginning from the first month of 1995 to the third month of 2018.

3.2 Methodology
3.2.1 Theoretical framework. The earliest theoretical model focusing on the importance of consumer confidence can be found in the pioneering study of Hall (1978). The study by Hall (1978) explained that assuming the consumers behave as per the postulate of the Permanent Income Hypothesis, the household expectations in the $(t + 1)$th time is impacted by the behavior of the economy and consumer expenditure of the tth time. Based on the random walk theory following Hall (1978), the theoretical framework of the current model is explained in Equation (1):

$$U(\text{CC}) = \text{Exp}_t \sum_{t=0}^{\infty} (1 + \alpha)^{-t} U(\text{CC}_t) \tag{1}$$

CC denotes the levels of consumer expectation, α is the discount factor, Exp denotes the expected function of information content. Following the study by Katona (1975), this study proposes how policy uncertainty, share market upheaval and financial stress affect consumers' confidence see Equation (2) for empirical investigation:

$$\text{CCI}_{t+1} = \beta_0 + \beta_1 \, \text{GU}_t + \beta_2 \, X_t + u_t \tag{2}$$

where CCI_{t+1} represents the consumer confidence index, GU_t is the overall uncertainty measure and X_t represent the control variables and u_t is the usual error term. β_i = parameters of the model; $i-1, 2$. The impact on CCI by the explanatory variables comes with a time lag. An increase in GU will lead to a glum future thereby reducing CCI, a high value of FS implies macroeconomic stress this will also negatively impact CCI and further higher S implies high volatility of the economy which will dampen the CCI.

3.2.2 Econometric specification. 3.2.2.1 Unit root tests. Before application of any time series method, it is essential to find out whether the set of observations is stationary or not, it would be counterfeit to obtain the results, with a time series of observations that are non-stationary. To explore the stationary properties of the time series, the unit root test of augmented Dickey–Fuller unit root test (ADF test), (1979) and the Phillips–Perron unit root test (PP), Phillips, and Perron (1988) is used here.

However, the difficulty with the ADF and PP test methods is with the basic presumption of the linearity in the time series. Usually, due to economic emergencies and policy shifts, the structural change takes place in many time series. The importance of examination of structural breaks is essential for Japan because it has gone through peculiar economic circumstances. In this paper (Clemente *et al.*, 1998), the unit root with structural breaks is used. The null hypothesis of Clemente *et al.* (1998) unit root test can be found in Equation (3):

$$H0: \ y_t = y_{t-1} + \delta_1 DTB_{1t} + \delta_2 DTB_{2t} + \varepsilon_t \tag{3}$$

The alternative hypothesis are in equation (4)

$$H1: \ y_t = \varepsilon + d_1 DU_{1t} + d_2 DTB_{2t} + e_t \tag{4}$$

Here DTB_{it} is a pulse variable it has the value of 1 when $t = TB_i + 1$ $(i = 1, 2)$ and 0 or else. Again $DU_{it} = 1$ when $t > TB_i$ $(i = 1, 2)$ and it is 0 or else.

After determining the stationary properties of the time series, the next task is to see the long-run cointegrating relation of the variables. The study applies the NARDL (Non-Linear Autoregressive Distributed Lag Model) method to examine the long-run relationship among the variables.

3.2.3 NARDL method of cointegration. The Nonlinear Auto-Regressive Distributed Lag Model (NARDL) proposed by Shin *et al.* (2014) is applied in this study to examine the scope of the passthrough of overall policy uncertainty (GU) into consumer confidence index over the long-run and short-run. A model for the long-run asymmetric cointegration is shown in Equation (5)

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t \tag{5}$$

where y_t, is the dependent variable and x_t is the regular set of the independent, explanatory variables. The variable x_t is additionally divided into the partial sums of the negative and positive alterations in the explanatory variables in Equation (6):

$$x_t = x_0 + x_t^+ + x_t^- \tag{6}$$

where x_t^+ and x_t^- are partial sum series that can be assessed with the help of Equations (7) and (8):

$$x_t^+ = \sum_{j=1}^{t} \Delta x_j^+ = \sum_{j=1}^{t} \max\left(\Delta x_j^+, 0\right) \tag{7}$$

$$x_t^- = \sum_{j=1}^{t} \Delta x_j^- = \sum_{j=1}^{t} \min\left(\Delta x_j^-, 0\right) \tag{8}$$

