Exploring the Dual-Card Crisis Under the Information Asymmetry

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The article aimed to explore Taiwan's dual-card crisis under the information asymmetry. Different from South Korea or Hong Kong, the card debts in Taiwan were derived from the credit cards and the cash cards. To achieve the goal, the article constructed the information asymmetry model combined with the adverse selections and the moral hazards. The results showed that the adverse selections and the moral hazards did exist in the dual-card market which led to the dual-card crisis. To cope with the dual-card crisis, the conclusion implied that the card debts in the dual-card market needed to be solved at the same time.

Keywords: dual-card crisis, information asymmetry, adverse selections, moral hazards

INTRODUCTION

After the Asian financial crisis in 1997, Hong Kong, South Korea and Taiwan had all experienced the card debt crises since 2000. It was obvious that whether the credit card debt crisis or the dual-card crisis, it was inseparable from the 1997 Asian financial crisis. Therefore, if the causes of Taiwan's dual-card crisis needed to be explored, it was necessary to understand the Asian financial crisis in 1997.

Looking back at the history, the Asian financial crisis was not caused overnight. In fact, the 23 East Asian economies grew faster than all other regions of the world from 1965 to 1990. The high-performing economies of Japan, South Korea, Taiwan, Hong Kong, Singapore, Thailand, Malaysia, and Indonesia experienced low and declining levels of income inequality as well, which was called "Asia economic miracle" (Grabowski, 2003). Bloom & Williamson (1998) claimed that the miracle occurred in part because East Asia's demographic transition resulted in its working-age population growing at a much faster rate than its dependent population during 1965-90, thereby expanding the per capita productive capacity of East Asian economies. Andersson et al. (2024) stressed the significance of the economic shrinking in Asia in a comparative perspective to demonstrate how and why resilience to the economic shrinking was a significant aspect of the successful development of the region. Lauridsen (2013) reviewed "No Miracle: What Asia Can Teach All Countries About Growth" by Mitchell Wigdor and recognized that some scholars in the neo-liberal tradition, culturist or statist had explained the region's impressive economic growth, but was mostly concerned with relating itself to and criticizing the influential New Institutional Economics (NIE) approach, which emphasized how institutions mattered for the economic transformation and in bridging the digital divide.

However, in the last two decades of the 20th century, Asia stumbled from miracle into crisis (Rigg, 2002). In 1994, economist Paul Krugman even published an article criticizing the "Asian economic miracle". He believed that East Asia's economic growth was the result of long-term increases in capital

investment, but the growth in total factor productivity was actually minimal (Krugman ,1994). Although Krugman himself admitted that he did not foresee the crisis or its depth, the result proved that the 1997 financial crisis had challenged these economies. Many of the high-performing economies had experienced serious problems, such as falls in currency and equity markets, significant slowdowns in international trade, and setbacks in economic growth. First, the Asian financial crisis swept through Thailand, and soon affected Malaysia, Singapore, Japan, South Korea, China and other places. The currencies of Thailand, Indonesia, South Korea and other countries had depreciated sharply, which also caused a sharp decline in most major stock markets in Asia. It had impacted the foreign trade companies in Asian countries, resulting in the collapse of many large-scale enterprises in Asia, unemployment of workers, and social and economic depression, which broke the rapid economic development in Asia. Some major Asian countries began to experience the depression and political chaos. Thailand, Indonesia and South Korea were the countries most affected by the financial crisis. Singapore, Malaysia, Philippines and Hong Kong were also affected, while mainland China and Taiwan were barely affected.

South Korea's economy nearly went bankrupt during the 1997 Asian financial crisis. In order to save the economy, the government encouraged the credit card borrowing and consumption. In 1999, there were only more than 38.9 million credit cards in South Korea. By 2002, there were more than 100 million credit cards. The annual growth rate of the private consumption reached a maximum of 7.9%; the bad debt rate reached 14.05% in the fourth quarter of 2003. Hong Kong, which was less affected by the financial crisis, also relaxed controls on the circulation of credit cards in 1998. The bad debt rate of the credit cards soared to 14.55% in the third quarter of 2002.

Taiwan issued its first credit card in 1974. How did Taiwan, which was not significantly affected by the Asian financial crisis, derive a more serious dual-card crisis? The reason was that since Taiwan opened up the new banks in the 1990s, the competition in banking business had been fierce, and the quality of the assets had declined due to the price competition for many commodities, resulting in an increase in overdue loans in the banking industry. Coupled with the transformation of the economic structure, the domestic enterprises had increasingly diversified the financing channels, and the need for the bank financing had been relatively reduced. As the corporate financial business shrined, the banks shifted their focus to the consumer finance business in order to seek the profit growth. Therefore, in order to expand the number of the card issuance, the bankers had relaxed the original credit card review procedures which made the test of the personal financial resources a mere formality. Even worse, the cash cards were issued in 1999 by Wantai Bank, which further made the number of cards in circulation in the market had increased year by year. When the market was flooded with too many credit cards and cash cards, the subsequent operating losses of the card-issuing banks and the emergence of the card slaves provided a favorable environment for the outbreak of the dual-card crisis.

It could be seen that in order to explore the reasons for the dual-card crisis in Taiwan, in addition to the credit cards, the cash cards should not be ignored. This article intended to conduct the literature review, collect documents, information and data related to the card debt crisis, and attempted to establish a theoretical model and hypothesis of Taiwan's dual-card crisis. Through empirical testing, it would show the role of the credit card and cash cards in Taiwan's dual-card crisis.

LITERATURE REVIEW

Card Debts

The card debts were also a type of debt under the consumer loans. Gorbachev & Luengo-Prado (2018) demonstrated that the creation and accumulation of credit card debt originated from a special phenomenon which was termed the credit card debt puzzle: why consumers simultaneously co-hold high-interest credit card debt and low-interest assets that could be used to pay down this debt. In other words, households simultaneously revolved significant credit card debt and held sizeable amounts of low-return liquid assets (Telyukova & Funding, 2013). Similarly, Choi & Laschever (2018) examined the role of noncognitive skills as well as the economic, financial, and demographic factors and found that the households with a more agreeable, introvert, and less conscientious head of household were more likely to co-hold. Ricaldi et al.

(2022) discovered that the households who displayed the co-holding behavior were more likely to have lower financial literacy than the convenience users, which suggested the financially literate households were less likely to display irrational behavior regarding the credit card debt puzzle. Pulina (2024) documented the simultaneous accumulation of the liquid assets and credit card debt in euro area countries and even pointed out that the tertiary education did not appear to significantly mitigate this puzzling behavior in the euro area. Simeulately, Norvilitis et al. (2023) also recognized that the college students with credit cards from on-campus solicitation had higher debt-to-income ratios than did those with credit cards from other sources, which suggested that the knowledge of financial issues might be an important variable for the future consideration.

