
RESEARCH ARTICLE

Confidence is Key: A Study on Consumer Confidence and its Potential in the Recovering Philippine Economy

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ABSTRACT

The Coronavirus Disease 2019 (COVID-19) Pandemic has caused major damage to the Philippine economy, resulting in a drastic -17.0% drop in aggregate output since 2019 and a downturned economy that could be felt by 2021. The impact of the pandemic could be felt at a household level, as 1.8 million Filipino families report to have become newly poor within the last 1 to 4 years, in addition to 17.6 million pre-existing families below the poverty threshold in 2018. The Philippine citizens and their government are hoping for economic recovery soon. This study provides an in-depth multivariate analysis of the role of selected monetary indicators and labor and commerce indicators in the consumer confidence of the general Philippine population using multivariate regression and vector autoregression analyses. It also establishes a causal relationship of the latter to HFCE and GDP using the Granger causality test to determine which indicators affect general consumption the most in the context of recovery from the COVID Pandemic. The paper has successfully confirmed the significance of consumer confidence in the fluctuations of the Philippine economy in the short- and long-run, as well as systematically illustrates the relationship of consumer confidence with other macroeconomic variables. As the model shows, consumer confidence is heavily influenced by the country's economic stability and the individual's level of income, purchasing power, access to financial instruments, and ability to borrow.

KEYWORDS

Consumer Confidence, Consumer Expectancy, Interest Rates, Exchange Rates, Inflation Rates, Stock Market Prices, Unemployment Rates, GDP per Capita

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1. Introduction

1.1 Background of the Study

As of writing in 2021, the Coronavirus Disease 2019 (COVID-19) Pandemic has crippled economies at the inset of the year 2020. The Philippines experienced its largest GDP recession of -17% since 2018 and stayed below the pre-pandemic threshold until the 2nd quarter of 2021 (PSA, 2021). Global supply chains were significantly disrupted, causing obstruction in international trade across industries and potentially damaging the very structures of global supply chains in the long term (ILO, 2020). According to the World Bank (2020), developed countries were no exception, as the estimated damage brought by hampered domestic demand and supply, trade, and finance is expected to shrink their economies by as much as 7%. The organization had come to name this global recession as the "Worst Recession since World War II". The Philippine economy was anticipated to contract by 7.3% in 2020 due to the drastic drop in private consumption and investment, employment, and overall economic activity from the private sector (ADB, 2020).

In this state of international economic crisis, from countries big to small- from the United States of America to the Philippines and many more- turned to John Maynard Keynes' (1936) advocacy for the implementation of active fiscal policies, especially during market failures, with the intention of reviving and reinforcing aggregate private spending and business activity, therefore creating generating more income and improving aggregate output. The majority of governments all over the world took action and

implemented fiscal policies in response to COVID-19's effects on their economies, such as above-the-line measures (additional government spending and reduced tax revenues) and below-the-line measures (equity stakes and loans) (IMF, 2020).

The question in every person's mind was, "will everything go back to normal?". United Nations Conference on Trade and Development (2020) would answer that if countries would choose to maintain their older monetary and fiscal strategies, then employment would not be able to recover fully, thus widening income gaps, and they would remain in debt distress. An attempt for an economy to recover without monetary and fiscal developments would, at best, result in a u-shaped recession shock, wherein an economy may improve after a recession but would not be able to return to its pre-crisis state. This was popularly known as the "90% economy".

1.2 Statement of the Problem

The study aims to answer the following questions:

1. What impact do the following variables have on consumer confidence:
 - a. Interest Rates
 - b. Exchange Rates
 - c. Inflation Rates
 - d. Stock Market Prices
 - e. Unemployment Rates
 - f. Gross Domestic Product (GDP)
2. Is there a uncausality or bicausality between GDP and consumer confidence?
3. To what extent is the relationship of consumer confidence with the identified variables?

1.3 Significance of the Study

With an emphasis on the significance of consumer confidence, the researchers hope that this study can contribute meaningfully toward the rolling body of research on the demand-side of the economy as a crucial tool for government policy, especially for the central bank (Bangko Sentral ng Pilipinas), and its supporting entities and organizations, to stifle the dangerous cycle in consumer fear in a recessionary scenario.

This paper intends to highlight the effect of interest rates, exchange rates, stock market prices, and unemployment rates on the fluctuations of consumer expectancy as important metrics to be considered in macro analyses of consumption and aggregate output as a whole.

1.4 Scope and Limitations

The study is limited to the use of secondary data from different sources in its respective analysis, as well as limited by the time constraint provided to conduct the research. The study acknowledges the possibility of discrepancies that may arise from the difference in methodologies and theoretical frameworks under which the data sets are governed.

1.5 Definition of Terms

"Consumer confidence" and "consumer expectations" shall be used interchangeably throughout the paper. The Philippine central bank may be interchanged with Bangko Sentral ng Pilipinas or abbreviated into "BSP".

2. Literature Review

2.1 Consumer Confidence and its Determinants

Past literature has presented a standard set of variables for their studies on consumer confidence, namely: labor income growth, real stock prices, and short-term interest rates (Carroll et al., 1994; Bram and Ludvigson, 1998; Ludvigson, 2004; Malovana et al., 2021). Moreover, unemployment and economic growth rates were found to contribute substantially to the consumers' perception of their financial well-being (Brüggen et al., 2017). Meanwhile, Malovana, Hodula, and Frait (2021) utilized Gross domestic product, gross domestic income, gross savings, wages, employment, lending rates on consumer loans and household loans, property prices, share prices, nominal effective exchange rate, and terms of trade. They found that consumer expectations are tightly linked to current macroeconomic conditions.

a. Interest rates

Interest rates have an inverse relationship with consumption growth, as a rise in interest rates would constitute a decrease in consumption due to the lowering prospect of borrowing (Hall, 1978; Arapova, 2018; lyke and Ho, 2019; BSP, 2020). This relationship was found to be significant through Malovana, Hodula, and Frait's (2021) modified consumer confidence measure or Household Macroeconomic Environment (HOME) index. Although, Modigliani (1993) argues that, in the long term and through the perspective

of his life-cycle model, interest rates have a direct relationship with consumption. This may be due to the prospect of a household investing in an asset and anticipating its rise in value as interest rates increase in the future.

