Reexamine the Role of the Financial Institution Management During Card Debt Crisis or the COVID-19

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Due to the increasing popularity of financial technology and the lifting of financial regulations, various financial institutions have become increasingly competitive and actively expand their consumer finance business. Changes in generational consumption behaviour have led to excessive credit expansion, excessive debt or bad credit records. All of these result in the emergence of adverse selection and moral hazard problems of information asymmetry, and finally cause the card debt crisis in 2005. This article focuses on variables such as the number of cards in circulation, retail sales volume, revolving balance, and overdue ratios of credit cards in public and private banks, and examine whether the information asymmetry in the credit card market has been improved, with the financial institution management. Furthermore, due to the COVID-19, exploring whether the information asymmetry has been worsened or improved deserves the attention of the financial authority again. The results reveal that continuous financial institution management is very important and effective during the card debt period or the pandemic.

Keywords: information asymmetry, adverse selection, moral hazard, card debt crisis, COVID-19, financial institution management

INTRODUCTION

Research Motivation

There is no doubt that 2020 was a year full of shocks for companies and people around the world. The impact of COVID-19 on the overall economy and industrial activities was no less than the financial tsunami in 2008. Under such circumstances, the domestic economic environment has been able to maintain relatively normal activities.

Considering the impact of the epidemic on the economic activities and debt repayment ability of some people, the Financial Supervisory Commission invited the Association of Banks and relevant banks to coordinate and extend the debt negotiation mechanism for credit cards and other personal loans. The debt negotiation mechanism is mainly aimed at assisting the processing of personal financial products, including housing loans, car loans, consumer loans, credit card payments, etc., or extending the deadline so that personal credit is not affected.

In recent years, due to the rapid development of financial technology and the deepening of consumer finance habits, coupled with the gradual loosening of domestic financial controls, the consumer finance business has been expanding. Consumer finance business has the characteristics of a large number of transactions, a small amount, a short loan period, and personal consumption expenditures. Although the unit cost is high, it can meet customer needs and diversify financial products, making it an attractive

financial tool. Therefore, with financial liberalization, diversified development, convenient digital application channels, and financial institutions actively cooperating with various industries to meet customer financing and payment needs, various derivative financial products (such as credit cards, cash cards, petty credit, etc.) continue to innovate. Consumer finance has gradually become one of the main sources of profit for banks, driving financial growth and expanding the digital ecosystem.

Taiwan issued its first credit card in 1974, fully opened it up in 1982, and in 1984, domestic card issuers issued a "joint charge card". Since the establishment of private financial institutions, credit cards have been growing at an astonishing rate since 2000, and it has been nearly 50 years of development so far. Using credit cards has now become a part of people's daily life. The credit card market has entered a relatively stable stage after the card issuers experienced the rapid growth period of credit cards and the credit card debt storm. However, in response to the digital financial era, in order to maintain the healthy growth of the credit card market, whether it is a traditional financial institution or a new Fintech player, the importance of continuous accurate credit risk assessment for customers and improvement of risk management techniques cannot be ignored.

Research Purpose

After the dual card storm in 2005, the financial tsunami in 2008, and the outbreak of the new crown pneumonia in 2020, in addition to the government's efforts to prevent the epidemic and actively carry out industrial bailouts, the Financial Supervisory Commission (FSC) also proposed a debt negotiation mechanism in a timely manner, so that the domestic economy can recover and maintain relatively normal activities.

In order to alleviate the impact of the card debt storm, the government needs to intervene in the market to solve and alleviate the card debt problem, which has long been confirmed by research. For example, the FSC and the Association of Banks proposed a self-disciplined "debt negotiation mechanism" platform to implement differential interest rates in response to the credit card debt crisis; in 2007, the Legislative Yuan passed the more heteronomous "Consumer Debt Settlement Regulations". The results show that since 2007, the credit card overdue ratio has been decreasing year by year and has been flattening, which shows the importance of active and effective financial management to maintaining financial order and financial discipline.

In addition, the FSC also promoted amendments to the Banking Law in 2005, reducing the upper limit of the revolving credit interest rate for cash cards or credit cards from 20% to 15%. Although this move may have a greater impact on banks with large revolving credit balances and cardholders' revolving interest rates of more than 15%, it also demonstrates the determination of the competent authorities to maintain financial discipline.

In 2020, in response to the impact of the COVID-19 epidemic on consumer finances, the FSC will provide measures such as deferring or deferring payment for 3 to 6 months for personal financial products, including housing loans, car loans, consumer loans, credit card payments, etc. Considering the impact of the epidemic on the economic activities and debt repayment ability of some people, the FSC invited the Association of Banks and relevant banks to discuss and coordinate the banks to extend the acceptance period of the debt coordination mechanism for credit cards and other personal loans. This shows that the financial management of the competent authorities has changed from a passive improvement of information asymmetry to an intermediary role that actively assists financial institutions to become competent fund suppliers and fund demanders, and has accurate credit risk assessment and risk control technology. The article aims to explore whether the information asymmetry in the credit card market is improved by financial management, and to confirm the necessity of the competent authorities to intervene in the credit card market during information asymmetry or the pandemic.

The article is constructed as follows: the next part presents the literature related to information asymmetry, adverse selection, moral hazard, and the impact of COVID-19 to construct the proposed model and hypotheses. The following part presents the methodology, as the base of understanding and examining hypotheses. The article is completed with discussion, conclusion, and recommendation.

LITERATURE REVIEW

Information Asymmetry

The amount of information that transaction participants have and the information that can affect the transaction is obviously different. For example, one of the buyers and sellers has more information. In this case, the party with more information may conceal some information for its own interests, thereby harming the interests of the other party. This is called information asymmetry. When there is information asymmetry among participants, adverse selection and moral hazard will arise. Economist Akerlof (1970) published "Lemon Market: Quality Uncertainty and Market Mechanism" in 1970, proposing the concept of "lemon market". Taking the used car market as an example, he pointed out that the seller of the used car market obviously has more information about the used car than the buyer, because the information asymmetry causes the buyer to buy low-quality goods for a long time. This results in the buyer's distrust of the quality of the goods, and the seller does not believe that the goods provided by the seller are of good quality. Even if the seller provides corroboration, it cannot convince the buyer to trust it, which leads to adverse selection. Buyers buy at lower prices to avoid risk losses due to information asymmetry. Therefore, when the buyer's low buying price makes the seller unwilling to provide good-quality goods, high-quality goods are gradually withdrawn from the market, resulting in the phenomenon that bad money drives out good money, which finally leads to a decline in transaction volume and shrinks the used car market.