Accordingly, Tahir et al. (2020) examined the relative strength of the association of the financial literacy, attitude toward balancing spending and savings, and financial satisfaction with the credit card debt-taking behavior and claimed that higher financial literacy was associated with less credit card debt. Sprenger & Stavins (2008) explored the relationship between the revolving credit card balances and payment use and found that the credit card revolvers were significantly more likely to use debts and less likely to use credit than the convenience users who repaid their balances each month. That was why Soll et al. (2013) identified several judgmental biases related to paying off credit card debts and showed that people underestimated how long it took to eliminate the debt when the payments barely covered the interests owed. Therefore, Greene & Stavins (2023) confirmed that the borrower-savers were worse off financially than the savers because the differences between them were much broader than just their credit card debt and bank account balances.

Information Asymmetry

Silova & Kovina (2023) asserted that the problems caused by the information asymmetry included the decision-making of any enterprise of any form of ownership, as well as consideration of the effects of this phenomenon on the company's activities, effective development and functioning in the market and the impact of the information asymmetry on the competitiveness and viability of the company. In other words, the information asymmetry carried additional costs of decision-making, negatively affected the competitiveness of the company. Besides, Batool et al. (2024) investigated the influence of the information asymmetry on the financial behavior of investors and confirmed that the investors' behavior in the financial markets could be significantly limited by the information asymmetry. Accordingly, Silpachai et al. (2024) examined the effect of the corporate governance and the information asymmetry on the firm performance and found that the information asymmetry significantly moderated the relationship between the corporate governance and the firm performance. Akimova & Petchenko (2024) recognized the impact of informational asymmetry on the processes of evaluating a company's financial potential because the stakeholders had different levels of access to the information and differing positions regarding the overall purpose of the company's activities. Specifically, Lu (2024) aimed to study the influence of the information asymmetry on IPO pricing within the financial market and highlighted a significant prevalence of IPO underpricing which was derived from the information asymmetry.

In addition, Bakhiet (2024) analyzed the intricate relationships among the financial statements readability, information asymmetry, stock liquidity and stock price crash risk, verified the mediating roles of the information asymmetry and stock liquidity and provided the novel insights, advancing theoretical understanding and practical implications for the risk management and financial reporting. Similarly, Azarberahman et al. (2023) proposed that the information asymmetry could be affected by the factors such as accounting comparability, sophisticated investors, relevance, and therefore, its value-relevance for decision-making and indicated that the comparability of accounting practices had a notable adverse impact on the information asymmetry. Zhang (2024) explored the correlation between the information asymmetry and audit fees and suggested that the information asymmetry had a notable influence on the determination of the audit fees and the result of the audit quality. To overcome the problems resulting from the information asymmetry, Yaacob et al. (2024) made a systematic review of the application of IR4 on mitigating the information asymmetry and supported the impact of the technology on mitigating the information

asymmetry in the corporate governance, including Blockchain, Cyber-Physical System (CPS), Internet of Things (IoT) and Cloud Computing.

Nonetheless, the information asymmetry was still most commonly found in the financial or insurance markets. Gan (2020) asserted that the existence of financial intermediaries was arguably an artifact of the information asymmetry because the banks could provide a mechanism for the information transmission, which would reduce the degree of the information asymmetry and consequently increase the market efficiency. During the process of the information transmission, the banks were able to provide unique services in the production and exchange of the information. In other words, the banks owned the comparative advantages in the information production, transmission, and utilization even if they might make both good and bad lending decisions during the financial crisis. Besides, Assab (2023) investigated the impact of the flood management policies on the airport investment and the resulting financial constraints and suggested that the observed increase in financial constraints resulting from the stricter building codes and public adaptation investment was likely driven by the information asymmetry rather than the materiality of flood risk. The public investment in flood risk reduction seemed to signal to the investors that the airport was exposed to the flood risk, potentially leading to the increased financial constraints which highlighted the importance of considering the information asymmetry when assessing the impact of the flood management policies or flood insurance on the financial constraints. Similarly, Zhao & Lv (2023) examined the effect of joining agricultural industry chains on the supply-based and demand-based credit rationing for farmers and found that the agricultural industry chains could increase farmers' credit by reducing the information asymmetry between the farmers and banks, reducing the agricultural business risks, and forming the effective collateral and guarantee mechanisms while the insurance had limited effects on alleviating farmers' credit rationing.

On the other hand, though Pamdey & Snekkenes (2016) argued that the cyber-insurance was the most practical and only way of handling a major financial impact of an information security event, the cyber-insurance market suffered from the problem of the information asymmetry, lack of product diversity, illiquidity, high transaction cost, and so on. Similarly, AI-Faryan & Alokla (2023) studied the impact of the improvements in Saudi corporate governance practices among the insurance firms when the Saudi Arabia market was open to the foreign investors and indicated that the firm performance was affected by the information asymmetry when the investors needed to feel confident in the Saudi enterprises' appropriate monitoring and regulation.

Adverse Selections

Like the information asymmetry, the adverse selection most often mentioned was still in the insurance markets. Pauly (2024) argued that the adverse selection in the insurance usually arose because of some external influence (either regulations or customs) which forced the insurers to ignore the information on risk that they could easily obtain. Hodgson (2015) studied the market collapse that could result from the adverse selection in health insurance markets and explained why the adverse selection led to the high prices on good quality insurance and why it forced the healthy individuals into the low quality plans. Cheung et al. (2019) employed the principal-agent models to study a monopolistic reinsurance market with the adverse selection and revealed that the reinsurer (principal) aimed to maximize his average profit by designing an optimal policy provision (menu) of 'shirt-fit' reinsurance contracts for every insurer from one of the two groups with hidden characteristics due to the information asymmetry.

Meanwhile, Browne (1992) tested the market for individual health insurance to determine if adverse selection is present and found that low risk consumers did purchase less insurance in the individual market than they do in the group market. This finding is consistent with adverse selection existing in the individual market for insurance. Similarly, Fischer et al. (2023) presented robust evidence on adverse selection in hospitalization insurance for low-income individuals that received first-time access to insurance and revealed substantial selection in individual policies, leading to welfare losses and the threat of a market breakdown, which was exactly caused by the adverse selection. Hence, in the presence of adverse selection and aggregate uncertainty and under a simple nondegeneracy condition on loss probabilities, Smith & Stutzer (1990) showed that some agents purchase participating policies (from mutual insurers) while others

purchase nonparticipating policies (and hence do not share risk with their insurer). Specifically, agents with low loss probabilities signal their type by sharing aggregate risks with their insurer. Besides, Doherty & Thistle (1996) examined the model of the adverse selections and argued that risk type was known to the consumer but not to the insurer due to the assumption that the information has zero social value and negative prior value. However, the fact was that the private value of information is non-negative only if insurers cannot observe consumers' information status, or if consumers can conceal their informational status.

