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Original Paper

The Successful Experience on Facing Information Asymmetry—Cash Cards in Taiwan

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Abstract

With the opening of the establishment of new banks in the 1990s, it led to an excessive number of domestic bankers and an excessively small scale, which caused a decline in the quality of financial assets and eventually resulted in adverse selection and moral hazard under information asymmetry in the domestic cash card market, triggering a card debt crisis and serious social problems. This article examined whether the phenomenon of information asymmetry was improved after the competent authority intervened. The results highlighted the important position of the competent authority in financial institution management and made information asymmetry improved eventually.

Keywords

cash card, card debt crisis, information asymmetry, adverse selection, moral hazard, competent authority

1. Introduction

1.1 Research Background and Motivation

In response to international financial liberalization and accession to the World Trade Organization (WTO), Taiwan also opened up the establishment of new financial institutions in the 1990s to improve financial efficiency. With the establishment of new banks, restrictions on banks are gradually loosened. During this period, there were 16 newly established banks including Wantai Bank, Yushan Bank, Taishin Bank, Public Bank, Fubon Bank, etc. Subsequently, a number of credit cooperatives were used

to restructure commercial banks, and regional financial institutions were allowed to operate across regions, which brought the domestic financial industry into a more competitive stage. Immediately afterwards, a series of financial opening policies were launched, including encouraging cross-industry mergers of domestic banks, securities, and insurance, as well as various consumer financial derivatives and emerging financial products (such as credit cards, cash cards, microfinance, etc.). Among them, the growth of cash cards is even faster, and the commodity properties of cash cards and credit cards are very similar and complementary, which makes various banks launch cash card and credit card businesses in order to obtain more business opportunities.

Due to the fast application speed of cash card, it also promotes the increase of bank demand deposits, in addition to bringing stable fee income to banks. Furthermore, it is very convenient to use, and therefore it is also quite competitive and attractive in the market. Especially inspired by the issuing of "George & Mary Cash Card" by Wan Tai Bank in 2000, various banks have joined the cash card market and successfully attracted young people to apply for cash cards, which inspires more young people to obtain more consumer loans, fall into the trap of high interest rates but cannot extricate themselves financially. Besides, card-issuing banks vigorously sell and offer a variety of gifts. Almost everyone has more than one card in their hands. "Cash in advance" and "card consumption" are popular. Even though the interest rate of cash card is scarily high, the development of the cash card market has become more and more enthusiastic due to the loose application conditions, and the proportion of consumer loans in all loans has been increasing, reaching its peak in 2005.

In order to obtain huge profits, banks have increasingly increased their consumer finance business, especially in instigating the concept of "enjoy first, pay later" or even "consume first, then debt". Borrowers eventually became incapable of repaying debts and there were constant disputes with banks, and some even made suicide due to unbearable bank debts. The "dual-card storm" that detonated in 2005 has experienced fierce competition in the banking industry, consumer finance has developed rapidly, and the dual-card market has gradually become saturated. It eventually evolved into serious dual-card overdue lending and card debt problems. The "dual-card storm", which originally seems to be an economic problem, is also unexpectedly presented as an incredible social problem.

1.2 Research Purpose

Financial institutions were originally the core of financial market financing. In addition to acting as an intermediary role for capital suppliers and capital demanders, they must also do their best to control the risks of financing. However, the dual-card storm that occurred in 2005 indicated that financial institutions did not play a role in stabilizing the financial order. On the contrary, in order to obtain huge profits, they also invested heavily in highly profitable dual-card business, which finally resulted in unmanageable consequences.

The card issuing bank uses a revolving interest rate of up to 20%, plus high liquidated damages or handling fees, and it is indeed profitable. In addition, in order to increase market share, the card issuance is excessive, which makes the cardholder's debt more and more.

Statistics information showed that the overdue ratio of cash cards has risen sharply in 2005 (Figure 1), and the accumulated amount of bad debts transferred from cash cards in that year also peaked (Figure 2). When the dual card storm emerges, social problems also arise, such as suicide cases one after another, leading to family fragmentation, social unrest, and even endangering national development. In the face of the card debt storm and its derivative social problems, can the government or the competent authority just sit back and watch the impact of the card debt storm and do nothing in the name of respecting the market price mechanism?

Apparently, the government or financial authorities are under heavy pressure from public opinion, which prompted the Association of Banks to propose a "debt negotiation mechanism" platform to respond to this crisis. However, it's just a debt negotiation mechanism that is not compulsory. How to resist the tsunami-like card debt storm? Facts have proved that inadequate policies will not only help to alleviate the card debt problem, but the resulting social problems will continue unabated.

Under the continuous pressure of public opinion, the financial authorities finally stepped in and took the lead in passing the Consumer Debt Clearance Regulations in 2007. Through legislation, the authorities strongly declared their determination to resolve the card debt storm. Different from the debt negotiation mechanism, the debt liquidation regulations are more mandatory. More importantly, debtors no longer have to negotiate with the bank. They can also choose to apply to the court for "mediation", "rebirth" or "liquidation", so that all cardholders who are overwhelmed by debt can get more respite.