It is recognized that Information asymmetry is common in financial markets. Yu et al. (1992) found that the weaker the manufacturer's operating conditions, the higher the value of the collateral required by the bank. Because weaker operating conditions represent a higher probability of bankruptcy, banks charge higher-value collateral from borrowers with weak operating conditions in order to secure claims. The operating conditions of manufacturers are different, so there is a significant difference between the borrowing rate and the level of collateral. It can be seen that manufacturers with stronger operating conditions require lower collateral values, whereas banks require high-priced collateral to eliminate the follow-up problems caused by information asymmetry. This means that the higher the value of the collateral, the more real information asymmetry exists.

Jian and Lv (2019) believe that the trend of Taiwan's aging society has led to an increasing demand for long-term care. If the market price mechanism is used, monopoly or information asymmetry may occur; through the government, due to the complicated procedures, it will cause the problem of inefficiency. Therefore, the private sector cooperates to provide services and the government has an entrustment and agency relationship, and the private sector and the government jointly promise to provide long-term care services like the government. If this is not done, the public will not trust the government entrusted to the private sector, and instead the government will fall into a crisis of information asymmetry.

In addition to the agriculture, Yang et al. (2022) tested the impact of a "high-speed railway (HSR) opening" on the merger and acquisition (M&A) premium and found an HSR opening affects M&A premium through two channels: "reducing information asymmetry" and "alleviating agency problems". Examining the link between sustainability reporting and information asymmetry in family- and non-family-controlled firms, Natour et al. (2022) found a negative and significant relationship between sustainability reporting and information asymmetry. Cho and Ryu (2022) studied a firm's corporate social responsibility (CSR) and revealed that managers did not value their CSR reputations in firms with poor financial reporting quality and serious information asymmetry. Instead, they diverted CSR resources to other projects to meet their interests. Yang et al. (2022) also indicated that ensuring a consistent, continuous, and efficient spare parts supply is a critical issue that must be addressed in the equipment support system. Therefore, in order to effectively improve the coverage level and handle the common asymmetry information present in practical applications, the spare parts transport vehicle routing and scheduling model was further optimized. After examining the effect of corporate governance on labor investment efficiency, Oh and Park (2022) concluded that labor investment inefficiency is due to information asymmetry and can be improved by excellent corporate governance. Kuryłowicz and Śliwiński (2022) analyzed the presence of self-selection mechanisms on the market that could bring the market closer to the separating equilibrium state and showed that s thanks to the self-selection induced by the possibility of driving behavior monitoring, the industry

can minimize the negative effect information asymmetry has on the motor insurance market. Tasic and Cano (2022) stated that the COVID-19 pandemic has recently brought attention to several acute human needs. However, it has also demonstrated how crisis can spark innovation in the context of information asymmetry and uncertainty.

Adverse Selection

When there is information asymmetry among market participants, adverse selection and moral hazard will occur. The occurrence of adverse selection is nothing more than a great relationship with the psychological factors of the participants. Since they each have different levels of information, the party with the relative lack of information may thus risk making choices that compromise their own.

Taking the lending market as an example, when the willingness of borrowers to repay cannot be confirmed, borrowers with low risk can easily borrow loans with lower interest rates, so they are reluctant to borrow at average interest rates. This will lead to the fact that most of the borrowing groups are high-risk people, and the borrowers will have a high probability of not paying or even deliberately not paying. All of these make most of the borrowers' funds unrecoverable, the interest collected cannot compensate for the loss of funds, or the market interest rate is high, resulting in more people being unwilling to borrow or unable to repay.

Yu (1993) proposed that in the case of information asymmetry between borrowers and lenders, in order to protect their own interests, they can use contracts to make "self-selection" to prevent adverse selection. Li (2009) argued that if the depository institution did not assess the operational risk of the institution to be insured, and simply calculated the insurance premium rate on an average basis with big data, and handled it with an unvalued amount, some low-cost and well-managed companies might be eliminated from the market which results in the flood of inferior financial institutions on the market, and adverse selection occurs. Zhang et al. (2019) pointed out that the adverse selection of credit cards refers to the fact that commercial banks are more willing to lend funds to individuals with more property and higher income under the same conditions, but these people start from maximizing their own utility. They may be reluctant to apply for a credit card for borrowing money; and those individuals with low income and less wealth, in order to improve their utility level, will take the initiative to apply for a credit card for overdraft consumption. Funds lent by banks often cannot be recovered smoothly, and even bad debts are formed, which is contrary to the choice of commercial banks, thus forming the problem of adverse selection in the credit card market. By using the money's worth calculations to investigate the degree of adverse selection in the Korean individual annuity market and on a cross-country, Yun and Zi (2022) found that the cost of adverse selection is higher in countries with more generous social security income. Meanwhile, Asmuni et al. (2022) recognized that prior studies have shown that a substandard health status in retirement reduces annuitization due to adverse selection. However, though the annuitization rate is relatively small in the insurance market in many countries around the world, annuities provide a steady stream of income for retirees.

Simultaneously, Pudpong et al. (2019) took the Migrant Fund (M-Fund) as an example, which is a voluntary, non-profit health insurance scheme operating along the Thai–Myanmar border in Thailand since 2017 and aims to protect the health of migrants uncovered by existing government insurance schemes and showed that the M-Fund acts as a safety-net initiative for those left behind due to unclear government policy to protect the health of undocumented/illegal migrants. Despite clear merits, the issue of adverse selection to the scheme is a critical challenge. Furthermore, Khan (2019) took the takaful industry as an example, which is searching for an optimal model for Islamic insurance operation and showed that the wakalah–surplus-sharing hybrid serves as the optimal structure for takaful operation; in the presence of Akerlof's gift-exchange, the wakalah fee reduces the adverse selection problem and the wakalah fee could be used to protect infant takaful operators. Sinha and Tripathi (2016) assessed the gaps in the adoption of crop insurance in Thailand and the result revealed that adoption of coping mechanisms, such as drought-resistant rice and irrigation increases the chances of adverse selection. Were et al. (2020) discussed the global push to achieve the 90-90-90 targets designed to end the HIV epidemic and thought that universal health insurance is one tool that can be used to this end. The findings indicated that health insurance enrolment

among HIV positive pregnant women was low mirroring national level and this might potentially be because of adverse selection and information asymmetries. Wang et al. (2020) designed credit contracts with inversely related interest rates and collateral, and proposed that banks can overcome the problems of adverse selection and moral hazard when there is an informational asymmetry in competitive credit markets. Enguix (2021) analyzed the new EU remuneration regulation of bank executive compensation and the role of corporate social responsibility (CSR) on this and demonstrated that the new regulation might drive unintended consequences, creating adverse selection problems in EU banks and hidden compensation habits that lower transparency, thus threatening financial system's sustainability.

