

Consumer Confidence under Economic Crises: Empirical Analysis across Regions and Countries

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Abstract

This paper differentiates the impact of five economic crises on consumer confidence with OECD monthly data. There exhibits an amplified confidence response to contemporaneous changes in industrial production in advanced country groups but the link is lagged by six months in China. The role for the inflation and long-term interest rate is overall absent, indicating limits for monetary policy. S&P 500 returns increase confidence, whereas the VIX shows minimal effects. Two distinct relations for the nominal effective exchange rate are observed through changes in purchasing power in advanced economies and trade-related dynamics in China. The EMS Crisis dampens confidence in most subsamples but strengthens the Chinese counterpart. The Asian Crisis intensifies the downward shift in Japanese and Chinese confidence, while the Dotcom Bubble Burst enhances confidence in most subsamples. Consumer confidence fluctuates in both directions in 2008-2009 except for China. A higher volatility but a lower mean in Covid-19 confidence movements suggest a steady improvement in household resilience over the past decade.

Key Words: Consumer confidence, economic crisis, OECD, euro area, business cycle, resilience

1. Introduction

This paper attempts to differentiate the impact of five economic crises having occurred since the early 1990s on consumer confidence across key regions and countries. In the empirical investigation based on the Organization of Economic Cooperation and Development (OECD) dataset, focus is placed on representative groups of countries as well as affected advanced and emerging economies. Five significant economic crises are examined: the 1992-1993 European Monetary System (EMS) Crisis, 1997-1998 Asian Crisis, 2000-2002 Dotcom Bubble Burst, 2008-2009 Global Financial Crisis (GFC), and 2020-2021 Covid-19 Crisis.

The reshaping of world geopolitics in the end of the 1980s has contributed to a continual increase in international mobility and openness across goods, factor, and financial markets at both regional and global levels over the past three decades. In parallel, individual and regional economies have been exposed to more frequent and larger-scaled economic crises under intensified economic integration. One of the most important implications for policymakers under ongoing regionalization and globalization in the past three decades resides in a greater sensitivity of private sectors to external shocks, which makes policy implementation more complex. This paper intends to examine how consumer confidence, which constitutes a crucial determinant for aggregate household demand, has responded to the fore mentioned economic crises besides standard micro and macro determinants. The empirical findings serve to shed light on actual signals from dynamics in consumer confidence and associated government actions aiming to stimulate aggregate consumption in times of crisis.

In existing literature, attention has been paid to the direct link between consumer confidence and consumption spending. Their findings, however, appear mixed. Cotsomitis and Kwan (2006) adopt two harmonized confidence-based measures from the European Commission Business and Consumers Surveys and assess their ability to forecast household spending. Echoing previous single-country empirical studies such as Carroll, Fuhrer, and Wilcox (1994) who examine the explanatory power of the Index of Consumer Sentiment (ICS) published by the University of Michigan for household expenditure in the US, Cotsomitis and Kwan (2006) find significant variability in in-sample predictability of both consumer confidence and economic sentiment indicators in the multi-country context and limited performance of the two measures in out-of-sample forecast for household spending. Beyond the US, Acemoglu and Scott (1994) and Delorme, Kamerschen, and Voeks (2001) examine the British data and substantiate the predictive ability of consumer confidence for future consumption expenditure in the UK. In contrast, Fan and Wong (1998) observe little or no predictability of consumer confidence for household spending in Hong Kong. In a similar fashion, the consumer confidence measure fails to consistently explain consumer spending at the regional level in Kwan and Cotsomitis (2006) who analyze national and regional data in Canada.

Nguyen and Claus (2013) highlight asymmetry inherent in the relation between consumer confidence and spending decision in response to good news and bad news. Lahiri, Monokroussos, and Zhao (2016) additionally incorporate real-time monthly data in empirical investigation of the effect of consumer confidence on real personal consumption expenditure (PCE) and confirm the crucial role of confidence surveys in improving forecast accuracy in terms of consumption of services. The authors also observe that the consumer sentiment has effectively influenced consumption of durable goods, non-durable goods, and services over the 2008-2009 recession.

Beyond the implication of consumer confidence for future household expenditure, Howrey (2001) emphasizes that the timing advantage of the standard measures of consumer confidence highlights their key role in monitoring the economy in real time and designing dynamically appropriate policy actions. Hori and Kawagoe (2013) advance the aggregate-data-based empirical model proposed by Carroll (2003) and examine household inflation expectations with micro-based data from the Monthly Consumer Confidence Survey Covering All of Japan. They find that Japanese households tend to form upward biased inflation expectations without instantaneously incorporating publicly available forecast information, which in part echoes the sticky information model proposed by Mankiw and Reis (2002) arguing that economic agents are more likely to choose to update expectations less frequently in the presence of any cost incurred from information collection and process.

In more recent research, key factors behind consumer confidence have been deepened. Barsky and Sims (2012), for instance, decompose changes in consumer confidence into three major shock components: Keynesian animal spirits, news about exogenous future productivity, and purely noisy information. By studying the data from the Michigan Survey of Consumers, the authors substantiate that news-driven innovations in consumer confidence, mainly characterized by idiosyncratic changes in expected productivity growth over a relatively long horizon, play a central role in the observed relation between consumer confidence and future economic activity. Animal spirits, by contrast, exert a limited impact. Starr (2012) instead concludes that a substantial part of variations in consumer confidence is caused by non-fundamental shocks. Lachowska (2016) revisits the issue addressed in Barsky and Sims (2012) by using daily G1K data from the Gallup Survey and identifies alternative shocks to consumer confidence: autonomous fluctuations in the consumer's optimism, information on economic fundamentals, and exogenous economic news. The author observes a weak link between daily consumer confidence and daily spending and interprets the finding as a support to the evidence for the consumer's rational inattentiveness and unresponsiveness to small and temporary fluctuations in consumer confidence. Gagnon and Gimet (2019) look at how unconventional economic policies illustrated by the quantitative easing (QE), credit easing (CE), budget easing, and budget consolidation influence sentiment and confidence indicators represented by the number of initial public offering (IPO), stock market volatility premium, stock market turnover, and OECD consumer confidence index. The authors demonstrate that international policy spillovers change in the same direction as domestic policy effects with good news that reduce uncertainty about future economic growth. In particular, the consumer confidence which includes responses to both news and animal spirits acts as, in times of crisis, a more important signal for policymakers than the investor sentiment which consists only in pure psychological reactions. Kirchner (2020) investigates how consumer and business confidence respond to five alternative changes in the Australian central bank's policy rates: the actual change in the official cash rate target, two measures for expected future changes proxied by the spread in terms of forward overnight index swap rates, unexpected change based on the swap rate in the previous month, and change in the short-term interest rate represented by the 90-day bank-accepted bill rate. Both expected and unexpected rises in the policy rate exercise a negative impact on consumer sentiment whereas business confidence falls with a rise in the short-term interest rate.

