



The Impact of Economic Policy Uncertainty on Consumer Confidence in Pakistan

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Abstract:

This study examines the impact of Economic Policy Uncertainty (EPU) on the consumer confidence index (CCI) in Pakistan. Using a sample from the start of 2012 up to February 2020, a vector error-correction model is used to gauge the impact of EPU on CCI. Our results show that a shock to EPU in Pakistan affects CCI negatively and significantly. The shock persists for a span of more than 20 forecast horizons, informing economic policy makers in Pakistan that sudden changes in the stance without proper communication can deteriorate consumer confidence. This is important as consumer confidence in Pakistan accounts for not only the current economic situation, but expected changes in key macroeconomic variables which is usually a key consideration when forward-looking policies are devised. Our results remain robust to alternate Choleski specifications and lag lengths in the model.

Keywords: Pakistan, economic policy, uncertainty, consumer confidence, VECM, IRFs, VDCs.

JEL Classification: E32, H00, H31.

The Impact of Economic Policy Uncertainty on Consumer Confidence in Pakistan

1. Introduction

The use of alternative economic indicators for the measurement of economic conditions for policymaking has grown more important in economics. Consumer confidence, which is one such indicator, is defined in the economic literature as the perceptions formed by the agents in an economy from the quantitative evaluations of the given state of economy. Given that the agents are rational and utilize all readily available information to formulate expectations about the state of the economy, they are able to make positive – as well as negative – judgments about the state of the economy, in addition to their own well-being (Mirza, 2020).

Measurement of consumer confidence can be difficult as it is a latent variable depicting human behavior. However, attempts to formulate a measure that can identify the level of consumer confidence in an economy have been made since 1940. The first known consumer confidence index is the University of Michigan Consumer Sentiment Index, developed by George Katona at the University of Michigan in the late 1940s, and which remains in use. Initially, this index was computed annually transitioning to quarterly in 1952 and then monthly since 1978. Since its inception, the University of Michigan's consumer survey has been one of the widely followed indicators in the United States of America (Ludvigson, 2004).

This index was followed by the creation of a number of consumer confidence indices for the U.S. and other economies. The Organisation for Economic Co-operation and Development (OECD) (2021) provides detailed data on a large number of CCI indices across many countries. The State Bank of Pakistan (SBP), in collaboration with the Institute of Business Administration (IBA), began to measure consumer confidence for the Pakistani economy in January 2012. This index telephonically surveys 1,600 randomly selected households across Pakistan. This sample consists of a rotating panel with 33 percent of respondent households who have been surveyed six months earlier and are surveyed once again, while the remaining 67 percent are added and surveyed for the first time. The stratification scheme of the survey is applied in a rotating panel as well (State Bank of Pakistan, 2021).

As consumer confidence is an important indicator informing policy makers and researchers about people's perception about the state of current and future economic conditions, there has been an increase in the use of consumer sentiments and inflation expectations in monetary policy statements in Pakistan.¹ Bassey (2015) also emphasizes the need to take into account consumer sentiments using sample surveys while undertaking monetary policy decisions for the Central Bank of Nigeria. This indicates, therefore, that the factors determining and affecting this important indicator have been previously studied and thus part of the literature.

For example, Acemoglu and Scott (1994) found that CCI is a leading indicator for consumption, which in turn is significantly determined by the lagged CCI, housing wealth, real interest rates, and inflation. As political factors can have a bearing on household decision making, Ramalho, Caleiro and Dionfsio (2011), using data from Portugal, showed that both economic and political factors are significant determinants of consumer confidence. Consumers' confidence and the behavior of economic agents are highly affected by economic policy uncertainty.

Economic policy uncertainty refers to the unpredictability of fiscal, regulatory, and monetary policies, which leads to market volatility due to its effect on consumer confidence. Undefined or uncertain future government policies pose economic risk, which is further aggravated due to the deferred spending and investment decisions of the agents. To measure economic policy uncertainty, the economic policy uncertainty (EPU) index was initially measured by Baker et al. (2016), and is used by economists as a measure of uncertainty for analysis and policy decision making. It is a comprehensive measure of economic policy uncertainty and captures uncertainty from news, policy, market, and economic indicators. Many authors have followed their methodology and created EPU indices for their respective countries.² Choudhary, Pasha and Waheed (2020) formulated the EPU index for Pakistan.