Moral Hazard

Moral hazard means that one of the two parties to a transaction makes an action for its own benefit that harms the other party after adverse selection. Just similar to insurance, moral hazard often is accompanied with finance. For instance, Fintech Risks in China and found that the technology risk, moral hazard and legal risk are the dominant factors affecting the Fintech risk (Pi et al., 2022). Simultaneously, Chen and Wang (2021) demonstrated that the application of Fin Tech in China's banking industry resulted in less information asymmetry. The risk exposure was the most significant determinant in general. The study also showed that the effects of the adverse selection and moral hazard problems varied in different types of banks. Nickerson (2022) pointed out that the reliance on adverse selection or moral hazard in current models of limited lending and credit rationing poses difficulties in empirical testing for the presence and magnitude of regulation costs. By avoiding the reliance of current models on the exogenous presence of adverse selection or moral hazard, the potential efficiency costs were allowed to examine in a market environment without an ex ante assumption of informational market failure. Similarly, due to the historically most significant leak of its shareholder's data for owning offshore companies which was provided Mossack Fonseca on 3 April 2016, it's found that shareholders include many political and influential figures around the globe, which causes a moral hazard (Nasir et al., 2022). Examining the Impact of Corporate Governance Mechanisms on the Commitment of Managers, Lee (2022) suggested that managers may use the IPO lockup as a commitment device that complements corporate governance mechanisms in reducing investor concern about the moral hazard problem of managers when small and venture companies go public. Because social responsibility is essential to the sustainable development of megaprojects, Xue et al. (2022) argued that incentive contracts with multiple indicators in stages can effectively encourage subcontractors to disclose social responsibility information, and reduce information asymmetry, therefore enhancing social responsibility and improving overall project efficiency. Basis et al. (2022) proposed that policymakers should instruct all hospitals to publish LOS (length of stay) data, regulate referrals to (emergency department) EDs, and find an optimal LOS that will reduce competition, non-urgent visits, and moral hazard. Römeis et al. (2022) enriched a standard principal–agent model with hidden action by introducing salience-biased perception on the agent's side and showed that salience bias can reverse the nature of the inefficiency arising from moral hazard; in other words, the principal does not necessarily provide insufficient incentives that result in inefficiently low effort but instead may well provide excessive incentives that result in inefficiently high effort. Yin et al. (2021) stated that the cause of the COVID-19 medical resource run was rooted in China's local medical resource context and a sudden realignment of expectations, reflecting shortages and misallocations of hospital resources (inadequate liquidity and portfolio composition); high level hospitals siphoning-off patients from lower level health providers (bank moral hazard and adverse selection problem); patients selecting high-level hospitals over lower-level health care (depositor moral hazard problem).

Interestingly, Acharya et al. (2024) viewed the relationship between politicians and voters as a principal–agent interaction and discovered that both political efforts and electoral vulnerability tended to decline with tenure due to the moral hazard. Lovas et al. (2024) even constructed a double-sided moral hazard model of social entrepreneurship to derive the optimal state subsidy, implying that the applicants with higher scores in business plan, social impact, and geographical scope were significantly more likely to be selected, especially if their activities required no domain-specific knowledge from the advisors.

The Impact of COVID-19

In addition to the impact of the epidemic, all industries have been hit, and the debt of all classes has also risen sharply. This is an important issue that financial authorities must pay attention to during the pandemic or post-pandemic. First, there is an increase in the debt burden of households.

With a ratio of household debt to gross disposable income above, households are among the most indebted in Europe. A high level of debt exacerbates the sensitivity of household net worth to changes in house prices, which can increase the severity of economic downturns (Koulischer et al., 2022). There is no doubt that the pandemic has determined the amount of household debt due to consumer credit, which shows that the Covid-19 pandemic has determined the level of household debt. To some extent, a better understanding of household indebtedness at a time of turbulence and instability extends from health factors (Czech and Puszer, 2021). Second, the debt of the industry also rises like the household. Take the cruise industry as an example. It was one of the fastest growing before the COVID-19 pandemic. The break has led to a sharp drop in the number of cruise passengers, resulting in a significant decrease in operating income and profits of cruise companies, and the debt-to-assets ratio and leverage ratio have increased significantly. The excessive debt ratio will affect the sustainable operation of cruise companies and the sustainable development of the cruise industry (Lin et al. 2022). It even leads to the risk of corporate bankruptcy phenomenon in the COVID-19 times (Boratyńska, 2021). As for the national level, the debt ratio in many countries was still above pre-crisis levels, and the COVID-19 pandemic again increased the pressure on public finances. Because more intense government borrowing increases its costs and uncertainty about future taxation policy, thus potentially disturbing private consumption, investment, and economic growth (Butkus et al., 2021). Based on an integrated viewpoint based on financial, social and governance or institutional factors, economic growth, interest rate, life expectancy at birth, unemployment, government effectiveness and the last sovereign debt crisis have resulted as being the major determinants of its public debts evolution. The Covid-19 pandemic leads more damaged Eurozone countries with negative real economic growth and high unemployment rates to increase dramatically their current public debts (Briceño and Perote, 2020). Because the pandemic has caused government debt problems worldwide, macroeconomic stability is the core concept of sustainable development. Above all, fluctuations in government debt aggravate economic volatility (Yang et al., 2022). Therefore, central banks have been pursuing an expansionary monetary policy since before the pandemic, although the health and economic crisis of COVID-19 has boosted asset purchase programs (Fernández et al., 2022). Simultaneously, the choice of monetary policy targets is employed to hedge the impact of the pandemic. Targeted policy implications, such as selecting monetary policy targets according to different manifestations of the impact of the COVID-19 pandemic and placing emphasis on monetary policy tools to stimulate consumption, alleviate unemployment, and alleviate social inequality, are suggested to improve the sustainability of the Chinese economy (Zhang et al., 2022). The crucial importance of ECB extraordinary monetary policies of national expansionary fiscal policies adopted during pandemic shock is also showed; both European wide monetary and fiscal policies actually increase the sustainability area avoiding the high risk of sovereign debt crisis in Italy (Posta et al., 2022). Similarly, to formulate the possibilities of a shared economic policy I that could help overcome the consequences of the crisis caused by COVID-19, the BRICS propose a unique budget deficit optimization approach (Zharikov, 2021). Due to the impact of the crisis on the financial sector, especially consumer finance, the actions of financial market regulators, the accuracy of the selection of instruments and the speed of action turned out to be very effective (Gębski, 2021). Consequently, online shopping, already on a steady rise, was propelled even further with the advent of the COVID-19 pandemic, and credit cards are a dominant way of doing business online (Mekterović et al., 2021). In other words, the COVID-19 pandemic has limited people's mobility to a certain extent, making it difficult to purchase goods and services offline, which has led the creation of a culture of increased dependence on online services, though one of the crucial issues with using credit cards is fraud. (Alfaiz and Fati, 2022). Or, the health crisis caused by COVID-19 has affected consumption and payment patterns worldwide. Consumers have had to change their habits and deal with new sanitation guidelines and have often struggled with lengthy infrastructure closures. These factors significantly influenced both the choice of payment methods and purchase decisions made by consumers and credit card use became an important