In addition, based on the coverage-risk prediction of adverse selection theory, Cohen & Siegelman (2010) recognized that the policyholders who purchased more insurance coverage tended to be riskier. That was, the presence of a coverage-risk correlation could be explained either by the moral hazard or adverse selection. More specifically, Yang & Zhong (2023) found that the mandatory maternity insurance had lower coverage than other social insurances for employees. Above all, the younger the average age of employees, the more serious the adverse selection. In other words, there was a positive "coverage-risk" relationship in employee maternity insurance due to the adverse selection.

On the other hand, Fabel & Lehmann (2002) argued that the adverse selection induced the economic limits to the market substitution. If the quality uncertainty persisted in both Internet and traditional marketplaces, a second-best equilibrium with parallel market segments might arise. The information cost advantage of one marketplace was exactly offset by a more severe adverse selection problem associated with non-observable quality variables. Olabarrieta et al. (2023) analyzed the insolvency proceedings for the competitiveness of a national economy, which reflected on key information asymmetry and adverse selection problems resulting from a gap between the new challenges on insolvencies processes and options and identified parallelisms between the lemon market and current insolvency proceedings.

Nevertheless, though Huang & Thomas (2014) asserted that the variable pricing was one way of improving the profitability of credit cards, however, choosing the appropriate price for each risk grade of default was not straightforward, as one of the main problems was the adverse selection. Similarly, Michelle & McCarthy (2002) analyzed the purchasers of the annuities with the lower mortality than the general population and showed that the adverse selection associated with the purchase of individual annuities reduced mortality rates by at least 25% in the international context. Interestingly, Choi (2009) examined the effects of peer pressure in the adverse selection problem and presented a peer pressure function that represented the psychological costs and incorporated it into the agent's utility function.

How were the problems derived from the adverse selection overcome? Nzongang & Dzukou (2023) analyzed the effect of the customer relationship management within the microfinance institutions and revealed that a quality welcome and personalized support had effects on reducing the adverse selection. Simultaneously, Cao & Gruca (2005) also stressed that the adverse selection was an important problem for the marketers. To reduce the chances of acquiring an unprofitable customer, the companies might screen the prospects who responded to a marketing offer. Based on a firm's customer relationship management system, it showed how to target the prospects who were likely to respond and be approved and mitigate the adverse selection.

Moral Hazards

Similar to the adverse selection, the moral hazard was also most often mentioned in the insurance market. According to the statement from Marshall (1976), the moral hazard was commonly defined as the excessive expenditure due to the eligibility for the insurance benefits. The beneficiary was subsidized in his purchases and, as a consequence, continued to spend after the marginal benefit fell below the marginal cost and the social cost of the moral hazard was the deadweight loss associated with the insurance subsidy. Along with the adverse selection, Wu et al. (2020) asserted that the moral hazard was one of the major hurdles that the private and public insurance plans had to contend with. The moral hazard occurred if the risks were endogenous to a producer's behavior and if the insurer was unable to properly monitor the insured. Besides, Schmid (2020) explored the debate on European unemployment insurance (EUI) involved in the establishment of a "European Unemployment Reinsurance Scheme" and found that it was not until the shock waves of the COVID-19 pandemic were felt that any specific measures were actually taken to establish such a scheme. The reasons for such prevarication were the doubts as to whether the moral hazard

could be kept under control or this protracted stalemate: the neglect of the moral assurance as a countervailing force of the moral hazard. Furthermore, Pauly (1968) argued that the insurance was commonly found when the uncertainty was present in the economic activity which identified a kind of market failure with the absence of markets to provide the insurance against some uncertain events. However, the insurance against some types of uncertain events might be nonoptimal and the compulsory government insurance against some uncertain events even led to inefficiency. Hence, it was shown that the problem of the moral hazard in the insurance had, in fact, little to do with the morality, but could be analyzed with the orthodox economic tools.

In addition to the insurance market, the moral hazard often existed in the relationship between the principal and the agent. For example, Georgiadis et al. (2024) studied a moral hazard problem where the agent could choose any output distribution with a support in a given compact set and the agent's effort-cost was smooth and increasing in first-order stochastic dominance. Zhang et al. (2023) took the live streaming commerce as an example which was a new online selling channel and increasingly gaining popularity and creating a vast market worth. The cooperation between the brand suppliers and streamers might not always achieve a win-win situation due to the moral hazard and adverse selection problems. Under the double information asymmetry, the brand suppliers maintained the unit commission and price discount for the high-influence streamers unchanged while decreasing the unit commission and increasing the price discount for the low-influence streamers. Similarly, Cai et al. (2021) analyzed the platform operations in the sharing economy and uncovered that the presence of the platform created the "triple marginalization" problem in which the supply chain coordination couldn't be achieved even if the manufacturer was willing to supply at cost using the wholesale pricing contract. The moral hazard problem arose when the retailer had the incentive to overclaim the amount of the markdown sponsor. It was revealed that the moral hazard problem brought a loss to the manufacturer, an immoral gain for the retailer, and there was no impact on the platform and consumers.

Furthermore, Brunnquell & Michaelson (2016) brought the language and logic of the moral hazard to pediatrics and suggested that the decision makers were often not the primary party affected by their decisions but made a decision on behalf of others and let others to separate, respect, and prioritize the interests of affected parties. Similarly, Tuttle et al. (1997) also conducted a decision-making study, examined the effects of the moral hazard on the information systems (IS) professionals' decisions and revealed that the moral hazard was defined as an incentive to act in one's self-interest in conflict with the organization's overall goals while those actions might be hidden through the privately held information. Meanwhile, Pierret & Howarth (2022) studied the role of the banking union which was a major policy response to the financial crisis that began in 2007 and the subsequent Eurozone crisis and argued that the moral hazard had frequently been presented as a major cause of these crises and the banking union could be understood as a response to the moral hazard in relation to the banks and sovereigns. Similarly, Alsabah & Alibrahim (2024) examined the shift towards the reintermediation in the peer-to-peer (P2P) lending industry which increased the market's vulnerability to the moral hazard by the platform because the current regulations governing P2P lending platforms might not be sufficient to protect the lenders from the moral hazard risk.

On the other hand, Williams (2021) claimed that the arguments against providing the fiscal aid to the state governments usually depended on a simplistic moral hazard argument: supporting states through a cyclical downturn encourages them to overspend, which was recommended by the mainstream literature on Fiscal Federalism. Simultaneously, Poole (2010) reviewed the fallout from the current global market crisis and also recognized that the moral hazard did arise from the government bailouts.