Consumer confidence indices were also found to have a significant relationship or predicting power for forthcoming household borrowing (Klopocka, 2017). For instance, expectations are linked tightly with household debt (Angelico, 2019), as systematic extrapolative bias has a significant effect on mortgage leverage and, in extension, home equity (De Stefani, 2017).

b. Exchange Rates & Stock Market Prices

There is also a direct relationship between change in stock prices and consumption; following the wealth effect, all else equal, as the household's wealth increases, so does their consumption (Lettau and Ludvigson, 2004; Kale and Akkaya, 2016; Usul, Küçüksille and Karaođlan, 2017; Eyübođlu and Eyübođlu, 2018). Additionally, it was found that shocks cause a negative effect on consumer confidence (Basarir et al., 2018) due to the increasing uncertainty in exchange rates.

c. Inflation Rates

There is an inverse relationship between consumer confidence and inflation rates (BSP, 2020; Malovana et al., 2021), as the rise in consumer price baskets would decrease the purchasing power of individuals, thus leading to a decrease in prospect and power to consume. Inflation can also translate as an indicator of a shock in the rise of prices. Without proper policy response and with a population's stagnant flow of income, the rise in prices may reduce consumers' purchasing power and confidence.

Venkadasalam (2015) found that household consumer expenditure in Malaysia tends to have a direct relationship with the consumer price index in the long run. This would consequently lead to a direct relationship between consumer expenditure in Malaysia with inflation rates, as manageable inflation also translates to economic development.

d. Unemployment Rates

There is a direct relationship between labor income growth and consumption growth (Friedman, 1957; Campbell and Mankiw, 1991). In other words, a rise in unemployment rates would lead to a decrease in consumer confidence (BSP, 2020). Alternatively, this can be interpreted as an increase in the unemployment rate also negatively affecting consumers' confidence in the state of the economy.

Arapova (2018) found that there is no significant relationship between unemployment and household final consumption expenditure in Asian countries.

2.2 Prior Methods

Prior literature with similar objectives to find the relationship of consumer confidence with macroeconomic indicators used the Vector Autoregression method (Kale & Akkaya, 2016, Basarir et al., 2018), the Granger Causality Test (Matošec and Zoričić, 2019), and the MIDAS regression method (Qui, 2020). Meanwhile, Hampson, Gong, and Xie (2018) took a psychological, behavioral economics approach to their research and found that it is specifically the national consumer confidence that holds a stronger relationship with consumer expenditure.

For the purpose of measuring the impact of consumer and real sector confidence indexes on the economy in Turkey, Arsoy (2012) created two different VAR models using monthly data concerning the variables of Industrial Production Index, consumption expenditures, Consumer Confidence Index, Employment Rate, Real Sector Confidence Index, and BIST Index between 2005: 01 and 2012: 01 periods. As a result of the research, it was discovered that the Consumer Confidence Index has an influence on consumer spending, and the Real Sector Confidence Index has an impact on economic developments.

Afshar, Arabian, and Zomorrodian (2007) investigated consumer, investor, and business connections. Using quarter data for the United States, confidence indices and economic fluctuation in the United States were calculated. VAR and vector error correction models were used to analyze the United States of America from 1980 to 2005. Decompositions of variance demonstrated that the significant disparity in consumer confidence, stock returns, and buying managers' index is explained by consumer confidence, stock returns, and purchasing managers' index GDP. In general, the findings support the notion that confidence indices play an essential role in terms of decision-making.

Dees and Brinca (2013) used the Consumer Confidence Index for the United States and the Eurozone, consumption expenditures, Real Disposable Income, Financial and Real Estate Wealth, Real Stock Prices, Short Term Interest Rates, and Unemployment Rates, as well as quarter data from the 1985-1 and 2010-2 periods to examine the relationship between the variables using VAR and Threshold Models. As a result, during moments of substantial upheaval in the economy, the power of consumers' estimates on consumption expenditures is measured by the consumer confidence index. They discovered that the consumer confidence index

in the United States influences the consumer confidence index in the Eurozone, forming a "security channel" that assures shock transitivity. On the other hand, Kale and Akkaya (2016) investigated the link between consumer confidence and the real sector in Turkey. VAR Model predicts confidence and five separate stock indices (aggregate, financial, industrial, service, and technology). Monthly data from January 2004 to June 2015 were used in the study. As a consequence of the research, no noteworthy findings were found. The relationship between the consumer confidence index and stock returns has been established. Furthermore, it was discovered that stocks have a large and positive effect on the consumer confidence index.

In Turkey, Basarir, Bicil, M., and Yilmaz (2019) used a VAR model to investigate the link between the Consumer Confidence Index and selected macroeconomic and financial factors. The study found a causal relationship between the consumer confidence index and the industrial production index, as well as the consumer confidence index. When the VAR model's findings are examined, it is discovered that a shock in the USD exchange rate has a negative influence on the consumer confidence index, as well as a negative impact on the BIST100 index and the dollar exchange rate.

2.3 Supporting the Relationship between Consumer Confidence and Gross Domestic Product

Benhabib and Spiegel (2019) proved a significant positive relationship between consumer confidence, fundamental macroeconomic indicators, future consumer expenditure, and even future economic conditions. Variables in Reaction to Consumer Confidence During Economic Instability

In the case of economic downturns, the rise in unemployment and job insecurity leads to a contraction of the household's primary income (Lowe, 2018). If a household were to maintain their primary source of income, it would still lead to a decrease in purchasing power (Elsby et al., 2016), thus pushing households to spend their savings on maintaining their current standard of living (Bayer et al., 2019).

The relationship between interest rates and consumption growth decreases during this time, as well (Nordström, 2020). In the case of COVID-19, it was found that countries that have gone into nationwide lockdown experienced a great dip in consumer confidence, as participants expect drastically higher unemployment, lower inflation, higher uncertainty, and lower mortgage rates for the next decade (Coibion et al., 2020).

2.4 Significance of Consumer Confidence in Formulating Fiscal Policies

lyke and Ho (2019) argue that consumer behavior is an integral variable to be considered in creating economic policies. It shapes the business cycle, thus affecting monetary policies in the short term (Kapounek et al., 2016). Additionally, a change in consumption directly leads to fluctuations in the level of savings and capital stock, interest rates, compensation, and economic welfare, thus becoming a significant guide to long-run monetary policies.

It is common advice amongst economists that policymakers must utilize consumer and business confidence in creating more accurate forecasts for future consumption growth, especially in times of crisis (Lahiri et al., 2016; Matošec and Zoričić, 2019).

Conversely, some disprove the significance of consumer confidence indices. According to Alexander and Cuddy (2018), consumer confidence is obsolete and has become useless.

2.5 Synthesis & Research Gap

This study intends to join the ideas and methods of the prior literature, to create a complete picture of the relationships and significance of consumer confidence.

Since the Philippines' Consumer Expectations Survey was conducted, there had been little research focused on the involvement and effects of consumer confidence on the Philippines' macroeconomic condition. This study intends to contribute to the field by providing insight that may provide aid in the formulation of more effective policies in the future

2.6 Theoretical Framework

This study will follow the points of prior studies which confirmed the relationships between interest rates, exchange rates, inflation rates, stock market prices, unemployment, and GDP to consumer confidence, as well as the studies which push that consumer confidence has a significant impact on gross domestic product.