issue during the COVID-19 pandemic. (Gawior et al., 2022). It can be seen that the consumer credit or credit card use will be expanded because the easy monetary policy is employed by the central bank to respond to the problems derived from the pandemic of COVID-19. However, whether the phenomenon of information asymmetry in the credit card market is revived is not only the focus of attention, but also one of the research goals of the article.

Proposed Model and Hypotheses

Based on the above literature, a market with complete information is the most ideal situation, but the real world is often not as good as expected. The most classic case of adverse selection is the inefficiency caused by information asymmetry. The impact will be greater than expected, and even lead to "bad money drives out good money". The most common example in real life should be when the price of a commodity decreases, the demand for that commodity increases; when the price of a commodity increases, the supply of that commodity increases. However, due to incomplete consumer information, the results of both supply and demand sides are not as expected, which just highlights the ubiquity of adverse selection.

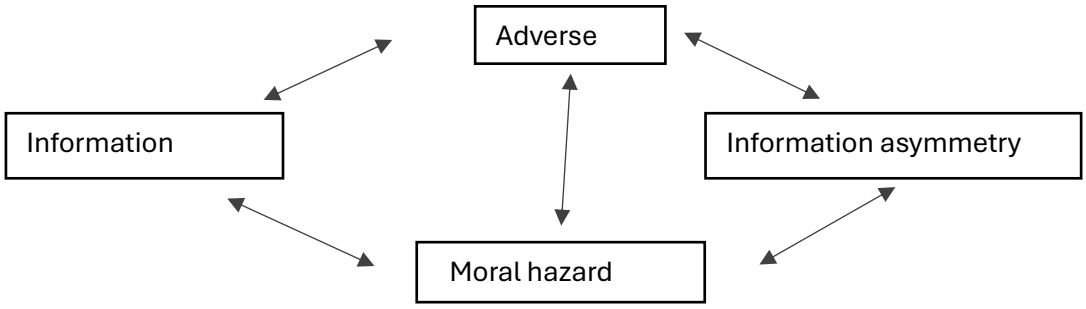
Take long-term care as an example. In order to avoid information asymmetry, the government has established an open case assignment mechanism. Service units need to discuss with their families when assigning cases, take the needs of the people as the primary consideration, and make the process of public dispatch information transparent, so as to stop the behaviour of moral hazard. The government intervenes to establish a system, and its effect is to allow immediate feedback when an event occurs. It can be taken into consideration when the same case is dispatched next time, urging service units to fulfill their contractual obligations, internalizing agency costs, and accepting complaints from the public through follow-up visits to understand the problem and improve it in a timely manner.

It can be seen that information asymmetry is flooding our lives. We must think about how to avoid and improve it. In addition to ensuring sufficient information through openness and transparency, and providing the required information based on the consideration of those who need it, the role of the government in establishing the system is more important.

Therefore, although the phenomenon of information asymmetry will be presented in two aspects: adverse selection and moral hazard, similarly, adverse selection and moral hazard also affect the degree of information asymmetry. In addition, adverse selection and moral hazard also affect each other, which further affects information asymmetry. In other words, information asymmetry, adverse selection, and moral hazard are the phenomena of mutual influence and causal cycle in the proposed model "(see Figure 1)". It can be seen that, whether it is to reduce the credit card debt crisis or social problems, or to improve the phenomenon of information asymmetry, facing information asymmetry, adverse selection, and moral hazard at the same time is the solution to the problems related to information asymmetry.

Due to COVID-19 in 2020, in response to the impact of the pandemic on consumer finances, the FSC has the different role to play. Considering the impact on the economic activities and debt repayment ability of some people, the FSC invited the Association of Banks and relevant banks to discuss and coordinate the banks to extend the acceptance period of the debt coordination mechanism for credit cards and other personal loans, such as deferring payment for 3 to 6 months for personal financial products, including housing loans, car loans, consumer loans, credit card payments, etc. This shows that the financial management of the competent authorities has changed from a passive improvement of information asymmetry to an intermediary role that actively assists financial institutions to become competent fund suppliers and fund demanders, and has accurate credit risk assessment and risk control technology. However, to avoid the information asymmetry reviving in the credit card market, it's still the responsibility of the financial authority during the pandemic or post-pandemic even if its role has changed.