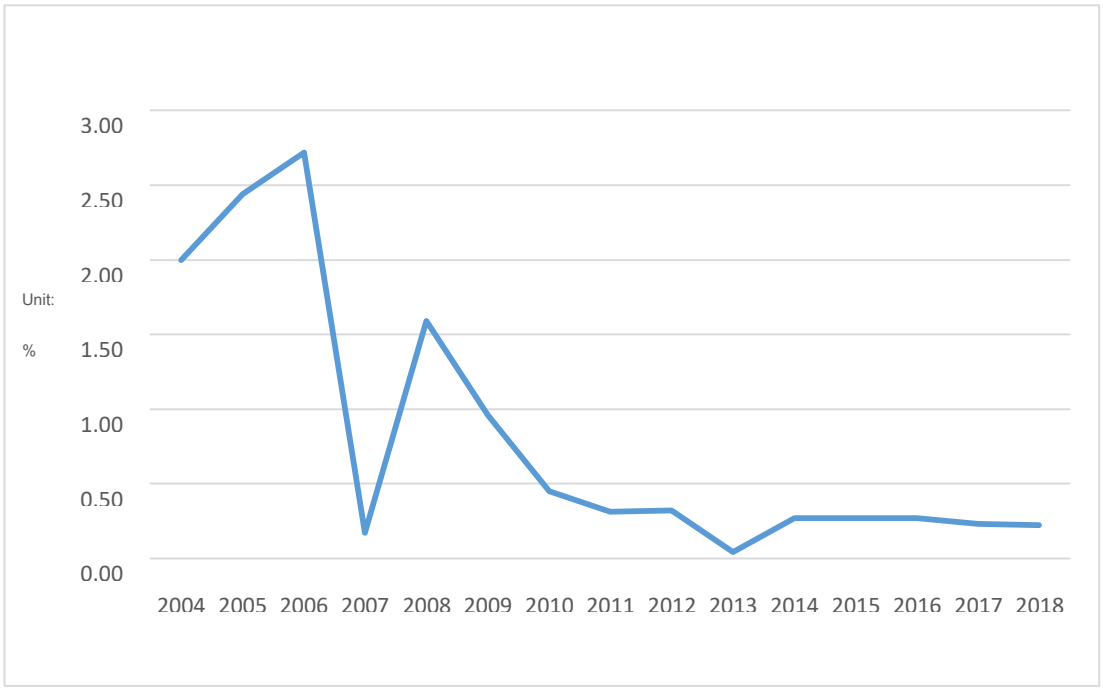

Figure 1. Overdue Ratio of Cash Cards

Recourse: Financial Supervisory Commission.

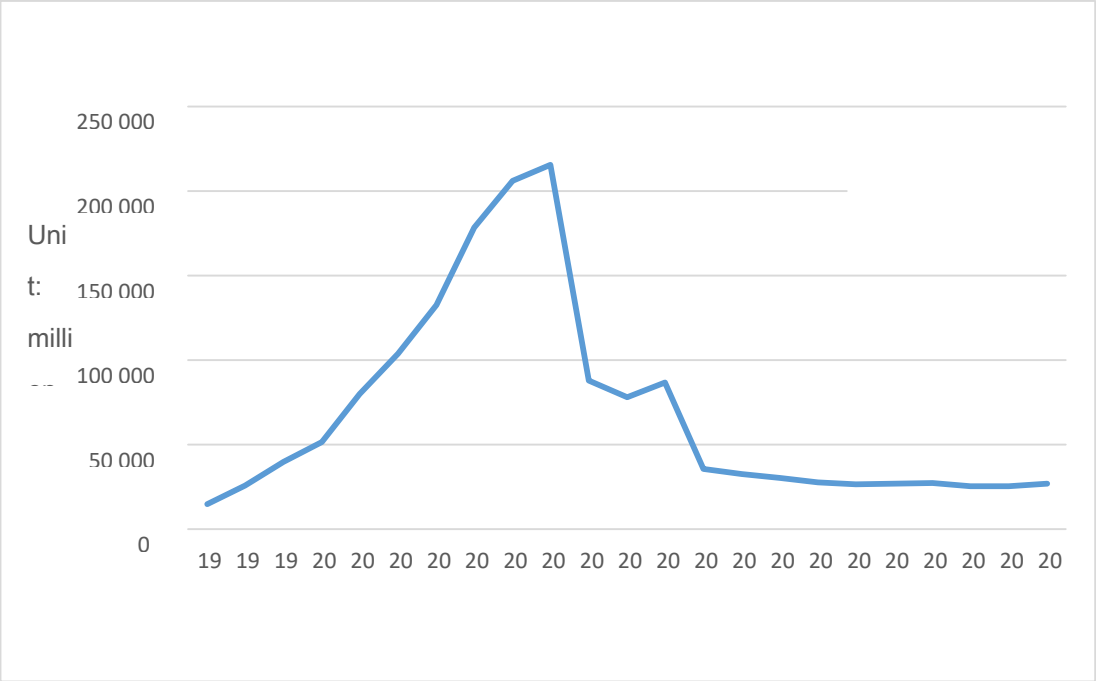

Figure 2. Accumulated Bad Debts from Cash Cards

Recourse: Financial Supervisory Commission.