2.7 Conceptual Framework

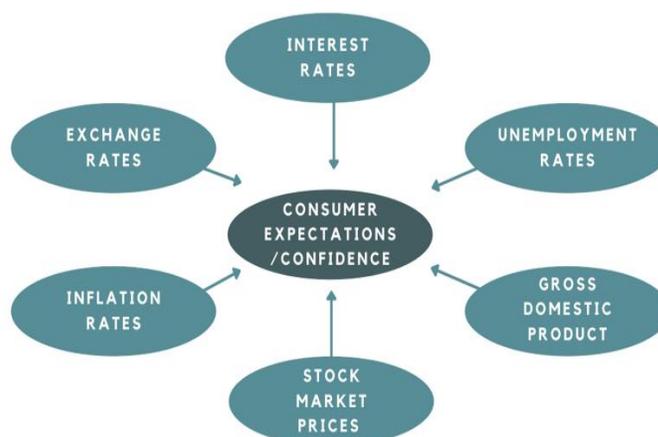


Figure 1: Conceptual Framework

This figure shows the intended relationships to be established within the paper. There are 7 variables mentioned in the figure. All independent variables are the illustrated metrics surrounding the dependent variable, consumer expectations, which include: interest rates, exchange rates, inflation rates, stock market prices, unemployment rates, and gross domestic product. The surrounding variables are hypothesized to have a significant influence on the center or dependent variable, consumer expectations.

2.8 Data Description

2.8.1 Procedures for Data Gathering

The values that will be used for this study are sourced from publicly available government websites.

The following variables are provided by the official website of Bangko Sentral ng Pilipinas: consumer expectancy, interest rates, exchange rates, and inflation rates. The consumer expectancy values are taken from the recorded results of the consumer expectancy survey conducted by BSP. Interest rates represent overnight reverse repurchase agreements. Exchange rates represent end-of-period exchange rates. Inflation rates are adjusted to the base year 2012, as published by BSP.

The following variables are provided by the Philippine Statistics Authority: GDP and unemployment rates, wherein GDP represents GDP per capita adjusted for the base year of 2018.

The stock market prices were based on the Philippine Stock Exchange Index (PSEi) found on Yahoo Finance.

The resulting regression analysis includes data sets ranging from the 3rd quarter of 2004 to the 3rd quarter of 2021. This counts the earliest to the latest record of the consumer expectancy survey. This, in total, results in 69 observations.

The data sets will be organized into a time series by quarter, amounting to a total of 69 values for each variable.

2.8.2 Descriptive Statistics

The following is an overview of the descriptive statistics concerning the equation to be used for the paper. All variables recorded below are untreated.

VARIABLE	OBSERVATION	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Sum	Sum Sq. Dev
Consumer Confidence	69	-21.37971	-21.3	-13.1	-54.5	18.39931	-0.029134	2.07207	-1457.2	23020.35
Interest Rate	69	4.446489	4	7.5	2	1.543831	0.717743	2.624303	306.8078	162.0722
Exchange rate	69	47.83621	47.91033	56.283	40.77567	4.11212	0.242817	2.121767	3300.69	1149.848
Inflation Rate	69	3.856522	3.6	10.26667	-0.066667	2.041092	0.689975	3.571914	266.1	283.2918
Stock Market Price	69	5192.747	5890.773	8404.216	1641.611	2220.104	-0.199653	1.48653	358299.5	3.35E+08
Unemployment Rate	69	7.184058	7.1	17.6	4.5	1.910083	2.668674	14.57815	495.7	248.0925
GDP	69	10.42217	10.40263	10.79628	10.0977	0.189469	0.08056	1.838084	719.1294	2.441103

Table 2.1: Summary of Descriptive Statistics

3. Methodology

3.1 Econometric Model

Consumer Confidence

$$= \beta_0 + \beta_1 \text{Interest Rates} + \beta_2 \text{Exchange Rates} + \beta_3 \text{Inflation Rates} + \beta_4 \text{Stock Market Prices} + \beta_5 \text{Unemployment Rates} + \beta_6 \text{GDPperCapita} + \beta_7 \text{Consumer Confidence}(-1) + [\text{AR}(1) = \beta_8, \text{Unconditional}] + u$$

Equation 1: Multiple Linear Regression Model for Consumer Confidence

$$\text{Consumer Confidence}_t = \sum_{i=1}^n \alpha_i \text{Consumer Confidence}_{t-i} + \sum_{j=1}^n \beta_j \text{GDP}_{t-j} + u_{1t}$$

$$\text{GDP}_t = \sum_{i=1}^n \lambda_i \text{GDP}_{t-i} + \sum_{j=1}^n \sigma_j \text{Consumer Confidence}_{t-j} + u_{2t}$$

Equation 2: Granger Causality Model for Consumer Confidence and Gross Domestic Product

$$\begin{bmatrix} CC_t \\ IR_t \\ ER_t \\ INF_t \\ SMP_t \\ UR_t \\ GDP_t \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \\ C_6 \\ C_7 \end{bmatrix} + \begin{bmatrix} \alpha_{1,1}^1 & \dots & \alpha_{1,7}^1 \\ \vdots & \ddots & \vdots \\ \alpha_{7,1}^1 & \dots & \alpha_{7,7}^1 \end{bmatrix} \begin{bmatrix} CC_{t-1} \\ IR_{t-1} \\ ER_{t-1} \\ INF_{t-1} \\ SMP_{t-1} \\ UR_{t-1} \\ GDP_{t-1} \end{bmatrix} + \dots + \begin{bmatrix} \alpha_{1,1}^p & \dots & \alpha_{1,7}^p \\ \vdots & \ddots & \vdots \\ \alpha_{7,1}^p & \dots & \alpha_{7,7}^p \end{bmatrix} \begin{bmatrix} CC_{t-p} \\ IR_{t-p} \\ ER_{t-p} \\ INF_{t-p} \\ SMP_{t-p} \\ UR_{t-p} \\ GDP_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \\ \varepsilon_{4,t} \\ \varepsilon_{5,t} \\ \varepsilon_{6,t} \\ \varepsilon_{7,t} \end{bmatrix}$$

Equation 3: Vector Autoregression Analysis Model

3.2 Description of Variables

Consumer Confidence refers to the consumers' insights about the current, future, and possibly past economic events. Prior literature has proven that consumer confidence has a significant relationship with macroeconomic indicators. Thus, consumers' insights greatly link to their actual economic activity. To measure this variable, the study is referring to the Philippines Consumer Expectancy Survey.

Gross Domestic Product refers to the general economic situation of a country, as it measures the overall consumption of its consumers, producers, government, and exchange with other countries. This is the macroeconomic indicator most often used in studies concerning the relationships of consumer confidence.