FIGURE 1
PROPOSED MODEL



Hypotheses of the article. The following were the hypothesis formulated within the framework of the article:

Hypothesis 1 (H1). *The financial institution management is effective to reduce the problems related to information asymmetry.*

Hypothesis 2 (H2). *The financial institution management is effective to reduce the problems related to adverse selection.*

Hypothesis 3 (H3). *The financial institution management is effective to reduce the problems related to moral hazard.*

Hypothesis 4 (H4). *The financial institution management is effective to avoid the adverse selection during the pandemic.*

Hypothesis 5 (H5). *The financial institution management is effective to avoid the moral hazard during the pandemic.*

METHODOLOGY

The main method of this article is the document analysis, combined with qualitative and quantitative analysis to conduct empirical analysis, discuss relevant literature according to the research purpose, collect relevant financial market information, survey reports and industrial development materials (Bowen G.A., 2009). The research analyzes what is adverse selection, what is moral hazard, and the derived information asymmetry. The basic framework of this paper is constructed from comprehensively grasping and evaluating the content that fits the theme, and by collecting information on the consumer finance business of various index banks, and then analyzing the phenomenon of adverse selection and moral hazard under information asymmetry.

This article searches for relevant information from the database of relevant government departments, and refers to the relevant information on credit cards published by the FSC, such as credit card revolving credit, usage limit, over-due ratio of domestic banks, and compares the operating trends of domestic private banks and public banks. Based on the document analysis method, combined with relevant information data, qualitative and quantitative analysis are integrated, in an attempt to demonstrate the theoretical framework of the mutual causal relationship between information asymmetry, adverse selection and moral hazard.

DISCUSSION

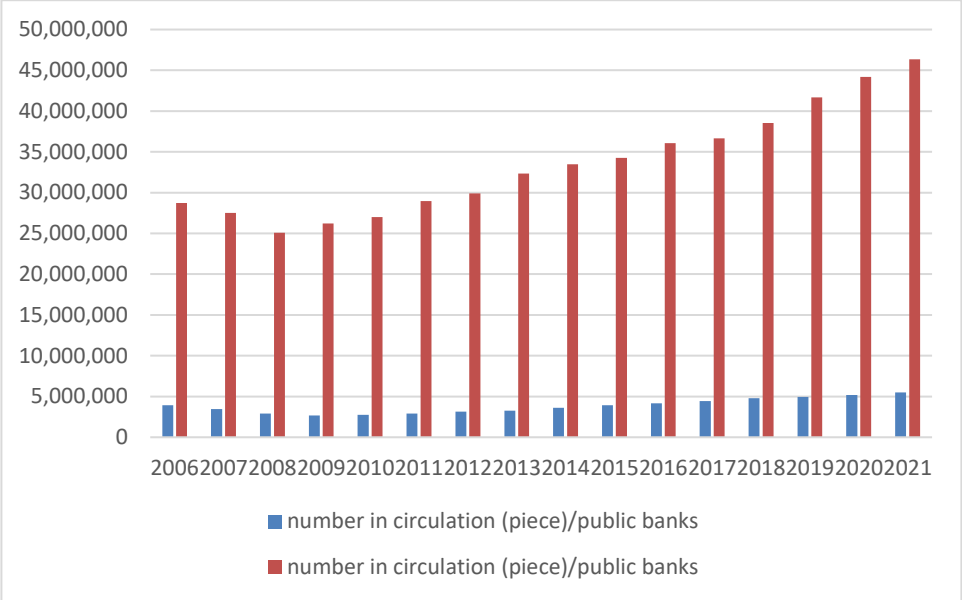
Adverse Selection

Comparing the number of cards in circulation and the maximum revolving interest rate in 2006 during the card debt storm with those in 2020 "(see Table 1)", the maximum revolving interest rate of private banks in 2005 was 20%, significantly higher than that of public banks 11%. However, the number of cards in circulation of public banks is far lower than that of private banks. This parallel phenomenon of high interest rate and high number of cards in circulation of private banks not only demonstrates the failure of the market price mechanism, but also shows the specific fact that there is indeed an adverse selection in the credit card market "(see Figure 2)".

TABLE 1
NUMBER OF CARDS IN CIRCULATION AND MAXIMUM REVOLVING RATE BETWEEN 2006 AND 2020

Financial institutions	2006		2020	
	number of cards in circulation	the maximum revolving interest rate (%)	number of cards in circulation	the maximum revolving interest rate (%)
Taiwan of Bank	125,592	11.66	112,975	11.06
South China Commercial Bank	282,995	18.25	765,376	15
Taipei Fu Bon Commercial Bank	1,570,934	18.25	2,571,152	14.71
Cathy Pacific Commercial Bank	1,918,421	20	5,134,530	15
Mega International Commercial Bank	342,917	20	637,050	15
Citi (Taipei) Commercial Bank	324,551	20	2,181,908	15
Yuan Ta Commercial Bank	101,999	18.25	591,895	14.75
Yong Feng Commercial Bank	-	-	1,108,933	15
E. Sun Commercial Bank	1,353,647	20	4,488,251	15
Tai Shin International Commercial Bank	2,026,778	20	4,016,276	15

FIGURE 2
NUMBERS OF CREDIT CARDS IN CIRCULATION / PUBLIC AND PRIVATE BANKS



As mentioned above, after the debt negotiation mechanism was proposed at the time of the card debt crisis in 2006, the Legislative Yuan passed the "Consumer Debt Settlement Ordinance" in 2007 and amended the law to reduce the maximum revolving credit interest rate from the original 20% to 15% in 2010. The government's intervention forced the issuing banks to face up to the marketing methods of the credit card market with high interest rates and high risks, and even believed that the credit card market was no longer lucrative, which let the number of cardholders decrease gradually "(see Figure 3)". When the number of in circulation is reduced, it also means that the phenomenon of adverse selection is gradually slowing down.

In addition to observing the trend of the number of cards in circulation, comparing the interaction between the retail sales volume of the credit card and the revolving credit balance can also obtain an important indicator of whether the inverse selection has been improved. Based on FIGURE 4, the retail sales volume and revolving balance reached a top point in 2005. Since 2010, though the revolving balance keep increasing, the retail sales volume still maintained a downward trend. It is proven that, under the effective management of the competent financial authorities, all card-issuing banks have implemented a strict card-issuing review mechanism while promoting the credit card business and the adverse selection has been improved concretely. In other words, H1 is supported.

