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Factors impacting consumer confidence: Evidence from China

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Abstract
This article aims to investigate the factors that may impact the Chinese consumer confidence. Three variables are selected: interest rate, exchange rate Chinese Yuan against US dollars (CNY/USD) and government expenditure. We apply Vector Error Correction Model (VECM) over the period spanning from 2008M01 to 2023M03. While in the short-run the findings report that interest rate, exchange rate (CNY/USD) and government expenditure do not notably influence the consumer confidence; in the long-run, we found a significant and positive relationship between government expenditure and China's consumer confidence index. More government expenditure indicates the country is boosting the whole economy and providing more resources to the people, which affect positively the consumer confidence. Policymakers in China can invest further in this measure to gain the confidence of their people.

Keywords: Consumer confidence; economic activity; China; Vector Error Correction Model

INTRODUCTION
Consumer confidence index is an economic indicator used to measure consumer attitudes regarding the financial situation of their country. Investigating the factors that may affect the consumer confidence is so important in scientific research and for policymakers because it helps understanding and forecasting current and future conditions of the economy. In this context, numerous studies attempted to examine the relationship between consumer confidence index and various economic variables. Most of current studies focused on the effect of consumer confidence index on economic activities, as it has been found a long run relationship between consumer confidence and economic growth (Islam and Mumtaz, 2016). More specifically, in case of individual consumers, some studies found that consumer sentiment is a good predictor for consumption expenditures, which shows that higher consumer confidence leads to the increase of household spending (Dees and Brinca, 2013; Anastasiou et al., 2023) and such effect will last for a long time on various types of consumption (Ahmed and Cassou, 2016). With regards to the market sector, sector-specific sentiment influences the sector return in the form of consumer confidence. Though this relationship varies across sectors, the overall sentiment-return relationship is dominated by consumer sentiment associated with manufacturing sectors (Salhin et al., 2016). From a more general perspective, some existing literature argue that the rise and fall in aggregate output for an economy, which is defined as the business cycle, can be explained by the changes of consumer confidence. In particular, periods of high consumer confidence are associated with periods of economic expansions while periods of lower consumer confidence are associated with periods of economic recessions (Møller et al, 2014).

However, only few studies investigated the drivers of consumer confidence. In fact, consumer confidence is influenced by several factors. Some existing studies try to explore the effect of news coverage. Negative news decrease consumer confidence while more positive news increase consumer confidence towards the whole economy (Hollanders and Vliegenthart, 2011; Rogmann et al., 2024). Furthermore, other studies find that political factors are also important for understanding consumer confidence index. Consumer confidence responds distinctively to different political and

institutional contexts (De Boef and Kellstedt, 2004; Duch and Kellstedt, 2011; Pitas, Zou and Mowen, 2024). From a macroeconomic point of view, some authors tried to explore the effect of economic variables such as unemployment, economic growth, and stock market (Jansen and Nahuis, 2003; Vuchelen, 2004; Berry and Davey, 2004; De Boef and Kellstedt, 2004; Hu and Sun, 2024). Our paper is subscribed into this line of research, and we intend to determine the financial and economic drivers of consumer confidence index. The theoretical justification of this topic lies in the wealth effect theory which stipulates that spending habits of individuals are influenced by their personal wealth. For instance, changes in stock prices, savings, housing values, …etc can impact the consumer spending and overall confidence in their economy.

Although some existing articles have already investigated the drivers of consumer confidence using a wide range of variables; in this article, we mainly focus on the effect of economic and financial variables on consumer confidence index in the case of China. The contribution in this study is threefold. First, we include new variables (interest rate, the exchange rate and government expenditure) which have not yet been widely used in the existing literature on consumer confidence. Indeed, these financial and economic variables are key elements for each economy which can help companies, researchers, and policymakers to understand in what extent they can influence the consumer confidence. Second, we choose to explore the case of China since this country is one of the largest consumer markets in the world. It was expected that the structure of consumption preferences resulted from the high rate of urbanization combined with a slowing population growth rate will evolve in the future (Sheng and Song, 2019). Third, we make use of an advanced and sophisticated model (VECM) to analyze the relationship between our variables. The advantage of this model is that it allows the modeling of both short-run and long-run dynamics.