Executing, the process of Shin *et al.* (2014), Equation (5) can be converted to an asymmetric error correction model (AECM). The NARDL (p, q) equation can be explained as:

$$\Delta y_t = \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1}^- + \sum_{j=1}^{p} \varphi_j \Delta y_{t-j} + \sum_{j=0}^{q}\left(\pi_j^+ \Delta x_{t-j}^+ + \pi_j^- \Delta x_{j-t}^-\right) + \varepsilon_t \quad (9)$$

Equation (8) can be calculated using OLS and the occurrence of the cointegrating relationship can be found by testing the joint null hypothesis test ($\rho = \theta^+ = \theta^- = 0$). The asymmetric relation can be verified by making comparisons of the coefficients θ^+ and θ^-. If the value of the coefficients is dissimilar, then the positive and negative changes of the independent variable would impact the dependent variable in a diverse way. The dissimilarity between θ^+ and θ^- can be assessed for the null hypothesis $\theta^+ = \theta^-$ in a Wald test. If the null hypothesis is overruled, it would sanction the existence of the nonlinear relationship in the long run.

The NARDL methodology has certain advantages which make the application suitable for evaluating the asymmetric repercussions of uncertainty. The study by Shin *et al.* (2014) explained that the problems with the earlier estimation procedures were associated with the selection of the threshold variables.

4. Results

4.1 Preliminary observations
Table 1 reports the basic characteristics of the observations, the mean of CCI is 99.5 while the SD is 1.19. The variable S has a high SD of 19.14. Table 2 presents the results of the correlation matrix. The results of the correlation matrix show that the consumer confidence index is negatively correlated with the overall uncertainty index and financial stress index. Since no substantial inference can be made based on the results of the correlation matrix, the subsequent subsection discusses the results based on the econometric model.

4.2 Results based on the econometric model
4.2.1 Unit root tests. To obtain the stationarity of the series, the augmented Dickey-Fuller unit root test (ADF test) (Dickey and Fuller, 1979) and the Phillips–Perron unit root test (PP) (Phillips and Perron, 1988) are performed (Table 3). Since none of the variables is of I(2), the

Variables	Mean	SD	Maximum	Minimum
CCI	99.5	1.19	101.83	95.83
GU	0.02	1.01	3.64	−1.68
FS	0.05	1.69	8.55	−2.19
S	80.85	19.14	120.80	47.05

Table 1.
Descriptive statistics

Note(s): Compilation Author

Variables	CCI	GU	FS	S
CCI	1.000	−0.39	−0.31	0.23
GU	−0.39	1.000	−0.26	0.04
FS	−0.31	−0.26	1.000	−0.018
S	0.23	0.04	−0.018	1.000

Table 2.
Correlation matrix

Note(s): Compilation Authors

NARDL bound test methodology is applied. Table 4 explains the Clemente *et al.* (1998) unit root test encompassing the structural breaks. Since none of the variables is of order I(2), we estimate the NARDL model for testing the long-run cointegrating relation of the variables.

4.2.2 Cointegration: bound tests. Table 5 provides the *F*-statistics tests for the linear and nonlinear cointegration relations, respectively, found in Panel A and B. The estimated *F*-statistics decline (do not decline) to discard the null hypothesis of no cointegration relationship if the statistics are smaller (larger) than the lower(upper) critical values. If the statistics fall within lower and upper critical values the results become indecisive.

	ADF test statistic	Results	PP test statistic	Results
Variables at level				
CCI	−1.44	Nonstationary	−9.02	Non-stationary
GU	−6.28	Stationary I(0)	−9.23	Non-stationary
FS	−8.04	Stationary I(0)	−49.77	Stationary I(0)
S	−1.23	Nonstationary	−8.36	Non-stationary
Variables in the first differenced form				
ΔCCI	−4.61	Stationary I(1)	−51.59	Stationary (1)
ΔGU	−0.34	Nonstationary	−273.01	Stationary (1)
ΔFS	−2.82	Nonstationary	−1.03	Non stationary
ΔS	−12.82	Stationary I(1)	−218.76	Stationary (1)
Critical values	1% − 4.12		1% − 19.13	
	5% − 3.48		5% − 13.40	
	10% − 3.17		10% − 10.77	
Source(s): Compilation: Author				