FIGURE 3
NUMBERS OF CREDIT CARDS IN CIRCULATION

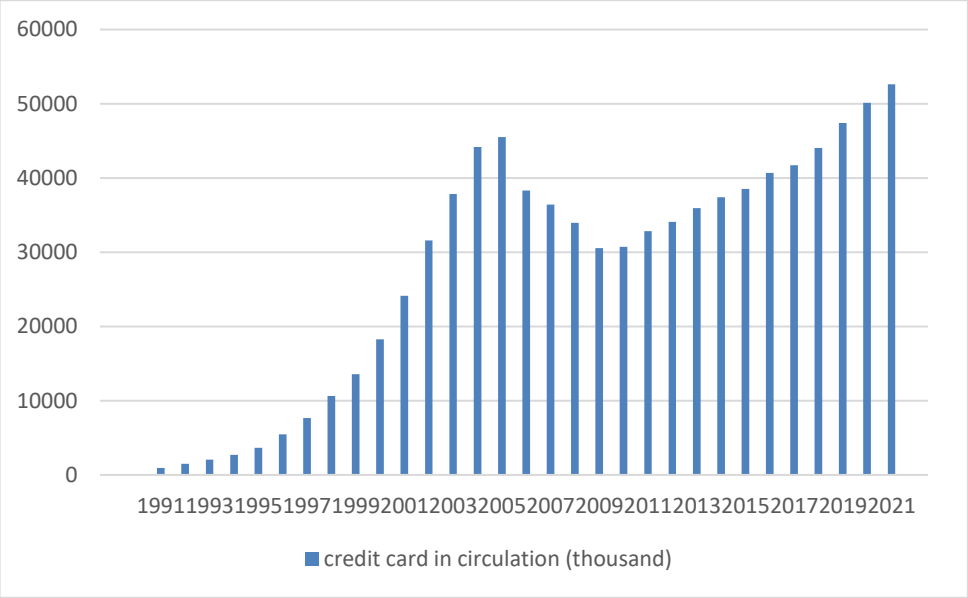
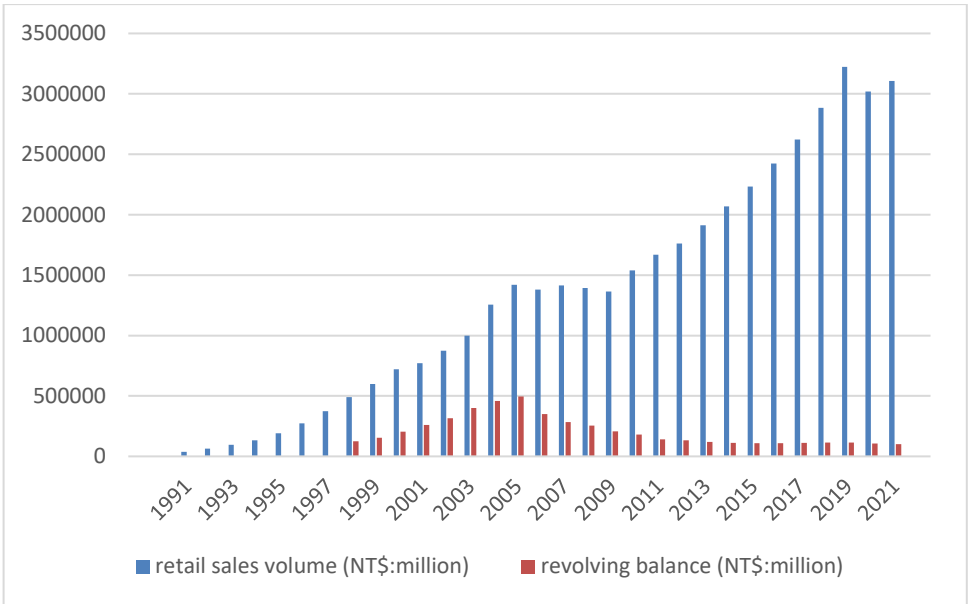


FIGURE 4
RETAIL SALES VOLUME AND REVOLVING BALANCE



Moral Hazard

Undoubtedly, the overdue ratio is an important indicator to observe whether there is a moral hazard in the credit card market. According to FIGURE 5, it can be seen that the overdue ratio of credit card has gradually decreased from 2006 to 2020. That is because the government encouraged the Association of Banks to establish a debt negotiation mechanism in an attempt to alleviate some of the card debt crisis after the card debt crisis in 2005. In 2007, the government even took the initiative to pass legislation and passed the "Consumer Debt Settlement Regulations", further requiring card-issuing banks to establish a credit

rating system and adopt differential interest rates for cardholders. Through government intervention in the market, the excess overdue ratio, which represents the moral hazard of information asymmetry, gradually slowed down as late as 2010. From 2010 to 2020, the trend of the overall overdue ratio has gradually decreased. In addition to indicating that the moral hazard has been improved, the information asymmetry in the credit card market is not as obvious as it was in the past. A further comparison of the overdue ratios of public banks and private banks shows that both have also declined at the same time. In particular, the decline of private banks is more obvious than that of public banks "(see Figure 6)". Combining the specific achievements of adverse selection and moral hazard, it shows that under the management of financial institutions, the phenomenon of information asymmetry in the Taiwan credit card market has been effectively controlled since 2005. Consequently, H1 and H3 are supported.

