Published : 28 December 2022

# Twitter Sentiment Analysis on Credit Card

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This research aims to evaluate the public's response to the global development of credit cards using primary data from Twitter tweets between January 1, 2019, and March 28, 2023. The research method employed is a qualitative approach using Python Library software called VADER (Valence Aware Dictionary and Sentiment Reasoner) to classify sentiments in these tweets. The research results indicate that the majority of the public has a neutral sentiment, accounting for approximately 97.6% towards credit cards, while positive sentiment reaches 1.7%, and negative sentiment is approximately 0.7%. Some keywords frequently appearing in the tweets include credit card, card needed, ASTRA Coins, card debt, and mobile users. It is expected that this research on public sentiment can assist relevant stakeholders in taking appropriate steps to enhance credit card usage and increase awareness and support for it. We also analyze the shariah perspective on credit card.

**Keywords: Credit Card; Sentiment Analysis; Twitter; Shariah**

**OPEN ACCESS**

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Received: 11 October 2022
Accepted: 21 November 2022
Published: 28 December 2022

(2022) Twitter sentiment analysis on credit card. Maqasid Shariah Review. 1.1.

# INTRODUCTION

Credit cards are non-cash financial instruments that have experienced rapid growth in recent years (Btoush et al., 2023). Although initially introduced as credit instruments, credit cards have now become a highly popular means and instrument of payment. Some financial observers initially doubted the feasibility of credit cards, and many issuing banks withdrew from the business. However, at present, most observers agree that credit cards offer unique benefits to consumers and merchants, as well as profit opportunities for banks (Chakravorti, 2003).

Currently, financial institutions and banks rely on computers and the World Wide Web to conduct financial transactions. This is done through the issuance of magnet-based plastic cards that enable holders to perform various financial transactions such as cash withdrawals or purchase payments (Tubishat & Kandah, 2018). The last decade has witnessed significant growth in the use of credit cards as a means of transaction. This growth has occurred due to the convenience and other benefits offered by credit cards. Specifically, credit cards are increasingly replacing checks as the preferred option for transactions that traditionally used checks. Therefore, the increased consumer demand for credit cards is likely the result of rational consumer choices (Brito & Hartley, 1995).

According to Brito & Hartley (1995) credit cards offer two advantages in transactions compared to cash and checks. First, unlike cash and checks, credit cards eliminate the need to always have sufficient cash on hand to cover expenses at that moment. Second, credit cards offer various additional benefits that are not available for cash and checks. Credit cards provide flexibility to consumers in matching their income and expenses by reducing the need to always have enough funds to cover expenses immediately. Instead, credit cards only require enough cash to pay the credit card bill once a month. Consumers only need to ensure that they have sufficient funds when the credit card bill payment is due to the issuing bank (Zywicki, 2005).

Currently, the primary use of credit cards is as a payment method, rather than a source of credit (Cargill & Wendel, 1996). However, the use of credit cards has declined in recent years. According to a global payments report published by FIS (2023), digital wallets are currently dominating e-commerce in the Asia Pacific (APAC) region. The percentage of transactions using digital wallets in APAC has reached 68.5% across various transaction value segments, while the use of credit cards and charge cards only accounts for 12.8%. It is estimated that the use of credit cards will continue to decline to 11% by 2025, while the use of digital wallets is projected to increase to 72% of the total transaction value within three years. Changes in consumer behavior, becoming more flexible and embracing technology, have shifted the trend of credit card usage towards being more inclined to use Buy Now Pay Later (BNPL) or Pay Later options.

Based on the background mentioned, the author is interested in discussing the perception of credit cards based on primary data from sentiment tweets on the social media platform Twitter. This research aims to identify the sentiments expressed by the public regarding credit cards through tweets on the Twitter platform. The study analyzes three sentiment classifications: positive, negative, and neutral, using the assistance of Python Library. By providing a comprehensive understanding of public perspectives on credit cards, including the positive aspects, advantages, potentials, and benefits, as well as identifying potential weaknesses and threats associated with negative views on credit cards, it is expected that this research will contribute to relevant stakeholders in taking appropriate actions to strengthen the credit card ecosystem and raise awareness and support for it.