After experiencing the impact of the card-debt storm and the involvement of financial authorities in the market, this study intends to examine: 1. Does the information asymmetry still exist in the cash card market as before? 2. What is the effect of the financial authorities' intervention on information asymmetry in the cash card market? And 3. Have the social problems brought about by the dual-card storm been resolved?

2. Literature Review

2.1 Information Asymmetry

Different from the publication of Hayek's influential contribution on the mechanism of market prices as a system of messages to exchange information and coordinate decisions in a decentralized system, remarkable research has been devoted to the identification of information problems that generate economic inefficiency and hence loss of welfare (Pablo Revilla, 2021). One of the most known works in this direction is Akerlof's, and the fact that information asymmetry distorts markets won Akerlof, Stiglitz, and Spence the 2001 Nobel Memorial Prize in Economic Science. This phenomenon called information asymmetry is that one human agent has more information than the other when human beings interact to make decisions. When one human agent is set to manipulatea decision to its advantage, the agent can signal a misleading information. Though, the agent can screen for information to diminish the influence of asymmetric information decisions (Marwalaand Hurwitz, 2017). Yakoub Salhi (2021) asserted that information asymmetry occurs when an imbalance of 8 knowledge exists

between two parties, such as a buyer and a seller, a regulator and an operator, and an employer and an employee. Madhav V. Rajan and Richard E. Saouma (2005) advanced to describe that the extent of the information asymmetry is often an endogenous construct as it's influenced by the owner's choice of internal accounting systems and the manager's investment in acquiring local expertise. Jie Miao et al. (2021) examined the far-reaching effects of commodity deterioration and information asymmetry on strategic inventories for supply chains, especially a two-period supply chain and claimed that the changes in decision thresholds between the retailer and the manufacturer are not synchronous as a result of information asymmetry. Machiel Mulder (2021) addressed that consumers and producers often don't have the same information in the retail energy market which results in so-called information asymmetry. Fevziye Kalipci Cagiran et al. (2021) considered information asymmetry can exist between the managers and the investors because the managers have more information about the current situation and the future perspectives of the companies than the investors. Imeda Tsindelian and Irina E. Mikheeva (2021) identified the prospects and main directions for improving Russian legislation on the protection of the rights of consumers of financial services taking into account the specifics of information asymmetry in banking. At this point, information asymmetry can be recognized as unfair behavior. Fateef Agbetunde et al. (2018) thought information asymmetry is a perception issue on the part of external users of financial information after studying environmental accounting and information asymmetry in developing economy with special focus on companies listed on Nigeria Stock Exchange. Kung-Cheng Ho and Yujing Gong (2021) examined the impact of information asymmetry on capital structure decisions in China and found that firms with higher IRs (information rates) have fewer debt issuances and lower leverage. Furthermore, Sébastien Michel Lemeunier (2020). raised an issue about the information asymmetry problem of actively managed mutual funds. Examining whether pre-announcement insider trading significantly resolves or intensifies information asymmetry in the Korean emerging stock market, Doojin Ryu et al. (2021) stated that insider trading increases post-announcement information asymmetry or adverse selection costs. Similiarly, because the stock market is relatively difficult for individual investors to obtain information, there exist information asymmetry, and the stock may have abnormal returns (Yung-Shun Tsai et al., 2021). Xiaoqi Zhang et al. (2021) suggested that the information asymmetry can explain the supply of micro health insurance programes lagging behind demand even if it is an important channel for financing health expenditure for low-income people. The results show that adverse selection exists widely for a variety of disease types and that moral hazard is only significant for chronic diseases. Assessing the relevance of decreasing information asymmetry on life and non-life insurance consumption, Simplicity Asongu (2021) provided information sharing offices, namely public credit registries and private credit bureaus. Hence, Jianfeng Hu (2018) also promoted option listing to increase informed and uninformed trading to reduce relative information risks. Srinivasan Balakrishnan and Mitchell P. Koza (1993) proposed that intermediate forms of organization like joint-ventures are superior to markets and hierarchies when the costs of valuing complementary assets are non-trivial due to information asymmetry. However, despite

fire insurance losses from systematic unexpected losses due to information asymmetry, there is an upper bound estimate because some portion of this cost may be due to failure to operate efficiently rather than incomplete information (Donald Vitaliano, 2021). Like insurance and other markets, the modern labour market is imperfect and characterized information asymmetry even though numerous ways of dealing with the issue of information asymmetry have been developed (Claire Holleran, 2021). There is no doubt that the relation between employee mistreatment and information asymmetry exactly exists (Omer Unsal, 2021). As to internet fraud on online shopping, the relationship between information asymmetry and online shopping behaviors as well as the effect of fraud results in a fall in customer trust (Theophilus Fiifi Ocansey, 2021).

Interestingly, outsourcing remanufacturing (Yujie Zhau et al., 2021), Wikipedia article for initial public offering firms (Thomas Jason Boulton et al., 2021), and transfer students (David Reeping & David B. Knight, 2021) are affected by information asymmetry. Jiyoon Lee (2021) even claimed that information asymmetry caused mispricing on security issuance and its effects are stronger on equity issuance than debt issuance.