FIGURE 5
THE AVERAGE OVERDUE RATIO OF CREDIT CARDS IN TAIWAN

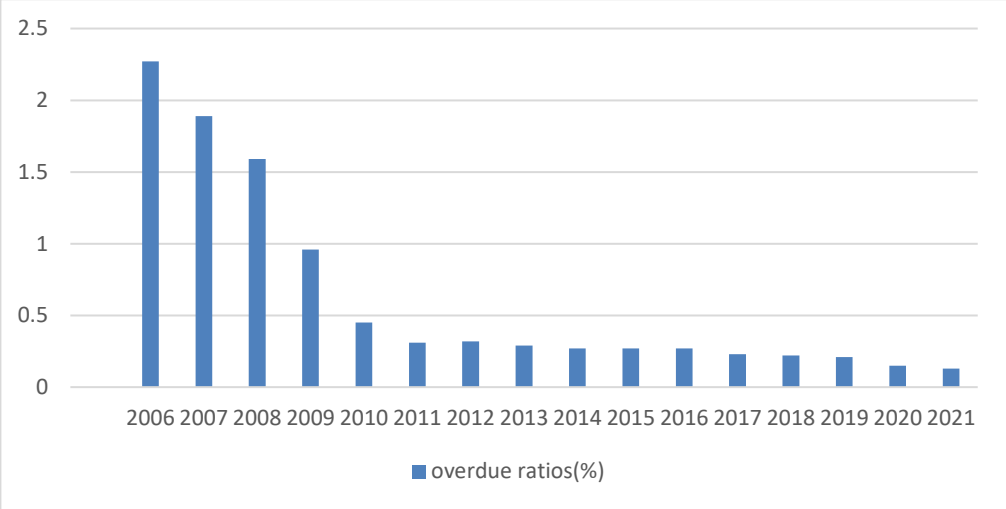
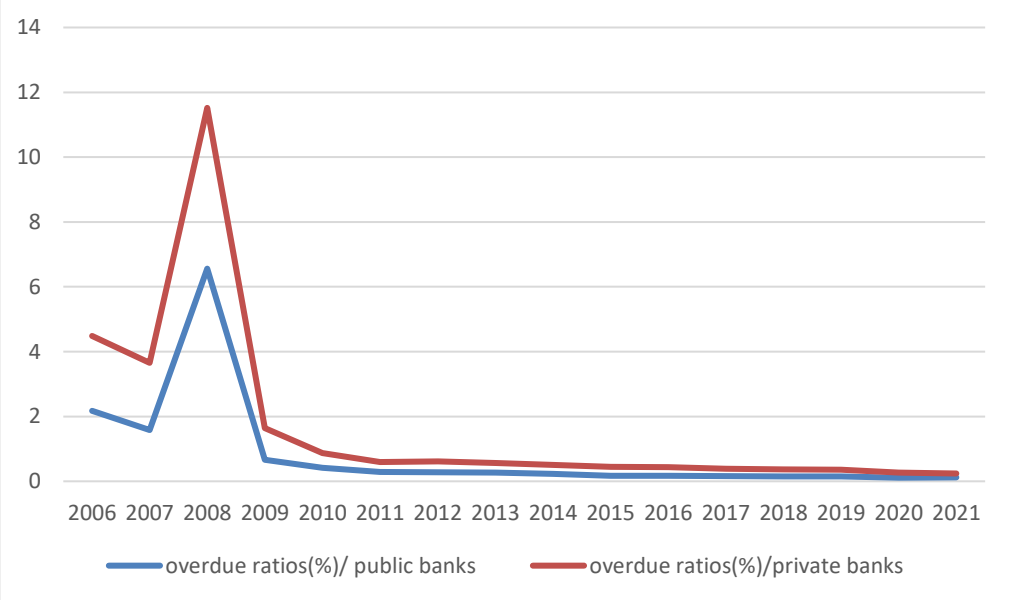


FIGURE 6
OVERDUE RATIOS OF PUBLIC AND PRIVATE BANKS



The Impact of COVID-19

In addition to the corresponding measures of the FSC, the government proposed to revitalize triple coupons and allow the use of digital binding, so that the number of credit cards in circulation tended to increase. In 2021, the government launched the five-fold revitalization coupon again, and many banks also offered more discounts in combination with credit cards, so that the number of credit cards in circulation increase furthermore "(see Figure 7)". Simultaneously, in order to maintain social distance and avoid gatherings, the public's willingness to shop online has increased, and the use of credit cards has become one of the main transaction tools, which has also increased the public's willingness to apply for cards. Besides the number of cards in circulation, the monthly retail sales volume and credit balance are found to increase at the same time "(see Figure 8)". Whether this leads to the recurrence of adverse selection phenomenon deserves the attention of the competent authority. However, though the number of cards in circulation continued to rise, the revolving balance and monthly retail sales volume did not increase abnormally. More importantly, the revolving balance is much lower than the monthly retail sales volume, which shows that the adverse selection has not deteriorated during the pandemic. Therefore, H4 is supported.

FIGURE 7
NUMBERS OF CREDIT CARDS IN CIRCULATION DURING COVID-19

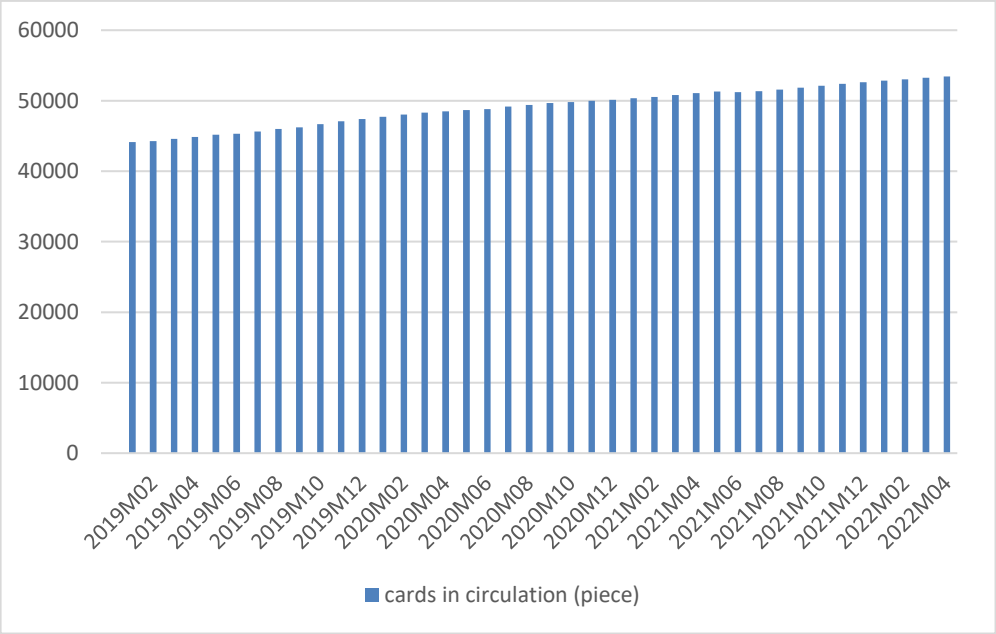
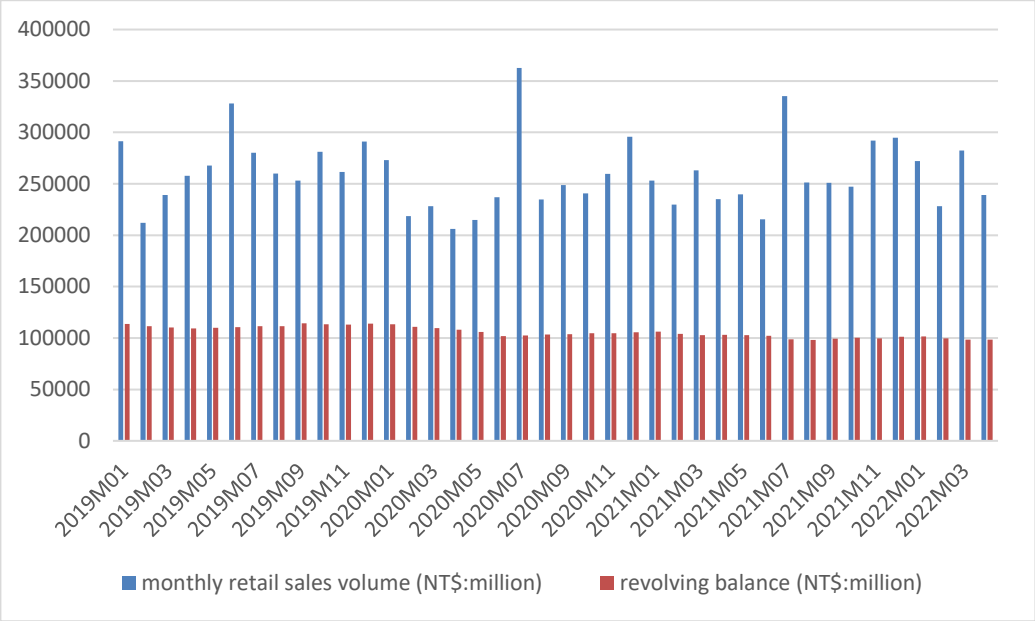