Especially, though the intervention might cause as well as calm the internal wars, Crawford (2005) demonstrated the way that caused them was captured by the concept of the moral hazard and suggested that the domestic groups which would not otherwise resort to political violence might be encouraged to do so by the prospect of the outside support. Similarly, Kuperman (2005) explored the emerging norm of the humanitarian military intervention which was employed to prevent the genocide and ethnic cleansing perversely would result in such violence through the dynamic of the moral hazard because the norm, intended as a type of insurance policy against genocidal violence, unintentionally encouraged the

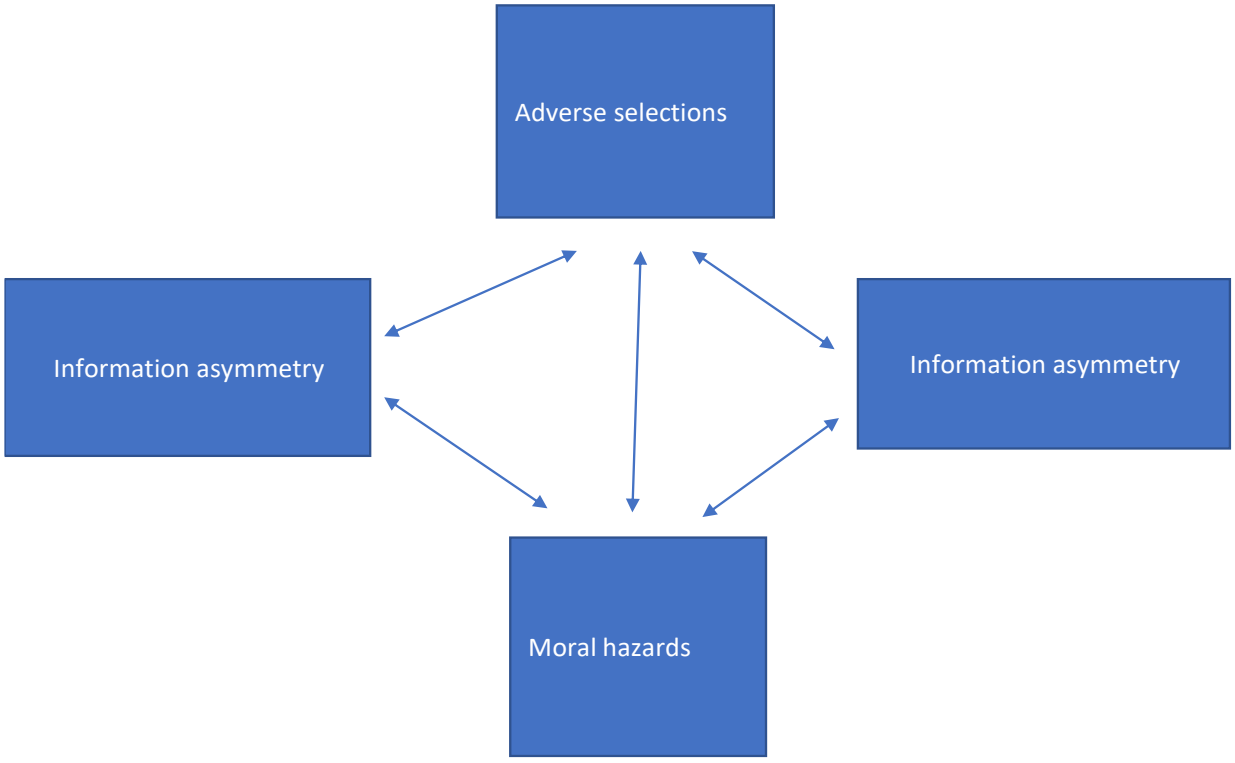
disgruntled sub-state groups to rebel if they expected the intervention to protect them from the retaliation by the state.

PROPOSED MODEL AND HYPOTHESES

Proposed Model

Whether the qualitative research or quantitative research, few studies employed the information asymmetry model to analyze the dual-card crisis in Taiwan. Based on the above literature review and related documents and data, this article aimed to construct an information asymmetry model which combined the adverse selections and the moral hazards to verify whether there was an information asymmetry phenomenon in Taiwan's dual-card market around 2005. Based on the related literature, the adverse selection referred to the ex ante existence of the information asymmetry due to the different levels of the information held by both parties to the transaction. Therefore, those who were relatively lacking in information might make choices that harmed themselves in order to avoid being harmed by the lack of the information. The moral hazard referred to the ex post existence of the information asymmetry. With the relatively sufficient information, one party pursued his own interests and acted to the detriment of the other party. Nonetheless, the adverse selections and the moral hazards in the information asymmetry model were not independent variables. Furthermore, they not only affected the information asymmetry individually, but also interacted with each other and had a causal relationship between them (see Figure 1). Therefore, to explore if an information asymmetry phenomenon occurred in Taiwan's dual-card market, or even deteriorated into a dual-card crisis, it was necessary to examine whether the conditions for the existence of the adverse selections and the moral hazards were simultaneously met.

FIGURE 1
INFORMATION ASYMMETRY MODEL



Hypotheses

To achieve the goal, the article was based on the information asymmetry model combined with the adverse selections and the moral hazards to design the research hypotheses as follows:

Hypotheses of the Adverse Selections:

H 1: *The interest rates of the dual cards were higher than the consumer loan interest rates.*

H 2: *The numbers in circulation of the dual cards were increasing.*

H 3: *The revolving credit balance of the credit cards or the loan balance of the cash cards was increasing.*

Hypotheses of the Moral Hazards:

H 4: *The amount of the bad debts written off by the dual cards was increasing.*

H 5: *The overdue ratios of the dual cards were increasing.*

H 6: *The criminal cases were increasing.*

H 7: *The suicide cases were increasing.*

RESULTS AND DISCUSSIONS

Adverse Selections

The Interest Rates

When observing whether the information asymmetry or the adverse selection existed in the financial market, the interest rates were definitely the most important indicator. The interest rates represented the price of the funds and were determined by both the supply and demand side. On the other hand, it represented the risk premium of the capital providers providing funds. Therefore, the higher the interest rate, the higher the probability that the information asymmetry or the adverse selection existed. Comparing the consumer loan interest rates of the five major banks, they had dropped significantly from 7.963% in 2000 to 3.568% in 2005, and continued to decline. However, according to Table 1, both the maximum revolving credit interest rates of the credit cards and the loan interest rates of the cash cards were much higher than the consumer loan interest rates of the five major banks. And they had raised the interest rate level to 20% of the maximum interest rate stipulated in the civil law. Even though the Banking Law was revised to lower the maximum revolving interest rate from 20% to 15% in 2015, this trend had not changed. The credit cards and the cash cards were both the consumer credit instruments. Setting such a high interest rate level might satisfy the card-issuing bank's pursuit of profits, but it also highlighted the high risk costs that needed to be borne, laying the groundwork for the possibility of the adverse selections in the future. Therefore, H1 was supported.