2.2 Adverse Selection

As to the problem of adverse selection, one party to a transaction knows things pertaining to the transaction that are relevant to but unknown by the second party. A classic example is life insurance, where the insurer may know things about the state of their health that are unknown by the insurer (David M. Kreps, 2020). Andrea Attar et al. (2021) provided a new characterization of competitive allocations under adverse selection, based on the standard premise that a perfectly competitive market should be immune to entry. To this end, there was little structure imposed on the buyers' preference in a general adverse-selection economy. Accordingly, Evan Saltzman (2021) considered that adverse selection in insurance markets may lead some consumers to underinsure or too few consumers to purchase insurance relative to the socially optimal level. Michelle S. Keller et al. (2020) examined the probability of being enrolled in the lowest-deductible plan among commercially insured patients after adverse selection in medical insurance is well documented. Ka Chun Cheung et al. (2019) followed the seminal works in economics to use the principal—agent models to study a monopolistic reinsurance market with adverse selection to make the risk assessment of each insurer by his value-at-risk at his own chosen risk tolerance level consistent with Solvency II. Jacob T. Bradt et al. (2021) stated that flood-related events are the most damaging natural hazard in the United States, yet many households at risk do not have flood insurance. That is because the National Flood Insurance Program failing to utilize full information on flood risk leads to adverse selection in the program. Heski Bar-Isaac et al. (2021) explored how the structure of asymmetric information impacts on economic outcomes in Akerlof's Lemons model applied to the labour market and extended to admit a matching component between worker and firm, which characterized the nature of equilibrium and defined measures of adverse selection and sufficiency. Likely, Xiaodong Fan and Jed Devaro (2020) constructed a model of employer learning (both symmetric and asymmetric) about worker ability from job histories which are

derived to detect asymmetry learning empirically and revealed that job hopping is associated with lower wages for college graduates, controlling for measured ability, labor market experience, and current job tenure. Accordingly, Daniel Aurelie et al. (2021) suggested that the widespread referrals raised questions regarding how they affect labor market outcomes and found that employers often hire via referrals, which in turn mitigates adverse selection and elevates wages. Seyed Mohammadreza Davoodalhosseini (2020) proposed a model of over-the-counter markets. Some assets buyers are informed in that they can identify high-quality assets. Sellers with private information choose what type of buyers they want to trade with. Adverse selection with heterogeneously informed agents might lead to large drops in liquidity, price, trading volume and welfare, like a financial crisis. Christopher House (2020) examined the relationship between financial market imperfections and economic instability and presented a model in which financial accelerator effects come from adverse selection in credit markets. Furthermore, Shamokin Li and Toni M. Whited (2014) investigated how adverse selection in the used capital market generates procyclical sales of used capital—capital reallocation and revealed that adverse selection produces a resale discount for used capital. Also, Brian Chang (2017) developed a tractable model with two—dimensional asymmetric information in asset markets: sellers are privately informed about their asset quality and distress positions and found illiquidity arises endogenously due to adverse selection. Inkee Jang and Kee-Youn Kang (2021) advanced to explore an asset exchange model with adverse selection and costly information acquisition incentives. That is because a seller of an asset knows the true value of the asset, while a buyer can obtain information about the asset ‘s quality at a cost. Stephen Morris and Hyun Song Shin even illustrated the corrosive effect of small amounts of adverse selection in an asset market and showed how it can lead to the total breakdown of trade. Apparently, adverse selection played an important role and caused the problem of “toxic asset” in the financial crisis. Benjamin Lester et al. (2018) incorporated a search—theoretic model of imperfect competition into a standard model of asymmetric information with u restricted contracts and showed that the relationship between an agent’s type, the quantity he trades, and the price he pays is jointly determined by the severity of adverse selection and the connection of market power, meaning that quantifying the effects of adverse selection requires controlling for market structure.

2.3 Moral Hazard

As to the concept of moral, Donald Brunnqell and Christopher M. Michaelson (2016) stated that moral hazard is a term familiar in economics and business ethics that illuminates why rational parties sometimes choose decisions with bad moral outcomes without necessarily intending to behave selfishly or immorally. Likely, Norovsambuu Tumennasan (2014) asserted that economists perceive moral hazard as an undesirable problem because it undermines efficiency.

However, Mccaffrey proposed that there is a long-standing controversy over the moral hazard implications though moral hazard is a well-known economic concept. The language economists used to describe moral hazard is often value-laden and implies moral judgments about the persons or actions of economic agents Therefore, the history of moral hazard in health insurance shows that this concept is

different from how moral hazard is understood in economics outside of health (Michael Grignon et al., 2018). Once insured, person might have little reason, financially speaking, to be careful if he will get fully reimbursed for his losses should things go wrong, if he does not risk an increase in his insurance premium fees (Will Braynen, 2013). Furthermore, over comsumpt of health care identified the link between public trust and moral hazard experienced by the patient with regard to health care consumption (Katarzyna Krot & Iga Rudawska, 2021). John A. Nyman et al. (2017) stimulated the portion of moral hazard that is due to the income transfer contained in the coinsurance price reduction. After examining whether the voluntary deductible in the Dutch health insurance system reduces moral hazard or acts only as a cost reduction tool for low-risk individuals, Rob J. M. Alessie et al. (2020) confirmed that the voluntary deductible reduces moral hazard.