Overnight reverse repurchase agreement interest rates are established interest rates for the purchase of securities, usually used for short-term overnight borrowing and lending to sell with a profit at a future date.

Unemployment rates refer to the number of individuals viable to and searching for work but have not found work at the time of the survey, calculated in proportion to the labor force. This is the proportion of the labor force in the Philippines which are unemployed.

Exchange rates refer to the price by which one currency is sold to receive another. The study utilizes the Philippine Peso Per US Dollar Exchange Rate at the end-of-the-period recorded by the Bangko Sentral ng Pilipinas (BSP).

Inflation rates refer to the rise and drop in the purchasing value of money over time.

Stock Market Prices are officially measured and presented through the Philippine Stock Exchange Index. The stock index measures the fluctuations in the share prices of stocks within the stock market.

Yearly and quarterly records of unemployment rates are officially published and archived by the Philippine Statistics Authority. This measures the proportion of the working-age population that has not found work by the time of the survey.

3.3 Instruments & Statistical Treatment of Data

The EViews 11 Student Version software was used to execute the planned data analysis strategies.

This study intends to analyze the data sets through the MLR method integrated with the ARIMA model and the Granger's Causality Test. Hypothesis testing is observed for each test.

The ARIMA model is often fitted in time series for forecasting and analysis of past data. This method is also used to eliminate non-stationarity and serial correlation that could be found in time-series data sets.

The first objective is answered through the MLR method, holding consumer expectancy as the dependent variable and its following determinants as independent variables: interest rates, exchange rates, inflation rates, stock market prices, unemployment rates, and GDP.

As with the methodology of previous literature (Usul et al., 2017; Bram and Ludvigson, 1998; Ludvigson, 2004; Juhro and Lyke, 2019), the proposed research may utilize period lags from 1 to 4 quarters. The Granger Causality Test determines if there exists a causal relationship between two chronologically organized empirical data sets.

The second objective is answered through Granger's Causality test. This is used to find a uncausality or bicausality between GDP and the identified macroeconomic models.

The Vector Autoregression method illustrates the relationship of multiple variables as they change over time.

The third objective is answered through the vector autoregression method. This will be used to determine the extent of the effect of a shock in consumer confidence on the identified macroeconomic variables and vice versa.

3.4 Different Statistical Tests

This study first conducts a multiple linear regression (MLR) analysis, wherein consumer confidence is held as the dependent variable, and interest rates, unemployment rates, exchange rates, inflation rates, stock market prices, and GDP are held as the independent variables. The Autoregressive integrated moving average model (ARIMA) is then incorporated along with generalized least squares to solve unobserved variables, which may explain the non-stationarity arising from the chosen indicators.

This study then tests the unidirectional or bidirectional causal relationship between consumer confidence and the identified macroeconomic variables. After which, the VAR analysis is used to address the extent of the relationship between consumer confidence and the identified macroeconomic variables.

4. Results and Discussion

4.1 Procedure 1: Multiple Linear Regression Model for Consumer Confidence

4.1.1 Procedure

This test follows Equation 1, wherein the dependent variable is consumer confidence, and the independent variables are interest rates, exchange rates, inflation rates, stock market prices, unemployment rates, and GDP. The null hypothesis is as stated: "there is no significant relationship between the independent variables and dependent variables."

4.1.2 Robustness Checks

The model was tested for multicollinearity, heteroskedasticity, serial correlation, specification errors, non-normality, and unit roots. All tests prove no issue in accuracy, misspecification, non-normality, and the like. Thus, it is reliable for future review and prediction.

Robustness Checks	Null Hypothesis	at the 0.05 level
Johansen Cointegration Test	Hypothesized number of equations (none to n)	4 integrating equations
Variance Inflation Factors	A Centered VIF higher than 10 indicates Multicollinearity	all variables reject the hypothesis of multicollinearity
Breusch-Pagan-Godfrey Heteroskedasticity Test	Homoscedasticity	P(7,60) = 0.1838
Breusch-Godfrey Serial Correlation LM Test	There is no serial correlation	P(3,56) = 0.1988
Ramsey Regression Equation Specification Error Test	There are no specification errors	P(1,58) = 0.5148
Jarque-Bera Test	Residuals are normally distributed	0.636137
Augmented Dickey-Fuller Test	The variables exhibit unit root (under the individual unit root process)	0.0001

Table 4.1: Summary of all Robustness Checks

4.1.3 Resulting Model

The resulting model is as follows:

Consumer Confidence

$$\begin{aligned}
 &= 380.931969036 - (0.48457976092)Interest\ Rates \\
 &+ (0.48457976092)Exchange\ Rates - (1.092127049)Inflation\ Rates \\
 &+ (0.00280226139599)Stock\ Market\ Prices \\
 &- (4.23966893244)Unemployment\ Rates \\
 &- (36.9727177546)GDP\ per\ Capita \\
 &+ (0.498580006963)Consumer\ Confidence(-1) \\
 &+ [AR(1) = 0.122014055822, Unconditional] + u
 \end{aligned}$$

Equation 4.1: Resulting Model from Multivariate Regression Analysis

Wherein GDP per capita is the natural log of the indicator, consumer confidence (-1) stands for the consumer confidence set at a lag of 1 period or 1 quarter, and AR stands for the one autoregression dummy used for this test.

4.1.4 Discussion

This model successfully possesses goodness of fit ranging from 88.5780% to 87.0293%, which confirms that the independent variables (interest rate, exchange rate, inflation rate, stock market price, and unemployment rate) have significant effects on the dependent variable (consumer confidence).

R-squared	0.88578
Adjusted R-squared	0.870293
F-statistic	57.19357
Prob(F-statistic)	0

Table 4.2: Summary of Goodness of Fit

All independent variables prove to be significant at the 90% confidence interval, excluding exchange rates. Exchange rates have been applied to the consumer confidence models tested in developed countries (Lettau and Ludvigson, 2004; Kale and Akkaya, 2016; Usul, Küçükşille and Karaoğlu, 2017; Eyüboğlu and Eyüboğlu, 2018). However, as consumer confidence is a relatively new metric that has only been monitored since the 3rd Quarter of 2004, there is a likelihood that a review of this model in the future, with more observations available, could lead to an improvement in the significance of exchange rates and all other variables. On the other hand, if the results do not improve in future tests, the insignificance of this variable may be due to the Philippines’ status as a developing country and its population’s lack of access to and knowledge of advanced financial instruments and the international financial market.