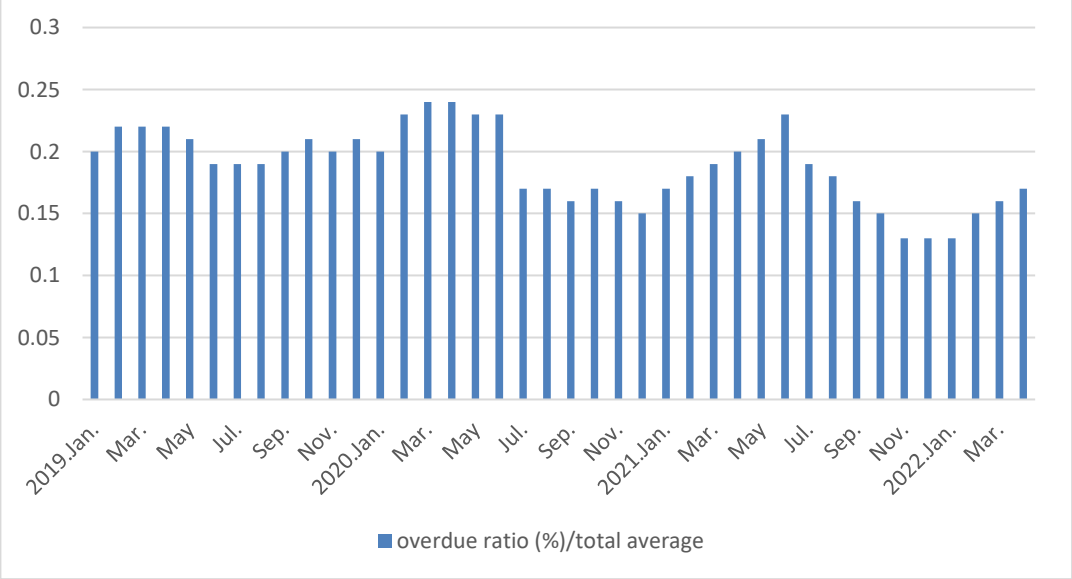
FIGURE 8
MONTHLY RETAIL SALES VOLUME AND REVOLVING BALANCE DURING COVID-19



As mentioned above, since the outbreak of the Covid-19, people prefer to consumption habits with credit cards even more than before. However, it's more noticeable that the overdue ratios have not only not risen, but have continued to decline slowly "(see Figure 9)". All this shows that the moral hazard of information asymmetry in the credit card market has been improved even during the COVID-19.

Combined with the progress in the adverse selection, the information asymmetry in the Taiwan's credit cards has achieve the further improvement. Hence, H1 and H5 are supported.

FIGURE 9
OVERDUE RATIOS OF CARD-ISSUING BANKS FROM 2019 TO 2020 (DURING COVID-19)



CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Public economics advocates that if the market is in perfect competition, the market price mechanism can fully operate, resources can be effectively allocated, and it may be acceptable for the government not to intervene in the market operation. However, when information asymmetry makes the market price mechanism unable to function normally or the market fails, especially like the 2005 credit card debt crisis, the adverse selection and moral hazard derived from information asymmetry not only endanger the sound development of the financial market, but even lead to serious social problems. Therefore, it is recognized that appropriate intervention in the market by the competent authorities or the government to conduct financial institution management not only demonstrates the determination to maintain financial discipline, but also successfully alleviates the phenomenon of information asymmetry. It can be proven that the information asymmetry has kept stable since the credit card crisis in 2005, or the COVID-19 in 2019. In other words, even though the financial authority changed his role from being passive to being active, the determination to conduct the effective financial institution management has never changed. Since it's impossible to make the information asymmetry vanish from the credit card market in Taiwan, the competent authorities should still play a proactive role to respond to market failures caused by information asymmetry, in order to prevent a resurgence of information asymmetry and maintain the continuous and stable development of the market, especially due to the unprecedented impact of COVID-19.

Recommendations

The article exactly makes a significant contribution to improving the information asymmetry in the Taiwan's credit cards market and offers an empirical evidence to confirm that the financial authority has to be responsible for the effective financial institutions management no matter when it is during card debt crisis or COVID-19. However, the article still has its own limitations in application. First of all, the article presents the policy effects only on Taiwan's credit cards market. In other words, it needs further study to apply the policy effects to other countries or regions. Next, though the article achieve some policy implications through document analysis, combined with qualitative and quantitative studies, it's still expected that in-depth techniques are employed to produce perspective results, to meet the theoretical and practical requirements. Finally, the pandemic has never been ended, but still impact all the dimensions. In other words, the struggle for fighting with the pandemic has never stopped. The role of the financial authority and financial institution management need to be examined continually. After all, it's not only impossible for information asymmetry to quit, it's more possible for information asymmetry to revive. It is recommended that the study will never stop.

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