Empirical literature on the impact of economic uncertainty and EPU is limited but growing. For example, Dalen, Vreese and Albæk (2017) show that EPU impacts CCI negatively in Denmark. Their results remain robust to the use of several model specifications and, more notably, to the addition of controls to account for the tone of economic news. Peric and

¹ For example, see. https://www.sbp.org.pk/m_policy/2019/MPS-May-2019-Eng.pdf

² The list of countries with data on their economic policy uncertainty index are available at <http://www.policyuncertainty.com>

Soric (2018) investigated the impact of EPU on CCI and gross domestic product (GDP) growth using a panel vector autoregressive (VAR) model for 13 countries.³ For a few countries, they found that there exists a bi-directional Granger causality, and for others, they find no causal effect at all. Hence, their results signify a marginal impact of EPU on consumer confidence and GDP growth.

Our study adds to the literature since Pakistan is one of the very few developing countries that has developed an economic policy uncertainty index and we used this index to look at the impact of EPU on CCI in a developing country context. In this paper we will be investigating the impact of EPU on the consumer confidence index in Pakistan. We use a vector error-correction model (VECM, hereafter) to investigate the impact of EPU on CCI. The sample period utilized in our paper is from January 2012 to February 2020.

2. Data

The main variable of interest, CCI, is the index published on a bimonthly basis by the SBP.⁴ Other variables included in the study are the EPU, the Consumer Price Index (P), the quantum index of large-scale manufacturing industries, which serves as a proxy for real output (Y), and the overnight weighted average repurchase rate (R). The variables P, Y, and R are added to our analysis as the CCI survey specifically asks about the current and expected general price level, prices of the durables, and the interest rate.

Furthermore, the interest rate is used as a measure of monetary policy, as it was designated as the operational target by the SBP in 2009 (Mahmood, 2016). All the variables are available on a monthly basis from January 2012 to February 2020.⁵ With the exception of R, which is in levels, all variables are in logs (*LEPU*, *LY*, *LCPI*, *LCCI*). All data except the CCI are taken from various online issues of the Monthly Bulletin of Statistics of the SBP. As data on CCI is only available at bimonthly, to obtain a consistent

³ The countries in their sample are: Canada, China, France, Germany, India, Italy, Japan, Korea, Netherlands, Russia, Spain, the UK and the USA

⁴ Details and data of the consumer confidence index can be found at: <https://www.sbp.org.pk/research/CCS.asp>

⁵ Our sample starts in January 2012 as the first observation of the CCI index is available from that time. Our sample ends at February 2020 as it is the month in which the last revised data on Y is available on the official website of Pakistan Bureau of Statistics.

monthly series of these variables, we interpolated the alternate monthly gaps by averaging the two adjacent data points before and after the missing value.

3. Methodology:

We start by testing all the variables for stationarity using a series of augmented Dickey-Fuller (ADF) tests (Enders, 2009). We then estimate a VAR model (Sims, 1980), which takes the typical form:

$$Y_t = \delta_i + \sum_{i=1}^n \theta_{i,t} Y_{t-i} + \varepsilon_{i,t} \quad (1)$$

Where Y_t is a vector of endogenous variables at time t , θ are the parameters and ε are the uncorrelated white noise disturbance terms. However, as pointed out in the literature, a VAR level estimated in first differences is misspecified in the presence of non-stationary variables (Engle and Granger, 1987). Therefore, before we implement VAR, we test the data for co-integration introduced by Johansen (1988) and Johansen and Juselius (1990). Given that our sample period is small, Johansen's (2000, 2002), small sample correction is also employed. If a variable or a set of variables are found to be cointegrated, a VECM is estimated.

4. Empirical Results:

We start discussing our results with the stationarity test results. Table 1 contains the results of the ADF test for each of the variables in our paper. The lags for each test are selected using the Akaike Information Criteria (AIC) introduced by Hirotugu (1974).⁶ An analysis of Table 1 shows that the variables CCI , Y and P are non-stationary in log-levels. An analysis of Table 1 also indicates that the interest rate is not stationary in levels.

⁶ To be consistent throughout the paper, we use the AIC for selection of lags for the ADF, cointegration tests and the estimation model.

Table 1: Results of Augmented Dickey-Fuller test

	In Log-Levels (Trend and Drift)		In Log-Levels (Drift)	
	Statistic	Critical-value	Statistic	Critical-value
Consumer Confidence Index (CCI)	-1.57	-3.45	-2.56	-2.90
Quantum Index of Large-Scale Manufacturing Industries (Y)	-1.68	-3.45	-1.94	-2.90
Weighted Average Overnight Repurchase Rate (R)	0.33	-3.45	-0.17	-2.90
Consumer Price Index (P)	-1.64	-3.45	0.93	-2.90
Economic Policy Uncertainty Index (EPU)	-4.41	-3.45	-4.42	-2.90

Notes: The critical values are taken from Table A of the Statistical Tables of Enders (2009) book. The number in bold represents a stationary variable (statistic value lower than the critical value).