Table 3.
Unit Root Test: ADF and Phillips Perron (PP) and DF-GLS test

Variables	*t* statistics	TB1	TB2	Result
Innovation outlier (IO)				
CCI	−4.64	September, 2003	December, 2007	
ΔCCI	−6.29	December, 2006	October, 2008	I(1)
GU	−4.60	April, 2007	April, 2008	
ΔGU	−6.79	February, 1997	December, 2002	I(1)
FS	−6.65	September, 1997	November, 1999	I(0)
ΔFS	−2.18	December, 1997	December, 2000	
S	−3.73	September, 2007	October, 2009	
ΔS	−7.14	December, 2007	September, 2008	I(1)
Additive outlier (AO)				
CCI	−4.24	September, 2004	September, 2008	
ΔCCI	−6.48	April, 2007	October, 2008	I(1)
GU	−4.48	January, 2000	December, 2007	
ΔGU	−6.07	January, 2000	November, 2008	I(1)
FS	−8.07	August, 1997	September, 1999	I(0)
ΔFS	−3.40	April, 2007	October, 2009	
S	−3.40	October, 1997	November, 2007	
ΔS	−8.34	September, 1997	November, 2000	I(1)

Note(s): Clemente–Montanes–Reyes unit root test, critical value for (structural breaks), for AO and IO, respectively is −5.960 and −5.490 at 5% level of significance. * shows that the values are significant at (5) % level of significance. TB1 and TB2 shows the first and second breakpoint respectively. Δ shows the variables in their first difference
Source(s): Compilation Author

Table 4.
Clemente–Montanes–Reyes unit root test with two structural breaks

The *F*-statistics shown in Panel A of Table 5 explain that no cointegrating relationship exists among the variables. Further, on examining the asymmetric impact based on the nonlinear ARDL, the results indicate that nonlinear cointegrating (long-run) relation exist between consumer confidence index, overall uncertainty index, financial stress index and stock price index for Japan, evident from *F*-statistics Panel B of Table 5.

4.2.3 NARDL: Results. We explore the short-run dynamics and the long-run changes in the relation of the dependent variable with the explanatory variables alongside the positive and negative transformations. Based on the results of Table 6 we find that in the short-run GU has a significant impact on CCI, further FS also impacts CCI significantly. A 10% rise in GU leads to the dampening of CCI by 123% again a 10% fall in GU leads to the boosting of CCI by 80%.

Table 7 presents the long-run results based on the NARDL model. The most notable feature of the outcome of the empirical estimation is the differentness in response of consumer confidence to a positive change in global policy uncertainty (GU) vis-à-vis the response to a negative change in GU. A 10% rise in GU in the long run dampens the confidence of the consumers by 39%, as against a 10% fall in GU boosts the confidence of the consumers by 4%.

It is clear from the results of Table 7 that policy uncertainty shocks are an important source of deviation in consumer confidence. The relationship between GU and CCI demonstrates that changes in confidence levels are almost exclusively pushed by shocks emanating from policy uncertainty. Overall, this finding confirms Hypothesis 1. This mechanism is also confirmed in the research by Nowzohour and Stracca (2020), Vanlaer *et al.* (2020) and Bahmani-Oskooee and Mohammadian (2021a).

According to our model, the shocks stemming from share prices and financial stress also impacts consumer confidence asymmetrically. The results reflect that the news from shocks provide better knowledge to consumers irrespective of their beliefs and accordingly the consumers respond in heterogeneity to positive and negative changes. A rise by 10% in FS dampens the confidence of the consumers by 8%, similarly, a fall in the FS by 10% enhances consumers' confidence by about 5% (Table 7). Further, a 10% rise in S dampens consumer confidence by 6% whereas a fall in S raises the confidence levels by 4.8%. Such findings are consistent with the earlier studies in the literature (De Mendonça and Almeida, 2019).