# METHODOLOGY

This research is a qualitative study using a sentiment analysis approach, also known as opinion mining. The opinion mining technique aims to automatically evaluate perspectives, feelings, judgments, and attitudes toward a target, such as products and services (Cambria et al., 2013; Liu & Zhang, 2013; Ravi & Ravi, 2015; Vinodhini & Chandrasekaran, 2012). The primary data used in this research originates from Twitter tweets. Twitter provides an Application Programming Interface (API) that enables researchers to automatically collect Twitter data. In this study, we utilized Twitter's official API to gather tweets in real-time from January 1, 2019, to March 28, 2023, totaling more than 100,000 tweets related to the topic of credit cards. Web scraping techniques were employed to retrieve data from websites for the purpose of collecting data from Twitter.

The reason for selecting Twitter as the platform for social media research is due to the relatively easy accessibility of Twitter data. Twitter has distinctive features in the world of social media, with two main characteristics: its messages are open to the public and it has a short message length limit. This limitation in message length allows for faster analysis

compared to other social media platforms. Additionally, Twitter enables research that includes the analysis of both individuals and media within a single analytical framework (Vargo et al., 2014).

In this study, we utilized a Python Library software known as VADER (Valence Aware Dictionary and Sentiment Reasoner). VADER is a lexicon-based sentiment analysis tool that has been customized for sentiments commonly found in social media (Liu, 2012). Python's VADER was employed to classify the sentiment in tweets into three categories: positive, negative, and neutral. Furthermore, VADER was employed to identify the most frequently used keywords in tweets related to the topic of credit cards. The composite sentiment score, calculated from lexicon assessments, is normalized between -1 (very negative) and +1 (very positive). This technique determines polarity, which is the level of positivity or negativity, as well as the intensity of the expressed emotions. The intensity of emotions in each tweet is divided into the number of positive, negative, and neutral elements contained in the tweet, with a total summing up to 1. Each tweet is classified as positive, negative, or neutral based on its score. Composite scores below 0.05 are considered negative, scores between -0.05 and 0.05 are deemed neutral, and scores above 0.05 are classified as positive (Roe et al., 2021). Other studies using sentiment analysis can be found at Rahayu (2022), Az-Zahro (2022), Rusydiana (2022) and also Zaidan et al., (2022).

## RESULT AND ANALYSIS

This research has the primary objective of evaluating the sentiments expressed in Twitter tweets related to credit cards. Sentiment analysis is used to depict the public's perspective on a particular topic. The data used in this study consist of Twitter tweets related to credit cards. Users and readers of tweets about credit cards on Twitter are highly diverse, encompassing various segments of society, from regular users to practitioners, politicians, and institutions. Therefore, opinions about credit cards can be obtained from users representing various social groups and different interests. The results of sentiment analysis regarding credit cards can be observed in the following diagram:

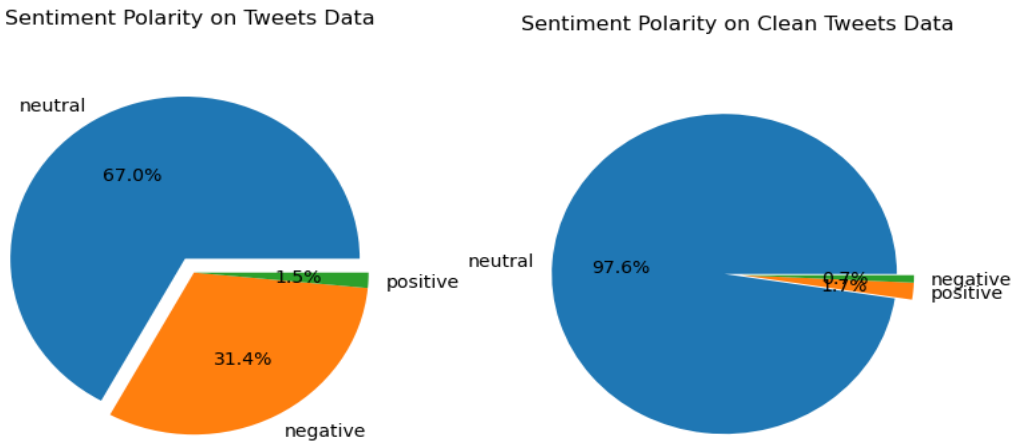


**Figure 1:** Sentiment Polarity in Tweets Data Regarding Credit Cards

The figure on the left side displays sentiment polarity for the entire dataset of tweets, while the one on the right illustrates sentiment polarity for the cleaned dataset of tweets. From both of these diagrams, it can be observed that credit cards generally have neutral sentiment, with percentages of 67% and 97.6% respectively. On the left-side diagram, negative sentiment ranks second with a percentage of 31.4%, followed by positive sentiment at 1.5%. Meanwhile, the results of sentiment polarity after data cleaning show that positive and negative sentiments towards credit cards have a very small difference, only at 1%.

Sentiment data was obtained from tweets written by Twitter users related to credit cards. Textual words were assessed on an interval scale from negative, neutral, to positive using a Python Library called Vader. Vader was used as a tool to process the data, classifying it into three groups: positive, neutral, and negative, based on the score assigned to each tweet. Each tweet was given a score and then classified as positive, negative, or neutral based on the assigned score. This tool also

generated words related to sentiments about credit cards in the tweet data, referred to as a word cloud.

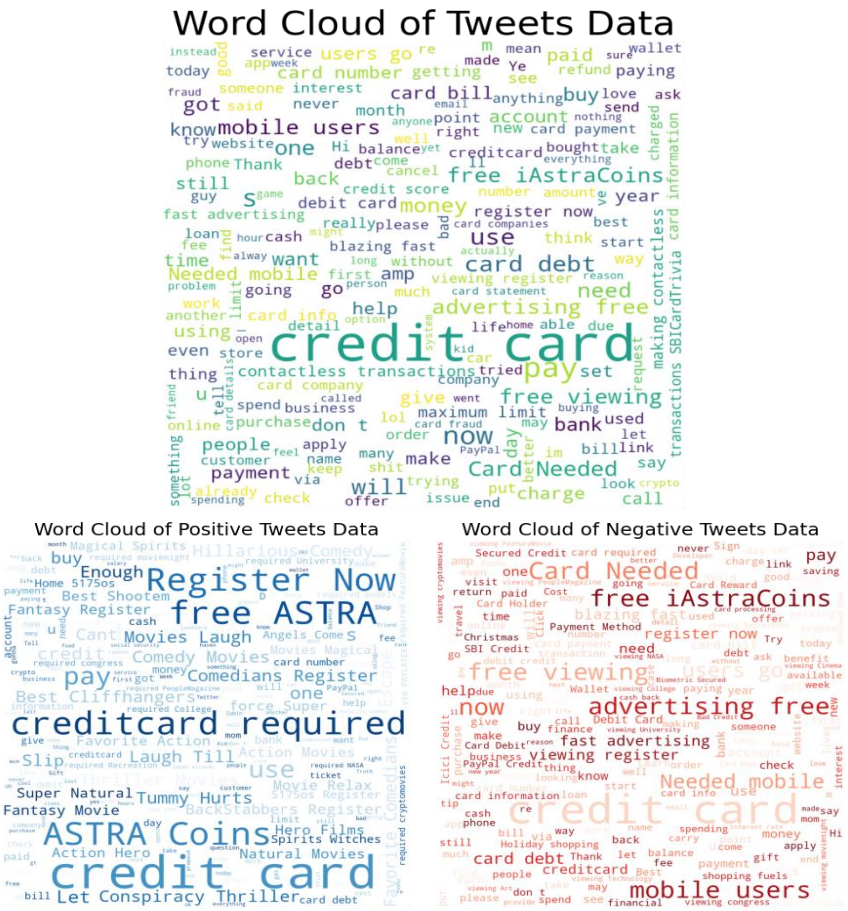


**Figure 2:** Wordcloud Data on Twitter

Based on the presented wordcloud, it can be observed that the most frequently appearing words in tweets related to credit cards are "credit card," "card needed," "ASTRA Coins," "card debt," and "mobile users." On the other hand, in the wordcloud showing positive tweets, frequently appearing words include "credit card," "credit card required," "ASTRA Coins," "register now," and "free ASTRA." Meanwhile, in the wordcloud containing negative tweet data, dominant words are "free ASTRA Coins," "mobile users," "credit card," and "card needed." This wordcloud illustrates the most commonly used words in tweets related to credit cards.