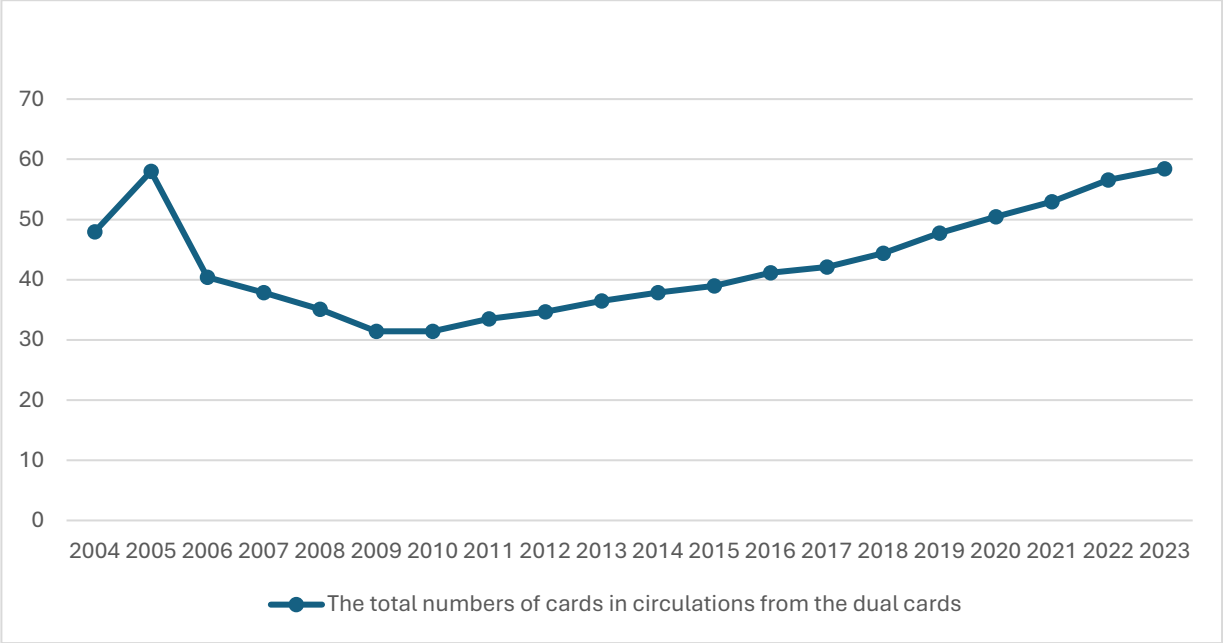
TABLE 1
THE MAXIMUM REVOLVING CREDIT INTEREST RATES OF THE CREDIT CARDS AND THE LOAN INTEREST RATES OF THE CASH CARDS

The issuing cards banks	The maximum revolving credit interest rates of the credit cards	The loan interest rates of the cash cards
CTBC Bank	20%	20%
Yuanta Commercial Bank	19.71%	
Mega International Commercial Bank	19.71%	
Risheng International Commercial Bank	19.99%	
Taipei Fubon Commercial Bank	19.98%	20%
Taishin International Commercial Bank	20%	20%
Shin Kong Commercial Bank	19.71%	20%
E.Sun Commercial Bank	19.71%	
Bank Sinopac Company Limited	19.97%	20%
Antai Commercial Bank	19.71%	
Citi Commercial Bank	19.97%	
Cathay Pacific Bank	19.7%	
KGI Bank	19.89%	20%
Far East Commercial Bank	19.97%	
Union Bank of Taiwan	19.99%	20%
HSBC	19.929%	20%
ANZ Bank	19.99%	20%
DBS Bank	19.71%	20%
COTA Commercial Bank	19.90%	20%

The Numbers of Cards in Circulations of the Dual Cards

Based on the market price mechanism, the card-issuing banks would have to raise interest rates for the precautionary reasons to cope with the risk premium of the adverse selection caused by the information asymmetry. Unless the return on the investment increased, the interest rates raised by card-issuing banks from the capital suppliers to compensate for the risk premium would inhibit the number of cards in circulation of the credit cards or the cash cards. However, what was the truth? This article used a relatively conservative approach to calculate the number of cards in circulation by summing up the numbers of the credit cards in circulations and the cash cards used. It showed that the total number of the dual cards in circulation reached a high of 57.980 million in 2005, which was more than twice the total population in Taiwan at that time (see Figure 2). It was proved that although the revolving credit interest rates of the credit cards and the loan interest rates of the cash cards were much higher than the consumer loan interest rates, the number of cards in circulations from the credit cards and the cash cards showed a sharp upward trend during the dual-card crisis. Obviously, it was against the demand law in the free market. The empirical results proved that the adverse selection did exist during the dual-card crisis. Hence, H 2 was supported.

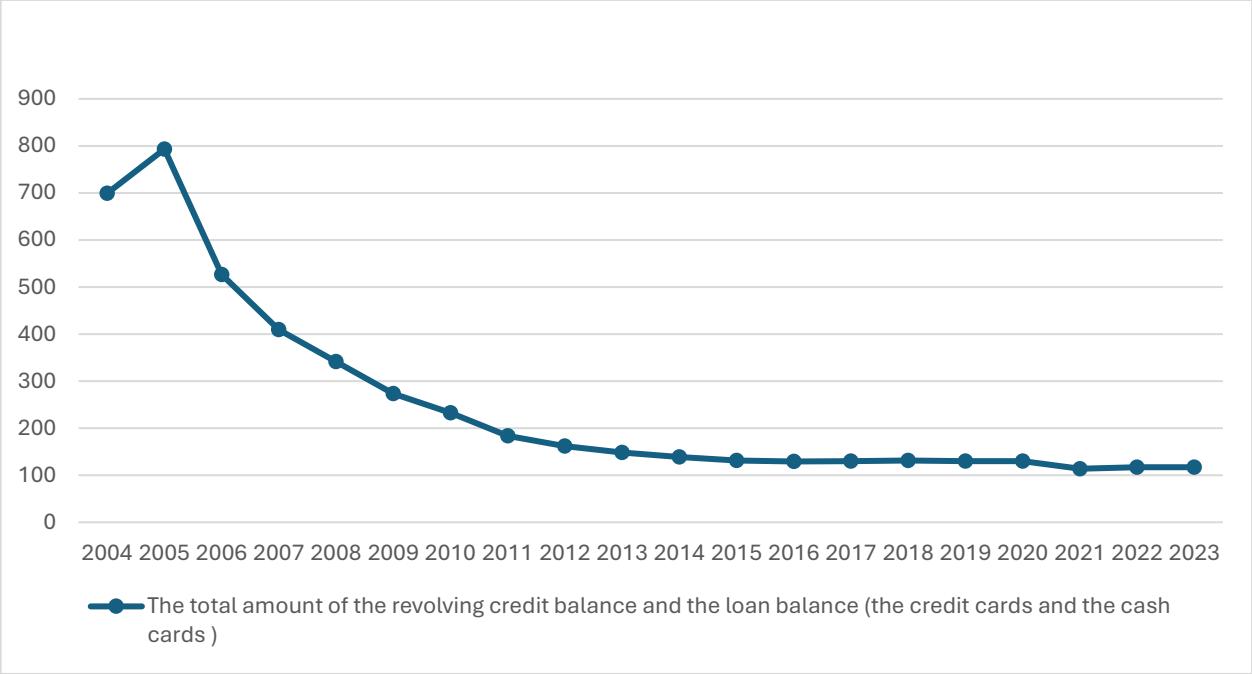
FIGURE 2
THE TOTAL NUMBERS OF CARDS IN CIRCULATIONS FROM THE DUAL CARDS



The Revolving Credit Balance of the Credit Cards and the Loan Balance of the Cash Cards