The remainder of this paper is structured as follows: section 2 reviews the existing literature on consumer confidence. In section 3, we describe the data and the methodology. In section 4, we discuss the empirical results. Finally, section 5 concludes the article.

LITERATURE REVIEW

Consumer confidence is a crucial factor that stimulates economic performance. Many researchers try to explore the link between consumer confidence and economic behaviors. To date, most studies focused on the effect of consumer confidence or sentiments on the economy rather than investigating the influence of economic activities on consumer confidence. Consumer confidence can be impacted by several economic factors including energy prices, inflation, household income and house buying conditions (Guntner and Linsbauer, 2018). De Boef and Kellstedt (2004) analyzed the effect of inflation rate and unemployment rate on the monthly consumer sentiment index in USA between January 1981 and August 2002. Using Error Correction Model, they found out that economic conditions exhibit a long run influence on consumer confidence. Similarly, Golinelli and Parigi (2004) analyzed the relationship between consumer confidence index and aggregate output in France, Germany, Italy, UK, USA, Japan, Canada and Australia. Through VAR model, they report that the evolution of consumer confidence index is mainly driven by inflation and labor market variables. Makridis (2022) examined the effect of local employment and housing prices in US on economic sentiments during the period 2008-2017. Based on panel regression model, the authors documented that a growth in labor market and housing prices lead to a significant increase in the beliefs and perceptions of households about the economic outlook. Similarly, Binder and Makridis (2022) reported that local gas prices in US have a significant impact on consumer beliefs and perceptions about their economy. More specifically, they found that an increase in gas prices is associated with a decline in consumer sentiments. Rooj et al. (2024) analyzed whether the local economic activity in India can affect their consumer sentiments. Their findings demonstrate that a rise in the scale of economic activities generates a significant positive impact on how respondents perceive and anticipate their overall economic situation.

On the other hand, some articles showed that stock returns are closely linked to the optimism of consumers on current and future economy. In this context, Jansen and Nahuis (2003) examined the short-run relationship between stock market developments and consumer confidence in 11 European countries over the period from 1986 to 2001. They found that consumer expectation acts as a transmission channel to deliver the confidence across countries. In particular, stock returns and changes in investor sentiment are found to be positively correlated among nine countries. Kale and Akkaya (2016) explored the relationship between consumer confidence and five different stock indices (aggregate, financial, industrial, services and technological). Using VAR model, they showed that there is no causality running from consumer confidence towards stock returns; however, stock returns are found to positively affect consumer confidence. Salhin et al. (2016) found the same results and conclude that there is no support for consumer confidence as a predictor for the stock return; but stock return may affect consumer sentiments. Recently, Hu and Sun (2024) examined the relationship between investor sentiment and stock returns in Chinese stock returns during the period January 2002-December 2021. Their results show evidence of negative association between the two variables and conclude that investor sentiment is a reliable factor to improve financial performance.

Another important factor having an impact on consumer confidence is media news coverage. Dom and Morin (2004) investigate the effect of media announcements on consumer confidence in USA between January 1978 and May 2003 and found that media news affects consumer confidence through three channels, namely the content of media news, the volume of media news and the styles of reporting the economic news. Hollanders and Vliegenthart (2011) studied the relationship between consumer confidence and economic news coverage in national newspapers in Netherlands during the period 1990-2009. Their findings indicate that negative economic news decreases consumer confidence. Similarly, Ahmed and Cassou (2016) in their study on animal spirit also found that different media news leads to different consumer confidence shocks. Good economic news results in an optimistic consumer confidence while bad economic news leads to a pessimistic consumer confidence. Although news coverage affects consumer sentiments, such effect is expected to be short-lived. (Doms and Morin, 2004; Alsem et al., 2008).