Besides insurance industries, moral hazard also brings an outsized shock to the financial system of a country especially to the banking sector (Mohammad Mobarak Hossain and Aftab Uddin Mahmud Chowdhury, 2015)

In order words, the concentration of risk within financial system is considered to be a source of systemic instability. By issuing financial claims to other institutions, relatively risky institutions endogenous become large and interconnected. The structure enables institutions to share the risk of systemic crisis in a privately optimal way, but channels funds to relatively risky investments and creates incentives even for smaller institutions to take excessive risks (Levent Altinoglu and Joseph E. Stiglitz, 2020). In the emerging FinTech industry, Xueru Chen et al. (2020) found that inexperienced individual investors are the main players in the market and they are suffering from frequent moral hazard exposure events such as platforms absconding. Pornsit Jiraporn (2018) investigated how deposit insurance and capital adequacy affect bank risk and found full coverage of deposit insurance induces moral hazard by bank. Accordingly, Josephat Lotto (2018) proposed that capital adequacy does not only strengthen financial stability by providing a larger capital cushion but also improves bank operating efficiency by preventing a moral hazard problem between shareholders and debt - holders. Jose Augusto Castillo et al. (2021) proposed the effect of moral hazard on short term credit (working capital) to small and medium—sized enterprises and found an empirical analysis result in an index measuring the impact of moral hazard on odds ratio mainly based on underinvestment moral hazard category. Bo Yang et al. (2021) investigated the impact of managerial moral hazard on the debt overhang of a firm and found the costs of debt overhang become more serious in the presence of managerial moral hazard. Hence, Christian Hott (2021) analyzed the effectiveness of different capital regulations in mitigating the effects of moral hazard that exists only for systemically important banks and promoted risk adjusted requirements to mitigate moral hazard.

2.4 Summary

In reality, information asymmetry, adverse selection, and moral hazard are mutual casual, interacting each other in cycles. Therefore, it's not difficult to find the simultaneous existence of the three in various industries and markets. For instance, Yu-Lin Wang et al. (2020) proposed that banks xan

overcome the problem of adverse selection and moral hazard when there's an information asymmetry in competitive credit markets, by designing credit contracts with inversely related interest rates and collateral. The results suggested that governance loan guarantees should target high-risk entrepreneurs, to reduce a pledge of collateral in credit contracts, drop social cost, and increase economic welfare. With recent a few years have witnessed the rapid expansion of the peer-to-peer lending marketplace, Xinyuan Wei et al. (2020) found that investors are at the disadvantage of information asymmetry, which is a key issue in this marketplace that is unavoidable and can lead to moral hazard or adverse selection. By applying the proposed model, the risk-averse investors could apply a higher penalty factor to lower the risk of losing principal at the cost of the loss of some potential investment opportunities accordingly to their own risk preferences. Besides, Pengcheng Xiang et al. (2018) argued that each individual participant in construction projects is driven to achieve maximum benefit, which can result in improper behavior with respect to each other because each participant has their own interests, by virtue of proprietary information advantage. The risk of this resulting in moral hazard and adverse selection based on information asymmetry is called behavioral risk among construction participants. Shuto Miyashita et al. (2020) focused on the principal - agent relationship between knowledge producers and knowledge consumers as a factor that impedes the creation of intellectual property, and discussed adverse selection and moral hazards caused you information asymmetry between knowledge producers and knowledge consumers and how to deal with them. Facing the COVID-19 pandemic, a medical disaster duplicated in many countries, Gaofeng Yin et al. (2021) draw from bank run theory to analyze the causes and consequences of the COVID-19 run on Wuhan's medical resources and recommend policy changes and government actions to attenuate runs on medical resources in the future, reflecting high level hospitals siphoning-off patients from lower level health providers(bank moral hazard and adverse selection problem). David Mhlanga (2021) discovered that artificial Intelligence and machine learning have a strong impact on credit risk assessments using alternative data sources such as public data to deal with the problems of information asymmetry, adverse selection, and moral hazard in banking and finance in emerging markets ,which recommended that financial institutions such as banks and credit lending institutions invest more in artificial Intelligence and machine learning to ensure that financially excluded households can obtain credit.

3. Research Method

This article adopts the document analysis method, combined with quantitative and qualitative research. Document analysis is a form of qualitative research in which documents are interpreted by the researchers to give voices and meaning around an assessment topic (Bowen, 2009). Analyzing documents incorporates coding content into theme similar to how focus groups or interview transcripts areanalyzed. A rubric can abused used to grade or score document.

O'Leary (2014) recommended that there be three primary types of documents, including public records, personal documents, and physical evidences.