Source: Author's calculation.

Table 1 also shows that the economic policy uncertainty index is stationary in log-levels. This means that we do not have to take first differences of log of economic policy uncertainty since it is first differenced in the VECM model.

Table 2 contains the results of the ADF test for variables in first difference.

Table 2: Results of Augmented Dickey-Fuller test

	In 1 st Difference (Trend and Drift)		In 1 st Difference (Drift)	
	Statistic	Critical-value	Statistic	Critical-value
Consumer Confidence Index (CCI)	-4.25	-3.45	-3.47	-2.90
Quantum Index of Large-Scale Manufacturing Industries (Y)	-12.61	-3.45	-12.52	-2.90
Weighted Average Overnight Repurchase Rate (R)	-5.30	-3.45	-4.80	-2.90
Consumer Price Index (P)	-4.54	-3.45	-3.93	-2.90
Economic Policy Uncertainty Index (EPU)	-10.58	-3.45	-10.64	-2.90

Notes: The critical values are taken from Table A of the Statistical Tables of Enders (2009) book. The number in bold represents a stationary variable (statistic value lower than the critical value).

Source: Author's calculation.

An analysis of Table 2 reveals that all the variables in this study are stationary in first difference. As some of the variables are non-stationary in levels, some of the variables may be cointegrated. Therefore, we next tested whether co-integration exists among the non-stationary variables in the system. The variables tested for co-integration are *LCCL*, *LP*, *LY* and *R*. The results of the trace test of the co-integration are presented in Table 3.

As cointegration tests are highly sensitive to the number of lags, we use the AIC to select the lags for the test. The AIC suggested using 1 lag for each variable.

Table 3: The Cointegration Test Results (Variables: LP, LY, R and LCCL)

Null Hypothesis	Alternative Hypothesis	Eigen Value	Trace Statistic*	Critical Value**	P values**
$r = 0$	$r = 1$	0.373	63.036	47.707	0.006
$r = 1$	$r = 2$	0.134	24.490	29.804	0.081
$r = 2$	$r = 3$	0.116	12.541	15.408	0.185
$r = 3$	$r = 4$	0.026	2.219	3.841	0.285

* The small sample corrected trace statistic

** The critical value at 5% level of significance and the p values are approximated using the gamma distribution, see Doornik (1998)

Source: Author's calculation.

Table 3 shows that there exists one cointegrating relationship among the non-stationary variables. Hence, the co-integration test shows that the VECM is an appropriate model to estimate.

However, before we estimate VECM, it is important to consider that co-integration analysis may be conducted with a stationary variable inside the co-integration space (Lütkepohl and Kilian, 2017). These authors found that adding a stationary variable to a set of non-stationary variables while testing for co-integration adds an additional cointegrating vector. This means that if we add the *LEPU* to the immediately aforementioned analysis, and if the co-integration analysis is conducted properly, the results should show two significant cointegrating relationships, whereas in actual terms, there only exists a single cointegrating vector among the variables of interest. To see if this is indeed the case, we conducted another co-integration analysis adding *LEPU*. The AIC once again pointed toward the use of 1 lag for each of the variables in the study. The results of the co-integration test are contained in Table 4.

Table 4 shows that there are two co-integrating relationships that are statistically significant. Hence, we see that adding a variable that is stationary in levels i.e. *LEPU* inserts an additional stationary relationship in among the variables. As there is a single co-integrating relationship as verified by the tests we have conducted above, we estimate the VECM using Engle and Granger’s (1987) two-step procedure.

**Table 4: The Cointegration Test Results
(variables: LEPU, LP, LY, R and LCCI)**

Null Hypothesis	Alternative Hypothesis	Eigen Value	Trace Statistic*	Critical Value**	P values**
r = 0	r = 1	0.527	120.868	69.611	0.000
r = 1	r = 2	0.355	59.546	47.707	0.002
r = 2	r =3	0.140	23.275	29.804	0.240
r = 3	r =4	0.098	10.761	15.408	0.231
r = 4	r =5	0.025	2.125	3.841	0.145

* The small sample corrected trace statistic

** The critical value at 5% level of significance and the p values are approximated using the gamma distribution, see Doornik (1998)

Source: Author’s calculation.