Just like the numbers of cards in circulations from the dual cards, the revolving credit balance of the credit cards or the loan balance of the cash cards could also be the important indicators of whether there was adverse selection under the information asymmetry and especially under the dual-card crisis. According to Figure 3, by summing up the revolving credit balance of the credit cards and the loan balance of the cash cards, it was found that the total amount of dual-card loans also reached a peak of NT$793.165 billion in 2005. In other words, the higher interest rates of the dual cards did not inhibit the revolving credit of the credit cards or the loan balance of the cash cards, which was against the demand law in the free market and proved the existence of the adverse selections. Hence, H 3 was supported.

FIGURE 3
THE TOTAL AMOUNT OF THE REVOLVING CREDIT BALANCE AND THE LOAN BALANCE

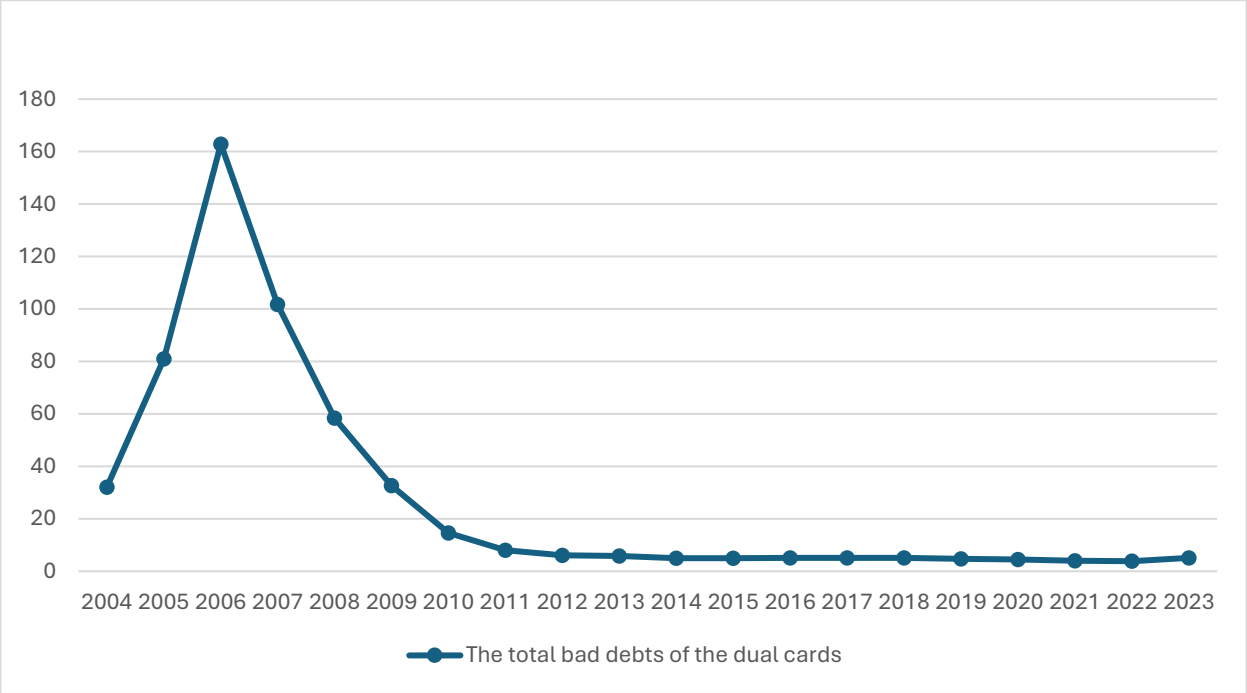


Moral Hazards

The Bad Debts of the Dual Cards

Obviously, the bad debts were an important indicator of whether the adverse selections resulted in the moral hazards. After all, the rise in interest rates might not be entirely caused by the increase in the cost of the funds due to the risk premiums from the card-issuing banks. If it was due to the increase in demand for the funds from the cardholders based on the increase in return on the investment, it was reasonable for the interest rate to respond with rising. On the contrary, if the high interest rates were caused by an increase in the cardholder's debt burden, the inability to repay the card debt, or even more seriously turning the cardholder into a card slave, they were the results that the card-issuing banks needed to respond to the adverse selection. The wishful thinking of trying to avoid the risks and obtain the high profits not only failed, but the final result was the rising bad debts. According to Figure 4, the total bad debts of the dual cards increased exponentially every year between 2004 and 2006, reaching a peak of NT$162.855 billion in 2006. When the bad debts were not reduced due to the high interest rates with the high risk premium of the issuing banks, it implied that the market price mechanism had failed. And the results of the moral hazard caused by the adverse selection had been confirmed. Hence, H 4 was supported.

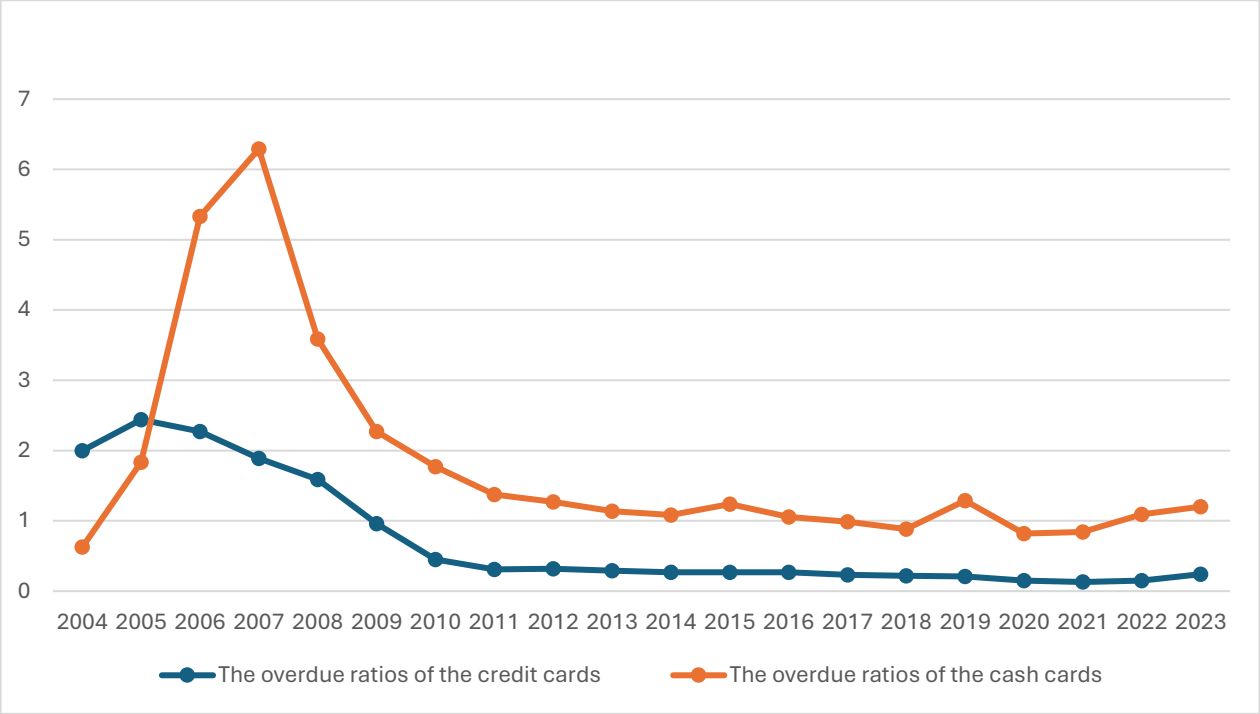
FIGURE 4
THE BAD DEBTS OF THE DUAL CARDS