Under increasingly frequent economic turmoil regionwide and worldwide, advanced studies in the connection between consumer confidence and economic crises emerged in the 2010s. Burns, Peters, and Slovic (2012) implement a nation-wide longitudinal survey to capture the respondent's trajectory of the risk perception related with major economic decisions, negative emotion, confidence in crisis management competence of policymakers and industry leaders, and belief in the ability to achieve personal goals over the Global Financial Crisis between September 2008 and October 2009. They find that risk perception appears to fall most rapidly. While negative emotion and subjective belief in one's ability to lean against the crisis act as predictive signals for increased risk, the confidence in national leaders seems unrelated to the perceived risk. The combination of individual characteristics and political attitude also makes overall risk perception heterogeneous in times of economic crisis, which echoes Souleles (2004) who emphasizes that households respond to aggregate shocks differently in terms of demographic characteristics and therefore calls for more cautious risk management approaches by policymakers with reference to sentiment-related information.

The purpose of this paper is to advance previous studies with a systematic analysis of consumer confidence in representative economies and groups of countries under five major economic crises over the past three decades. The remainder of the paper is structured as follows. Section 2 explicates our data and methodology to be employed for empirical investigation. Section 3 presents key findings and implications. Section 4 concludes.

2. Data and Methodology

To better examine the linkage between consumer confidence and economic crises, the monthly consumer confidence index (CCI) is adopted. The data source is the OECD, which collects the CCI for major global economic organizations, OECD members countries, and a small number of non-OECD countries. As the 1992-1993 EMS Crisis is the earliest economic crisis included in our target sample period between January 1991 and December 2022, we screen from the OECD dataset three groups of countries and four individual economies where CCI data are available as of January 1990 for calculation of year-on-year percentage changes. The three country groups are the OECD covering 38 countries, the G7, and the euro area that includes 19 countries by the end of 2022 (denoted as Euro-19 hereafter). The four economies are two OECD members, the US and Japan as representative advanced economies, and two non-OECD countries, China and South Africa as representative emerging economies. It is noted that around one-third of the OECD countries and Euro-19 members are emerging economies. The seven subsamples hence provide a balanced view of the spectrum in the world economy.

Table 1 summarizes descriptive statistics of five monthly variables to be analyzed in the subsequent empirical study of the above-mentioned seven subsamples: the consumer confidence index, industrial production index, headline consumer price index (CPI) inflation, long-term interest rate, and nominal effective exchange rate. The OECD consumer confidence index is set at 100 for the long-term average. A higher-than-100 value and a lower-than-100 one respectively implies the consumer's relative optimism and pessimism. The industrial production index serves as the key business cycle indicator and covers manufacturing and construction sectors with 2015 as the base year for the three country groups, the US, and Japan. Constrained to data availability, the index for the manufacturing sector is employed in the South Africa subsample, whereas the composite leading indicator (CLI) substitutes the industrial production index in the China subsample. However, the Chinese CLI is accessible only as of May 1992. The values prior to the first available month are then retrieved by deflating normalized monthly GDP reference series from the OECD dataset. The headline CPI inflation is the year-on-year percentage change in the monthly CPI with 2015 as the base year. The long-term interest rate refers to the annual yield on ten-year government bonds and applies for the subsample of the euro area, the US, Japan, and South Africa. For lack of region-wide interest-rate data, long-term interest rates for the OECD and G7 are proxied by the average rate in Euro-19 and US subsamples and the average rate in US and Japan subsamples. The discount rate set by China's central bank is adopted in the China subsample. The nominal effective exchange rate is expressed in the indirect quote with the national currency as the base currency. The data source is the International Financial Statistics (IFS) published by the International Monetary Fund (IMF). For the OECD and G7, the US dollar index published by the Intercontinental Exchange (ICE) is chosen as the proxy for the nominal effective exchange rate. Standard deviations for the five monthly variables in Table 1 appear overall higher in the two emerging economies than other subsamples except for the industrial production index. More specifically, China exhibits most volatile CPI inflation while South Africa has the most unstable nominal effective exchange rate. It is worth remarking that standard deviations in Japanese consumer confidence and inflation seem to be relatively small, which in part reflects persistent stagnation in Japan's economy since the burst of bubbles in the early 1990s.

For the monthly time series reported in Table 1, the null hypothesis of non-stationarity cannot be rejected by the Dickey-Fuller augmented unit-root test. The five variables are hence taken in the percentage change or first difference. Table 2 recapitulates descriptive statistics of these transformed variables, which all appear stationary by the unit-root and are denoted by CCI, IPI, INF, LIR, and NER. The statistics overall echo those in Table 1 across all subsamples. Table 3 lists descriptive statistics for two global financial market variables: the end-of-month S&P 500 Index with the associated year-on-year percentage return denoted by SP500 and end-of-month Chicago Board Options Exchange (CBOE) Volatility Index denoted by VIX.

This research selects five significant economic crises that have impacted individual, regional, and global economies to a different extent over the past three decades. Following Eichengreen and Naef (2022), the 1992-1993 EMS Crisis is specified for the period between June 1992 and August 1993 over which Denmark rejected the Maastricht Treaty by referendum in the starting month while the exchange rate mechanism (ERM) for the EMS was broadened from 2.25% to 15% in the ending month. For the 1997-1998 Asian Crisis where Indonesia, Malaysia, the Philippines, and Thailand were particularly exposed to international speculative attacks, the sample period begins in July 1997 and ends in July 1998, which covers the pre-crisis, crisis, and post-crisis windows in Forbes (2004) and Hegde and Paliwal (2011). The 2000-2002 Dotcom Bubble Burst is defined by the Nasdaq Composite Index, which reached the peak in March 2000 and the trough in October 2002. The 2008-2009 Global Financial Crisis (GFC) covers the sample period starting in September 2008 where Lehman Brothers filed for bankruptcy and ending in September 2009 as specified in Chang, Wang, and Chang (2023). As to the most recent 2020-2021 Covid-19 Crisis, the sample period follows Panda and Deb (2023) who specify the crisis from January 2020 to November 2021.