To preserve degrees of freedom, a maximum lag length of 12 lags is considered for the model. The pre-sample extends from 2012:01 to 2013:01, and the estimation of the VECM models is carried out from 2003:02 to 2020:02. The lag length for the model is chosen by the AIC, with the latter suggesting a lag length of 4 for both models. To ensure that the VECM is stable, the residuals from each equation are required to be white noise. To test for serial correlation among the residuals from each VAR equation, we conducted a series of Ljung-Box (1978) tests with the null hypothesis of no autocorrelation. The Q-statistics show that the residuals from each equation in the model estimated are white noise. For a robustness check, both models are also estimated using the maximum lag length of 6.

The results are reported in terms of both the variance decompositions (VDCs) and impulse response functions (IRFs). VDCs show the proportion of the forecast error variance (FEV) of each variable explained by the shocked variable in the system. However, the VDCs do not inform us of the direction of impact of a shocked variable on other variables of the system. Hence, IRFs show the response of variables in a system to a shock to one of the variables in the VAR/VECM system. IRFs not only inform us of the magnitude but also the direction of the impact.

We did not apply the Granger causality test due to its limitations in identifying causal impacts.

To compute VDCs and IRFs, the residuals from the VECM model must be orthogonalized. One technique to compute orthogonalized residuals is the Choleski decomposition of contemporaneous relationships. Under the Choleski decomposition, variables in the system must be ordered in a particular manner. Ordering means placing all variables in decreasing order of exogeneity (causality). Hence, the variables higher in the ordering contemporaneously influence the variables lower in the ordering and not vice versa. For the base model, we use the Choleski decomposition with ordering *EPU*, *P*, *Y*, *R* and *CCI* for the base model.

This ordering is chosen because we are most concerned with the portion of FEV of *CCI* explained by innovations to *EPU*. *EPU* is the uncertainty of the policies that prevail in an economy. Hence, they impact the economic decisions of the households and firms in current and future periods (through expectations); therefore, it is placed first in the ordering. For the base model, we place *EPU* above *P*, *Y*, *R* and *CCI*. This allows *EPU* to contemporaneously affect *P*, *Y*, *R* and *CCI* (within the same month). *P*, *Y*, *R* and *CCI* do not impact *EPU* contemporaneously, but they do impact this variable through the lags of the system. In the short run, prices are sticky. Hence, *Y* shocks do not have an impact on *P*. This places *P* above *Y*. Assuming markets are efficient and interest rates reflect all the available information quickly, *R* is placed at the end, just before the main variable of interest, that is, *CCI*.

P, *Y* and *R* are placed between *EPU* and *CCI*, and the placement of these variables relative to each other is not critical since we aim to test the impact of *EPU* on *CCI*. The conclusions from the base model do not change when we alter the ordering of *P*, *Y*, and *R* relative to each other or use alternate orders.⁷ Therefore, we report the results with ordering *EPU*, *P*, *Y*, *R*, and *CCI*.

⁷ The alternate-orderings for the base model containing 4 lags are: *EPU*, *P*, *Y*, *R*, *CCI*; *EPU*, *R*, *P*, *Y*, *CCI* and *EPU*, *R*, *Y*, *P*, *CCI*.

Table 5: Variance Decomposition of the Consumer Price Index in response to a shock to EPU

Horizon	Point Estimate	Standard Error
6	6.46533	0.11735
12	6.89545	0.13241
24	6.88591	0.13224
36	6.88594	0.13224
48	6.88594	0.13224