ARMA Generalized Least Squares	t-Statistic	Probability
c	3.086526	0.0031
Interest Rates	-1.936228	0.0576
Exchange Rates	1.632457	0.1079
Inflation Rates	-1.824617	0.0731
Stock Market Prices	2.333392	0.0231
Unemployment Rates	-7.713324	0
GDP per capita	-2.95687	0.0045
Consumer Confidence (-1)	3.086526	0
AR(1)	0.774597	0.4417

Table 4.3: Summary of Regression Analysis

The resulting econometric model shows the following behaviors: as $\beta_1 = -2.1082$, a 1 unit increase in interest rates would constitute a 2.1082 decrease in consumer confidence. As $\beta_2 = 0.4846$, a 1 unit increase in exchange rates would constitute a 0.4846 increase in consumer confidence. As $\beta_3 = -1.0921$, a 1 unit increase in inflation rates would constitute a 1.0921 decrease in consumer

confidence. As $\beta_4=0.0028$, a 1 unit increase in stock market prices would constitute a 0.0028 increase in consumer confidence. As $\beta_5=-4.2397$, a 1 unit increase in unemployment rates would constitute a 4.2397 decrease in consumer confidence. As $\beta_6=-36.9728$, a 1 unit increase in GDP would constitute a 36.9728 decrease in consumer confidence. As $\beta_7=0.4986$, a 1 unit increase in prior consumer confidence would constitute a 0.4986 increase in consumer confidence.

Unemployment rates and drastic changes in the economy prove to be the greatest concern of Filipino families, as this affects their consumer confidence the most, while stock market prices are found to have the slightest effect. This may be due to the population's general lack of access to various financial markets and allocated focus on direct income and expenditures.

Although, in contrast to prior literature, increased GDP discourages consumers. This is likely due to the Balassa-Samuelson Effect (1964), wherein the rise in GDP in a developing country does not necessarily lead to a higher standard of living. As a country's consumer price index grows, assuming that its people are left with the same level of nominal income and productivity, its people suffer from the consequence of higher expenditure, less savings, and thus less confidence.

In order from most to least in magnitude, the Philippines' consumer confidence fluctuates according to GDP, unemployment rates, interest rates, inflation rates, past consumer confidence, exchange rates, and stock market prices. This may be seen as a hierarchy of the most visible macroeconomic indicators from the perspective of the general Philippine population. The highest in the rank are indicators that directly impact their income and expenditure, while the lowest are indirect factors.

4.2 Procedure 2: Granger Causality Model for Consumer Confidence and GDP

4.2.1 Procedure

This test follows Equation 2, which seeks to find a Granger Cause relationship between consumer confidence and gross domestic product.

4.2.2 Treatment of Data

The tests are conducted with multiple lags to detect the strength of the Granger Cause relationship within the short- and long-term. The lags utilized are 2 lags (6 months), 4 lags (12 months), and 6 lags (18 months).

Results

Null Hypothesis:	After 6 months	After 1 year	After 18 months
GDP does not Granger Cause CC_t	0.0033	0.0050	0.0607
CC_t does not Granger Cause GDP	0.6680	0.1230	0.0677

Table 4.4: Summary of Granger Causality Tests

4.2.3 Discussion

The tests show that GDP does Granger Cause consumer confidence for the next 6 and 12 months at a 95% confidence interval and for the next 16 months at a 90% confidence interval. Meanwhile, consumer confidence only Granger Causes GDP after 16 months, at a 90% confidence interval.

There is an evident unidirectional Granger causal relationship between consumer confidence and GDP at 2 and 4 lags at a 95% confidence interval, wherein GDP Granger Causes consumer confidence. While, there is a bidirectional Granger causal relationship between consumer confidence and GDP at 6 lags at a 90% confidence interval, wherein consumer confidence Granger Causes GDP.

Supported by the cointegration tests and complete robustness checks, the results show that consumer confidence significantly affects GDP in the long run, although this is not immediately felt. On the other hand, GDP maintains an effect on consumer confidence in both the short-run and the long-run.

4.3 Procedure 3: VAR Analysis for Consumer Confidence and Identified Variables

4.3.1 Procedure

This test follows Equation 3, which seeks to illustrate and project the effect of a shock in consumer confidence on the identified macroeconomic variables, and vice versa.

4.3.2 Treatment of Data

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1953.155	NA	1.48e+17	59.39863	59.63086	59.49040
1	-1580.356	655.2215	8.16e+12	49.58655	51.44444	50.32069
2	-1459.994	186.0152	9.85e+11	47.42405	50.90759*	48.80056
3	-1402.244	76.99879	8.59e+11	47.15892	52.26812	49.17781
4	-1303.855	110.3151*	2.50e+11*	45.66228*	52.39713	48.32354*

Table 4.5 Lag Length Selection Criteria

The lag length selection criteria test is essential in confirming the most suitable lag length for the VAR analysis. The VAR analysis was taken to trial with 2 lags and with 4 lags. The study chooses 2 lags instead since it does not present any stationarity, unit roots, serial correlation, or any other plausible causes for statistical error.