Table 4 highlights, over each of the five crisis periods, the specific descriptive statistics of the variable CCI, the monthly consumer confidence index expressed in the year-on-year percentage change. It is observed that not all subsamples show consecutive falls in CCI. During the 1992-1993 EMS Crisis, the American consumer confidence increases in some months whereas the Chinese consumer confidence continues to improve over the whole crisis period. Symmetrically, the Euro-19 consumer confidence continually rises over the 1997-1998 Asian Crisis while Japanese and Chinese consumers lose confidence in a row. The response of consumer confidence appears more heterogeneous in the next three crises, except for the Chinese subsample whose CCI are all negative over the 2008-2009 Global Financial Crisis.

Regression models to be employed for empirical investigation are specified as follows. Equation (1) is the baseline model and applied to each of the seven subsamples. The consumer confidence acts as the explained variable and is defined by CCI denoted in Table 2. The first four explanatory variables correspond to IPI, INF, LIR, and NER summarized in Table 2. The Global Financial Market variables include SP500 and VIX reported in Table 2. Finally, there are five Crisis Dummy variables defined by respective sample periods specified above. It is reminded that CCI, IPI, NER, and SP500 are measured by the year-on-year percentage change in the monthly consumer confidence index, industrial production index, nominal effective exchange rate, and end-of-month S&P 500 Index. INF and LIR are month-on-month change in the headline CPI inflation and long-term interest rate.

$$\begin{aligned} \text{Consumer Confidence}_t = & a_0 + a_1 \cdot \text{Industrial Production}_t + a_2 \cdot \text{Inflation}_t \\ & + \sum a_3 \cdot \text{Interest Rate}_t + \sum a_4 \cdot \text{Exchange Rate}_t \\ & + \sum a_5 \cdot \text{Global Financial Market}_t + \sum a_{6k} \cdot \text{Crisis Dummy}_t + e_t \end{aligned} \quad (1)$$

Equations (2) and (3) extend Equation (1) by incorporating the lead-lag effect between consumer confidence and all independent variables except for crisis dummies. Equation (2) specifies three-month lags while Equation (3) sets six-month lags. The three equations are to be applied to Model (0), Model (3), and Model (6) in regression analysis and a best-fit model is to be proposed on the basis of estimation results from the three models.

$$\begin{aligned} \text{Consumer Confidence}_t = & a_0 + a_1 \cdot \text{Industrial Production}_{t-3} + a_2 \cdot \text{Inflation}_{t-3} \\ & + \sum a_3 \cdot \text{Interest Rate}_{t-3} + \sum a_4 \cdot \text{Exchange Rate}_{t-3} \\ & + \sum a_5 \cdot \text{Global Financial Market}_{t-3} + \sum a_{6k} \cdot \text{Crisis Dummy}_t + e_t \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Consumer Confidence}_t = & a_0 + a_1 \cdot \text{Industrial Production}_{t-6} + a_2 \cdot \text{Inflation}_{t-6} \\ & + \sum a_3 \cdot \text{Interest Rate}_{t-6} + \sum a_4 \cdot \text{Exchange Rate}_{t-6} \\ & + \sum a_5 \cdot \text{Global Financial Market}_{t-6} + \sum a_{6k} \cdot \text{Crisis Dummy}_t + e_t \end{aligned} \quad (3)$$

3. Empirical Findings

Preliminary correlation analysis is conducted prior to regression analysis. Table 5 reports correlation coefficients between the explained variable CCI and explanatory variables included in Equation (1) for the seven subsamples. The business cycle indicator, IIP, is strongly and positively correlated with CCI. The relation between CCI and INF is significant only in the OECD and G7. The stock market performance in terms of S&P 500 returns exerts a positive impact on CCI, whereas financial market volatility implied by VIX is negatively linked to CCI. Regarding the five economic crises, CCI responds across all subsamples only under the 2008-2009 Global Financial Crisis. It is worth remarking that the most recent Covid-19 Crisis, by Table 5, produces no significant impact on CCI in the euro area, Japan, and China. No potential collinearity problem is detected with analysis of correlations among explanatory variables. The estimation results in Model (0), Model (3), and Model (6) based on Equations (1), (2), and (3) and proposed best-fit model are summarized from Table 6 to Table 12 for the OECD, G7, Euro-19, the US, Japan, China, and South Africa. The adjusted R^2 is in average lower in the two emerging economies than in other subsamples, which suggests greater heterogeneity in economic structures and institutions for the two economies.

In the three country groups, Tables 6-8 indicate that *changes* in the contemporaneous business cycle indicator represented by the industrial production index, IPI in Model (0), have a positive effect on *changes* in consumer confidence at the 1% significance level. This dynamic causal relation can be translated into the one that directly associates the business cycle with consumer confidence. More specifically, a rise in industrial production unambiguously leads to an accelerated rise (fall) in consumer confidence as the consumer confidence index has increased (decreased) on an annual basis in the previous month. However, this amplification effect on the short-term trend in consumer confidence remains uncertain as the sign of the current-period change in industrial production is opposite to the sign of the previous-period change in consumer confidence. In Model (3), the marginal effect of the three-month lag of the change in industrial production, IPI(-3), is insignificant across the three subsamples. In Model (6), the sign for the six-month lag turns negative at a smaller level of significance in the OECD and G7. Overall, consumers in the three economic regions become less sensitive and possibly more confused to cyclical signals from a longer time horizon.

The dynamic link with consumer confidence is absent for contemporaneous changes in the headline CPI inflation by Model (0) and is mixed in sign for lagged changes by Model (3) and Model (6) for the three country groups. In the best-fit model, the three-month lag shows a very-close-to-zero positive coefficient in the OECD subsample. A significant negative connection with consumer confidence is found for changes in inflation in the current period, INF, in the G7, and those three months ago, INF(-3), in the euro area. The negative link suggests unambiguous intensification in short-term consumer confidence movement as the sign of the contemporaneous change in CPI inflation is opposite to the sign of the annual change in consumer confidence in the previous month. Our finding suggests a lagged effect of inflation on consumer confidence in the euro area.