Bowen explained that document analysis is a social research and is an important research tool in its own right, and is an invaluable part of most schemes of triangulation, the combination of methodologies in the study of the same phenomenon. In other words, document analysis requires that data be examined and interpreted to elicit meaning, gain understanding and develop empirical knowledge. That means document analysis is often used in combination with other qualitative research methods as a means of triangulation. In order to seek convergence and corroboration, qualitative researchers are usually expected to draw up multiple sources of evidence through using different data sources and methods. By examining information collected through different methods, researchers can corroborate findings across data sets and thus reduce the impact of potential biases that can exist in a single study. Document analysis is included in the mixed-method studies which combine quantitative and qualitative research techniques.

There is a question of how many documents the researcher should gather. A researcher can use a huge plethora of texts for research, although by far the most common is likely to be the use of written documents. Bowen suggests that a wide array of documents is better. Furthermore, although Bowen adds that documents should be assessed for their completeness; in other words, how selective or comprehensive their data is, of paramount importance when evaluating documents is not to consider the data as "necessarily precise, accurate, or complete recordings of events that ever occurred. "The attempt is to avoid the issue of bias in the author of the document and a second major issue of "unwitting" evidence, or latent content, of the document.

Therefore, Bowen put emphasis on content analysis which is used as a "first-step review "that can provide the researcher a means of identifying meaningful and relevant passage. In additional to content analysis, Bowen also notes thematic analysis, which can be considered a form of pattern recognition with the document's data.

Bowen sums up the overall concept of document analysis as a process of "evaluating documents in such a way that empirical knowledge is produced and understanding is developed. "It's not just a process of lining up collection of excerpts that convey whatever the researcher desires. The researcher must maintain a high level of objectivity and sensitivity in order for the document analysis results to be credible and valid.

It is confirmed that there are many reasons why the article chooses to use document analysis. Firstly document analysis is an efficient and effective way of gathering data. That is because obtaining and analyzing documents is often more cost efficient and time efficient than conducting your own research or experiments. Also, documents are stable, "non-reactive "data sources, meaning that they can be read and reviewed multiple times and remain unchanged by the researcher's influence or research process.

Furthermore, document analysis can be used in many different fields of research, as either a primary method of data collection or as compliment to other methods. In one word, document analysis can also point to questions that need to be asked or to situations that need to be observed, making the use of document analysis a way to ensure researches is critical and comprehensive. It is not denied that no

research methods perfect, and document analysis is never exceptional. As long as we begin document analysis knowing what the method entails and have a clear process planned, the advantages of document analysis are likely to far outweigh the amount of issues that may arise.

4. Discussion and Result

4.1 Adverse Selection

In 2005, when the dual-card storm broke out, the data showed that the highest revolving interest rate of domestic public banks was lower than that of private banks, but the number of valid cards of private banks was higher than that of public banks (Table 1). This apparent violation of the law of market demand shows empirically that Taiwan's cash card market does indeed have adverse selection of information asymmetry. However, with the introduction of the debt negotiation mechanism in 2005 and the passage of the Consumer Debt Clearance Regulations in 2007, it showed that the competent authority would

Table 1. The Highest Revolving Rates and Valid Cards from Public and Private

Financial Institution	2005 年		2019 年	
	Highest Revolving Rate	Number of Valid Cards	Highest Revolving Rate	Number of Valid Cards
Public Bank				
Bank Of Taiwan	10.80%	119,195	11.34%	115,335
LANDBANK OF TAIWAN	17.99%	56,004	14.77%	164,477
Private Banks				
CTBC BANK	20.00%	3,468,784	15.00%	4,564,963
Cathay United Bank	19.70%	1,934,320	15.00%	4,768,252
Taishin International Bank	20.00%	1,791,487	15.00%	3,587,137
Taipei Fubon Bank	20.00%	1,396,633	14.97%	1,959,466
UNION BANK OF TAIWAN	19.71%	1,023,095	15.00%	1,188,716
Bank SinoPac	19.97%	870,821	15.00%	1,084,985
FarEastern Int'l Bank	19.97%	730,955	14.99%	1,010,287
Shin Kong Bank	20.00%	403,587	15.00%	490,032
Mega International Commercial Bank	19.71%	324,415	15.00%	550,123
First Commercial Bank	17.82%	320,373	15.00%	739,161
HUA NAN BANK	20.00%	251,042	15.00%	800,724
The Shanghai Commercial & Savings Bank	19.71%	221,860	15.00%	218,907
Standard Chartered	20.00%	202,796	14.98%	260,023
Yuanta Commercial Bank	19.71%	131,496	15.00%	731,080
American Express	20.00%	71,603	15.00%	118,630
CHB	18.25%	69,109	15.00%	221,184
Taiwan Business Bank	19.24%	102,813	15.00%	122,748
Basic Lending Rate	4.12%		2.61%	

Recourse: Financial Supervisory Commission.

intervene in the market and would no longer allow the cash card market to have high revolving interest rates. Under unprofitable circumstances, many public and private banks have withdrawn from the cash card market, making the number of effective cards in the overall cash card market decrease year by year. It seemed that the phenomenon of adverse selection in cash cards got improved gradually. In other words, did this change in trend indicate a slowdown in the phenomenon of adverse selection? It needed to advance study and analysis.