The size of words in the wordcloud reflects how often the word appears in tweets, with larger words indicating higher frequency of occurrence. The tweet data obtained from Twitter is considered sufficiently representative to depict public sentiment regarding the topic of credit cards. This is due to the widespread use of the Twitter platform by various individuals to express their opinions on various topics, including credit cards. It should be noted that the topic of credit cards is relatively new in discussions, so this tweet data provides a current overview of sentiments related to the topic.

Tweets with neutral sentiments often receive responses indicating that the users have little knowledge or are not well-informed about credit cards. On the positive side, these tweets express that credit cards are a good innovation that needs improvement. The existence of credit cards makes people feel safer and more comfortable in using them. However, in tweets with negative sentiments, many state that the development of credit cards does not align with their level of literacy, and there are still many laypeople who do not have sufficient understanding. Therefore, the benefits of credit cards cannot be fully realized by them.

# DISCUSSION

The research results indicate that public sentiment regarding credit cards tends to be neutral. One of the reasons for the predominance of neutral responses in public sentiment towards the presence and

use of credit cards is the generally low level of financial literacy among consumers worldwide (Chen et al., 2023). Karakurum-Ozdemir et al. (2019) noted that a severe lack of financial literacy is particularly prevalent in five middle-income countries, including Mexico, Lebanon, Uruguay, Colombia, and Turkey. Consumer financial decision-making reflects their financial knowledge, and inadequate financial literacy can lead to irrational investments, improper financial planning, impulsive consumption, and also their opinions about the existence of credit cards.

Low levels of financial literacy have a negative impact on the ability to save and plan for retirement (Lusardi & Mitchell, 2008). Additionally, Howlett et al. (2008) confirmed that financial knowledge can influence consumer retirement savings and investment planning, which has significant long-term benefits. Furthermore, the COVID-19 pandemic has revealed that many consumers lack effective financial management and planning skills, particularly in terms of financial preparedness (Pak et al., 2020). herefore, the importance of financial knowledge and financial education should not be underestimated.

In response to the negative public perception regarding the use of credit cards, stakeholders should conduct an evaluation of the performance and development of credit cards with the aim of introducing products that provide benefits and are friendly to all segments of society. Empirical findings indicate that the use of credit cards has led to increased consumer spending behavior and exacerbated credit card debt levels during the Covid-19 pandemic (Horvath et al., 2023). One of the recurring issues posing a threat to the sustainability of credit cards is the potential for financial fraud and credit card forgery (Rai & Dwivedi, 2020). The banking industry has been significantly influenced by the advancement of information technology. Transactions using credit cards and online banking, which currently constitute a significant portion of all banking transactions, have their own vulnerability potential (Jiang & Broby, 2021).

In practice, according to their management, credit cards are divided into two categories: conventional credit cards and Sharia-compliant credit cards (Tarmizi, 2017). Although there are two concepts of credit cards, fundamentally, their purposes are the same: facilitating payment systems, obtaining cash, goods, services, or other valuable items, and then paying for them in installments. They also serve as evidence or collateral for individuals, allowing the cardholder to obtain loans within the set limit for purchasing goods and services (Firmanda, 2015).

The difference between the concepts of conventional credit cards and Sharia-compliant credit cards lies in fund management and the determination of interest. In Sharia-compliant credit cards, it is not allowed to charge interest; instead, only service fees are permitted for each transaction. In contrast, conventional credit cards are more interest-based because they assume the time value of money. Money, which is essentially a means of exchange, transforms into a commodity that can multiply solely due to opportunity and time, without any economic activity involved (Sahil, 2020). Another distinguishing factor between the two is the legal basis. Conventional credit cards are governed by banking laws, while Sharia-compliant credit cards are based on Sharia Banking Laws and Fatwa DSN. Regarding card issuers, conventional credit cards are issued by conventional commercial banks, whereas Sharia-compliant credit cards are issued by Islamic banking institutions. In terms of agreements, Sharia-compliant cards involve three contracts, including kafalah, qardh, and ijarah, while conventional credit cards do not (Firmanda, 2015).