The role for changes in the long-term interest rate and nominal effective exchange rate, LIR and NER, seems to be missing or marginal in most regression models from Table 6 to Table 8. One exception resides in the Euro-19 subsample where the appreciation (depreciation) in the euro dynamically strengthens the upward (downward) trend in consumer confidence as contemporaneous NER has the same sign as CCI in the previous month. The absent effect of LIR on CCI echoes Galariotis, Makrichoriti, and Spyrou (2018), who substantiate that the European Central Bank's conventional monetary policy has a positive impact on confidence in core countries but a weak effect in peripheral ones. Since the Euro-19 subsample is composed of both types of economies, our finding suggests that the positive interest-rate effect in core countries may be diluted regionwide. The stock market performance gauged by the S&P 500 returns overall shows a positive sign while the positive effect of VIX on consumer confidence appears minimal in all models for the OECD, G7, and Euro-19.

Regression analysis now turns to the two advanced economies, the US and Japan. By Tables 9 and 10, the dynamic positive effect of IPI, SP500, and VIX on CCI is similar to that in the three country groups. These results may serve as the benchmark relations for advanced countries at national and regional levels. A significant role for INF(-6) is present in both countries, which reflects relatively slow adjustment in consumer confidence to inflation signals at the national level. The dynamic effect of the long-term interest rate on consumer confidence is absent in the US but positive in Japan with a six-month lag. Similar to the Euro-19 subsample, CCI is sensitive to the contemporaneous change in the nominal effective exchange rate in the US, implying a dynamic external purchasing power effect on consumer confidence through changes in the value of the national/regional currency. A lagged effect is found in Japan by six months.

For the two emerging economies, China and South Africa, regression results recapitulated in Tables 11 and 12 are more mixed. While contemporaneous IPI is significant and shows a positive coefficient as in previous subsamples, a six-month lagged effect is observed in China, which is characterized by more complex cyclical patterns inherent in a large emerging economy. The link of consumer confidence with the inflation and long-term interest rate is missing in both countries, which in part results from relatively limited monetary policy tools for lack of a well-functioning financial system. It is worth noting that the dynamic relation between the nominal effective exchange rate and consumer confidence in China is opposite to the one observed in Japan. By Tables 10 and 11, both show a six-month lagged effect. But the sign for the NER coefficient turns negative. This implies that the Japanese consumer confidence is essentially responsive to changes in purchasing power caused by currency appreciation or depreciation, whereas the Chinese consumer confidence is mainly led by currency movements that change Chinese exports acting as a key driver in the Chinese economy. For instance, the negative sign for NER(-6) in Table 11 suggests that a decrease in NER reflected by the depreciation in the Chinese yuan against currencies of major trading partners and therefore an improvement in the trade balance will dynamically strengthen consumer confidence in six months as consumers continue to keep more optimistic. The S&P 500 return has a significant impact on consumer confidence in China but appears insignificant in South Africa, which implies deeper integration of Chinese stock market investors into the global scene.

The analysis of the five crisis dummies in combination with the descriptive statistics for changes in the consumer confidence index under these crises in Table 4 serves to differentiate shock responses across the seven subsamples and assess their evolution over time. On the basis of the regression results estimated by the best-fit model in each of the subsamples, the EMS Crisis significantly affects the euro area, Japan, and South Africa with a negative coefficient for the crisis dummy. As Table 4 indicates that consumer confidence all falls in the three subsamples during the EMS Crisis where both maximum and minimum values of CCI are below zero, a negative coefficient for the crisis dummy substantiates that consumer confidence is further dampened over the crisis period. It is interesting to remark a special case in China, whose CCI and estimated coefficient for the crisis dummy are positive. This suggests that the Chinese consumer confidence is further strengthened over the EMS Crisis in the early 1990s where alternative positive shocks that are not incorporated in our regression model may be present and offset the adverse effect of the EMS Crisis.

The 1997-1998 Asian Crisis essentially intensifies the downward shift in Japanese and Chinese consumer confidence with evidence from Tables 4, 10, and 11. The 2000-2002 Dotcom Bubble Burst creates a significantly positive impact on CCI in most subsamples with the exception of South Africa where the effect is at the 10% significance level only and the US where the link is absent. By Table 4, consumer confidence shows greater volatility gauged by the standard deviation in the Dotcom Bubble Burst than in the previous two crises in most economies except for China. Changes in Chinese consumer confidence are hence subject to more complex shock components in addition to the bubble burst *per se*.

In the 2008-2009 Global Financial Crisis, the crisis dummy shows a positive coefficient at the 1% significance level in all subsamples except for South Africa. By Table 4, consumer confidence continues to decrease in China but fluctuates substantially in other economies over the crisis period. The positive sign for the dummy coefficient in China may result from special government measures that serve to attenuate the overall magnitude of the negative shock effect on consumer confidence under an unprecedented crisis.

At last, standard deviations for changes in consumer confidence over the most recent Covid-19 Crisis are, as shown in Table 4, far above those in previous four crises across the subsamples except for the two advanced economies, the US and Japan. However, the average CCI value over the Covid-19 crisis period is far below that over the 2008-2009 counterpart. This seems to suggest a steady improvement in the household resilience against the economic crisis through dynamic adaptation as of the 2008-2009 Global Financial Crisis. It also explains in part an insignificant or weakly significant Covid-19 crisis dummy across most subsamples except for the US, where consumer confidence additionally falls during the crisis period.

Supplemental regressions are conducted to check for the robustness of our results. First, we adopt month-on-month rather than year-on-year ones for the variables CCI, IPI, NER, and SP500. Second, additional lagged effects are assessed with two-month, four-month, and five-month lags for non-dummy explanatory variables. Overall, major findings remain consistent with those discussed in this section.