Broadly speaking there are three ways to interpret our NARDL results. First, an upward movement in GU corresponds to an unanticipated policy uncertainty shock which worsens consumer confidence by impacting indirectly consumers expectations. Second, an upward movement in GU captures the bad news which is not fully captured in other variables, this triggers a harmful effect on the confidence of consumers. The impact of the harm of bad news

Panel A *F*-test for ARDL models			Panel B *F*-test results for the NARDL models		
Cointegration hypotheses	*F*-stat	Result	Cointegration hypotheses	*F*-stat	Result
F(CCI/ GU,FS,S)	2.10	No cointegration	F(CCI/GU$^+$, GU$^-$, FS$^+$, FS$^-$, S$^+$, S$^-$)	7.07	Cointegration
F(GU/ CCI,FS,S)	2.84		F(GU/CCI$^+$, CCI$^-$, FS$^+$, FS$^-$, S$^+$, S$^-$)	5.58	
F(FS/ CCI,GU,S)	1.67		F(FS/CCI$^+$, CCI$^-$, GU$^+$, GU$^-$, S$^+$, S$^-$)	2.86	No cointegration
F(S/ CCI,GU,FS)	0.83		F(S/CCI$^+$, CCI$^-$, FS$^+$, FS$^-$, GU$^+$, GU$^-$)	2.71	

Note(s): The critical values of ARDL model (Panel A) at 1% and 5% level respectively is 4.29–5.61 and 3.23–4.35 respectively. For Panel B the critical values for the NARDL model for 5% and 1% is 2.45–3.61 and 3.15–4.43 respectively

Table 5.
Bounds test results

Dependent variable ΔCCI_{t+1}
Short run estimation

Variables	Coefficient	t-statistic	Prob
Constant	−0.93	−12.0	0.00
CCI_{t+1}	−0.007	−3.85	0.00
GU_{t-1}^{+}	−1.23	−4.82	0.041
GU_{t-1}^{-}	−0.80	−2.98	0.009
FS_{t-1}^{+}	−1.33	−3.10	0.0092
FSI_{t-1}^{-}	−5.98	−5.49	0.0013
S_{t-1}^{+}	−0.076	−3.52	0.003
S_{t-1}^{-}	0.22	2.14	0.04
ΔGU_{t}^{+}	−0.55	−6.42	0.00
ΔGU_{t-1}^{+}	−0.32	−2.40	0.02
ΔGU_{t}^{-}	−0.31	−5.36	0.007
ΔGU_{t-1}^{-}	−3.95	−3.21	0.005
ΔFS_{t}^{+}	−0.76	−3.52	0.003
ΔF_{t}^{-}	−0.32	−2.40	0.02
ΔS_{t}^{+}	0.01	4.38	0.0012
ΔS_{t-1}^{-}	0.06	3.71	0.0045
DUMMY[1999]	0.21	6.21	0.002
DUMMY[2007]	0.003	3.21	0.02

Note(s): J–B denotes the Jarque–Bera test statistic for normality, LM(.) is the LM test for autocorrelation for lag order shown in the parenthesis and ARCH(.) is the test for autoregressive conditional heteroscedasticity, upto the lag order shown in the parenthesis. (*) denotes statistical significance to 5% level. DUMMY[1999] and DUMMY[2007] are the dummy variables

Table 6.
Nonlinear ARDL
estimation results

Panel A: Long run coefficients

Variables	Coefficient	p-value
Constant	−0.86*	0.01
GU^{+}	−0.39*	0.024
GU^{-}	−0.040*	0.00
FS^{+}	−0.08*	0.02
FS^{-}	−0.051*	0.00
S	−0.06*	0.01
S^{-}	0.048*	0.00

Symmetry results Wald tests

Long-run symmetry Wald statistics		The characteristic of the relationship	Short-run symmetry Wald statistics		The characteristic of the relationship
$W_{LR,GU}$	4.78 (0.002)	Asymmetry	$W_{SR,GU}$	5.55 (0.001)	Asymmetry
$W_{LR,FS}$	12.78 (0.004)		$W_{SR,FS}$	2.3 (0.12)	No asymmetry
$W_{LR,S}$	6.18 (0.001)		$W_{SR,S}$	7.18 (0.001)	Asymmetry

Note(s): $W_{LR,GU}$, $W_{LR,FS}$ and $W_{LR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the long run for the respective variables, similarly $W_{SR,GU}$, $W_{SR,FS}$ and $W_{SR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the short run for the respective explanatory variables
Source(s): Compilation: Author

Table 7.
Long-run relations and
symmetry results

is more severe than the good news emanating from downward movement in GU. Third, we see from the evidence of our empirical exercise that GU is an important propagating mechanism of uncertainty shocks which asymmetrically impacts consumer confidence. The asymmetry Wald Test (Table 7, Panel B) confirms the long-run asymmetric impact. The interesting behavior is the asymmetric response to the shocks. This finding is comparable to the recent discovery by Ozdemir *et al.* (2021) and Gholipour *et al.* (2021). The hypothesis H2 is confirmed.