The Overdue Ratios of the Dual Cards

The overdue ratios were another important indicator of the moral hazards after the bad debts. The rising overdue ratios year by year directly proved that the high interest rates of the card-issuing banks were simply to arbitrarily issue cards for their own original motivation of chasing the huge profits. As for the risk premium based on the precautionary motives, it was just an excuse for the card-issuing banks to pursue the profits and ignored the corporate social responsibilities. Therefore, the empirical evidence showed that when the interest rates were high, the overdue ratios of the credit cards and the cash cards did not decline during the dual-card crisis, but instead continued to rise (see Figure 5). There was no doubt that the high interest rates coupled with the high overdue ratios clearly indicated that the market price mechanism in the credit card and cash card markets had failed. In other words, the moral hazard was derived from the adverse selection with the high interest rates, allowing the information asymmetry model to fully describe the specific facts of the dual-card crisis in Taiwan. Therefore, H 5 was supported.

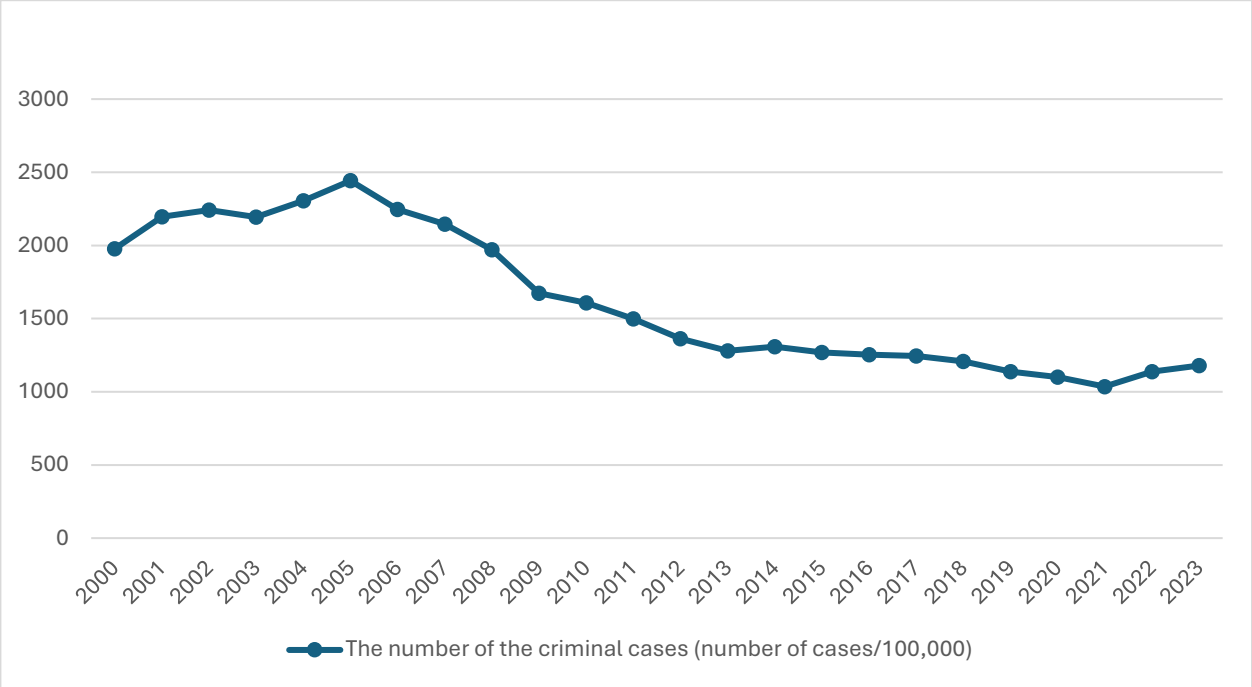
FIGURE 5
THR OVERDUE RATIOS OF THE DUAL CARDS



The Criminal Cases

The aforementioned two hypothesis tests confirmed that the card-issuing banks suffered serious losses during the dual-card crisis. In addition to the cardholders, the card-issuing banks were also the direct victims of the financial crisis caused by the dual-card crisis. As for the cardholders who needed to afford the card debts, they not only had to face the financial problems, but also couldn't escape from the social problems. The first issue was the criminal cases which were derived from the card-issuing banks and the card-debt group. With the permission of the financial authorities, the card-issuing banks outsourced the collection operations of the card debts, which led to the coercion, intimidation and other illegal behaviors. As for the cardholders, due to the improper collection of the card debts, they dared not return home, couldn't go to work, or even became homeless. What's more, some people took the desperate measures and robbed the stores at gunpoint. The multiplication effect between the card-issuing banks and the cardholders actually caused the criminal cases to rise abnormally in 2005 (see Figure 6). The empirical evidence showed that under the information asymmetry, the costs presented by the moral hazard had expanded from the financial crises to the social problems. Hence, H 6 was supported.