4. Conclusion

This paper attempts to differentiate the impact of five economic crises having occurred since 1990s on consumer confidence across key regions and countries. In the empirical investigation based on the Organization of Economic Cooperation and Development (OECD) dataset, focus is placed on balanced subsamples including three country groups (OECD, G7, and the euro area), two OECD advanced economies (the US and Japan), and two non-OECD emerging economies (China and South Africa). The study begins in January 1991, ends in December 2022, and covers the 1992-1993 European Monetary System (EMS) Crisis, 1997-1998 Asian Crisis, 2000-2002 Dotcom Bubble Burst, 2008-2009 Global Financial Crisis, and 2020-2021 Covid-19 Crisis. Regression models adopt the year-on-year change in the monthly consumer confidence index (CCI) as the explained variable and include three categories of explanatory variables. The first is represented by changes in key monthly macroeconomic variables including the industrial production index, headline consumer price index inflation, long-term interest rate, and nominal effective exchange rate. The second selects two measures in global financial markets: the stock market performance in terms of the annual return on the S&P 500 Index and Chicago Board Options Exchange Volatility Index (VIX). The third specifies five dummies for the crises examined. Besides contemporaneous links with CCI, the lead-lag effect is analyzed with two regression models incorporating three-month and six-month lags for non-dummy variables and one best-fit regression model.

Major findings are as follows. First, consumer confidence in the three country groups, the US, and Japan dynamically responds to contemporaneous changes in the business cycle indicator proxied by industrial production. More specifically, there exists an amplification effect through which a rise in current industrial production unambiguously leads to an accelerated rise (fall) in CCI having increased (decreased) in the previous month. In contrast, the effect is lagged by six months in China, implying more complex cyclical patterns.

Second, a negative lagged effect of inflation on consumer confidence is found in the euro area and Japan, with slower adjustment in response to inflation signals at the national level. The role for the inflation and long-term interest rate is overall absent, suggesting limits for monetary policy in consumer confidence management. S&P 500 returns dynamically exert a positive effect on consumer confidence, whereas the effect of the VIX appears minimal.

Third, two distinct dynamic relations for the nominal effective exchange rate are observed. In the euro area, the US, Japan, and South Africa, a positive link implies that consumer confidence is sensitive to changes in purchasing power caused by currency appreciation or depreciation. In China, a negative link suggests that Chinese consumers respond to currency movements that lead to changes in exports acting as a key driver in the Chinese economy.

Fourth, the 1992-1993 EMS Crisis mainly affects the euro area, Japan, and South Africa where consumer confidence is further dampened. The Chinese CCI is instead strengthened over the crisis where alternative positive shocks are possible to offset its adverse effect.

The 1997-1998 Asian Crisis intensifies the downward shift in Japanese and Chinese consumer confidence, while the 2000-2002 Dotcom Bubble Burst enhances consumer confidence in most subsamples with the exception of South Africa and the US.

At last, consumer confidence fluctuates in both directions during the 2008-2009 Global Financial Crisis (GFC) except for China where a positive coefficient for the crisis dummymay in part result from special government measures that attenuate a continual drop in consumer confidence. A higher volatility but a lower mean in CCI movements over the Covid-19 Crisis than over the GFC suggests a steady improvement in the household resilience against the economic crisis through dynamic adaptation over the past decade.

This research remains limited in terms of subsamples covered and explanatory variables included in regression analysis. Future study is recommended to be extended to a larger number of subsamples, in particular those in emerging economies where consumer confidence data are available. Monthly or quarterly industry-level variables are also suggested to be incorporated in the regression model to shed light on specific roles for micro factors in consumer confidence beyond aggregate determinants.

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Table 1. Descriptive Statistics of Monthly Variables by Subsample

Subsample	OECD	G7	Euro-19	US	Japan	China	South Africa
1. Consumer Confidence Index: Long-Term Average = 100							
Mean	100.12	99.97	99.83	100.04	99.64	100.07	100.20
Standard Deviation	1.18	1.19	1.47	1.53	1.31	2.40	1.75
Maximum	102.35	102.06	102.44	102.88	102.17	104.87	104.23
Minimum	96.53	96.26	95.26	96.11	95.46	92.31	95.51
2. Industrial Production Index: Manufacturing and Construction Sectors with Base Year = 2015							
Mean	89.92	93.61	95.01	89.42	102.05	100.01	91.07
Standard Deviation	12.26	8.90	9.24	12.25	6.37	2.14	9.91
Maximum	107.64	106.10	110.59	103.21	119.47	105.18	109.89
Minimum	66.09	74.43	74.49	59.78	78.29	83.42	47.75
3. Year-on-Year Headline CPI Inflation (%): Base Year = 2015							
Mean	3.37	2.15	2.17	2.56	0.42	3.89	6.43
Standard Deviation	1.96	1.36	1.58	1.58	1.18	5.51	3.43
Maximum	10.69	7.84	10.60	9.06	4.00	27.70	16.59
Minimum	-0.59	-1.45	-0.60	-2.10	-2.50	-2.68	-2.00
4. Long-Term Interest Rate (%): Annual Yield on Ten-Year Government Bond							
Mean	4.18	2.87	4.24	4.13	1.62	4.47	10.95
Standard Deviation	2.26	1.69	2.72	1.90	1.60	2.50	3.02
Maximum	9.47	7.51	10.84	8.28	6.74	10.44	18.30
Minimum	0.40	0.31	-0.09	0.62	-0.28	2.70	6.90
5. Nominal Effective Exchange Rate							
Mean	91.63	91.63	94.56	108.20	84.22	103.65	117.51
Standard Deviation	10.17	10.17	11.99	12.62	11.17	15.94	55.88
Maximum	120.28	120.28	114.62	135.23	111.36	133.10	245.25
Minimum	71.80	71.80	64.34	76.80	52.86	73.83	50.77

Note. The data source is the OECD except for the nominal effective exchangerate obtained from the International Financial Statistics published by the International Monetary Fund. Due to data availability, the industrial production index in China and South Africa subsamples respectively adopts the composite leading indicator and the index for the manufacturing sector. The long-term interest rates for the OECD, G7, and China are proxied by the average rate in Euro-19 and US subsamples, average rate in US and Japan subsamples, and discount rate set by China's central bank. For the OECD and G7, the US dollar index published by the Intercontinental Exchange is chosen as the proxy for the nominal effective exchange rate.