4.3.3 Results

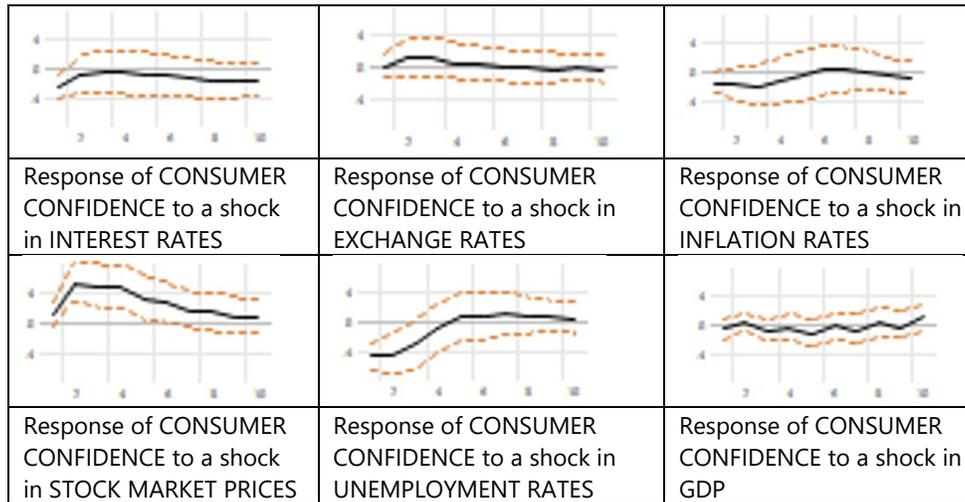


Table 4.6 Response of Consumer Confidence to Identified Variables

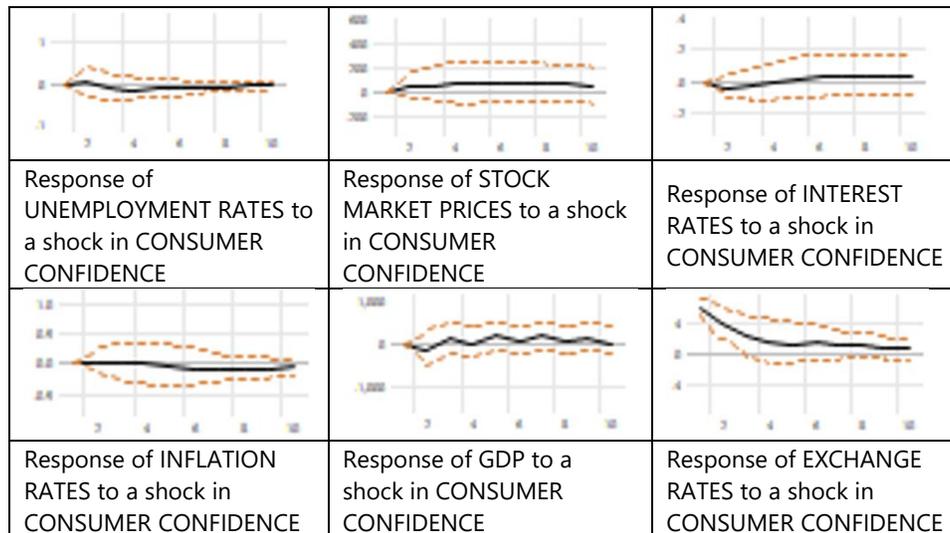


Table 4.7 Response of Identified Variables to Consumer Confidence

4.3.4 Discussion

Table 4.6 illustrates the response of consumer confidence to shocks in interest rates, exchange rates, inflation rates, stock market prices, unemployment rates, and GDP. Consumer confidence shows positive responses to exchange rates, stock market prices, and GDP, while it shows negative responses to interest rates, inflation rates, and unemployment rates. Unemployment rates have the greatest impact on consumer confidence, with the negative effect persisting until 5 lags or 1 year and 3 months before finally reaching normality. A shock in unemployment rates greatly devastates consumer confidence, thus showing the latter's potential

as an indicator of a more labor-productive economy. Meanwhile, stock market prices are the second to greatly impact consumer confidence, inciting a positive reaction from the latter that persists even past 8 lags or 2 years. It can also be seen that, despite the upturns and downturns, consumer confidence shows an upward trend in response to a shock in GDP.

Table 4.7 illustrates the response of interest rates, exchange rates, inflation rates, stock market prices, unemployment rates, and GDP to a shock in Consumer Confidence. This confirms the relationships detected in the resulting model from the regression analysis (Equation 4.1) and in Table 4.6., where all three tests illustrated by Equation 4.1, Table 4.6, and Table 4.7 possess the same relationships, except for the case of GDP; wherein interest rates, inflation rates, and unemployment rates respond negatively to consumer confidence, while exchange rates, and stock market prices respond positively to consumer confidence. The greatest response can be seen in that of the exchange rate, as its positive response is measured to be above 4 standard deviations and persists past 10 lags or 2 years and 6 months.

The VAR analysis fills the gap in the contradiction of GDP's relationship with consumer confidence. The results of the regression analysis depict that GDP negatively affects consumer confidence. However, it can be seen from the results of the VAR analysis (Table 4. 6) that consumer confidence is only negatively impacted by a shock in GDP for a single quarter or 3 months before stabilizing and entering a positive relationship with GDP that becomes a cycle of downturns and upturns but nevertheless possesses an upward trend.

5. Conclusion

It is common advice amongst economists that policymakers must utilize consumer and business confidence in creating more accurate forecasts for future consumption growth, especially in times of crisis (Lahiri et al., 2016; Matošec and Zoričić, 2019). Other than fiscal policies focused on investment, government expenditure, and net exports, the government may choose to create policies aiming to raise consumer confidence; such action would very likely bear fruit most speedily and provide more stability within the country, as consumer confidence exhibits a quick reaction to the fluctuation of the independent variables and as a rise in consumer confidence implies a more active economy in terms of expenditures.

His paper tackles the question of which economic indicators contribute to the shocks in consumer confidence and clarifies the relationships between the variables and the extent to which they affect one another.

This paper found specific macroeconomic indicators can be associated significantly with the fluctuations of the consumer confidence of Filipinos, namely: interest rates, inflation rates, stock market prices, unemployment rates, and GDP. Under regression analysis, exchange rates are found to be insignificant in determining the fluctuations of consumer confidence. However, it is significant in maintaining the stability of the overall model. This alludes to the idea that the current statistics may be flawed due to limited observations. A review of this model in the future, wherein the observations would be more plentiful and thus more reliable in testing, could lead to an improvement in the significance of exchange rates and all other variables. However, if the results do not improve, the insignificance of this variable may be due to the Philippines' status as a developing country and its population's lack of access to and knowledge of advanced financial instruments and the international financial market.

All independent variables behaved as hypothesized, excluding GDP. In contrast to prior literature, increased GDP discourages consumers. Balassa (1964) and Samuelson (1964) found that the growth in the economy does not entail an equal growth in productivity in developing countries. As a country's consumer price index grows, assuming that its people are left with the same level of nominal income and productivity, its people suffer from the consequence of higher expenditure, less savings, less real income, less purchasing power, and thus less consumer confidence. However, this was resolved by the VAR analysis (Table 4.6), wherein GDP only shortly negatively impacts consumer confidence before entering a cyclical yet upward trending relationship.

This paper found that consumer confidence has a unidirectional Granger causal relationship with GDP, wherein GDP Granger Causes consumer confidence for 2 to 4 lags at a 95% confidence interval and a bidirectional Granger causal relationship between the two variables for the 6th lag at a 90% confidence interval.

Lastly, the VAR analysis depicted that Filipinos are most heavily discouraged by shocks in unemployment rates and most encouraged by shocks in stock market prices. On the other hand, consumer confidence incites a significant positive response from exchange rates that persists beyond 2 years.

These observations thus confirm the significance of consumer confidence in the fluctuations of the Philippine economy in the short- and long-run, as well as systematically illustrate the relationship of consumer confidence with other macroeconomic metrics. As the model shows, consumer confidence is heavily influenced by the country's economic stability and the individual's level of income, purchasing power, access to financial instruments, and ability to borrow.

The pandemic and measures against the spread of the virus brought about economic instability and economic anxiety, consequently forcing and dissuading consumers from active economic participation. For the country to regain its pre-pandemic economic prowess and attain economic stability and growth after the pandemic, the government must regain the trust of the people to engage in purchases and common consumption.

Therefore, the country's leaders must recognize the significance of the consumer confidence of the population and its effects on the country and make efforts to improve it through adapting consumer-friendly policies, improving the population's knowledge of financial instruments and the money market, further enhancing the country's financial technology, and favoring to maintain steady economic growth and development over a shock.