Further analysis, even in 2019, the highest revolving interest rate of public banks was still lower than that of private banks, but its market share of valid cards was less than1%. On the contrary, private banks had high revolving interest rates, but they had most of the market share, and eventually even reached 99%, accounting for almost all markets (Table2). Obviously, this kind of low interest rate and low market share, or high interest rate and high market share coexist combined with, indicated that the phenomenon of adverse selection that violated the law of market demand still existed in the domestic cash card market, especially in private banks at least.

Table 2. Market Shares of Issued Cards from Public and Private Banks

Year	Number of Valid Cards of Public Banks	Number of Valid Cards of Private Banks	Private Share
2004	445,226	24,143,378	98.19%
2005	491,874	24,085,669	98.00%
2006	401,764	20,004,589	98.03%
2007	373,386	19,391,592	98.11%
2008	362,058	19,093,184	98.14%
2009	360,062	18,467,604	98.09%
2010	379,197	19,148,533	98.06%
2011	375,081	20,384,480	98.19%
2012	393,981	21,103,935	98.17%
2013	393,683	22,170,740	98.26%
2014	410,189	23,955,766	98.32%
2015	468,776	24,888,540	98.15%
2016	522,650	26,501,176	98.07%
2017	554,753	27,479,957	98.02%
2018	600,497	28,973,491	97.97%

Recourse: Financial Supervisory Commission.

4.2 Moral Hazard

Studies have shown that private banks with high revolving interest rates have more valid cards than state-owned banks, such as Cathay Pacific Commercial Bank, China Trust Commercial Bank, etc., but their overdue ratio is also higher than that of state-owned banks (Taiwan Land Bank, Kaohsiung Bank and Central Trust Bureau). When the high revolving interest rate also derives a high overdue ratio, it is

true that the moral hazard caused by the asymmetry of empirical information does exist in the domestic cash card market.

As mentioned above, since the intervention of the financial authority in 2005, regardless of assisting in promoting the debt negotiation machine or assisting in passing the consumer debt liquidation regulations, the cash card overdue ratio of domestic banks has indeed gradually declined, showing the phenomenon of moral hazard in the cash card market has been improved initially (Table3).

Table 3. The Highest Revolving Rates and Overdue Ratios from Public and Private Banks

Financial Institution	Revolving Rate(%)	Overdue Ratio(%)														
	2019	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Public Bank																
Central Trust of China	*	0.57	0.87	1.02	*	*	*	*	*	*	*	*	*	*	*	*
Bank Of Taiwan	11.34	0.56	1.97	3.35	0.19	0.75	0.5	0.3	0.41	0.44	0.47	0.23	0.3	0.48	0.28	0.31
LANDBANK OF TAIWAN	14.77	4.47	2.49	2.02	0.3	0.97	0.71	0.79	0.94	0.97	0.69	0.57	0.28	0.45	0.34	0.26
TCB Bank	15	3.68	2.27	2.14	1.57	1.15	1.1	0.75	0.64	0.62	0.64	0.7	0.31	0.19	0.26	0.19
Private Banks																
First Commercial Bank	15	1.38	2.62	1.59	0	0.52	0.1	0.19	0.13	0.13	0.16	0.2	0.16	0.18	0.18	0.16
HUA NAN BANK	15	2.52	2.86	2.88	0.01	0.34	0.58	0.39	0.05	0.1	0.09	0.04	0.04	0.06	0.04	0.07
CHB	15	2.8	1.8	1.94	0.36	0.38	0.21	0.18	0.14	0.19	0.27	0.21	0.34	0.14	0.19	0.16
The Shanghai Commercial & Savings Bank	15	1.93	2.45	1.12	0	1.15	0.66	0.49	0.54	0.52	0.61	0.57	0.57	0.73	0.59	0.51
Taipei Fubon Bank	14.97	0.3	2.73	1.09	0	0.89	0.49	0.14	0.08	0.1	0	0.19	0.17	0.14	0.11	0.1
Cathay United Bank	15	1.26	2.69	2.01	0	1.24	0.36	0.19	0.14	0.17	0	0.13	0.13	0.12	0.13	0.15
Bank Of Kaohsiung	14.97	0.4	1.02	0.05	0.2	0.46	0.12	0	0.01	0	0.17	0.23	0.33	0.65	0.32	0.25
CITIBANK TAIWAN	15	2.25	1.68	1.72	0	1.79	0.93	0.67	0.62	0.66	0.16	0.61	0.66	0.67	0.57	0.66
Taiwan Business Bank	15	3.95	2.12	2.39	0.59	0.79	0.69	0.31	0.41	0.26	0.03	0.24	0.07	0.15	0.14	0.13
Standard Chartered	14.98	0.85	1.93	2.15	0.04	1.03	0.6	0.34	0.34	0.72	0	0.47	0.5	0.4	0.41	0.27
TAICHUNG BANK	14.98	3.63	1.94	1.61	0	0.74	0.54	0.72	0.66	1.42	0	1.46	1.44	1.59	1.07	0.63
HWATAI Bank	15	2.1	0.04	0.76	0.89	0.09	0.17	0.53	0.21	0.25	0.12	0.75	0.45	1.12	0.83	0.23
Shin Kong Bank	15	1.38	2.75	2.48	0.22	1.94	1.11	0.36	0.22	0.25	0	0.16	0.2	0.26	0.25	0.23
UNION BANK OF TAIWAN	15	3.84	2.95	2.72	0	2.82	1.82	0.65	0.27	0.36	0	0.27	0.31	0.36	0.29	0.27
Far Eastern Int'l Bank	14.99	2.29	1.14	2.52	0.1	1.7	1.47	0.48	0.22	0.4	0.1	0.27	0.29	0.36	0.24	0.3
E SUN Bank	15	0.98	1.53	2.02	0.32	1.66	1.44	0.36	0.23	0.22	0	0.23	0.23	0.26	0.24	0.23
KGI Bank	15	2.86	1.1	0.88	2.73	2.02	1.42	0.75	0.87	1.12	0.68	1.32	1.52	0.97	0.77	0.63
Taishin International Bank	15	1.49	2.82	2.98	0.16	2.59	0.76	0.41	0.28	0.29	0	0.23	0.25	0.23	0.2	0.17
Yuanta Commercial Bank	15	2.09	2.87	2.95	0	0.06	0	0	0.04	0.38	0	0.27	0.15	0.12	0.07	0.08
Jih Sun International Bank	14.99	3.68	1.72	3.83	0	2.41	1.14	0.51	0.34	0.4	0	0.37	0.18	0.25	0.33	0.25
CTBC BANK	15	1.97	2.47	2.81	0.01	1.23	0.81	0.53	0.29	0.23	0	0.15	0.15	0.16	0.13	0.11
Total		2	2.44	2.72	0.17	1.59	0.96	0.45	0.31	0.32	0.04	0.27	0.27	0.27	0.23	0.22