The political environment is also found to have an impact on consumer confidence. In this context, De Boef and Kellstedt (2004) argue that politics is important for understanding consumer confidence. They use Error Correction model to analyze the effect of US government's political management of the economy on consumer confidence. The results show that politics affect the confidence of consumers on the economy in both short and long-run. Duch and Kellstedt (2011) also explored whether consumer confidence responds differently to different political and institutional contexts in Canada, France, Germany and UK. Their findings suggest that the degree to which consumer confidence responds to political adjustment varies under different political contexts. Moreover, since each country has its own political context, changes of consumer confidence in one country only resulted from its own country's political adjustment. Gillitzer and Prasad (2018) studied the impact of political elections on the sentiments of voters in Australia and report that the results of political elections have a significant impact on consumer sentiments. In particular, partisans of the winning party are shown to be more optimistic about economic conditions than those of losing party. Likewise, Benhabib and Spiegel (2019) found that political outcomes in US drive significantly consumer sentiments, in the sense that people where a larger proportion of congressional representatives align with the president's political party exhibited higher optimism about the economic activity.

DATA AND METHODOLOGY

To examine the drivers of China's consumer confidence index, we use in this article consumer confidence index (CCI) as dependent variable, and interest rate (I), exchange rate (FX) and government expenditure (GE) as independent variables. Monthly data on each variable is collected over the period from 2008M01 to 2023M03. CCI variable is obtained from the Organization for Economic Cooperation and Development (OECD) Database. When CCI value exceeds 100, it refers to a boost in the consumers' confidence towards the future economic situation in China, while a value below 100 indicates a pessimistic attitude towards future developments in the economy. Interest rate (I) is extracted from International Monetary Fund (IMF) Database, which is the short-run deposit interest rate of China. As a change in the deposit rate affects households' choices between consumptions and savings, thereby it is expected to impact the consumer confidence. When deposit rate increases, households are more willing to spend on savings instead of consuming, and vice versa. Exchange rate (FX) is also extracted from IMF database and is expressed as one unit of local currency in terms of USD. Finally, government expenditure (GE) represents the responsibility of one country's central government for the provision of public goods and services to satisfy the people's needs and stabilize the general economy. More government expenditure indicates the country is boosting the whole economy and providing more resources to the people, which may affect the consumer confidence. This variable is obtained from National Bureau of Statistics of China.

The relationship between the above variables is modeled through vector error correction model (VECM). This model is widely used for estimating multivariate cointegrated time series. It deals with both long-term relationships through cointegration equations (CE) and short-term relationships through unrestricted VAR equations.
This model can be written as:

$$\Delta CCI_t = \lambda ECT_{t-1} + \sum_{j=1}^{p} \alpha_j \Delta CCI_{t-j} + \sum_{k=1}^{p} \beta_k \Delta I_{t-k} + \sum_{l=1}^{p} \gamma_l \Delta FX_{t-l} + \sum_{m=1}^{p} \delta_m \Delta GE_{t-m} + \varepsilon_t \quad (1)$$

Where Δ is the first difference operator; CCI_t is the consumer confidence index; I_t is the interest rate; FX_t is the exchange rate CNY/USD; GE_t is the government expenditure; and ECT_{t-1} is the error correction term, which is the estimated residuals from the cointegration equation.

Empirical results

1.1 Descriptive statistics and correlations matrix

Table 1 below shows the descriptive statistics and correlations matrix for our variables. It is shown that most of correlation coefficients demonstrate a weak correlation between our variables, which can lead to more statistically stable estimates and reliable regression results.

Table 1. Descriptive statistics and correlations matrix

Descriptive statistics				
	CCI	I	FX	GE
Mean	108.7334	2.216557	0.151864	30.48686
Median	106.6000	1.750000	0.151240	31.99767
Maximum	127.0000	4.140000	0.165175	35.40300
Minimum	85.50000	1.500000	0.136509	22.52500
Std. Dev.	9.913721	0.828417	0.007002	3.435117
Correlations matrix				
	CCI	I	FX	GE
CCI	1	-0.367	-0.189	0.423
I	-0.367	1	0.291	-0.795
FX	-0.189	0.291	1	-0.018
GE	0.423	-0.795	-0.018	1

1.2 Unit root test

We use Augmented Dickey Fuller (ADF) test to check the unit roots and identify the integration order in times series. Table 2 reports the ADF unit root test results for each time series.