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APPENDIX

Dependent Variable: CE
 Method: ARMA Generalized Least Squares (BFGS)
 Date: 12/14/21 Time: 14:59
 Sample: 2004Q4 2021Q3
 Included observations: 68
 Convergence achieved after 5 iterations
 Coefficient covariance computed using outer product of gradients
 d.f. adjustment for standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EREOF	0.484580	0.296841	1.632457	0.1079
INF	-1.092127	0.598552	-1.824617	0.0731
INTRRP	-2.108235	1.088836	-1.936228	0.0576
SMP	0.002802	0.001201	2.333392	0.0231
UNEMP	-4.239669	0.549655	-7.713324	0.0000
GDPCAPLOG	-36.97272	12.50401	-2.956870	0.0045
CE(-1)	0.498580	0.086813	5.743123	0.0000
C	380.9320	123.4177	3.086526	0.0031
AR(1)	0.122014	0.157519	0.774597	0.4417
R-squared	0.885780	Mean dependent var		-21.10588
Adjusted R-squared	0.870293	S.D. dependent var		18.39392
S.E. of regression	6.624547	Akaike info criterion		6.742397
Sum squared resid	2589.193	Schwarz criterion		7.036156
Log likelihood	-220.2415	Hannan-Quinn criter.		6.858793
F-statistic	57.19357	Durbin-Watson stat		1.941790
Prob(F-statistic)	0.000000			
Inverted AR Roots	.12			

Appendix A: Complete Regression Estimate

Johansen Cointegration Test

Date: 12/15/21 Time: 17:32
 Sample (adjusted): 2005Q3 2021Q3
 Included observations: 65 after adjustments
 Trend assumption: Linear deterministic trend
 Series: CE EREOF GDPCAPLOG INF INTRRP SMP UNEMP
 Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.666157	231.8761	125.6154	0.0000
At most 1 *	0.583375	160.5656	95.75366	0.0000
At most 2 *	0.442031	103.6537	69.81889	0.0000
At most 3 *	0.432041	65.72930	47.85613	0.0005
At most 4	0.191620	28.95842	29.79707	0.0622
At most 5	0.138854	15.13141	15.49471	0.0567
At most 6 *	0.079924	5.414458	3.841465	0.0200

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **Mackinnon-Haug-Michelis (1999) p-values

Appendix B: Complete Johansen Cointegration Test

Group Unit Root Test on GROUP01

Group unit root test: Summary
 Series: CE, INTRRP, EREOF, INF, SMP, UNEMP, GDPCAPLOG
 Date: 12/15/21 Time: 17:34
 Sample: 2004Q3 2021Q3
 Exogenous variables: Individual effects
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0 to 5
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.34464	0.0095	7	468
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.32064	0.0004	7	468
ADF - Fisher Chi-square	43.7735	0.0001	7	468
PP - Fisher Chi-square	35.7949	0.0011	7	476

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Appendix C: Complete Unit Root Test

Variance Inflation Factors
 Date: 12/15/21 Time: 21:09
 Sample: 2004Q3 2021Q3
 Included observations: 68

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
EREOF	0.088114	242.5285	1.710133
INF	0.358264	8.156532	1.837499
INTRRP	1.185563	31.00680	3.322747
SMP	1.44E-06	55.77642	8.261468
UNEMP	0.302121	19.81805	1.423812
GDPCAPLOG	156.3502	20393.45	6.706638
CE(-1)	0.007537	7.363893	3.198294
C	15231.93	18268.30	NA
AR(1)	0.024812	1.483843	1.483787

Appendix D: Complete Multicollinearity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
 Null hypothesis: Homoskedasticity

F-statistic	1.502648	Prob. F(7,60)	0.1838
Obs*R-squared	10.14287	Prob. Chi-Square(7)	0.1806
Scaled explained SS	5.729317	Prob. Chi-Square(7)	0.5717

Appendix E: Complete Heteroskedasticity Test

Breusch-Godfrey Serial Correlation LM Test:
 Null hypothesis: No serial correlation at up to 3 lags

F-statistic	1.603483	Prob. F(3,56)	0.1988
Obs*R-squared	5.379183	Prob. Chi-Square(3)	0.1460

Appendix F: Complete Serial Correlation Test

Ramsey RESET Test
 Equation: EQ01
 Omitted Variables: Squares of fitted values
 Specification: CE EREOF INF INTRRP SMP UNEMP GDPCAPLOG CE(-1)
 C AR(1)

	Value	df	Probability
t-statistic	0.655365	58	0.5148
F-statistic	0.429503	(1, 58)	0.5148
Likelihood ratio	0.502665	1	0.4783

F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	19.03260	1	19.03260
Restricted SSR	2589.193	59	43.88462
Unrestricted SSR	2570.160	58	44.31310

LR test summary:	
	Value
Restricted LogL	-220.2415
Unrestricted LogL	-219.9902

Appendix G: Complete Misspecification Test

Pairwise Granger Causality Tests
 Date: 12/15/21 Time: 23:36
 Sample: 2004Q3 2021Q3
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPCAPLOG does not Granger Cause CE	67	6.27088	0.0033
CE does not Granger Cause GDPCAPLOG		0.40614	0.6680

Appendix H: Granger Causality Test set to 2 lags

Pairwise Granger Causality Tests
 Date: 12/15/21 Time: 23:36
 Sample: 2004Q3 2021Q3
 Lags: 4

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPCAPLOG does not Granger Cause CE	65	4.17728	0.0050
CE does not Granger Cause GDPCAPLOG		1.90109	0.1230

Appendix I: Granger Causality Test set to 4 lags

Pairwise Granger Causality Tests
 Date: 12/15/21 Time: 23:36
 Sample: 2004Q3 2021Q3
 Lags: 6

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPCAPLOG does not Granger Cause CE	63	2.17745	0.0607
CE does not Granger Cause GDPCAPLOG		2.11659	0.0677