FIGURE 6
THE NUMBER OF THR CRIMINAL CASES

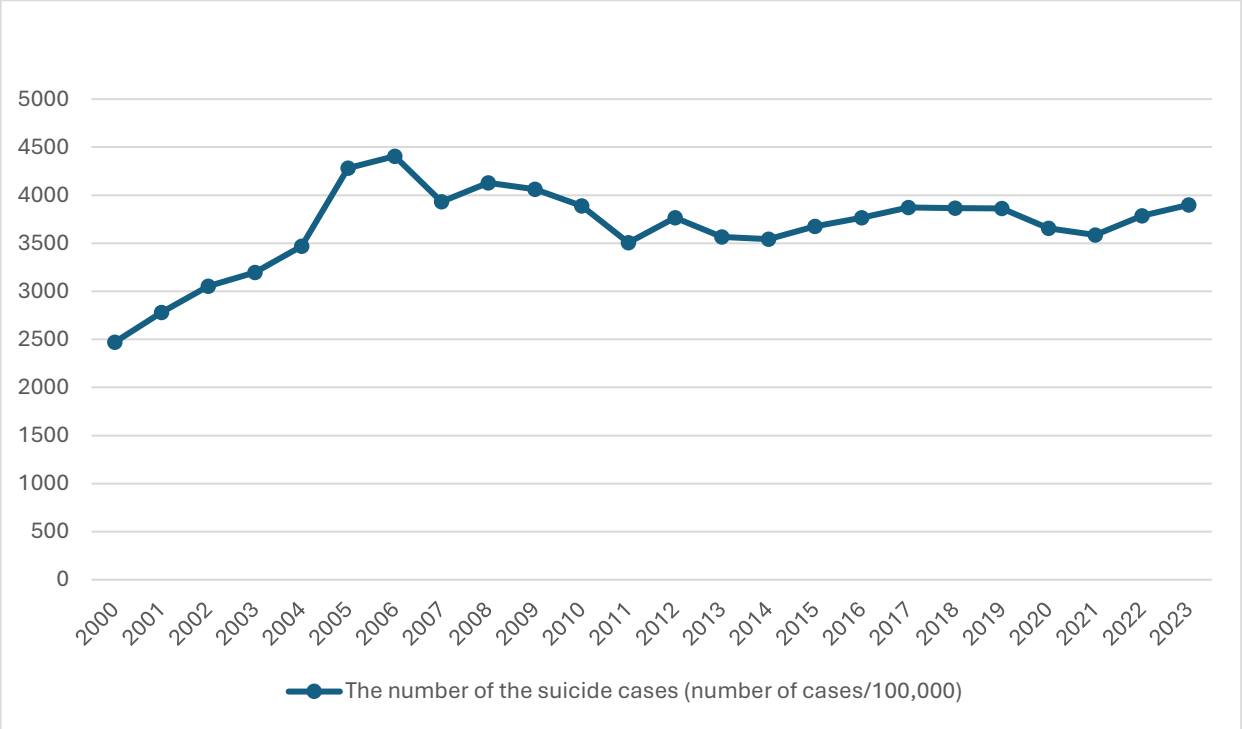


The Suicide Cases

Due to the overwhelming card debts, it was sad that many people committed suicide because they couldn't pay off their card debts. Especially under the pressure of the coercion and intimidation, many families had been broken up. The frequent suicides due to the card debts, and even suicides with their children burning charcoal or jumping into a river became a major issue at that time. According to the data from the Financial Supervisory Commission, an average of 50,000 people in Taiwan went bankrupt every month and became the card slaves. Besides, based on the police investigations, at least forty card slaves were driven into despair every month due to the card debts. The cases of the card debts that drove people to death occurred almost every day.

Perhaps, the reason why the card slave existed was very complicated. For example, the excessive consumption by the cardholders due to the endless desires was a possible reason, and the natural disasters and accidental inability to repay were also the possible reasons. Nonetheless, it was unsuitable to oversimplify the inferences that gave rise to the card slaves, which might aggravate the hopelessness or negative feelings of those with the card debts, and even suggested that the suicide was a way to solve the problem of the card debts. However, just like the number of the criminal cases, it was an indisputable fact that the number of the suicide cases increased abnormally in 2005 (see Figure 7). The debt repayment was inevitable. However, if the life needed to be sacrificed as the price of the moral hazard, the society might not be able to afford the burden. Hence, H 7 was supported.

FIGURE 7
THE NUMBER OF THE SUICIDE CASES



CONCLUSIONS AND RECOMMENDATIONS

Conclusions

According to the constructed information asymmetry model, while both the credit cards and cash cards were at relatively high interest rates, the total numbers of cards in circulations and the total loan balance were rising against the trend, which violated the market price mechanism. All of this confirmed the existence of the adverse selection. Due to the adverse selection, the bad debts and the overdue ratios of the card-issuing banks continued to rise, resulting in serious losses; due to the adverse selections, the cardholders needed to bear the long-term card debts and even sacrificed their lives, causing the number of the criminal cases or the suicide cases to rise abnormally. It was confirmed that the moral hazards followed the adverse selections. Furthermore, the empirical evidence showed that during the dual-card crisis in Taiwan, the impact from the card debts was obviously combined with the credit cards and the cash cards. The article concluded that Taiwan's dual-card crisis was caused by the specific facts presented by the information asymmetry model, combined with the adverse selections and the moral hazards.

Obviously, no one was the winner in this wave of the dual-card crisis. The economically disadvantaged and young cardholders had become card slaves. The card-issuing banks had caused huge overpayments because the cardholders could not pay off their card debts, which had in turn overwhelmed the card-issuing banks themselves. The card-issuing banks suffered the heavy losses in this wave of dual-card crisis at their own expense. However, the expansion of the dual-card crisis from the financial crisis to the social problems was probably unexpected. The criminal cases or the suicide cases derived from the dual-card crisis had increased abnormally which had brought an unbearable burden to the society and even impacted the economic growth rate. Undoubtedly, the conclusion has brought significant management implications to the financial authorities in the future management of the financial institutions.

RECOMMENDATIONS

The financial crisis derived from the card debts did not start from Taiwan. Hong Kong and South Korea already had serious card-debt problems before Taiwan's dual-card crisis. It was a pity that Taiwan did not learn from the painful lesson of Hong Kong and South Korea. Instead, the card-debt problem extended from the credit cards to the cash cards, creating an unmanageable dual-card crisis. What's more, it was even more regrettable that Taiwan was relatively less affected by the 1997 Asian financial crisis, but failed to make use of this advantage to prevent the trouble before it happened.

When facing the dual-card crisis arising from the information asymmetry, the financial authorities were still stuck in the dilemma of respecting the market price mechanism or intervening in the market. Even if they had collaborated with the banking industry to launch a debt negotiation mechanism or passed the debt liquidation regulations through the legislation, it turned out that the opportunity had been missed, which not only worsened the financial situation, but also paid a heavy price to the country and society.

From the Asian Financial Crisis in 1997, the credit card crisis in 2005 and the financial tsunami in 2008 to the Covid-19 in 2019, Taiwan had not been able to stay away. Undoubtedly, it would be more difficult to face the future challenges. In order to prevent the crises before they occurred, the financial authorities needed to assess the situation, discern opportunities, avoid delaying opportunities and repeating the same mistakes, and be fully prepared for the possible crises in the future.

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