5. Discussion
This study's findings suggest that only sound policy frameworks can positively influence consumer confidence, which, in turn, has favourable impact on the broad macroeconomic performance of the country. Consumer expectancies matter immensely as consumption is a significant component of major global economies. In the world's main economies, private consumption comprises at least half the country's GDP. In Japan, private consumption was about 55% of its nominal gross domestic product in 2019. Thus, a major downfall in consumer confidence because of the feeling of uncertainty of the economy will lead to economic decline. Our findings confirm the earlier studies by Ozdemir *et al.* (2021) and Gholipour *et al.* (2021).

Overall, we found that consumer confidence in households is substantially impacted by policy uncertainty. Lee *et al.* (2019) assessed consumer confidence and its related impact on expenditures and had similar findings. Heightened levels of uncertainty originating from policy decisions affect consumer confidence; however, asymmetries in impact matters. Similarly, Aye (2019) explored asymmetries in uncertainty and their overall impact on consumer confidence levels. These studies obtain a statistically significant impact of asymmetry on consumer confidence, which indirectly assesses consumers' spending patterns.

5.1 Robustness tests: main findings
To test model robustness, the dataset was split into two subperiods, one covering monthly observations from 1995 to 2000, and a set of 72 observations was chosen. This period is related to the time of the Asian financial crisis. The second subperiod covers the monthly observations from 2005 to 2011, and a set of 84 observations was chosen. The second period covered the global financial crisis. The results confirm long-run asymmetric relationships across the variables. These tables are reported in Appendix.

6. Conclusion and policy implications
This study, based on monthly observations covering the period from the first month of 1995 to the third month of 2018, explored the asymmetric influence of the overall policy uncertainty index generated through the principal component analysis based on the data sets developed (Arbatli *et al.*, 2017) on consumer confidence index in Japan, using the nonlinear methodology of ARDL, developed by Shin *et al.* (2014). The financial stress index and share price index were major control variables used in this study. Further, we have fragmented the period into subperiods while considering the Asian economic and global financial crises to study the robustness of the exercise. The study establishes the long-run cointegrating behavior among the observations based on the nonlinear ARDL model. Our results confirm asymmetric impact of the overall policy uncertainty index on the CCI in Japan. A 10% escalation in the overall policy uncertainty in the long-run diminishes the consumer confidence index by 39%. Similarly, a 10% decrease in the overall uncertainty index increases consumer confidence by 4%. The asymmetry Wald test parameter confirms the existence of asymmetric behavior in the consumer confidence index by the concerned set of the explanatory variables. The robustness tests confirm the existence of asymmetric behavior in the consumer price index by the overall

uncertainty index in conjunction with other control variables. Therefore, this study demonstrates how heightened uncertainty can affect outcomes related to consumer behavior. Our evidence and discussion suggest that credible policy prescriptions can favourably influence consumers in the Japanese context, which can indirectly foster macroeconomic performance. Analysis of the consumer confidence indicator has become increasingly useful because of its underlying co-movement with economic movements. Studies have extended the analysis of consumer behavior, which is not clearly obtained in the established data (Bergman and Worm 2020; Ozdemir *et al.* 2021). This study provides important insights into how consumers react to changes in indicators in their way of assessing market movements. Moreover, our results suggest that periods of the global financial crisis are important in impacting consumer confidence. Further research is needed for establishing the underlying mechanisms. We posit the importance of the global crisis in impacting consumer confidence levels. After periods of financial crisis, consumer confidence levels tend to fall, which may impact a country's long-term financial situation. The results suggest that confidence levels deteriorated owing to the impact of the crisis. However, households react differently to a positive shock vis-à-vis negative shock. When recovery gains momentum, household confidence boosts and has interesting implications for policy research. Our analysis, based on aggregate data, helped identify the undercurrent association between consumer confidence and uncertainty. Collecting micro-level data could enhance the scope of the analysis, particularly across countries. Follow-up research with high-frequency data can be used for testing the robustness of our findings.