Table 2. ADF unit root test results

	level				1st difference			
Variables	Tend and intercept	intercept	None		Tend and intercept	intercept	None	Integration order
CCI	2.47	0.50	0.62		2.30	0.62	6.72*	I(1)
I	-1.05	1.59	-1.58		0.38	-1.05	5.47*	I(1)
FX	1.34	1.99	-1.36		1.42	-0.89	8.35*	I(1)
GE	1.83	1.59	4.75		-0.33	5.53* (-11.81)		I(1)

*Indicates significance at 5% level.

As shown in Table 2, consumer confidence index (CCI), interest rate (I) and exchange rate (FX) are all stationary at first difference. They are integrated of order 1, denoted I(1).

Johansen Cointegration test

Since consumer confidence index (CCI), interest rate (I), exchange rate (FX) and government expenditure (GE) are integrated of the same order I(1), they can be tested for possible cointegration relationships. The cointegration test aims to reveal the long-run equilibrium relationship between variables. However, with multivariate variables, it is possible to have multiple cointegration relationships. As a result, we use the Johansen cointegration test (1988) that allows for possible multiple cointegration relationships among variables rather than the Engle-Granger approach that is used for two variables cointegration tests. The null hypothesis for the Johansen test is non-cointegration while the alternative hypothesis allows for cointegration. To determine the number of long-run relationships, two test statistics namely the trace statistics and the maximum eigenvalue statistics (Johansen and Juselius, 1990) will be used.

We first estimate the unrestricted VAR model as shown below from equation (2) to equation (5) including all variables in levels to determine the optimal lag lengths based on information criteria.

$$CCI_t = \partial_1 + \emptyset_{11} \cdot CCI_{t-1} + \cdots + \emptyset_{1p} \cdot CCI_{t-p} + \beta_{11} \cdot I_{t-1} + \cdots + \beta_{1p} \cdot I_{t-p} + \gamma_{11} \cdot FX_{t-1} + \cdots + \gamma_{1p} \cdot FX_{t-p} + \delta_{11} \cdot GE_{t-1} + \cdots + \delta_{1p} \cdot GE_{t-p} + \varepsilon_{1t} \quad (2)$$

$$I_t = \partial_2 + \emptyset_{21} \cdot CCI_{t-1} + \cdots + \emptyset_{2p} \cdot CCI_{t-p} + \beta_{21} \cdot I_{t-1} + \cdots + \beta_{2p} \cdot I_{t-p} + \gamma_{21} \cdot FX_{t-1} + \cdots + \gamma_{2p} \cdot FX_{t-p} + \delta_{21} \cdot GE_{t-1} + \cdots + \delta_{2p} \cdot GE_{t-p} + \varepsilon_{2t} \quad (3)$$

$$FX_t = \partial_3 + \emptyset_{31} \cdot CCI_{t-1} + \cdots + \emptyset_{3p} \cdot CCI_{t-p} + \beta_{31} \cdot I_{t-1} + \cdots + \beta_{3p} \cdot I_{t-p} + \gamma_{31} \cdot FX_{t-1} + \cdots + \gamma_{3p} \cdot FX_{t-p} + \delta_{31} \cdot GE_{t-1} + \cdots + \delta_{3p} \cdot GE_{t-p} + \varepsilon_{3t} \quad (4)$$

$$GE_t = \partial_4 + \emptyset_{41} \cdot CCI_{t-1} + \cdots + \emptyset_{4p} \cdot CCI_{t-p} + \beta_{41} \cdot I_{t-1} + \cdots + \beta_{4p} \cdot I_{t-p} + \gamma_{41} \cdot FX_{t-1} + \cdots + \gamma_{4p} \cdot FX_{t-p} + \delta_{41} \cdot GE_{t-1} + \cdots + \delta_{4p} \cdot GE_{t-p} + \varepsilon_{4t} \quad (5)$$

Table 3 shows the lag-order selection results for unrestricted VAR model. According to Akaike information criterion (AIC), Schwarz criterion (SC) and Hannan-Quinn information criterion (HQ), 3 lags is found to be the optimal lag length.