These differences in credit card concepts also influence the sentiments and intentions of card usage among the public, especially Muslims. The use of Sharia-based credit cards makes Muslim communities feel safer and more comfortable in their usage. However, on the flip side, it can lead to lavish spending (tabzir). Credit cards encourage consumer behavior beyond one's financial capacity, which contradicts Islamic teachings (Mustofa, 2015). Furthermore, the use of the qardh contract in Sharia-compliant credit cards is inappropriate. Qardh is the act of lending wealth to others without expecting any compensation in return. In classical Islamic jurisprudence literature, qardh is categorized as an act of charity or mutual assistance, rather than a commercial transaction (Antonio, 1999). Therefore, it is not suitable for use in the Sharia-compliant credit card system. Finally, in Sharia-compliant credit card products, there is no control system to ensure whether cardholders are using their cards for purchasing only halal (permissible) items. Typically, when a customer uses a Sharia-compliant credit card for a transaction by swiping it, only the merchant's name is recorded, not the names of the specific items purchased. This makes Sharia-compliant credit cards vulnerable to misuse (Mustofa, 2015).

The differences in opinions among the public as expressed in Twitter tweets indicate the enthusiasm of

the community in responding to the presence of credit cards as an innovation in the financial industry. Based on the positive responses, credit cards have the opportunity to continue evolving. With the rapid growth of financial innovation, new financial products, and financial services, the global financial market becomes more accessible for "small investors" to participate in (Richards et al., 2017). One of the innovative financial products is the credit card.

There are various factors that influence the use of credit cards. For example, marital status is believed to have a significant impact on credit card ownership (Duca & Whitesell, 1991). Income is also one of the most important factors affecting credit card usage (Chen et al., 2023). Hancock et al. (2013) showed that employment status is positively related to the number of credit cards owned. Characteristics and risk attitudes also have a significant correlation with credit card usage performance. In some families, credit card usage becomes important as an emergency source of funds when taking care of children, and homeownership can also affect credit card ownership (Chen et al., 2023).

The development of credit cards remains a controversial topic in various segments of society, creating a phenomenon that triggers diverse opinions within the community. Nevertheless, the banking industry continues to compete to attract the attention of customers to use these credit cards (Sahil, 2020). Credit cards are also one form of credit provided by banks to cardholders to pay for the purchase of goods or services from merchants that accept the card or to provide cash loans that can be withdrawn by cardholders from ATMs that accept the card. This definition has been accepted by economists and financial experts (Tarmizi, 2017).

In this modern era, credit cards have become a necessity, especially for those in the middle class and above. There are several benefits that can be obtained by credit cardholders. First, credit cards can serve as a reasonably affordable source of loans. Many people view credit cards only as a payment tool that allows the owner to shop without carrying cash. Second, with the current trend of online shopping, credit cards have become a very useful tool. In the context of online shopping, we no longer need to go through the hassle of meeting all our needs. One of the main benefits of credit cards is reducing the risk when shopping online. Third, credit cards can also serve as an international currency. This allows us to transact abroad without the hassle of exchanging our currency (Sahil, 2020).

# CONCLUSION

Credit cards are non-cash financial instruments that have experienced rapid growth in recent years. Therefore, this research aims to analyze public sentiment regarding the use of credit cards as an effort to evaluate and strengthen their usage. The results of the research analysis, conducted using Python Library, indicate that neutral sentiment dominates with a percentage of approximately 97.6% towards credit cards, while positive sentiment reaches around 1.7%, and negative sentiment is about 0.7%. Furthermore, the research findings also identify keywords that frequently appear in credit card-related tweets, such as credit card, card needed, ASTRA Coins, card debt, and mobile users. It should be emphasized that the results of this research are dynamic and may change over time, influenced by new trends or changes in factors affecting public perceptions of credit card usage. Nevertheless, this research provides initial insights into the public's response to credit cards and is expected to assist stakeholders in taking strategic actions to enhance credit card usage in the current digital era, strengthen regulations, and increase awareness about credit cards.

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