Based on the empirical findings of this study, we can make subsequent policy propositions. Policymakers must take steps to reinforce institutions through which better levels of transparency and communication can be maintained. Public law, order, and management practices should be better guides on consumers' expectations and confidence. The evaluation shows that government policy decisions tend to significantly influence consumer confidence. Thus, policy planners should focus on the adoption of strategies inculcating credibility. In the Japanese context, credible policy plans include medium-term reforms in the trade and investment sectors, which would create investments related to trade. This would foster consumer confidence in the trajectory of Japanese macroeconomic policies. Future policy efforts in Japan should also be directed toward lessening uncertainty originating from monetary policy prescriptions. The Bank of Japan should periodically update its communication framework so that there is transparency that boosts consumer expectations and confidence levels. This study's results expand the scope of investors' decision-making as it provides an in-depth understanding of the drivers of consumers' confidence in the economy of Japan. This relates to greater level of understanding of consumers' saving consumption plans. Such explorations can be crucial in developing incentives to raise the level of consumers' expectations in matters related to public policy. For policy analysts, there appears to be a prospect to draw policies competent in utilising the relationship between policy uncertainty and stock market situation and its association with consumer confidence. Provided that consumer confidence is a major driver of the real economy, steps should be taken to enhance consumer confidence levels in Japan. Such policy initiatives include education, awareness, and empowerment. If such measures are taken, levels of consumers' confidence and of well-being will increase. These steps would lessen the adversative implications of uncertainty. This would allow consumers to plan for expenditures while focusing on the long-run expectations of employment and income opportunities.

Future research could explore the impact of uncertainties on consumer expectations by considering the heterogeneity of age, income, and educational background. Another direction for future research could be the use of high-frequency data on mixed sampling, which would provide significant insights into the heterogeneity of consumer behavior. Further research could also analyse how uncertainty in the stock market represented by volatility has spill over in the formation of consumer expectations.

Note

1. The datasets available at the public repository.

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Appendix

Panel A: Long-run coefficients		
Variables	Coefficient	*p*-value
Constant	−0.16*	0.01
GU$^+$	−0.059*	0.02
GU$^-$	−0.30*	0.00
FS$^+$	−0.18*	0.03
FS$^-$	−0.21*	0.005
S	−0.16*	0.00
S$^-$	0.44*	0.00

Symmetry results Wald tests				
Long-run symmetry Wald statistics		The characteristic of the relationship	Short-run symmetry Wald statistics		The characteristic of the relationship
$W_{LR,GU}$	14.08 (0.00)	Asymmetry	$W_{SR,GU}$	15.25 (0.00)	Asymmetry
$W_{LR,FS}$	10.28 (0.002)		$W_{SR,FS}$	12.3 (0.001)	
$W_{LR,S}$	16.18 (0.00)		$W_{SR,S}$	8.18 (0.00)	

Table A1.
Long-run relations and symmetry results. Monthly observations from 1995 to 2000

Note(s): $W_{LR,GU}$, $W_{LR,FS}$ and $W_{LR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the long run for the respective variables, similarly $W_{SR,GU}$, $W_{SR,FS}$ and $W_{SR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the short run for the respective explanatory variables
Source(s): Compilation Author

Panel A: Long-run coefficients		
Variables	Coefficient	*p*-value
Constant	−0.36*	0.01
GU$^+$	−1.79*	0.02
GU$^-$	−0.309*	0.00
FS$^+$	−0.77*	0.03
FS$^-$	−0.46*	0.005
S	−0.64*	0.00
S$^-$	0.89*	0.00

Symmetry results Wald tests				
Long-run symmetry Wald statistics		The characteristic of the relationship	Short-run symmetry Wald statistics		The characteristic of the relationship
$W_{LR,GU}$	6.08 (0.002)	Asymmetry	$W_{SR,GU}$	6.7 (0.004)	Asymmetry
$W_{LR,FS}$	24.28 (0.0024)		$W_{SR,FS}$	4.3 (0.001)	
$W_{LR,S}$	14.12 (0.00)		$W_{SR,S}$	19.42 (0.00)	

Table A2.
Long-run relations and symmetry results. Monthly observations from 2005 to 2011

Note(s): $W_{LR,GU}$, $W_{LR,FS}$ and $W_{LR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the long run for the respective variables, similarly $W_{SR,GU}$, $W_{SR,FS}$ and $W_{SR,S}$ refer to the Wald test (Null Hypothesis) of asymmetry for the short run for the respective explanatory variables
Source(s): Compilation Author

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