Table 3. VAR lag order selection results

Lag	AIC	SC	HQ
0	11.04105	11.13925	11.08088
1	2.150647	2.641643	2.349797
2	1.015478	1.899271	1.373949
3	0.592105*	1.868696*	1.109897*
4	0.730943	2.400331	1.408055
5	0.835067	2.897252	1.671500
6	0.783167	3.238149	1.778921
7	1.011438	3.859217	2.166513
8	1.097956	4.338533	2.412351
9	1.196210	4.829584	2.669926
10	1.298293	5.324464	2.931330

To determine the deterministic components for our model, we use case 2 (intercept but no trend for cointegration equation and neither trend nor intercept in VAR model), as this choice is suggested by both AIC and SC information criteria (see Table 4).

Table 4. Information criteria by rank and model

Data Trend:	None	None	Linear	Linear	Quadratic
Rank or	No Intercept	Intercept	Intercept	Intercept	Intercept
No. of CEs	No Trend	No Trend	No Trend	Trend	Trend
Akaike Information Criteria by Rank (rows) and Model (columns)					
0	0.701130	0.701130	0.728544	0.728544	0.718616
1	0.659362	0.593029	0.612208	0.565156	0.538144
2	0.673839	0.468844*	0.577610	0.572743	0.482525
3	0.771210	0.685747	0.691382	0.543272	0.557864
4	0.896179	0.826746	0.826746	0.678153	0.678153
Schwarz Criteria by Rank (rows) and Model (columns)					
0	1.456596*	1.456596*	1.578444	1.578444	1.662949
1	1.603695	1.560970	1.650974	1.627531	1.671344
2	1.807039	1.753159	1.805243	1.743694	1.804592
3	2.093276	2.078638	2.107881	2.030596	2.068797
4	2.407112	2.432112	2.432112	2.377953	2.377953

Last, based upon the lags we select for unrestricted VAR model (p = 3) and the deterministic components for both CE and VAR (case 2), we conduct the Johansen cointegration test to determine the numbers of cointegration relationships. The results are reported in Table 5.

Table 5. Johansen cointegration test results

Null hypothesis	Trace statistic	5% critical value	Max-Eigen statistic	5% critical value
r = 0	57.30*	54.08	30.65*	28.59
r ≤ 1	26.66	35.19	20.37	22.30
r ≤ 2	6.28	20.26	4.78	15.90
r ≤ 3	1.50	9.16	1.50	9.16

*Indicates rejection of the null hypothesis at 5% level.

Since we have four variables, the Johansen cointegration test can show up to three cointegration relationships between our variables. As both Trace and Maximum Eigen value statistics exceeds the critical value at 5% significance level, the null hypothesis of r = 0 is rejected. However, we fail to reject each of the hypotheses r≤1, r≤2 and r≤3 as both statistics (Trace and Maximum Eigen value) are less than their critical values. Therefore, we conclude that there is one cointegration relationship between the four variables.

VECM estimation

The VECM estimates are given in Table 6.

Table 6. VECM estimation output

Short-run estimates	Dependent variables			
	ΔCCI	ΔI	ΔFX	ΔGE
ECT	-0.04 (-3.72)*	-0.0227 (-2.74)*	-0.0090 (-3.01)*	0.0704 (0.29)
ΔCCI (-1)	1.19 (15.48)*	0.0339 (0.63)	-0.0028 (-0.14)	-3.8200 (-2.46)*
ΔCCI (-2)	-0.46 (-5.72)*	0.0087 (0.16)	0.0147 (0.73)	2.9715 (1.84)
ΔI (-1)	0.0745 (0.55)	0.3525 (3.74)*	-0.0082 (-0.24)	-2.0918 (-0.77)
ΔI (-2)	-0.1395 (-1.03)	0.0372 (0.40)	-0.0493 (-1.45)	2.2095 (0.81)
ΔFX (-1)	-0.7012 (-1.83)	-0.1859 (-0.69)	0.1377 (1.42)	6.8571 (0.88)
ΔFX (-2)	-0.7226 (-1.84)	-0.5566 (-2.03)*	-0.1515 (-1.53)	-17.5258 (2.21)*
ΔGE (-1)	-0.0037 (-0.89)	-0.0028 (-0.98)	-0.0012 (-1.11)	-0.7046 (-8.41)*
ΔGE (-2)	-0.0017 (-0.46)	-0.0013 (-0.49)	0.0002 (0.17)	-0.6468 (-8.51)*
Long-run estimates	Variables			
CCI	I	FX	GE	C
1	0.85 (1.70)	-1.88 (-1.52)	-0.26 (-2.81)*	-85.09 (-8.83)*

Notes: t-statistics are in parenthesis. *Indicates statistically significant at 5% level.