Table 2. Descriptive Statistics of Changes in Monthly Variables by Subsample

Subsample	OECD	G7	Euro-19	US	Japan	China	South Africa
1. Year-on-Year Percentage Change in Consumer Confidence Index (CCI)							
Mean	-0.10%	-0.10%	-0.14%	-0.08%	-0.14%	-0.11%	-0.06%
Standard Deviation	1.09%	1.08%	1.60%	1.16%	1.41%	2.33%	1.70%
Maximum	2.65%	2.47%	3.86%	2.52%	3.55%	4.67%	5.12%
Minimum	-3.78%	-3.89%	-6.35%	-3.55%	-3.94%	-10.54%	-5.16%
2. Year-on-Year Percentage Change in Industrial Production Index (IPI)							
Mean	1.56%	1.01%	1.08%	1.67%	0.01%	0.05%	0.93%
Standard Deviation	4.36%	4.62%	5.38%	4.36%	7.22%	3.16%	8.11%
Maximum	24.33%	23.23%	41.47%	16.18%	27.32%	23.06%	102.30%
Minimum	-20.02%	-21.49%	-28.64%	-17.26%	-33.33%	-15.00%	-54.04%
3. Month-on-Month Change in Year-on-Year Headline CPI Inflation (INF)							
Mean	0.00%	0.00%	0.01%	0.00%	0.00%	-0.01%	-0.02%
Standard Deviation	0.27%	0.29%	0.28%	0.40%	0.35%	0.73%	0.62%
Maximum	1.07%	1.35%	1.50%	2.02%	1.80%	2.30%	1.82%
Minimum	-1.48%	-1.79%	-1.00%	-2.59%	-1.80%	-2.60%	-2.37%
4. Month-on-Month Change in Long-Term Interest Rate (LIR)							
Mean	-0.02%	-0.01%	-0.02%	-0.01%	-0.02%	-0.01%	-0.01%
Standard Deviation	0.19%	0.15%	0.20%	0.22%	0.14%	0.22%	0.39%
Maximum	0.69%	0.54%	0.76%	0.65%	0.51%	1.62%	1.92%
Minimum	-0.71%	-0.64%	-0.59%	-1.11%	-0.57%	-2.16%	-1.79%
5. Year-on-Year Percentage Change in Nominal Effective Exchange Rate (NER)							
Mean	0.83%	0.83%	1.77%	1.68%	1.90%	0.05%	-3.76%
Standard Deviation	8.18%	8.18%	6.31%	5.75%	10.71%	8.46%	11.50%
Maximum	22.81%	22.81%	18.69%	17.52%	38.86%	19.79%	33.34%
Minimum	-16.97%	-16.97%	-14.04%	-10.32%	-22.12%	-35.76%	-31.71%

Table 3. Descriptive Statistics of Global Financial Market Variables

	S&P 500 Index	Year-on-Year Return in S&P 500 Index (SP500)	CBOE Volatility Index (VIX)
Mean	1552.22	9.40%	19.66
Standard Deviation	997.07	16.04%	7.67
Maximum	4766.18	53.71%	59.89
Minimum	367.07	-44.76%	9.51

Table 4. Descriptive Statistics of Percentage Changes in Consumer Confidence Index under Economic Crisis by Subsample

Subsample	OECD	G7	Euro-19	US	Japan	China	South Africa
1. 1992-1993 European Monetary System (EMS) Crisis: 1992/06-1993/08							
Mean	-0.53%	-0.44%	-1.65%	0.63%	-1.20%	3.00%	-1.52%
Standard Deviation	0.29%	0.34%	0.46%	1.08%	0.45%	0.86%	0.83%
Maximum	-0.02%	0.18%	-0.82%	2.52%	-0.54%	3.97%	-0.09%
Minimum	-1.05%	-1.00%	-2.29%	-0.77%	-1.65%	1.53%	-2.95%
2. 1997-1998 Asian Crisis: 1997/07-1998/07							
Mean	0.56%	0.50%	1.27%	0.84%	-1.29%	-1.42%	-0.85%
Standard Deviation	0.29%	0.33%	0.18%	0.42%	0.44%	0.71%	0.30%
Maximum	0.85%	0.83%	1.47%	1.40%	-0.65%	-0.22%	-0.22%
Minimum	-0.11%	-0.24%	0.79%	-0.10%	-2.01%	-2.77%	-1.33%
3. 2000-2002 Dotcom Bubble Burst: 2000/03-2002/10							
Mean	-0.48%	-0.48%	-0.48%	-0.74%	-0.40%	0.66%	-0.30%
Standard Deviation	0.70%	0.79%	0.76%	1.10%	1.23%	0.58%	1.34%
Maximum	0.54%	0.57%	1.11%	0.53%	1.11%	1.47%	1.33%
Minimum	-1.63%	-1.87%	-1.29%	-2.64%	-2.65%	-0.16%	-3.49%
4. 2008-2009 Global Financial Crisis (GFC): 2008/09-2009/09							
Mean	-1.13%	-0.90%	-1.14%	-0.73%	-0.98%	-2.58%	-1.37%
Standard Deviation	1.78%	1.65%	1.82%	1.41%	2.41%	0.57%	1.94%
Maximum	1.50%	1.48%	2.02%	1.15%	2.83%	-1.39%	1.12%
Minimum	-2.98%	-2.71%	-3.14%	-2.37%	-3.63%	-3.22%	-3.67%
5. 2020-2021 Covid-19 Crisis: 2020/01-2021/11							
Mean	-0.49%	-0.58%	-0.13%	-1.10%	-0.43%	-0.48%	-0.83%
Standard Deviation	1.88%	1.67%	2.50%	1.33%	2.22%	1.45%	2.55%
Maximum	2.65%	2.31%	3.86%	1.30%	2.99%	1.97%	2.97%
Minimum	-3.17%	-2.96%	-3.53%	-2.88%	-3.94%	-3.06%	-5.16%

Table 5. Correlation Coefficients between Consumer Confidence and Explanatory Variables by Subsample

Subsample	OECD		G7		Euro Area 19		US		Japan		China		South Africa	
Monthly Variable														
IPI	0.47	***	0.41	***	0.42	***	0.37	***	0.45	***	0.22	***	0.27	***
INF	0.15	***	0.14	***	0.04		0.06		0.04		0.06		0.01	
LIR	0.02		0.03		0.01		0.01		0.09	*	0.07		0.04	
NER	-0.08		-0.05		0.02		0.09	*	-0.05		0.01		0.39	***
SP500	0.55	***	0.52	***	0.48	***	0.45	***	0.36	***	0.30	***	0.18	***
VIX	-0.40	***	-0.39	***	-0.30	***	-0.38	***	-0.30	***	-0.33	***	-0.33	***
Dummy Variable for Economic Crisis														
EMS Crisis	-0.08		-0.06		-0.19	***	0.12	**	-0.15	***	0.27	***	-0.17	***
Asian Crisis	0.11	**	0.10	**	0.17	***	0.15	***	-0.15	***	-0.11	**	-0.09	*
Dotcom Burst	-0.11	**	-0.11	**	-0.06		-0.17	***	-0.06		0.10	*	-0.04	
GFC2008	-0.18	***	-0.14	***	-0.12	**	-0.10	**	-0.11	**	-0.20	***	-0.15	***
Covid-19	-0.09	*	-0.11	**	0.00		-0.22	***	-0.05		-0.04		-0.11	**

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. ***, **, and * stand for significance at the 1%, 5%, and 10% level.