Recourse: Financial Supervisory Commission.

However, the asymmetry of information in the cash card market has improved across the board as late as 2010.Because even though private banks with high revolving interest rates still have more cards in circulation than state-owned banks with low revolving interest rates, the overdue ratio of cash cards produced a major turning point in 2010. Not only did the overdue ratio continue to decline, more importantly, the decline in the overdue ratio of private banks was even lower than that of state-owned banks. It shows that the market price mechanism is re-operating in the domestic cash card market, which invariably declares that the asymmetry of domestic cash card information has been greatly improved.

5. Conclusion and Recommendation

5.1 Conclusion

The study found that the effective number of cards issued by the overall cash card has decreased year by year after the dual-card storm broke out. Among them, private banks with a higher number of issuing cards include Wantai Bank, China Trust Commercial Bank, Taishin International Commercial Bank, Cathay United Bank, and Yushan Bank. Compared with public banks such as Land Bank, Kaohsiung Bank, and Central Trust, the number of cards issued by public banks is significantly lower than that of private banks, but the effective interest rate is relatively low. When borrowers tend to apply for cards in private banks with high interest rates, while staying away from public banks with lower interest rates, all this shows the phenomenon of adverse selection under information asymmetry.

The empirical results show that Taiwan's cash card market is not an exception to the financial market. In fact, the results show that Taiwan's cash card market is not an exception to the financial market. Adverse selection and moral hazards under the information asymmetry have led to a dual-card storm, which also caused economic problems and serious social problems. Public economics says that because the market fails to prevent the price mechanism from operating normally, the government will inevitably need to intervene in the market. Especially in the face of strong public opinion pressure, the competent

authority may eventually have to act as an active manager of the financial market. In 2005, the Association of Banks proposed a self-disciplined debt negotiation mechanism. In 2007, the financial authority led to pass the debt liquidation regulations. In 2015, the highest revolving interest rate was drastically lowered to 15% through amendments. All that eventually caused Taiwan's information asymmetry concrete improvements.

It can be seen from this that in the face of information asymmetry, the competent authority's intervention in the market is not only duty-bound, but the empirical results also confirm that the competent authority has indeed achieved specific results after its intervention in the market, which all highlights the important position of the competent authority in effective financial institution management.

5.2 Recommendation

Theoretically, financial institutions absorb surplus funds in the market through indirect financing, and then supply funds to those who need funds through investment or lending to achieve the purpose of financing market funds; however, when information asymmetry occurs and the demand for funds that accept high interest rates gradually rises, and even adverse selection and moral hazards arise, the rate of bank bad debts or overpayment increasing. What is worrying is that, with no shortage of funds, the differential pricing adopted in response to adverse selection and moral hazard often becomes a tool for some financial institutions to capture higher profits. In other words, financial intermediaries, which were originally intended to reduce the information asymmetry between the supply and demand sides of

direct financial funds, have instead become the source of information asymmetry, which is obviously not the favorite of the competent authorities.

Therefore, when financial intermediaries no longer help the improvement of information asymmetry in the financial market, and even become a source of worsening information asymmetry, the financial authority must of course be duty-bound and must effectively manage financial institutions to reduce information asymmetry. Otherwise, if the information asymmetry in the cash card market continues to deteriorate, it will not only trigger a card debt storm, endanger the development of the financial market, and even cause serious social problems, the competent authority may no longer have an excuse to shirk its responsibilities.

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