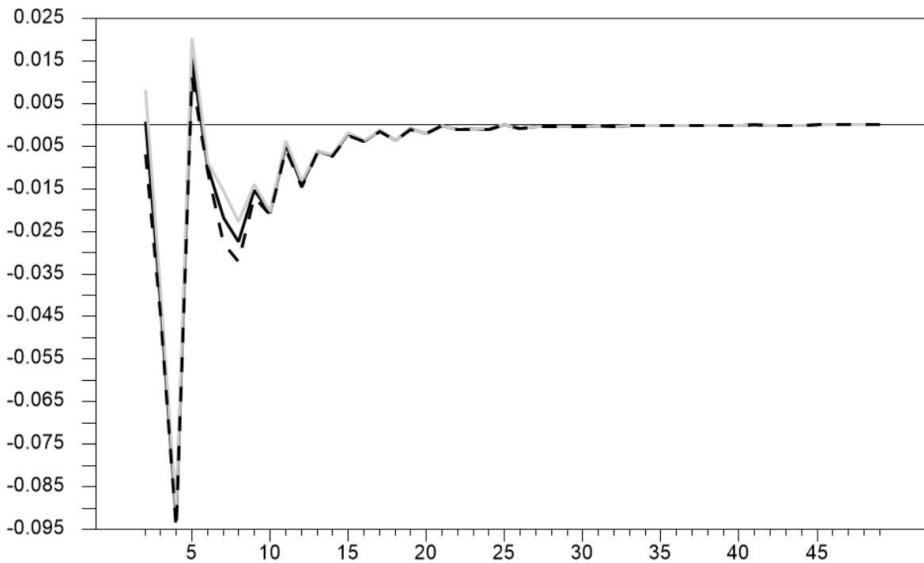
Notes: The numbers in bold represent a statistically significant point estimate. A point estimate is statistically significant if the point estimate is approximately twice as big as the standard error.

Table 5 contains the results of VDCs. We report the point estimates and the standard errors for horizons 6, 12, 24, 36 and 48. It is evident from the table that a shock to EPU explains more than 6 percent of the forecast error variance in CCI at all forecast horizons. This means that uncertainty related to macroeconomic policies in Pakistan has a strong bearing on how consumer confidence evolves through time. Hence, abrupt changes in policy stance without major economic changes like a crisis or a pandemic such as COVID-19 can have a significant impact on consumer confidence.

The above analysis informs us about the magnitude of impact in terms of forecast error variance but does not provide any information related to the direction of impact of a shock to a variable to other variables in the system. The direction of the impact is shown by the IRF. The impulse response of CCI to EPU is depicted in Figure 1⁸.

⁸ The confidence intervals for the IRFs are computed via five thousand Monte Carlo draws. A two-standard-deviation confidence interval is reported for each IRF. A confidence interval containing zero indicates lack of statistical significance.

Figure 1: Response of Consumer Confidence to a shock in Economic Policy Uncertainty



Time (in months) from a shock in EPU

An observation of Figure 1 reveals that, with the exception of the 5th forecast horizon, a shock to EPU has a negative and significant impact on CCI for the first 20 forecast horizons with a maximum at the 3rd forecast horizon. The impact becomes insignificant for the 21st forecast horizon but remains significant and negative for a few months thereafter. From the 27th forecast horizon onward, the impact becomes statistically insignificant.

As a robustness check, the base model was also run with different Choleski orderings, estimated with 6 lags. However, the results of the model from all these additional checks qualitatively remained the same.

This result shows that as the uncertainty of the economic policies in Pakistan rises, consumer confidence begins to deteriorate. It is important to note that in the consumer confidence survey, there are questions asking both about the state of general economic conditions, the price of the durables, food, nonfood and energy, the general price level, the interest rate, income, and unemployment in the current time period and 6 months ahead. Hence, it is a very comprehensive measure that informs policy makers about the current state of the economy as well as perceptions about future economic conditions.

Our findings are consistent with Nowzohour and Stracca (2017), Bergman and Worm (2020) and Montes and Nogueira (2021), who provide empirical evidence of the negative impact of economic policy uncertainty on consumer confidence in different developed economies. The findings have important policy implications for policy makers and for monetary policy authorities in particular, as consumer sentiments are clearly an important transmission channel for the transmission of monetary policy shocks along with other conventional channels (Debes et al, 2014).

5. Conclusion:

This empirical paper examined the impact of a shock to economic policy uncertainty on Pakistan on consumer confidence in Pakistan. The sample of the study is from January 2012 to February 2020. The results are reported in terms of VDCs and IRFs. Both the VDCs and IRFs show that a shock to EPU has a significant impact on CCI in Pakistan.

Consumer confidence as an indicator in Pakistan can contain or provide information on expectations of economic agents about the economy, which in turn means that it is an important indicator for policy makers. Both fiscal and monetary policy are forward-looking policies and work well if the expectations of agents in an economy are well anchored. It is therefore important that governments and central banks maintain a stance that is not only consistent with their past actions and future commitments but with the current and future economic situation (which in turn depends primarily on the confidence of consumers in policy actions). This will help to ensure minimal uncertainty about their policies and will improve consumer confidence over time.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Code availability statement: The code that supports the findings of this study is available from the corresponding author, Dr. Ateeb Akhter Shah Syed, upon reasonable request.

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