Table 6. Estimation Results for OECD Subsample

Variable	Model (1)		Model (3)		Model (6)		Variable	Best-Fit Model	
Constant	0.00		0.00		0.00		Constant	0.00	
	0.00		0.00		0.00			0.00	
IPI	0.10	***	0.02		-0.02	*	IPI	0.10	***
	0.01		0.01		0.01			0.01	
INF	0.00		0.00	***	-0.01	***	INF(-3)	0.00	**
	0.00		0.00		0.00			0.00	
LIR	0.00		0.00		0.01	**	LIR(-6)	0.00	
	0.00		0.00		0.00			0.00	
NER	0.00		0.00		0.01				
	0.01		0.01		0.01				
SP500	0.04	***	0.04		0.04	***	S&P 500	0.03	***
	0.00		0.00		0.00			0.00	
VIX	0.00	***	0.00	***	0.00	***	VIX	0.00	***
	0.00		0.00		0.00			0.00	
EMS Crisis	0.00		-0.01	***	-0.01	***	EMS Crisis	0.00	
	0.00		0.00		0.00			0.00	
Asian Crisis	0.00		0.00	***	0.00		Asian Crisis	0.00	
	0.00		0.00		0.00			0.00	
Dotcom Burst	0.01	***	0.01		0.01	***	Dotcom Burst	0.01	***
	0.00		0.00		0.00			0.00	
GFC 2008	0.03	***	0.01		0.01	***	GFC 2008	0.02	***
	0.00		0.00		0.00			0.00	
COVID-19	0.00	*	-0.01	***	-0.01	***	COVID-19	0.00	*
	0.00		0.00		0.00			0.00	
Adjusted R^2	0.47		0.41		0.44		Adjusted R^2	0.49	

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 7. Estimation Results for G7 Subsample

Variable	Model (1)		Model (3)		Model (6)		Variable	Best-Fit Model	
Constant	0.00		0.00		0.00		Constant	0.00	
	0.00		0.00		0.00			0.00	
IPI	0.08	***	0.01		-0.03	**	IPI	0.09	***
	0.01		0.01		0.01			0.01	
INF	0.00		0.00	*	0.00	***	INF	-0.01	***
	0.00		0.00		0.00			0.00	
LIR	0.00		0.01		0.01	**	LIR	0.01	**
	0.00		0.00		0.00			0.00	
NER	0.00		0.01		0.01				
	0.01		0.01		0.01				
SP500	0.04	***	0.04		0.04	***	S&P 500	0.03	***
	0.00		0.00		0.00			0.00	
VIX	0.00	***	0.00	***	0.00	***	VIX	0.00	***
	0.00		0.00		0.00			0.00	
EMS Crisis	0.00		0.00	***	-0.01	**	EMS Crisis	0.00	

	0.00		0.00		0.00		0.00	
Asian Crisis	0.00		0.00	***	0.00		Asian Crisis	0.00
	0.00		0.00		0.00			0.00
Dotcom Burst	0.01	***	0.01		0.01	***	Dotcom Burst	0.01
	0.00		0.00		0.00			0.00
GFC 2008	0.03	***	0.02		0.01	***	GFC 2008	0.02
	0.00		0.00		0.00			0.00
COVID-19	0.00	**	-0.01	***	-0.01	***	COVID-19	0.00
	0.00		0.00		0.00			0.00
Adjusted R^2	0.43		0.39		0.42		Adjusted R^2	0.48

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 8. Estimation Results for Euro-19 Subsample

Variable	Model (1)	Model (3)	Model (6)	Variable	Best-Fit Model
Constant	0.00	0.00	0.00	Constant	0.00
	0.00	0.00	0.00		0.00
IPI	0.11	***	0.06	IPI	0.12
	0.01		0.01		0.01
INF	0.00		0.00	***	-0.01
	0.00		0.00	***	0.00
LIR	0.00		0.00		0.00
	0.00		0.00		0.00
NER	0.03	***	0.01	NER	0.03
	0.01		0.01		0.01
SP500	0.05	***	0.05	S&P 500	0.05
	0.01		0.01		0.01
VIX	0.00	***	0.00	***	0.00
	0.00		0.00	***	0.00
EMS Crisis	-0.01	***	-0.02	***	-0.02
	0.00		0.00	***	0.00
Asian Crisis	0.00		0.01		0.00
	0.00		0.00		0.00
Dotcom Burst	0.01	***	0.01	Dotcom Burst	0.01
	0.00		0.00		0.00
GFC 2008	0.04	***	0.03	GFC 2008	0.03
	0.00		0.00		0.00
COVID-19	0.00		0.00	***	0.00
	0.00		0.00	***	0.00
Adjusted R^2	0.42		0.37		0.35
				Adjusted R^2	0.44

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 9. Estimation Results for US Subsample