In the short run, none of interest rate, exchange rate and government expenditure showed an impact on the consumer confidence index. Indeed, although interest rates and exchange rates play an important role in the overall Chinese economic landscape, consumers may not directly associate them to their personal financial situations, thus making less impactful on short-term sentiment. Moreover, this finding can be explained by the gap in policy communication, because If changes in variables such as interest rates or exchange rates are not effectively communicated to household, their potential effects on consumer expectations might remain muted. These findings are consistent with those of Monge, Lazcano and Infante (2024) who found that monetary policy did not show a significant impact on consumer sentiments in the US.

As for government expenditure, an increase or a decrease in government expenditure does not affect immediately the economic activity. When changes in government expenditure occurred, consumers sometimes do not show any awareness about the change in spending, income and employment (the deterministic factors considered by the public when generating their confidence of the overall economy). As a result, consumers do not change their attitudes toward the overall economy in the short-run. However, in the long-run, this effect comes into sight. 1% increase in government expenditure generates 0.26% rise in the consumer confidence index. In fact, in the long horizon, the influence of changes in government expenditure on the global economy appears gradually. Consequently, people can perceive changes in the overall economic situation. They react to the new face of the economy by showing different consumer confidence accordingly. These results are in line with those of Mankiw (2018) who highlight that monetary policy has a longer and substantial outside lag effect, while fiscal policy has more immediate impact on the economy. As a result, unlike interest rate and exchange rate that are considered as key factors of monetary policy, government expenditure that is treated as fiscal policy can influence the overall economy only in the long term and results in fluctuations of consumer confidence.

Finally, the error correction term (-0.04) is negative and significant at 5% statistical level, indicating 4% of the disequilibrium between consumer confidence index, interest rate, exchange rate and government expenditure is corrected within one month. It is a quite slow correction speed for such disequilibrium to move back towards long-term equilibrium. These results corroborate those of short-term, in the sense that the nexus between interest rate, exchange rate and

government expenditure on the one hand and consumer confidence on the other hand is very weak and not statistically significant, implying that other factors such as geopolitical events, income levels, or broader economic stability may have a more significant role in shaping immediate consumer confidence.

CONCLUSION

Consumer confidence is broadly considered as a crucial factor influencing several economic decision-making activities. However, only few studies focused on what may drive consumer confidence. In this article, we explored the drivers of China's consumer confidence. A Vector Error Correction model has been implemented to describe both the short-run and the long-run relationships between consumer confidence index, interest rate, exchange rate CNY/USD and government expenditure. Our results show that interest rate, exchange rate and government expenditure do not cause the consumer confidence index in the short-run. This finding emphasizes the challenge policymakers can face in quickly influencing consumer confidence through economic variables such as interest rates, exchange rates, or government spending. Effective policy outcomes may require more long-run strategies to ensure a sustainable impact on consumer confidence. In the long-run, the government expenditure is found to affect significantly the China's consumer confidence index. This impact is not immediate, but rather gradual. Indeed, in the short-run, consumers may perceive government expenditure as unreliable factor for the future economic conditions, due to information asymmetry, implementation of new policies, …etc. However, over time, the increased and cumulative government expenditure on education, infrastructure, healthcare, …etc may lead to an increase in the consumers' confidence attributed to the economy at whole. These results highlight the importance of directing government spending towards long-run investments that have positive impact on the economy. By doing so, policymakers can strengthen economic growth which result in an improvement in consumer confidence index.

The limitations of our article can include the use of only financial and economic variables to explain to consumer confidence index. However, the change in consumer confidence index may be due to other indicators such as national happiness index, technological development level, social trends, …etc. Therefore, it would be interesting to consider these factors to obtain more accurate insights into the dynamics influencing consumer confidence. Moreover, this study investigated only the Chinese market. Since the degree of confidence and the trust of consumers may depend on cultural factors which differ from one country to another, it would be important to extend this study to other countries to gain more broad results which can be generalized to other countries.

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