Appendix J: Granger Causality Test set to 6 lags

n	Date	GDP At Constant 2018 Prices	Exchange Rates	Inflation Rates	Unemployment Rates	SMP Adj Close	Interest Rates RRP	Consumer Confidence	
			EOF	2012=100				Current Quarter	
1	2004	Q3	2029118.986	56.187	5.8	11.7	1,641.6112	6.75	-40
2		Q4	2282019.601	56.283	6.733333333	10.9	1,823.8043	6.75	-49.1
3		Q1	2071139.873	54.874	7.233333333	11.3	2,017.5612	6.75	-44.2
4		Q2	2195368.688	54.88	7.066666667	8.3	1,902.2575	6.985433333	-49.9
5	2005	Q3	2117984.699	56.10666667	6.033333333	7.7	1,959.2362	7.0272	-54.1
6		Q4	2389831.347	54.042	6.1	7.4	2,051.4725	7.447466667	-52.7
7		Q1	2164381.215	51.90266667	6.333333333	8.1	2,154.2127	7.5	-40.7
8		Q2	2325314.094	52.089	6.066666667	8.2	2,247.9087	7.5	-38.7
9	2006	Q3	2217592.682	50.98266667	5.2	8	2,419.3045	7.5	-37.2
10		Q4	253516.285	49.56666667	4.333333333	7.3	2,825.7734	7.5	-39.8
11		Q1	2297796.865	48.52533333	3.1	7.8	3,169.2751	7.5	-33.3
12		Q2	2484417.016	46.70266667	2.633333333	7.4	3,467.8616	7.5	-26.0
13	2007	Q3	2362773.255	45.78966667	2.833333333	7.8	3,478.9020	6.183833333	-23.6
14		Q4	2698252.114	42.71533333	3.233333333	6.3	3,652.1010	5.619066667	-33.6
15		Q1	2393607.289	40.95933333	5.2	7.4	3,126.0828	5.077333333	-32.1
16		Q2	2602999.343	43.61	8.3	8	2,678.3747	5.0706	-43.8
17	2008	Q3	2491195.640	45.58066667	10.26666667	7.4	2,610.9419	5.750666667	-52.8
18		Q4	2782075.257	48.37033333	8.866666667	6.8	1,931.3400	5.941533333	-40.3
19		Q1	2420350.057	47.91033333	6.966666667	7.7	1,894.0229	5.076966667	-25.7
20		Q2	2652251.487	48.18666667	4.366666667	7.5	2,309.6728	4.447066667	-34.2
21	2009	Q3	2514310.803	48.20633333	2.066666667	7.6	2,827.0497	4.023666667	-31.9
22		Q4	2832720.670	46.94666667	3.6	7.1	3,001.2782	4	-36.0
23		Q1	2616890.924	46.07366667	3.9	7.3	3,052.1285	4	-27.6
24		Q2	2863766.596	45.722	3.833333333	7.9	3,310.9920	4	-28.7
25	2010	Q3	2692051.540	44.96266667	3.866666667	6.9	3,696.7992	4	-14.0
26		Q4	3011151.937	43.774	3.5	7	4,140.1289	4	-8.5
27		Q1	2743208.698	43.78566667	4.533333333	7.4	3,900.1104	4.020766667	-23.1
28		Q2	2965725.983	43.26766667	4.933333333	7.2	4,284.0184	4.403866667	-24.1
29	2011	Q3	2773776.253	42.79	4.733333333	7.1	4,282.8254	4.5	-18.7
30		Q4	3132649.459	43.58866667	4.7	6.4	4,304.4665	4.5	-20.6
31		Q1	2908989.080	42.93666667	3.333333333	7.2	4,894.6813	4.22	-14.7
32		Q2	3150174.444	42.72333333	2.933333333	6.9	5,178.7819	4	-19.5
33	2012	Q3	2979022.273	42.034	3.466666667	7	5,281.9585	3.82	-13.3
34		Q4	3378370.393	41.11266667	2.966666667	6.8	5,624.4504	3.5	-10.4
35		Q1	3129775.550	40.77566667	2.8	7.1	6,602.1891	3.5	-11.2
36		Q2	3386828.970	42.28133333	2.333333333	7.5	6,850.9784	3.5	-5.7
37	2013	Q3	3178883.729	43.782	2.166666667	7.3	6,300.4098	3.5	-7.9
38		Q4	3559155.378	43.77633333	3.033333333	6.4	6,226.4089	3.5	-21.3
39		Q1	3308136.019	44.93566667	3.6	7.5	6,296.6774	3.5	-18.8
40		Q2	3621755.886	44.05666667	3.8	7	6,731.5591	3.5	-17.3
41	2014	Q3	3367553.456	44.01166667	4.1	6.7	7,064.4435	3.75	-26.3
42		Q4	3798601.384	44.803	2.866666667	6	7,230.2840	4	-21.8
43		Q1	3481796.470	44.33833333	1.5	6.6	7,784.9881	4	-10.0
44		Q2	3853504.007	44.7	0.966666667	6.4	7,617.9676	4	-16.2
45	2015	Q3	3589387.681	46.41633333	-0.066666667	6.5	7,179.0840	4	-11.6
46		Q4	4066219.293	47.04166667	0.266666667	5.6	7,002.6693	4	-8.1
47		Q1	3722688.281	47.16366667	0.6	5.8	6,871.8862	4	-5.7
48		Q2	4140185.999	46.836	0.966666667	6.1	7,450.4642	3.666666667	-6.4
49	2016	Q3	3852482.661	47.26966667	1.433333333	5.4	7,791.3999	3	2.5
50		Q4	4347318.954	49.36833333	2.033333333	4.7	7,007.0781	3	9.2
51		Q1	3959977.370	50.09166667	2.9	6.6	7,249.2926	3	8.7
52		Q2	4437331.262	50.01066667	2.866666667	5.7	7,778.4300	3	13.1
53	2017	Q3	4142636.106	50.94033333	2.666666667	5.6	8,047.2808	3	10.2
54		Q4	4636033.348	50.69566667	3	5	8,390.4124	3	9.5
55		Q1	4215576.481	51.88733333	3.833333333	5.3	8,404.2157	3	1.7
56		Q2	4720383.967	52.72533333	4.766666667	5.5	7,501.4378	3.172833333	3.8
57	2018	Q3	4397241.325	53.64933333	6.266666667	5.4	7,599.5558	4	-7.1
58		Q4	4931988.485	52.97933333	5.933333333	5.1	7,322.8371	4.666666667	-22.5
59		Q1	4463185.921	52.38	3.833333333	5.2	7,875.9416	4.75	-0.5
60		Q2	4985924.379	51.907	2.966666667	5.1	7,972.1001	4.583333333	-1.3
61	2019	Q3	4675544.205	51.798	1.666666667	5.4	7,932.8034	4.3444	4.6
62		Q4	5258096.106	50.85833333	1.533333333	4.5	7,841.7635	4	1.3
63		Q1	4,445,834	50.96166667	1.533333333	5.3	6,434.9900	3.786	1.3
64		Q2	4,134,663	50.389	2.666666667	17.6	5,914.2333	2.831	-54.5
65	2020	Q3	4,202,942	48.76766667	2.266666667	10	5,890.7733	2.250	-51.20
66		Q4	5,155,143	48.17966667	2.466666667	8.7	6,771.9167	2.136	-47.9
67		Q1	4,363,700	48.408	4.66666667	8.7	6,857.0654	2	-34.7
68		Q2	4,758,903	48.27833333	4.5	8.7	6,598.1261	2	-30.9
69	2021	Q3	4,609,991	50.447	4.333333333	6.9	6,766.4784	2	-19.3

Appendix K: Raw Data