Variable	Model (1)			Model (3)			Model (6)			Variable	Best-Fit Model	
Constant	0.00			0.00	***		0.00			Constant	0.00	
	0.00			0.00			0.00				0.00	
IPI	0.07	***		0.01			-0.03	**		IPI	0.07	***
	0.02			0.01			0.01				0.02	
INF	0.00			0.00	***		0.00	***		INF(-6)	0.00	***
	0.00			0.00			0.00				0.00	
LIR	0.00			0.00			0.00					
	0.00			0.00			0.00					
NER	0.04	***		0.03			0.02	*		NER	0.03	***
	0.01			0.01			0.01				0.01	
SP500	0.04	***		0.04			0.04	***		S&P 500	0.04	***
	0.00			0.00			0.00				0.00	
VIX	0.00	***		0.00	***		0.00	***		VIX	0.00	***
	0.00			0.00			0.00				0.00	
EMS Crisis	0.00			0.01			0.01	**		EMS Crisis	0.00	
	0.00			0.00			0.00				0.00	
Asian Crisis	0.00			0.00	***		0.00			Asian Crisis	0.00	
	0.00			0.00			0.00				0.00	
Dotcom Burst	0.00			0.00			0.00			Dotcom Burst	0.00	
	0.00			0.00			0.00				0.00	
GFC 2008	0.02	***		0.01			0.01	**		GFC 2008	0.02	***
	0.00			0.00			0.00				0.00	
COVID-19	-0.01	***		-0.01	***		-0.01	***		COVID-19	-0.01	***
	0.00			0.00			0.00				0.00	
Adjusted R^2	0.39			0.37			0.39			Adjusted R^2	0.42	

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 10. Estimation Results for Japan Subsample

Variable	Model (1)			Model (3)			Model (6)			Variable	Best-Fit Model	
Constant	0.00			0.00	*		0.00			Constant	0.00	
	0.00			0.00			0.00				0.00	
IPI	0.09	***		0.01			-0.03	***		IPI	0.09	***
	0.01			0.01			0.01				0.01	
INF	0.00			0.00			0.00	**		INF(-6)	-0.01	***
	0.00			0.00			0.00				0.00	
LIR	0.01	**		0.02			0.01	**		LIR(-6)	0.01	**
	0.00			0.00			0.00				0.00	
NER	0.01			0.02			0.02	***		NER(-6)	0.03	***
	0.01			0.01			0.01				0.01	
SP500	0.03	***		0.04			0.04	***		S&P 500	0.03	***
	0.01			0.01			0.01				0.01	
VIX	0.00	***		0.00	***		0.00	***		VIX	0.00	***
	0.00			0.00			0.00				0.00	
EMS Crisis	-0.01	**		-0.01	***		-0.02	***		EMS Crisis	-0.01	***
	0.00			0.00			0.00				0.00	
Asian Crisis	-0.01	***		-0.02	***		-0.02	***		Asian Crisis	-0.01	***
	0.00			0.00			0.00				0.00	
Dotcom Burst	0.01	***		0.01			0.00	**		Dotcom Burst	0.01	***

	0.00		0.00			0.00		0.00	
GFC 2008	0.03	***	0.01		0.00		GFC 2008	0.02	***
	0.00		0.00		0.00			0.00	
COVID-19	0.00		-0.01	***	-0.01	***	COVID-19	0.00	
	0.00		0.00		0.00			0.00	
Adjusted R^2	0.38		0.28		0.33		Adjusted R^2	0.43	

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 11. Estimation Results for China Subsample

Variable	Model (1)		Model (3)		Model (6)		Variable	Best-Fit Model	
Constant	0.00		0.00		0.00		Constant	0.00	
	0.00		0.00		0.00			0.00	
IPI	0.02		0.15		0.14	***	IPI(-6)	0.14	***
	0.04		0.04		0.04			0.04	
INF	0.00		0.00	***	0.00	*	INF(-6)	0.00	*
	0.00		0.00		0.00			0.00	
LIR	0.00		0.00		0.00				
	0.00		0.00		0.00				
NER	0.04	**	0.00	***	-0.03	**	NER(-6)	-0.03	**
	0.01		0.01		0.01			0.01	
SP500	0.06	***	0.04		0.05	***	S&P 500	0.05	***
	0.01		0.01		0.01			0.01	
VIX	0.00	***	0.00	***	0.00	***	VIX	0.00	***
	0.00		0.00		0.00			0.00	
EMS Crisis	0.03	***	0.03		0.03	***	EMS Crisis	0.03	***
	0.01		0.01		0.01			0.01	
Asian Crisis	-0.02	***	-0.01	***	-0.01	*	Asian Crisis	-0.01	*
	0.01		0.01		0.01			0.01	
Dotcom Burst	0.02	***	0.02		0.03	***	Dotcom Burst	0.03	***
	0.00		0.00		0.00			0.00	
GFC 2008	0.01		0.01		0.02	***	GFC 2008	0.02	***
	0.01		0.01		0.01			0.01	
COVID-19	-0.01		-0.01	***	-0.01		COVID-19	-0.01	
	0.00		0.00		0.00			0.00	
Adjusted R^2	0.28		0.29		0.31		Adjusted R^2	0.31	

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.

Table 12. Estimation Results for South Africa Subsample

Variable	Model (1)		Model (3)		Model (6)		Variable	Best-Fit Model	
Constant	0.01	***	0.01		0.01	***	Constant	0.01	***
	0.00		0.00		0.00			0.00	
IPI	0.04	***	0.03		0.01		IPI	0.04	***
	0.01		0.01		0.01			0.01	
INF	0.00		0.00		0.00				
	0.00		0.00		0.00				
LIR	0.00		0.00	***	0.00				
	0.00		0.00		0.00				
NER	0.06	***	0.04		0.01	*	NER	0.05	***

	0.01		0.01		0.01			0.01	
SP500	0.00		0.00		0.01				
	0.01		0.01		0.01				
VIX	0.00	***	0.00	***	0.00	***	VIX	0.00	***
	0.00		0.00		0.00			0.00	
EMS Crisis	-0.02	***	-0.02	***	-0.02	***	EMS Crisis	-0.02	***
	0.00		0.00		0.00			0.00	
Asian Crisis	-0.01		-0.01	***	-0.01		Asian Crisis	-0.01	
	0.00		0.00		0.00			0.00	
Dotcom Burst	0.01	*	0.00		0.00		Dotcom Burst	0.01	*
	0.00		0.00		0.00			0.00	
GFC 2008	0.01		0.01		0.00		GFC 2008	0.01	
	0.01		0.01		0.01			0.00	
COVID-19	-0.01	*	-0.01	***	0.00		COVID-19	-0.01	*
	0.00		0.00		0.00			0.00	
Adjusted R^2	0.31		0.25		0.17		Adjusted R^2	0.31	

Note. See Table 2 for monthly variable abbreviations and Table 4 for dummy variables of the five economic crises examined. Standard errors are reported below the estimated coefficient and ***, **, and * stand for significance at the 1%, 5%, and 10% level. (-3) and (-6) stand for three-month and six-month lags for the monthly variable.